U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

SANTA CRUZ QUADRANGLE
CALIFORNIA - SANTA CRUZ COUNTY
7.5-MINUTE SERIES

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 10S

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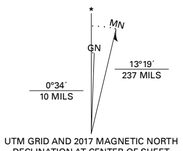
Imagery	NAIP,	June 2016 - October 2016
Roads	U.S. Census Bureau,	2016
Names	GNIS,	1981 - 2018
Hydrography	National Hydrography Dataset,	2005 - 2018
Contours	National Elevation Dataset,	1999
Boundaries	Multiple sources; see metadata file	2016 - 2017
Public Land Survey System	BLM,	2018
Wetlands	FWS National Wetlands Inventory	1981 - 1993



UTM GRID AND 2017 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
EF
Grid Zone Designation
10S

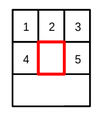
SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18

QUADRANGLE LOCATION



ADJOINING QUADRANGLES

1 Davenport
2 Felton
3 Laurel
4 Santa Cruz OE W
5 Soquel

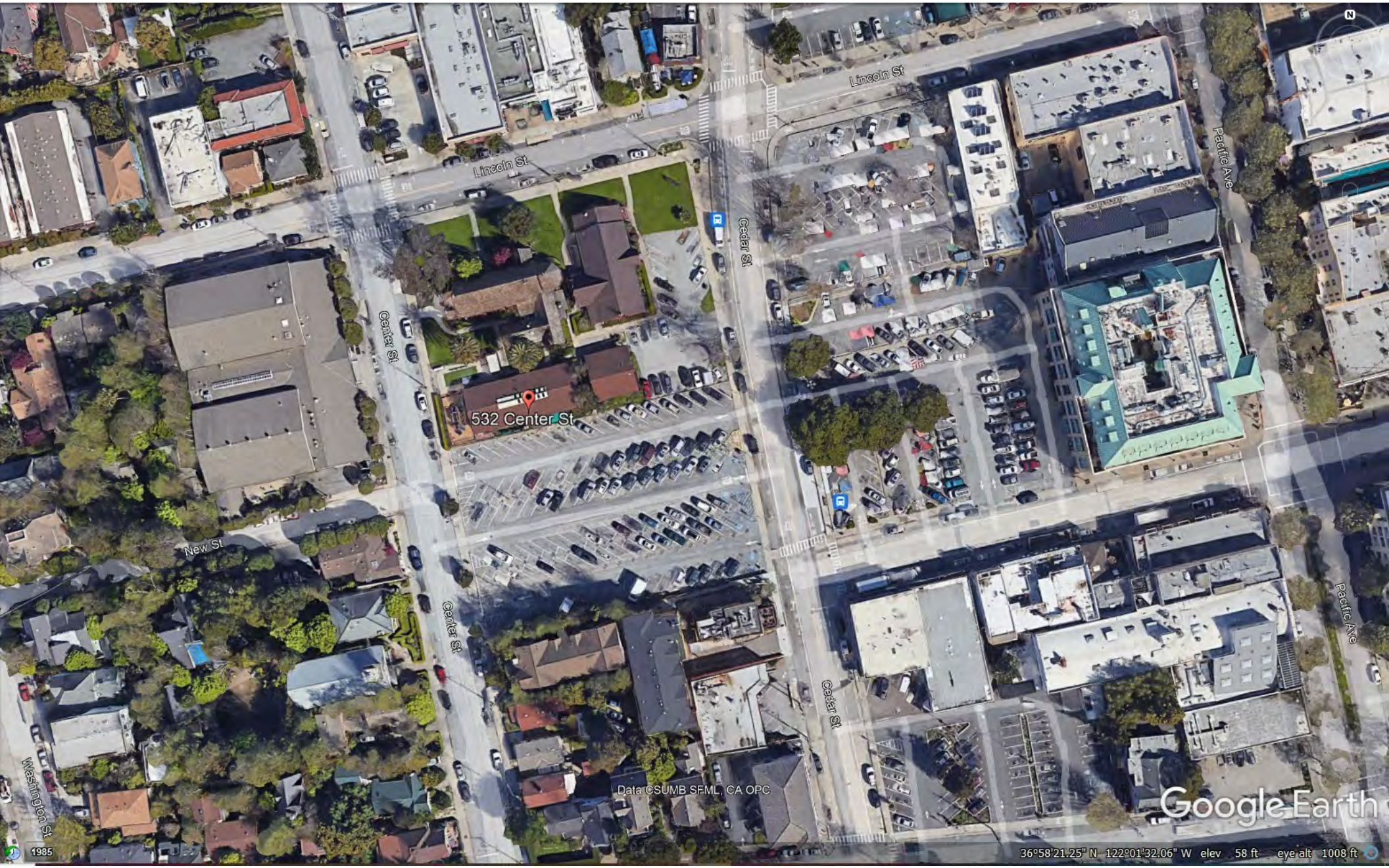
ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD

Interstate Route · US Route · State Route

SANTA CRUZ, CA
2018

NSN 7643016357679
NGA REF NO. USGSX24K339967


Lincoln St
Lincoln St
Pacific Ave
Cedar St
Center St
532 Center St
New St
Center St
Cedar St
Pacific Ave
Washington St
Data CSUMB SFML, CA OPC
Google Earth
1985
36°58'21.25" N 122°01'32.06" W elev 58 ft eye alt 1008 ft

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

ALAMEDA
COLUSA
CONTRA COSTA
DEL NORTE
HUMBOLDT
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLATA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
1400 Valley House Drive, Suite 210
Rohnert Park, California 94928-3609
Tel: 707.588.8455
nwic@sonoma.edu
http://nwic.sonoma.edu

November 16, 2021 NWIC File No.: 21-0714

Roy Hastings
R.L. Hastings & Associates, LLC
P.O. Box 552
Placerville, CA 95667

Re: Record search results for the proposed Cedar Street Family Apartments.

Dear Mr. Roy Hastings:

Per your request received by our office on the 8th of November, 2021, a rapid response records search was conducted for the above referenced project by reviewing pertinent Northwest Information Center (NWIC) base maps that reference cultural resources records and reports, historic-period maps, and literature for Santa Cruz County. An Area of Potential Effects (APE) map was provided depicting the Cedar Street Family Apartments project area and will be used to conduct this records search. Please note that use of the term cultural resources includes both archaeological resources and historical buildings and/or structures.

As per information provided to this office, the proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California (APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18). The site is currently a parking lot. The project will consist of 64 affordable units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east. The APE is the project and an approximately one-block radius around the project site. As per updated information provided to this office on the 16th of November, 2021, the APE is just the facing structures around the site on all sides.

Review of this information indicates that there has been no cultural resource studies that cover the Cedar Street Family Apartments project area. This Cedar Street Family Apartments project area contains no recorded archaeological resources. The State Office of Historic Preservation Built Environment Resources Directory (OHP BERD), which includes listings of the California Register of Historical Resources, California State Historical Landmarks, California State Points of Historical Interest, and the National Register of Historic Places, lists two recorded buildings or structures that face the proposed Cedar Street Family Apartments project area. At 532 Center Street, is the Calvary Episcopal Church (OTIS # 416954) listed with a 7R, meaning this resource was Identified in a Reconnaissance Level Survey or in an Area of Potential Effect

(APE), but not evaluated. In addition, at 516 Center Street, is an unnamed building, circa 1930 (OTIS # 478663) listed with a 1D, meaning it is a Contributor to a multi-component resource like a district listed in the National Register (NR) by the Keeper, and a 2D, meaning this resource is a contributor to a multi-component resource determined eligible for the NR by the Keeper. Also listed in the California Register (CR). In addition to these inventories, the NWIC base maps show no recorded buildings or structures within the proposed Cedar Street Family Apartments project area, and one recorded historic district located adjacent to the project area, P-44-000939, the Santa Cruz Downtown Historic District.

At the time of Euroamerican contact, the Native Americans that lived in the area were speakers of the Awaswas language, part of the Costanona/Ohlone language family (Levy 1978:485). There are no Native American resources in or adjacent to the proposed Cedar Street Family Apartments project area referenced in the ethnographic literature (Levy 1978:485, Levy 1976).

Based on an evaluation of the environmental setting and features associated with known sites, Native American resources in this part of Santa Cruz County have been found in areas marginal to Monterey Bay and Santa Cruz Harbor, and inland near intermittent and perennial watercourses, and near areas populated by oak, buckeye, manzanita, and pine, as well as near a variety of plant and animal resources. The Cedar Street Family Apartments project area is located in the town of Santa Cruz in an urban area approximately 0.6 miles north of Santa Cruz Harbor of Monterey Bay and approximately 0.2 miles west of San Lorenzo River. Current aerial maps indicate a paved parking lot adjacent to two streets, rows of trees, and two buildings. Given the similarity of these environmental factors, there is a moderate potential for unrecorded Native American resources to be within the proposed Cedar Street Family Apartments project area.

Review of historical literature and maps indicated historic-period activity within the Cedar Street Family Apartments project area. Early Sanborn Fire Insurance Maps of the City of Santa Cruz indicated the project area formerly contained between two and six buildings and/or structures (1886, 1892, 1905, 1928). With this in mind, there is a moderate to high potential for unrecorded historic-period archaeological resources to be within the proposed Cedar Street Family Apartments project area.

The 1952 photo revised 1987 Santa Cruz USGS 7.5-minute topographic quadrangle depicts an urban area, indicating the possibility of multiple buildings or structures within the APE of the Cedar Street Family Apartments project area. If present, these unrecorded buildings or structures may meet the Office of Historic Preservation's minimum age standard that buildings, structures, and objects 45 years or older may be of historical value.

RECOMMENDATIONS:

1) There is a moderate potential for Native American archaeological resources and a moderate to high potential for historic-period archaeological resources to be within the project area. We recommend a qualified archaeologist conduct further archival and field study to identify cultural resources. Field study may include, but is not limited to, pedestrian survey, hand auger sampling, shovel test units, or geoarchaeological analyses as well as other common methods used to identify the presence of archaeological resources. Please refer to the list of consultants who meet the Secretary of Interior's Standards at http://www.chrisinfo.org.

2) Our research indicates that there are two buildings or structures within the APE of the Cedar Street Family Apartments project area included in the OHP BERD; 532 Center Street, the Calvary Episcopal Church (OTIS # 416954), and 516 Center Street, an unnamed building, circa 1930 (OTIS # 478663). In addition, the APE contains one recorded historic district, P-44-000939, the Santa Cruz Downtown Historic District, and possibly other unrecorded resources that may meet the Office of Historic Preservation's minimum age standard that buildings, structures, and objects 45 years or older may be of historical value. Therefore, it is recommended that the agency responsible for Section 106 compliance consult with the Office of Historic Preservation regarding potential impacts to these buildings or structures:

Project Review and Compliance Unit
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816
(916) 445-7000

3) Review for possible historic-period buildings or structures has included only those sources listed in the attached bibliography and should not be considered comprehensive.

4) We recommend the lead agency contact the local Native American tribes regarding traditional, cultural, and religious heritage values. For a complete listing of tribes in the vicinity of the project, please contact the Native American Heritage Commission at (916)373-3710.

5) If archaeological resources are encountered **during construction,** work should be temporarily halted in the vicinity of the discovered materials and workers should avoid altering the materials and their context until a qualified professional archaeologist has evaluated the situation and provided appropriate recommendations. Project personnel should not collect cultural resources. Native American resources include chert or obsidian flakes, projectile points, mortars, and pestles; and dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials. Historic-period resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits or bottle dumps, often located in old wells or privies.

6) It is recommended that any identified cultural resources be recorded on DPR 523 historic resource recordation forms, available online from the Office of Historic Preservation's website: https://ohp.parks.ca.gov/?page_id=28351

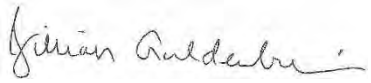
Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the California Historical Resources Information System (CHRIS) Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain

information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law.

Thank you for using our services. Please contact this office if you have any questions, (707) 588-8455.

Sincerely,



Jillian Guldenbrein
Researcher

LITERATURE REVIEWED

In addition to archaeological maps and site records on file at the Northwest Information Center of the Historical Resource File System, the following literature was reviewed:

Chase, John
1979 *The Sidewalk Companion to Santa Cruz Architecture*. Revised Edition. Paper Vision Press, Santa Cruz.

City Planning Department, Santa Cruz, California
1974 *Historic Preservation Plan, Santa Cruz, California.* City Planning Department, Santa Cruz, CA.

Department of Planning and Community Development, City of Santa Cruz
1989 *Santa Cruz Historic Building Survey – Vol. II.*

General Land Office
1874 Survey Plat for Township 11 South/Range 2 West.

Levy, Richard
1978 Costanoan. In *California*, edited by Robert F. Heizer, pp. 485-495. Handbook of North American Indians, vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Page, Charles Hall
1976 *Santa Cruz Historic Building Survey.* Moore's Graphic Art Service, Santa Cruz, CA.

Page, Charles Hall
1976 *Santa Cruz Renovation Manual, A Homeowner's Handbook.* Charles Hall Page & Associates, Inc. Santa Cruz, CA.

Sanborn Fire Insurance Maps
1886, 1892, 1905, 1928 Santa Cruz

State of California Department of Parks and Recreation
1976 *California Inventory of Historic Resources*. State of California Department of Parks and Recreation, Sacramento.

State of California Department of Parks and Recreation and Office of Historic Preservation
1988 *Five Views: An Ethnic Sites Survey for California*. State of California Department of Parks and Recreation and Office of Historic Preservation, Sacramento.

State of California Office of Historic Preservation **
2020 *Built Environment Resources Directory*. Listing by City (through March 3, 2020). State of California Office of Historic Preservation, Sacramento.

**Note that the Office of Historic Preservation's *Historic Properties Directory* includes National Register, State Registered Landmarks, California Points of Historical Interest, and the California Register of Historical Resources as well as Certified Local Government surveys that have undergone Section 106 review.

Cultural Resources Study

CEDAR STREET FAMILY APARTMENTS
ASSESSOR'S PARCEL NUMBERS 005-148-21 AND 005-148-22
AND PORTIONS OF 005-148-17 AND 005-148-18,
532 CENTER STREET, SANTA CRUZ,
SANTA CRUZ COUNTY, CALIFORNIA 95060

JANUARY 2022

Prepared for:
R. L. Hastings & Associates, LLC
P.O. Box 552
Placerville, CA 95667

Prepared by:
Historic Resource Associates
3142 Bird Rock Road
Pebble Beach, CA 93953

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ATTACHMENTS

DPR 523 Site Records
NWIC Record Search

Abstract

The project is being conducted under the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) and its implementing regulations found at 36 CFR Part 800 regarding the proposed Cedar Street Family Apartments, identified as Assessor's Parcel Numbers (APNs) 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18 and located at 532 Center Street, Santa Cruz, Santa Cruz County, California. The subject property is depicted on the 7.5' United States Geological Survey (USGS) *Santa Cruz, California* Topographic Quadrangle Map in Section 13 of Township 11 South, Range 2 West, Section 13, MDBM (Figure 1). The proposed 65-unit affordable housing project will be built on 2 full parcels and 2 partial parcels totaling approximately 0.77 acres. The site is currently a parking lot (Figure 2). The project area of potential effect (APE) has been determined to be a one block radius surrounding the project site.

On November 16, 2021, a record search (NWIC File # 21-0714) was conducted by staff at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) in Rohnert Park, California. According to the NWIC database, there have been no cultural resource studies that cover the project area, and the project site contains no recorded archaeological resources. The State Historic Preservation Office (SHPO) Built Environment Resources Directory (BERD) lists two recorded buildings or structures facing the proposed project site and within the APE. One of the buildings is the Calvary Episcopal Church (OTIS #416954), located at 532 Center Street and listed as 7R, meaning that the property was identified in a reconnaissance level survey, but was not formally evaluated for the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR). The second building is a 1930 building (OTIS #478663), located at 516 Center Street and listed as a 1D, meaning it is a contributor to a multi-component historic district listed in the NRHP by the Keeper. The Santa Cruz Downtown Historic District lies approximately 1 block to the east of the project site. Review of historic maps, such as Sanborn Fire Insurance Maps, indicate that the project site once included two to six buildings or structures dating from 1886-1928 (Figure 3). Taking into consideration the age of the former buildings or structures on the subject property, there is a relatively high potential for historic-period subsurface archaeological deposits in the project footprint.

On December 26, 2021, a pedestrian survey was carried out within the project APE. Photographs were taken of the project footprint, the Calvary Episcopal Church, and surrounding buildings and landscape features. The Calvary Episcopal Church was formally recorded on California Department of Parks and Recreation (DPR) forms and evaluated for listing on the NRHP for this federally funded project.

Introduction and Project Description

This cultural resources study was completed by Dana E. Supernowicz, M.A., RPA in accordance with state guidelines (California State Historic Preservation Office). The Principal Investigator meets and/or exceeds the qualifications described in the Secretary of the Interior's Professional Guidelines (Federal Register 48:190:44738-44739) (United States Department of the Interior 1983). Background research was conducted at the Northwest Information Center (NWIC), utilizing the California Historical Resources Information System (CHRIS); the California State Library, Sacramento; and the archives of Historic Resource Associates. The project is being conducted under the National

Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) regarding the Cedar Street Family Apartments affordable housing project. The project site is located in the community of Santa Cruz near the historic downtown, and is illustrated on the USGS 7.5-minute, *Santa Cruz, California* quadrangle map within Section 11 of Township 11 South, Range 1 West (Figure 1).

The proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres. The site is currently a parking lot (Figure 2). The project will consist of 64 affordable rental units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east. The project APE has been determined to be a one block radius surrounding the project site.

Subject Property

The subject parcel is developed with a paved asphalt level parking lot, at one time developed with several homes as delineated on Sanborn Fire Insurance Maps (Figures 4-8). The project site or parking lot abuts the Calvary Episcopal Church to the north; the Progressive Missionary Baptist Church, several older residences converted to commercial use, and the Girls and Boys Club of Santa Cruz to the west; an apartment building to the south; remodeled commercial buildings, a late nineteenth century residence converted to commercial use, and Jack's Restaurant or Diner to the north; and a large paved asphalt parking lot that abuts commercial buildings of various ages along Pacific Avenue to the east.

Environmental Setting

According to the United States Geological Survey (USGS) 7.5' *Santa Cruz, California* Topographic Quadrangle Map, the project site is located at an elevation of approximately 13' above mean sea level (amsl). The project site is level and lacks any vegetation.

Archaeology

The coastal region stretching from Santa Cruz to San Francisco has been the subject of numerous archaeological surveys and excavations since the early 1900s. The earliest of these investigations reflected an amateur archaeological approach, which included collecting museum specimens for display purposes or for private collections. In general, these studies were extremely limited in scope and provided little understanding of prehistoric culture of the Central Coast. Beginning in the late 1960s, academic research by students at San Francisco State University (and later San Jose State University) expanded the number of recorded archaeological sites along the coasts of San Mateo and Santa Cruz counties.

While much of this research was limited to site recording and limited sampling, a few important studies provided valuable information for the development of a regional chronology and an integrated understanding of prehistoric life (Roop 1976; Hylkema 1991). Hylkema's 1991 thesis was particularity important, as it not only provided the first integrated examination of prehistoric adaptations along the San Mateo-Santa Cruz coast, but it also provided the basis for comparisons of local economies with those of surrounding areas, including the San Francisco Bay, Monterey Bay and inland valleys (Environmental Science Associates 2001). Finally, studies driven by the requirements of the National Historic Preservation Act (NHPA) and California Environmental Quality Act (CEQA) since the 1970s have provided important data towards our understanding of the area's prehistory (Jones and Hildebrandt 1990; Fitzgerald and Ruby 1997; Environmental Science Associates 2001).

Archaeological and ethnographic studies indicate that the North Coast was possibly occupied from as early as the 10,000 years ago. The earliest evidence for occupation of the region comes from a site located in the Santa Cruz Mountains near Scotts Valley. This deeply buried site has been dated to 8000 BC and is the only evidence of what archaeologists refer to as the Paleo Indian period (Cartier 1993), a designation that subsumes all occupations dating earlier than 5000 BC. Progressively rising sea levels documented for this period may have obliterated additional evidence for occupation of the coast during this time. As with the climate, sea levels appear to have stabilized to current conditions by 5000 years ago (Environmental Science Associates 2001).

Evidence of habitation along the coast proper comes later, during the Lower Archaic period (3000-5000 BC), and from a site at Sand Hill Bluff (Jones and Hildebrandt 1990). This locale appears to have been occupied over a span of 5000 years, beginning about 6000 years ago. Habitation of both the coastal and interior regions in and surrounding Sand Hill Bluff is evidenced in numerous sites dating to the Middle Archaic (3000 - 1000 BC) and Upper Archaic (1000 BC - AD 1000). The latest prehistoric occupation appears to have occurred during what is known as the Emergent Period (AD 1000 - 1800), as evidenced at a site located at Davenport Landing (Fitzgerald and Ruby 1997) and at a site about 5 miles inland in the Santa Cruz Mountains (Hylkema 1991; Environmental Science Associates 2001).

Ethnography

Beginning immediately south of the Carquinez Strait, and continuing southward to Big Sur, was a region once occupied by the Costanoan peoples. Aboriginal groups of the San Francisco and Monterey Bay area came to be known collectively as Costanoan, a word derived from the Spanish word Costaños meaning 'coast people' (Levy 1977). The term Costanoan refers to a linguistic family consisting of eight languages: Karkin was spoken in a single tribelet on the southern edge of the Carquinez Strait; Chochenyo or East Bay Costanoan was spoken among the tribelets occupying the east shore of San Francisco Bay between Richmond and Mission San Jose, as well as the Livermore Valley; Tamyen or Santa Clara Costanoan was spoken around the south end of San Francisco Bay and in the lower Santa Clara Valley; Ramaytush or San Francisco Costanoan was spoken in San Mateo and San Francisco counties; Awaswas or Santa Cruz Costanoan was spoken among the people living along the ocean shore between Davenport and Aptos in Santa Cruz County; Mutsun was spoken among the tribelets of the Pajaro River drainage; Rumsen speakers occupied the lower Carmel, Sur, and lower Salinas rivers; and Chalon or Soledad was spoken on the Salinas River (Ibid).

Most of what we know about native inhabitants of the region has been pieced together from the Spanish exploring expeditions, ethnographic accounts in the 1920s and 1930s, and archaeological research. The Costanoan territory was occupied by approximately 50 separate and politically autonomous tribelets, each one occupying one or more permanent village sites and consisting of 50 to 500 persons. The Costanoans encountered by the Spanish were hunter-gatherers who managed their resources to ensure a sustained livelihood. They lived in sedentary communities in domed structures covered with thatched roofs, and relied for subsistence on nuts and seeds from various trees and plants, local fauna, and fish, particularly salmon, from the rivers and Pacific Ocean. Materials crafted by the Costanoans and used in subsistence activities included baskets, mortars, pestles, nets, net sinkers, anchors, and a variety of chipped stone tools.

Trade with the surrounding Plains Miwok, Sierra Miwok and Yokuts allowed nonindigenous materials and food (i.e. piñon nuts) to be brought into the area as well. In exchange, the Costanoan are thought to have exported bows, salt, and salmon to neighboring groups (Levy 1977). Economic reciprocity, in addition to intermarriage, is thought to have linked settlements together, some of which, by Spanish accounts, indicate stable and prosperous villages with as many as 200 people (Milliken 1993). Overall population density along this part of the coast was, nevertheless, very sparse.

For the first human inhabitants living along the Santa Cruz County coastline, there was a variety of natural resources that were available. Plants bearing edible seeds and/or leafy greens are known to have been used throughout the year, as revealed by plant remains from archaeological sites. In the spring, lupine was harvested for its edible green leaves, while chia provided seeds. During the late spring and summer, a variety of seed-bearing plants were gathered, including tarweed, goosefoot and elderberry. Soaproot was particularly important as it was used for food (edible root), fish poison, soap, and brushes (Fitzgerald and Ruby, 1997). Numerous species of trees and shrubs were also a source of nuts and berries, including baynut, hazelnut, and tan oak, all of which were harvested in the fall (Ibid). Buckeye, California bay laurel and coast live oaks were also considered to have been economically important (Hylkema 1991).

Acorns and grass seeds constituted a significant proportion of the native diet. Ethnographic accounts indicate that the natives sought to increase seed production of coast grasslands through intentional burning. Rediscovered as "prescribed burning" in modern times, this prehistoric practice also served to increase forage and attract large mammals, such as black tailed deer, which were regularly hunted (Jones and Hildebrandt 1990). Other animals in the aboriginal larder came from the coastal scrubland, oak woodlands and forests of the area, habitats for terrestrial mammals, reptiles, fish, and amphibians. Modern and historic use of the region has altered somewhat the ecology of the Central Coast, and reconstruction of prehistoric conditions is, at least partly, by inference. Species known to have been important to native peoples include a wide variety of small to medium mammals, including the jackrabbit, cottontail rabbit, kangaroo rat, ground squirrel, and badger.

Offshore vegetal resources such as kelp, seaweed and sea palm are known to have been exploited prehistorically. Native peoples collected these plants on-shore and roasted them for immediate consumption or dried and stored them for future use (Jones and Hildebrandt 1990). Shell refuse from an extensive menu of mussels, barnacles, limpets, chitons, abalone and clams are commonly found in

coastal archaeological sites. Studies have identified more than two hundred resident species of birds in the region but, perhaps more importantly, the cold and nutrient-rich waters immediately offshore lie astride the Pacific migratory waterfowl flyway Avifaunal remains from archaeological sites on the Santa Cruz coast indicate that waterbirds, such as canvasback duck, common merganser and blue winged teal were part of the prehistoric diet (Dietz et al. 1988). Migratory marine mammals known historically on the Central Coast were probably present prehistorically, and no doubt harbor seals, northern elephant seals, and sea lions were sources of protein and fat. These species were attracted by the same fish exploited by humans: Pacific mackerel, night smelt, white croaker, righteyed and lefteyed flounder and anchovy (Jones and Hildebrandt 1990).

The Rumsen were reportedly the first of the Costanoan peoples to be encountered by Spanish exploring expeditions in 1602 and between 1769 and 1776 (Levy 1977). Between 1770 and 1797, seven missions were established within Costanoan territory (Ibid). During the mission period, 1770-1835, significant changes occurred for the Costanoan people. The population was recruited into nearby missions and their traditional subsistence economy was replaced by an agricultural one. Analyses of mission baptismal records demonstrate that the last Costanoan tribelets living a traditional existence had disappeared by 1810 (Cook 1943; Levy 1977). The population declined from 10,000 in 1770 to less than 2,000 in 1832, due to the introduction of European diseases and falling birth rates. The mission culture that had absorbed and to some degree supported the Costanoans was short-lived. The secularization or abandonment of the missions by the Mexican government in 1832 caused the Costanoan to relocate to different areas and establish small settlements, fragmenting the survivors and separating them farther away from their cultural heritage. It is believed that the Costanoan languages were probably extinct by 1935 (Levy 1977).

History

The diverse range of natural resources in Santa Cruz County played an important role in settlement patterns during prehistoric, ethnographic, and historic times. In 1774 Father Francisco Palou accompanied an expedition to San Francisco Bay and beyond. Father Palou recommended the banks of the San Lorenzo River for the establishment of a mission. On September 25, 1791, Mission Santa Cruz was completed (Verardo and Verardo 1987:13). During the mid-1790s the Mission expanded and by 1831 mission lands contained over 8,000 head of cattle, creating a large trade in hides and tallow. The mission also included a large number of Native American neophytes, many of whom would remain in the Mission system throughout their adult lives (Verardo and Verardo 1987:14).

In 1832 the Mission system was secularized, and the Indians of the Mission were given Spanish surnames and goods were distributed among them. In the meantime, American interest in California and the Santa Cruz area had grown. During the 1840s settlement increased along the northern California coastline, including exploratory incursions by notable individuals, such as John Charles Freemont in 1846 (Verardo and Verardo 1987:19). Fremont enlisted American volunteers and formed a small battalion, which included Americans living in the Santa Cruz area. Fremont's brief incursion against Mexico, known as the Bear Flag Revolt, ended with the treaty of Guadalupe-Hidalgo in 1848, wherein Alta California became a territory of the United States.

With the discovery of gold at Coloma in January 1848, came a wave of new immigration to California and the Santa Cruz area. Tanneries sprang up along the coast, utilizing tan oak bark, which meant stripping the bark from the trees. Other industries included grist mills, saw mills, and small agriculture. In 1851, the first lime kiln was established in Santa Cruz County (Verardo and Verardo 1987:23). Another important industry that developed in the county was the production of "giant powder." In December 1861, the California Powder Works were established. The company was the first on the coast to produce nitro-cotton or smokeless powder for cannon. A great deal of the powder during the 1860s was shipped to the Central Pacific Railroad during its construction over the Sierra Nevada Mountains (Verardo and Verardo 1987:25). In 1876 the South Pacific Railroad, a narrow-gauge, ran between Felton and Santa Cruz. In 1879, direct service was extended from Santa Cruz to San Jose, Oakland, and the East Bay. By 1883, a line was extended through the Pajaro Valley (Ibid).

By the turn of the century, much of the natural wealth of Santa Cruz County had been exploited or was in jeopardy, including the vast stands of coastal redwood (*sequoia sempervirens*) that surrounded the community. Fortunately, through the efforts of Andrew P. Hill, a noted San Jose photographer, a tract of land north of Santa Cruz was set aside in 1904 as California's first state park. Originally known as Redwood State Park, the name of the state park was changed in the 1920s to Big Basin Redwoods State Park. Like other coastal communities in Santa Cruz County, Soquel, Aptos, and Santa Cruz would evolve during the first few decades of the twentieth century into resort communities. Assisted by better transportation systems, visitors from the Bay Area and Santa Clara Valley routinely came to the Santa Cruz coast for leisure and entertainment.

The historic context of the proposed project is tied to development of the Calvary Episcopal Church, which occupies a rectangular-shaped parcel immediately north of the project site. The church was built in 1864 and completed in 1865. The Carpenter Gothic Revival church is flanked to the east by the Parish Hall and to the south by classrooms that reportedly date to the 1950s. In the far east end of the property is a paved parking lot and to the south is a much larger parking lot.

The following history of the church was recounted by Eliza Boston in 1900, annotated in the Parish Register 1903 and transcribed by Carol Walker, parish archivist, in September 2014:

> The first service of the Protestant Episcopal Church was held in Santa Cruz, on Sunday May 11th 1862 by Rev. Dr. Ver Mehr. The second service was held on Sunday May 10th 1863 by Rev. C.B. Wyatt, Rector of Trinity Church, San Francisco. The Rev. C.F. Loop, a Missionary appointed by the Board of Missions Domestic, New York City, arrived in Santa Cruz and began regular services in the Court house, July 5th 1863. On Easter Monday [March 28th] 1864 Calvary Parish was formally organized and the Rev. C.F. Loop was elected Rector. On St. Peter's Day June 29th 1864 the corner stone of the Church Edifice was laid by the Rector assisted by the Rev. D.D. Chapin, of San José, and the Rev. Mr. Easton of San Mateo. The first service was held in the new Church Edifice [unfinished] on January 8th 1865. On Sunday October 27th 1867 the debt of $675 having been paid, the Church was solemnly consecrated to the worship and Service of Almighty God, by the Rt. Rev. Wm. I. Kip D.D. Bishop of California, assisted by the Rector and the Rev. A.L. Brewer of San Mateo. On September 4th 1868

> the Rector Rev. C.F. Loop sent his resignation to the Vestry of Calvary Church, which was accepted and also notified the Standing Committee, the Bishop being absent from the Diocese. During its first 100 years, Calvary Church continued to grow and reach out, not only to the city of Santa Cruz, but also to Episcopalians in the surrounding area. The clergy and laity of Calvary were largely responsible for creating and sustaining missionary work in the surrounding areas of Santa Cruz County, especially in helping to establish the present Episcopal churches at Ben Lomond, Aptos and Scotts Valley. In 2015, Calvary Church celebrated the 150th Anniversary of the first service held at the church with the play Lincoln's Eulogy written by parishioner Dana Bagshaw. This play told the story of how Calvary was involved in the Santa Cruz community in response to the death of President Abraham Lincoln. While parishioners prepared for the first service at Calvary Church to be held Easter Sunday, April 16, 1865, the news arrived that President Lincoln had been assassinated. The floral decorations were removed, and emblems of mourning were hung in the chancel. On April 19, the then-rector Rev. Loop held a special service in honor of the slain president. Accounts in the church records say he was a personal friend of Abraham Lincoln, and his address to the congregation was so eloquent that the City Fathers of Santa Cruz asked him to repeat it publicly the following week. Calvary's involvement in the community began here, at its inception (Calvary Episcopal Church Website 2021).

The above history provided by Eliza Boston in 1900, wife of Joseph Boston, who reportedly donated the land for the church, appears to be consistent with period newspaper accounts as described below. The earliest known photograph of the church appears to have been taken in 1866-1867. Historic newspapers indicate that Eliza Boston's husband, Joseph Boston, an avocational architect, designed the church, based upon a love for Anglican churches found in England.

According to an article that appeared in the *Santa Cruz Weekly Sentinel* on June 23, 1866, the site for the church, rectory, and school was donated by Mrs. Joseph Boston and the "church edifice" was erected. In the following year, according to the *Santa Cruz Weekly Sentinel* in November 1867:

> Calvary Church, Santa Cruz, which was consecrated by Bishop Kipp, on the 27th of October, is a beautiful and substantial edifice of wood, built upon a firm foundation of brick. The style is Gothic of the early English period. The plan is for nave, chancel, tower, porch and vestry-room. The tower is to be built hereafter on the north side. The interior dimensions of the nave are 64 feet by 25, with open timbered roof; the height from the floor to the apex is 37 feet. A wainscot, four feet high, surmounted by a heavy moulding runs round both nave and chancel. The sections of the roof divide the nave into four bays of sixteen feet each. The sides between the posts are plastered and painted a delicate tint of ochre; each bay having a window nine feet in length. The chancel, separated from the nave by a lofty gothic arch, is apsidal in form, 21 x 20 feet in depth; the walls are pierced by six lancet windows filled with rich colored glass, containing the principal Christian emblems. The west gable has a beautiful clustered window of three lights, headed by a trefoil three feet in diameter, soon to be filled with glass of exquisite design and workmanship, from the establishment of Henry Sharp, New York who has furnished the windows for the whole church. The altar is placed

> against the east wall under the central light, which contains the emblem of the Great Sacrifice – the cross of cavalry and the crown of thorns. At the right is the Bishop's chair, ornamented by elaborate carvings of black walnut. The chancel rail is upon the chard of the apse, outside of which are the stalls and lectern. A very beautiful Baptismal Font of Nova Scotia stone, made by Fishure & Bird, N.Y., stands outside the chancel arch, at the north side. The floor of the chancel is covered with Brussels carpet of ecclesiastical pattern. On entering the west door, the effect of the interior of this building is not only very pleasing but imposing. We feel that it is a fitting place to offer the sacrifice of prayer and praise, and worthy of being consecrated to the service of God. The whole cost of the building, including the windows, was about seven thousand dollars. By a recent effort on the part of the Rector, Rev. C.F. Loop, and his parishioners, the remaining debt of six hundred and seventy-five ($675) dollars, was paid. The lot upon which the church is built, containing over an acre, was the gift of Mrs. Joseph Boston (Santa Cruz Weekly Sentinel, November 16, 1867).

During the 1870s, prior to his death, Joseph Boston, his wife, and family were living on Mission Street in Santa Cruz (*Santa Cruz Weekly Sentinel*, October 24, 1874). Based upon a newspaper article published on July 1, 1893 in the *Santa Cruz Surf* newspaper for Parish Day, the cornerstone for the church was laid on June 29, 1864, and the first rector was Rev. C.F. Loop.

In 1914, the church celebrated its Golden Jubilee with a Souvenir edition of the church history published in the parish paper known as the Ivy Leaf. From the late-nineteenth century through the first half of the twentieth century, the importance of the church to citizens of Santa Cruz is well documented in local newspapers.

Prior Cultural Resource Surveys

On November 16, 2021, a record search (NWIC File # 21-0714) was conducted by staff at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) in Rohnert Park, California. According to the NWIC database, there have been no cultural resource studies that encompass the project area, and the project site contains no recorded archaeological resources. The State Historic Preservation Office (SHPO) Built Environment Resources Directory (BERD) lists two recorded buildings or structures facing the proposed project site and within the APE. One of the buildings is the Calvary Episcopal Church (OTIS #416954), located at 532 Center Street and listed as 7R, meaning that the property was identified in a reconnaissance level survey, but was not formally evaluated for the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR). The second building is a 1930 building (OTIS #478663), located at 516 Center Street and listed as a 1D, meaning it is a contributor to a multi-component historic district listed in the NRHP by the Keeper. The Santa Cruz Downtown Historic District lies approximately 1 block to the east of the project site. Review of historic maps, such as Sanborn Fire Insurance Maps, indicate that the project site once included two to six buildings or structures dating from 1886-1928 (Figure 3). Taking into consideration the age of the former buildings or structures on the subject property, there is a relatively high potential for historic-period subsurface archaeological deposits in the project footprint.

Known Archaeological and Historical Sites

According to NWIC records, there were no prehistoric archaeological or historical archaeological sites identified in the project footprint.

Tribal Consultation

On December 30, 2021, the Native American Heritage Commission (NAHC) responded to a record search request by R.L. Hastings & Associates, LLC. The NAHC submitted the following contacts: Valentin Lopez, Chairperson, Amah Mutson Tribal Band; Irene Zwierlein, Chairperson, Amah Mutson Tribal Band of Mission San Juan Bautista; Patrick Orozoo, Chairman, Costanoan Ohlone Rumsen-Mutsen Tribe; Kanyon Savers-Roods, Indian Canyon Mutsun Band of Costanoan; Ann Marie Savers, Chairperson, Indian Canyon Mutsun Band of Costanoan; Monica Areilano, Vice Chairwoman, Muwekma Ohlone Indian Tribe of SF Bay Area; De Dee Manzanares Ybarra, Chairperson, Ohlone/Costanoan; and Kenneth Woodrow, Chairperson, Wuksache Indian Tribe/Eshom Valley Band.

National/State Register Files

There were no built environment properties identified within the project footprint. The nearest National or State Registered historic property is a 1930 building (OTIS #478663), located at 516 Center Street and listed as a 1D, meaning it is a contributor to a multi-component historic district listed in the NRHP by the Keeper. The Santa Cruz Downtown Historic District lies approximately 1 block to the east of the project site.

Historic Map and Aerial Photograph Review

A review of historic topographic quadrangle maps from 1954-2021, aerial photographs from 1950-2021, and Sanborn Fire Insurance Map from 1886-1950, indicate the evolution of the project site and the Calvary Episcopal Church. In 1886, the project site was developed with an "L" shaped church at the corner of Center and Lincoln Streets with two single-family residences to the east bordering Cedar Street, which at the time was no more than an alley. By 1892, little had changed, with the exception of the front double-gable entryway leading into the church having been built and a privy placed south of the church, where the school or classrooms were later constructed. Between 1892 and 1928, the Parish Hall was built east of the church in a similar configuration as it is today, with the exception of an addition to the north. In addition, between 1892 and 1928, classrooms were constructed to the south of the church and Parish Hall, along with a residence southwest of the classrooms fronting Center Street and a shed or garage in the rear of the parcel fronting Cedar Street. In 1950, the revised Sanborn Fire Insurance Map depicts the property much the same as it was in 1928. During the 1950s, aerial photographs illustrate the expansion of the church with a cross-gable wing projecting west from the south wing of the church, expansion of the school or classrooms to the south, and, as previously noted, enlargement to the north of the Parish Hall. The residence to the southwest on the parcel was demolished, as was the shed or garage in the rear of the parcel, both of which appear to lie along the northern edge of the current parking lot.

Archaeological and Historical Sensitivity

The precontact sensitivity of the project has been determined to be low, taking into account past disturbances to the project footprint, such as grading, compaction, and former soils displacement. Historical archaeological features, however, are likely to be present in the project footprint associated with former residential houses dating to the late-nineteenth century.

Pedestrian Survey

A pedestrian survey of the project area was completed by Dana E. Supernowicz, M.A., RPA on December 26, 2021. The surface reconnaissance focused on assessing and photographing the general surface conditions found within the project area. The proposed impact area's archaeological potential was evaluated based on several factors, including proximity to recorded sites, creeks, rivers, and wetlands; the presence of early historic development; as well as disturbances, such as grading, fill slopes, and cutting. Ground surfaces within the entire project site are covered with asphalt paving.

Conclusion and Recommendations

Following a pedestrian survey of the project footprint, walking 1-5 meter transects, no prehistoric archaeological or historical archaeological sites were identified within the project footprint. The probability of discovering subsurface archaeological sites is low. No additional cultural resource study is recommended for the proposed project.

The property was assessed using the National Register of Historic Places (NRHP) Criteria for Evaluation, described as the quality of significance in American history, architecture, archaeology, and culture found in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association, and meets one of the following criteria:

Criterion A: Are associated with events that have made a significant contribution to the broad patterns of our history; or

Criterion B: Are associated with the lives of persons significant in our past; or

Criterion C: Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

National Register criteria considerations (36 CFR §60.4) Consideration A: A religious property according to National Register guidelines, "requires additional justification (for nomination) because of the necessity to avoid any appearance of judgement by government about the merit of any religion or belief." However, religious properties may qualify if they are integral parts of districts that do meet the criteria or if they fall within the following category - "a religious property deriving primary significance from architectural or artistic distinction or historical importance."

The Calvary Episcopal Church remained an important part of the secular and social history of Santa Cruz through the 1930s. Thus, the period of significance for the property extends from its completion in 1865 to 1940, because improvement made during this period contribute to the history of the church. Therefore, despite the addition of the double-gable entrance in the front of the church after 1886 and prior to 1892, thus eliminating the main entrance along Lincoln Street to a side entrance, and the cross-gable addition on the south end of the church after 1950, the church retains adequate integrity to convey its historic significance. This is apparent in the post-1950 addition, due to the care taken to construct the addition using materials and a design sympathetic to the original church, without entirely duplicating historic fabric on the original, giving a false sense of history. The Parish Hall and the School or Classrooms, however, appear to have undergone the most dramatic alterations since they were constructed and consequently the integrity of both buildings has been compromised.

In applying NRHP Criterion A, the church represents one of the oldest secular institutions in Santa Cruz, and its significance to the community since its construction in the 1860s is well documented. Therefore, the church appears to be eligible for the NRHP under Criterion A, being the oldest surviving such structure in Santa Cruz. Under Criterion B, no documentation has been found to suggest the church is associated with a person or persons of significance in history of Santa Cruz, despite the fact the church may have been designed by Joseph Boston, whose wife donated the land on which the church is located today. The construction of the church appears to have been a community effort with donations from various individuals living in Santa Cruz during the 1860s. Under NRHP Criteria C, the church building is the oldest surviving structure of its type in Santa Cruz, retains adequate integrity to convey its historic appearance, and is an important example of Carpenter Gothic architecture. Similarly, the church appears to be eligible under National Register Criterion Consideration A, deriving primary significance from "architectural or artistic distinction or historical importance." The parish hall and school or classrooms do not appear to be eligible for the NRHP under any of the criteria, due to numerous additions and alterations post-1940.

In regards to potential effects, because the historic church is setback to the north from the proposed project and screened in part by a non-contributing part of the church, namely the school or classrooms, the project will not diminish the characteristics that make the church potentially eligible for the NRHP, such as its architecture and function serving the greater Santa Cruz area.

In the event that a concentration of artifacts or culturally modified soil deposits (including trash pits older than 50 years) should be encountered at any time during ground disturbing activities, all work must stop until a qualified archaeologist views the finds and makes a preliminary evaluation. If warranted, further archaeological work in the discovery area should be performed. Although unlikely, if human remains are encountered, all work must stop in the immediate vicinity of the discovery until the County Coroner and a qualified archaeologist evaluate the remains.

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FIGURES

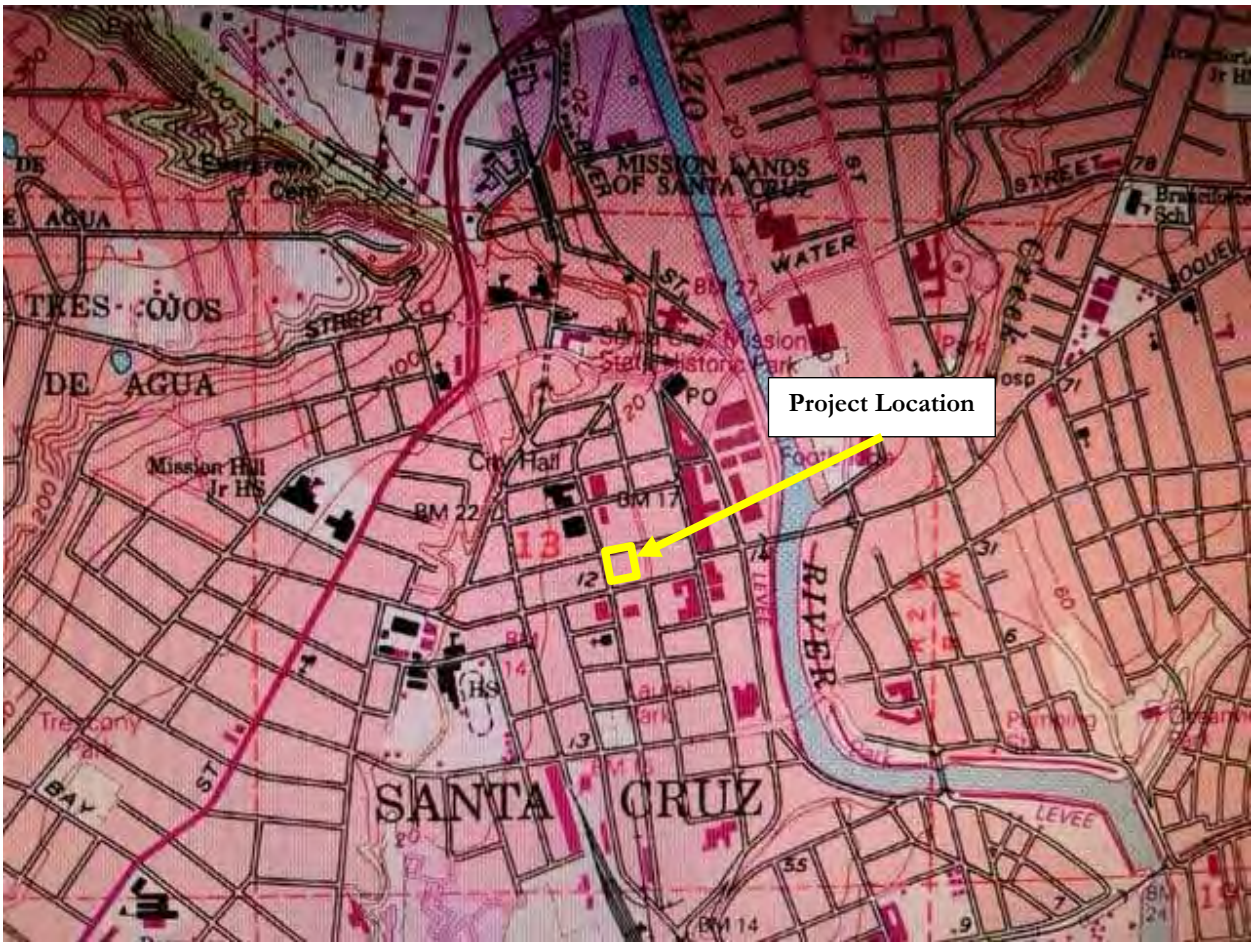


Figure 1: Project Location Map
(USGS 7.5' *Santa Cruz, CA* Topographic Map 1954).

Figure 2: Project Aerial Vicinity Map (Google Earth 2021).

Figure 3: Project Aerial Location and Historic Properties Map (Google Earth 2021).

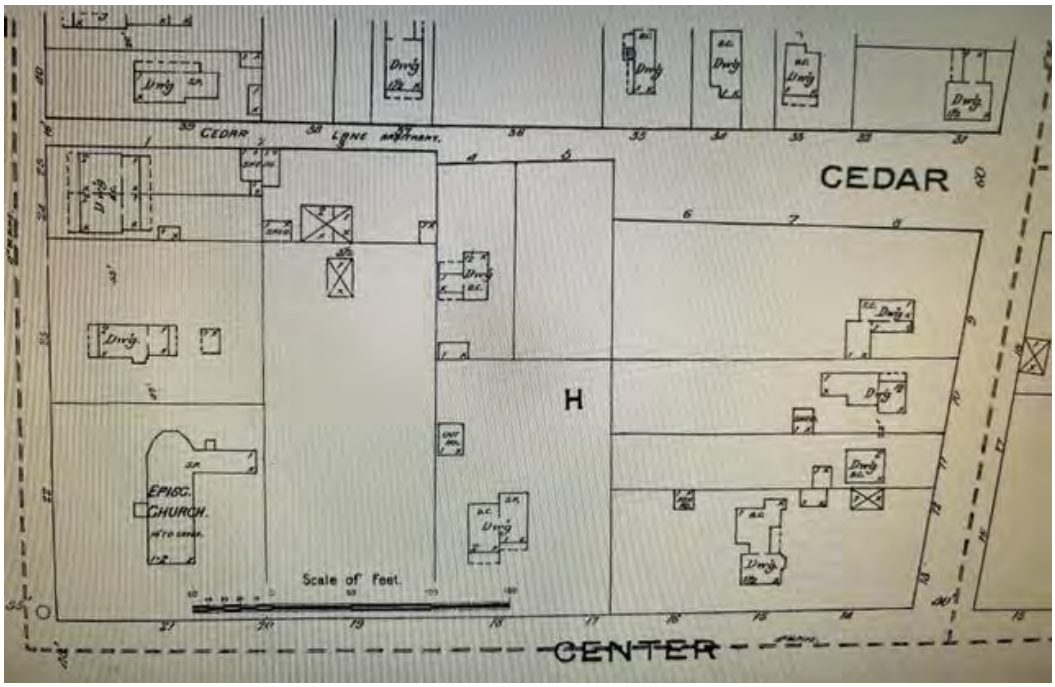


Figure 4: Sanborn Fire Insurance Map.
(Santa Cruz, CA 1886)

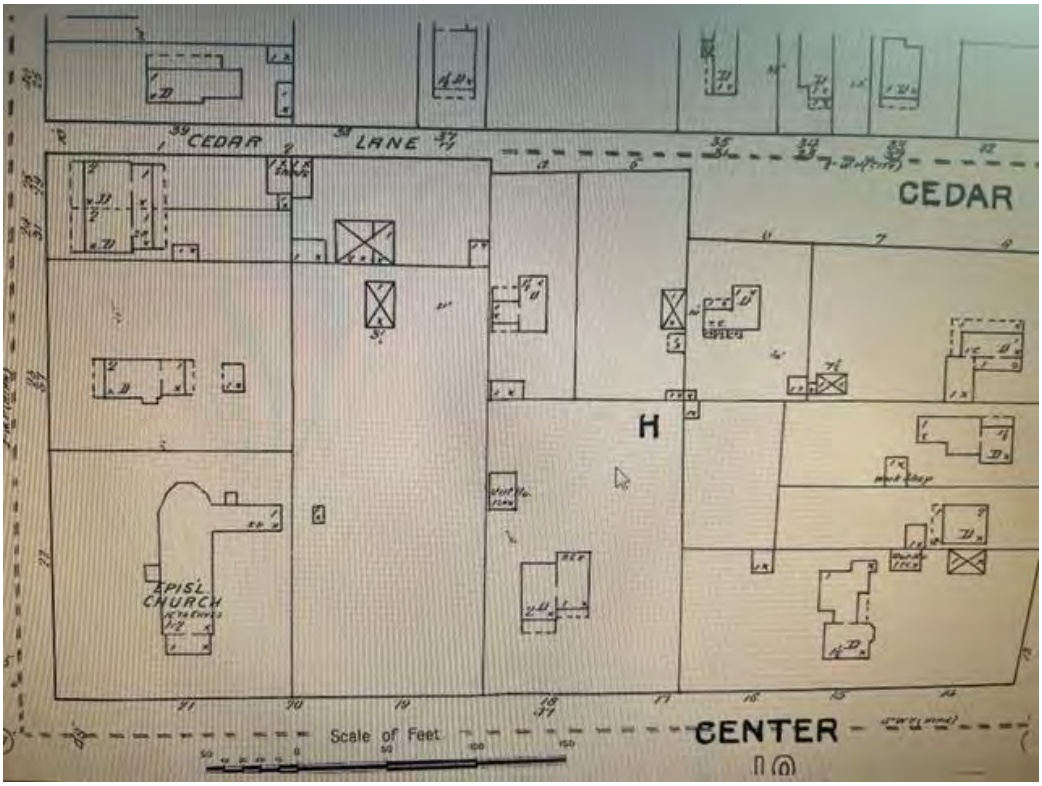


Figure 5: Sanborn Fire Insurance Map
(Santa Cruz, CA 1892).

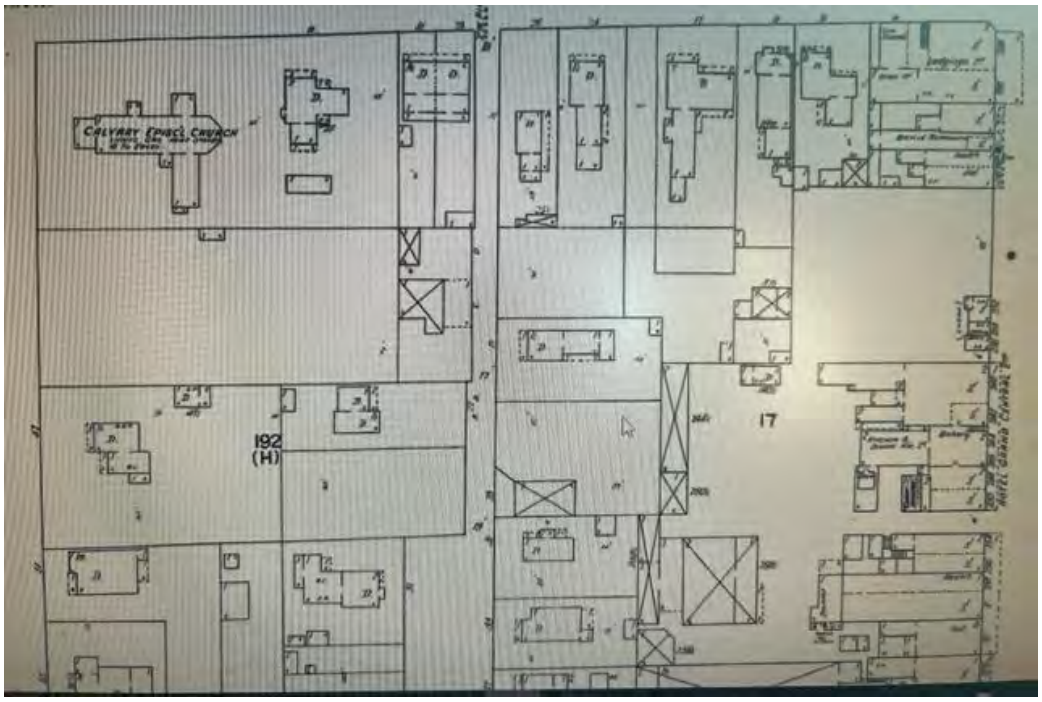


Figure 6: Sanborn Fire Insurance Map (Santa Cruz, CA 1905).

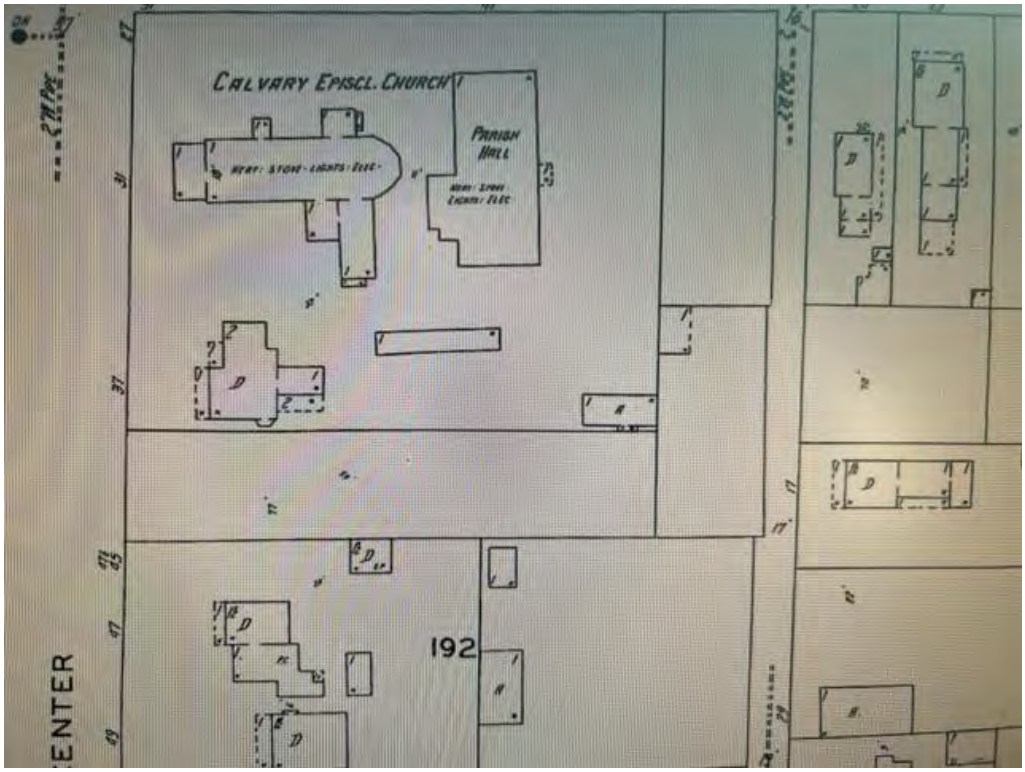


Figure 7: Sanborn Fire Insurance Map (Santa Cruz, CA 1928).

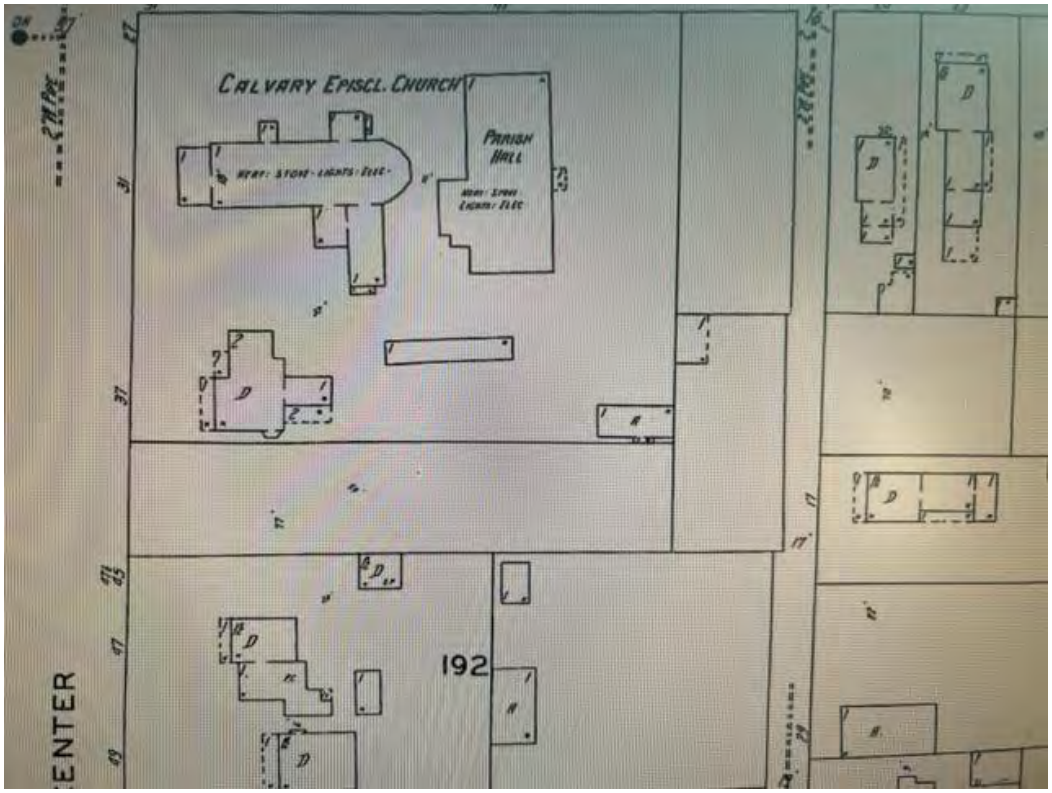


Figure 8: Sanborn Fire Insurance Map (Santa Cruz, CA 1928-revised 1950).

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #: _____
HRI # _____
Trinomial _____
NRHP Status Code: _____
Other Listings _____
Review Code ____ Reviewer _____ Date _____

 ***Resource Name or #:** (Assigned by recorder) Calvary Episcopal Church

P1. Other Identifier: Calvary Church

***P2. Location:** ☐ Not for Publication ■ Unrestricted ***a. County:** Santa Cruz

b. USGS 7.5' Quadrangle: Santa Cruz, CA 1954

c. Address: 532 Center Street **City:** Santa Cruz **Zip**: 95060

d. UTM: N/A

e. Other Locational Data (APN #): The church is sited at the northeast corner of Center and Lincoln Street in downtown Santa Cruz, APN 005-148-21 and 005-148-22 and Portions of 005-148-17, 005-148-18, and 5731-019-100.

***P3a. Description:** The subject property, commonly known as the Calvary Episcopal Church, was built in 1864 and completed in 1865. The Carpenter Gothic Revival church is flanked to the east by the Parish Hall and to the south by classrooms that reportedly date to the 1950s. In the far east end of the property is a paved parking lot and to the south is much larger parking lot. Architectural defining characteristics of the church or sanctuary include a steep gable wood shake roof with two parallel single-story gable roofs forming the entry vestibule, and an intersecting gable roof in the rear of the church that returns towards the front of the church facing Center Street with another steep gable roof clad with wood shakes. The north elevation of the church along Lincoln Street forming the nave, features a gablet on the north center of the left vestibule roof, an enclosed secondary gable roof entrance near the center of the church, and a tall intersecting gable near the rear of the church. The rear or chancel of the church features a unique apsidal style bay filled with Gothic influenced stained-glass windows in each panel. The upper roof forms a modest hip with a small cross affixed to it. The exterior walls of the church are sided with horizontal wood clapboard. The sidewalls feature wooden buttresses that divide individual stained-glass Gothic windows. The front entrance is characterized by the two gables with wooden buttresses that flank each of the two double-arched (replacement) entry doors. Between the two sets of doors are three arched stained-glass windows. The church is accessed via replaced concrete stairs with steel hand rails. The top of the front gable includes a small wooden cross as do the two gable entrances. The intersecting gable addition on the south side of the church or sanctuary features a bank of (replacement) fixed plate glass windows that face Center Street. The detached rectory and office or administration building on the east side of the church features a more modest intersecting gable roof with contemporary Gothic inspired wood windows along its north elevation. The building appears to have a basement evidenced by windows along the skirt of the building and two entrances facing the rear of the church. The main entrance to the building faces the parking lot and Cedar Street. The building is sided with horizontal wood clapboard similar to the church and features wood-sash windows, the main entrance having Gothic arch surrounding two wooden double doors. To the west of the rectory and office are classrooms in a shallow gable rectangular-shaped building that runs east to west bordering the parking lot to the west. The church grounds are fully landscaped with lawns, shrubs, several mature palm trees, concrete walkways, and metal fencing.

***P3b. Resource Attributes:** HP16 - Religious Buildings

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

P5b. Description of Photo: View northwest at the Calvary Episcopal Church from Center Street.

***P6. Date Constructed/Age and Sources:** ■ Historic The church or sanctuary was reportedly built in 1864 and completed in 1865. The Parish Hall was built between 1892 and 1905 with later additions, and the school or classrooms were built between 1905 and 1928 with later additions and alterations (Santa Cruz Historic Building Survey, 1976, p. 65; historic aerial photographs, newspapers, Sanborn Fire Insurance Maps).

***P7. Owner and Address:** Calvary Episcopal Church, 532 Center Street, Santa Cruz, CA 95060.

***P8. Recorded by:** Dana E. Supernowicz, Architectural Historian, Historic Resource Associates, 3142 Bird Rock Road, Pebble Beach, CA 93953.

***P9. Date Recorded:** January 2022

***P10. Type of Survey:** ■ Architectural

***P11. Report Citation:** Cultural Resources Study, Cedar Street Family Apartments, Assessor's Parcel Numbers 005-148-21 and 005-148-22 and Portions of 005-148-17 and 005-148-18, 532 Center Street, Santa Cruz, Santa Cruz County, California 95060. Prepared for R.L. Hastings & Associates, LLC, P.O. Box 552, Placerville, CA 95667. Prepared by Historic Resource Associates, 3102 Bird Rock Road, Pebble Beach, CA 93953. January 2022.

***Attachments:** Building, Structure, and Object Record; Photograph Record.

B1. Historic Name: Calvary Church
B2. Common Name: Calvary Episcopal Church
B3. Original Use: Church **B4. Present Use:** Same
***B5. Architectural Style:** Carpenter Gothic
***B6. Construction History:** Based upon church records, an historical building survey of Santa Cruz, historical aerials, and newspapers, the church or sanctuary was constructed in 1864 and completed in 1865/1866. A review of historic topographic quadrangle maps from 1954-2020, aerial photographs from 1950-2021, and Sanborn Fire Insurance Maps from 1886-1950, reveal the evolution of the project site and the Calvary Episcopal Church. In 1886, the project site was developed with an "L" shaped church at the corner of Center and Lincoln Streets with two single-family residences to the east bordering Cedar Street, which at the time was no more than an alley. By 1892, little had changed, with the exception of the front double-gable entryway leading into the church having been built and a privy placed south of the church, where the school or classrooms were later constructed. Between 1892 and 1928, the Parish Hall was built east of the church in a similar configuration as it is today, with the exception of an addition to the north. In addition, between 1892 and 1928, classrooms were built to the south of the church and Parish Hall, along with a residence southwest of the classrooms fronting Center Street and a shed or garage in the rear of the parcel fronting Cedar Street. In 1950, the revised Sanborn Fire Insurance Map depicts the property much the same as it was in 1928. During the 1950s, aerial photographs illustrate the expansion of the church with a cross-gable wing projecting west from the south wing of the church, expansion of the school or classrooms to the south, and, as previously noted, enlargement to the north of the Parish Hall. The residence to the southwest on the parcel was demolished, as was the shed or garage in the rear of the parcel, both of which appear to lie along the northern edge of the current parking lot.
***B7. Moved?** ■ No ☐ Yes ☐ Unknown **Date:** N/A **Original Location:**
***B8. Related Features:** The historic downtown district of Santa Cruz is located one block to the east. To the north is a previously developed paved parking lot, and single-family houses and businesses flanking Center Street between Lincoln and Elm Street.
B9a. Architect: Possibly Joseph Boston **B9b. Builder:** Undetermined
***B10. Significance: Theme:** Religion/Socio-Cultural/Carpenter Gothic Architecture **Area:** Santa Cruz
Period of Significance: 1865-1866 **Property Type:** Church **Applicable Criteria:** A, B & C
The indigenous Ohlone people occupied the land that would become Santa Cruz when the Spanish arrived in California in 1769. Beginning in the 1790s, the future city accommodated a Spanish mission and a secular pueblo, but the area remained sparsely populated until the 1840s, when American settlers began to arrive in the area, then under Mexican rule. By the time the American government took possession of California in 1848, a commercial center developed in the flatlands south of the former mission. As more settlers arrived, various industries developed in Santa Cruz, including a sawmill, a kiln, and a foundry. Powder manufacturing and lumber became the city's primary early industries, and Santa Cruz County became a major supplier of wood to San Francisco as its northern neighbor developed into a major city. The arrival of community services to Santa Cruz, such as churches, facilitated the city's growth into a comfortable residential community. Early churches included United Methodist Church, founded in 1848, and Calvary Episcopal Church, founded in 1862. A railroad line connected Santa Cruz to nearby Watsonville and Gilroy in 1876, allowing Santa Cruz to be more accessible to tourists. In the 1880s, hotels, baths, and amusements were constructed to attract visitors who would sometimes stay weeks at a time. In 1894, the city received national publicity with an article in Harper's Weekly and by the turn of the century, Santa Cruz became one of the West Coast's major seaside resort towns. President Teddy Roosevelt visited Santa Cruz in 1903 and the Santa Cruz Boardwalk opened in 1907. Along with an increasing number of seasonal visitors, the year-round population increased as well. New residential neighborhoods developed in disarranged grids east and west of downtown, in the West Cliffs area and in Seabright. These neighborhoods were linked with a streetcar system. In 1915, a highway opened to Santa Cruz, changing the nature of tourism in the city. Visitors came for shorter periods of time, and auto camps, motels, and other car-centered accommodations were developed. While tourism slowed in the first decades of the twentieth century, the University of California system announced plans to expand with new campuses in 1957. In 1965, the University of California, Santa Cruz opened in the bluffs overlooking the city (Page & Turnbull, Inc. 2019) (refer to BSO Page 3 of 17).
B11. Additional Resource Attributes: None
B12 References: Calvary Episcopal Church Website. "History." www.calvarysantacurz.org. Accessed December 29, 2021; Charles Hall Page & Associates, Inc. Santa Cruz Historic Building Survey. Prepared for the City of Santa Cruz. 1976; Cocke, Thomas et al. "Recording a Church: An Illustrated Glossary." *Practical Handbook in Archaeology 7*. Council for British Archaeology, 1996 (reprinted 1999); McAlester, Virginia and Lee. *A Field Guide to American Houses.* New York: Alfred A. Knopf. 1990; Page & Turnbull, Inc. Garfield Park Christian Church, Santa Cruz, California DPR forms. May 23, 2019; Rose, Michael S. *The Renovation Manipulation: The Church Counter-Renovation Handbook*. Hope of Saint Monica, Inc. 2001; Sanborn Fire Insurance Maps, Santa Cruz, California 1886, 1892, 1905, 1928, and 1928-revised 1950; *Santa Cruz Sentinel*, Newspaper, Santa Cruz, California, December 25, 1938, September 11, 2018; *Santa Cruz Surf*, Newspaper, Santa Cruz, California, July 1, 1893; *Santa Cruz Weekly Sentinel*, Newspaper, Santa Cruz, California, June 23, 1866, November 16, 1867, and October 24, 1874.
B13. Remarks:
B14. Evaluator: Dana E. Supernowicz, Historic Resource Associates, 3142 Bird Rock Road, Pebble Beach, CA 93953.
Date of Evaluation: January 2022

(This space reserved for official comments.)

B10. Significance (Continued):

Figure 1: 3D Google Earth Photograph of the Calvary Episcopal Church looking north.

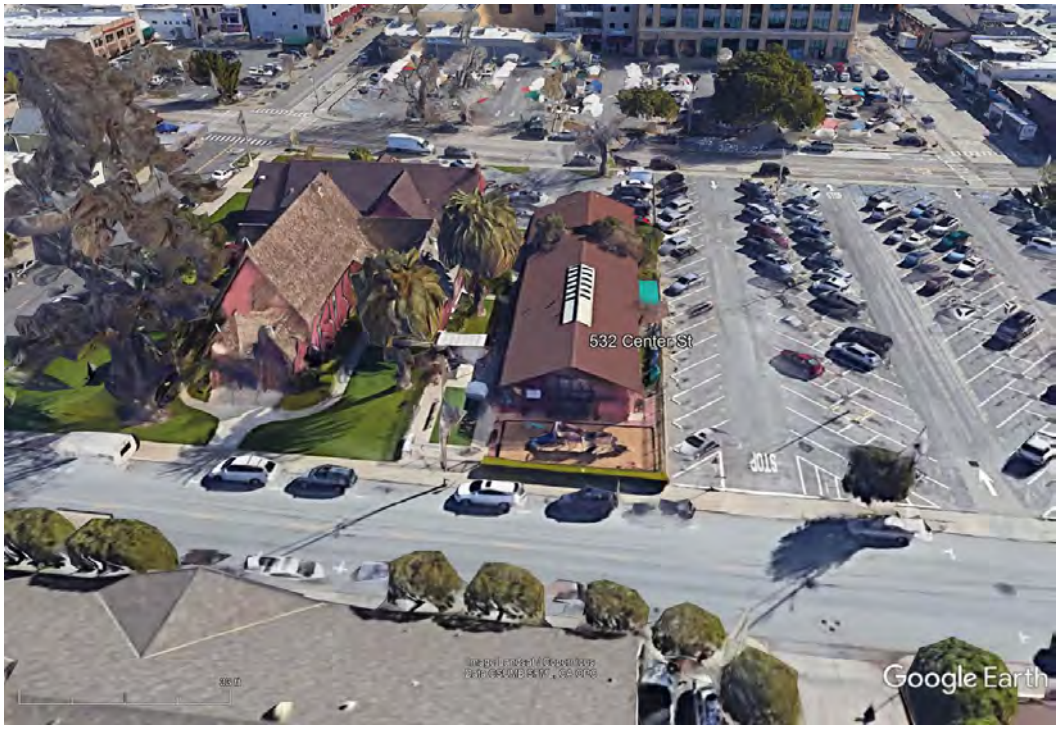


Figure 2: 3D Google Earth Photograph of the Calvary Episcopal Church looking east towards downtown Santa Cruz.

B10. Significance (Continued):

The following history of the church was recounted by Eliza Boston in 1900, annotated in the Parish Register 1903 and transcribed by Carol Walker, parish archivist, in September 2014:

> The first service of the Protestant Episcopal Church was held in Santa Cruz, on Sunday May 11th 1862 by Rev. Dr. Ver Mehr. The second service was held on Sunday May 10th 1863 by Rev. C.B. Wyatt, Rector of Trinity Church, San Francisco. The Rev. C.F. Loop, a Missionary appointed by the Board of Missions Domestic, New York City, arrived in Santa Cruz and began regular services in the Court house, July 5th 1863. On Easter Monday [March 28th] 1864 Calvary Parish was formally organized and the Rev. C.F. Loop was elected Rector. On St. Peter's Day June 29th 1864 the corner stone of the Church Edifice was laid by the Rector assisted by the Rev. D.D. Chapin, of San José, and the Rev. Mr. Easton of San Mateo. The first service was held in the new Church Edifice [unfinished] on January 8th 1865. On Sunday October 27th 1867 the debt of $675 having been paid, the Church was solemnly consecrated to the worship and Service of Almighty God, by the Rt. Rev. Wm. I. Kip D.D. Bishop of California, assisted by the Rector and the Rev. A.L. Brewer of San Mateo. On September 4th 1868 the Rector Rev. C.F. Loop sent his resignation to the Vestry of Calvary Church, which was accepted and also notified the Standing Committee, the Bishop being absent from the Diocese. During its first 100 years, Calvary Church continued to grow and reach out, not only to the city of Santa Cruz, but also to Episcopalians in the surrounding area. The clergy and laity of Calvary were largely responsible for creating and sustaining missionary work in the surrounding areas of Santa Cruz County, especially in helping to establish the present Episcopal churches at Ben Lomond, Aptos and Scotts Valley. In 2015, Calvary Church celebrated the 150th Anniversary of the first service held at the church with the play *Lincoln's Eulogy* written by parishioner Dana Bagshaw. This play told the story of how Calvary was involved in the Santa Cruz community in response to the death of President Abraham Lincoln. While parishioners prepared for the first service at Calvary Church to be held Easter Sunday, April 16, 1865, the news arrived that President Lincoln had been assassinated. The floral decorations were removed, and emblems of mourning were hung in the chancel. On April 19, the then-rector Rev. Loop held a special service in honor of the slain president. Accounts in the church records say he was a personal friend of Abraham Lincoln, and his address to the congregation was so eloquent that the City Fathers of Santa Cruz asked him to repeat it publicly the following week. Calvary's involvement in the community began here, at its inception (Calvary Episcopal Church Website 2021).

The above history provided by Eliza Boston in 1900, wife of Joseph Boston, reportedly donated the land for the church, appears to be consistent with period newspaper accounts as described below. Figure 3, is the earliest know photograph of the church (circa 1865-1866. Historic newspapers indicate that Eliza Boston's husband, Joseph Boston, an avocational architect, designed the church.

Figure 3: View looking northwest at Calvary Episcopal Church Santa Cruz, circa 1865-1866 shortly after its construction (Courtesy *Santa Cruz Sentinel*, September 11, 2018).

B10. Significance (Continued):

Based on an article that appeared in the *Santa Cruz Weekly Sentinel* on June 23, 1866, the site for the church, rectory, and school were donated by Mrs. Joseph Boston, and in the past year the "church edifice" was erected. In the following year, according to the *Santa Cruz Weekly Sentinel* in November 1867:

> Calvary Church, Santa Cruz, which was consecrated by Bishop Kipp, on the 27th of October, is a beautiful and substantial edifice of wood, built upon a firm foundation of brick. The style is Gothic of the early English period. The plan is for nave, chancel, tower, porch and vestry-room. The tower is to be built hereafter on the north side. The interior dimensions of the nave are 64 feet by 25, with open timbered roof; the height from the floor to the apex is 37 feet. A wainscot, four feet high, surmounted by a heavy moulding runs round both nave and chancel. The sections of the roof divide the nave into four bays of sixteen feet each. The sides between the posts are plastered and painted a delicate tint of ochre; each bay having a window nine feet in length. The chancel, separated from the nave by a lofty gothic arch, is apsidal in form, 21 x 20 feet in depth; the walls are pierced by six lancet windows filled with rich colored glass, containing the principal Christian emblems. The west gable has a beautiful clustered window of three lights, headed by a trefoil three feet in diameter, soon to be filled with glass of exquisite design and workmanship, from the establishment of Henry Sharp, New York who has furnished the windows for the whole church. The altar is placed against the east wall under the central light, which contains the emblem of the Great Sacrifice – the cross of cavalry and the crown of thorns. At the right is the Bishop's chair, ornamented by elaborate carvings of black walnut. The chancel rail is upon the chard of the apse, outside of which are the stalls and lectern. A very beautiful Baptismal Font of Nova Scotia stone, made by Fishure & Bird, N.Y., stands outside the chancel arch, at the north side. The floor of the chancel is covered with Brussels carpet of ecclesiastical pattern. On entering the west door, the effect of the interior of this building is not only very pleasing but imposing. We feel that it is a fitting place to offer the sacrifice of prayer and praise, and worthy of being consecrated to the service of God. The whole cost of the building, including the windows, was about seven thousand dollars. By a recent effort on the part of the Rector, Rev. C.F. Loop, and his parishioners, the remaining debt of six hundred and seventy-five ($675) dollars, was paid. The lot upon which the church is built, containing over an acre, was the gift of Mrs. Joseph Boston (*Santa Cruz Weekly Sentinel*, November 16, 1867).

During the 1870s, prior to his death, Joseph Boston, his wife, and family were living on Mission Street in Santa Cruz (*Santa Cruz Weekly Sentinel*, October 24, 1874). Based upon a newspaper article published on July 1, 1893 in the *Santa Cruz Surf* newspaper for Parish Day, the cornerstone for the church was laid on June 29, 1864, and the first rector was Rev. C.F. Loop.

Figure 4: Historic photograph of the Calvary Episcopal Church looking northeast, circa 1930 (Courtesy Calisphere Website).

B10. Significance (Continued):

Figure 5: Photograph of the Calvary Episcopal Church looking northeast, 2021. The front gable on the right was added after 1950.

Figure 6: View looking west at the north elevation of the Calvary Episcopal Church and Parish Hall, 2021.

B10. Significance (Continued):

In 1914, the church celebrated its Golden Jubilee with a Souvenir edition of the church history published in the parish paper known as the Ivy Leaf. From the late-nineteenth century through the first half of the twentieth century, the church's importance to citizens of Santa Cruz is well documented in local newspapers. The church is a registered historic property in the City of Santa Cruz having been documented in the city's first historic property survey in the 1970s. In 1971, the California Heritage Council, awarded the church by creating a bronze plaque commemorating the property, which is situated in front of the church along Center Street. A metal enamel sign was placed on the north side of the church by the Santa Cruz Historical Society. The church is pictured in Volume I of the Santa Cruz Historic Building Survey (Charles Hall Page & Associates 1976: 65), and is listed in the State Historic Preservation Office (SHPO) Built Environment Resources Directory (BERD) as a 7R status code, meaning it was not formally evaluated.

SIGNIFICANCE STATEMENT

The property was assessed using the National Register of Historic Places (NRHP) Criteria for Evaluation, described as the quality of significance in American history, architecture, archaeology, and culture found in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association, and meets one of the following criteria:

Criterion A: Are associated with events that have made a significant contribution to the broad patterns of our history; or

Criterion B: Are associated with the lives of persons significant in our past; or

Criterion C: Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

National Register criteria considerations (36 CFR §60.4) Consideration A: A religious property according to National Register guidelines, "requires additional justification (for nomination) because of the necessity to avoid any appearance of judgement by government about the merit of any religion or belief." However, religious properties may qualify if they are integral parts of districts that do meet the criteria or if they fall within the following category - "a religious property deriving primary significance from architectural or artistic distinction or historical importance."

The Calvary Episcopal Church remained an important part of the secular and social history of Santa Cruz through the 1930s. Thus, the period of significance for the property extends from its completion in 1865 to 1940, because improvement made during this period contribute to the history of the church. Therefore, despite the addition of the double-gable entrance in the front of the church after 1886 and prior to 1892, thus eliminating the main entrance along Lincoln Street, which became a side entrance, and the cross-gable addition on the south end of the church after 1950, the church retains adequate integrity to convey its historic significance. This is apparent in the post-1950 addition, due to the care taken to construct the addition using materials and a design sympathetic to the original church, without entirely duplicating historic fabric on the original, giving a false sense of history. The Parish Hall and the School or Classrooms, however, appear to have undergone the most dramatic alterations since they were constructed and consequently the integrity of both buildings has been compromised.

In applying NRHP Criterion A, the church represents one of the oldest secular institutions in Santa Cruz, and its significance to the community since its construction in the 1860s is well documented. Therefore, the church appears to be eligible for the NRHP under Criterion A, being the oldest surviving such structure in Santa Cruz. Under Criterion B, no documentation has been found to suggest the church is associated with a person or persons of significance in history of Santa Cruz, despite the fact the church may have been designed by Joseph Boston, whose wife donated the land on which the church is located today. The construction of the church appears to have been a community effort with donations from various individuals living in Santa Cruz during the 1860s. Under NRHP Criteria C, the church building is the oldest surviving structure of its type in Santa Cruz, retains adequate integrity to convey its historic appearance, and is an important example of Carpenter Gothic architecture. Similarly, the church appears to be eligible under National Register Criterion Consideration A, deriving primary significance from "architectural or artistic distinction or historical importance." The parish hall and school or classrooms do not appear to be eligible for the NRHP under any of the criteria, due to numerous additions and alterations post-1940.

B10. Significance (Continued):

PHOTOGRAPH RECORD

Photograph 1: View looking northeast at the church or sanctuary from Center Street.

Photograph 2: View looking southwest at the Parish Hall.

B10. Significance (Continued):

Photograph 3: View looking east at the west elevation the church or sanctuary showing the cross-gable extension.

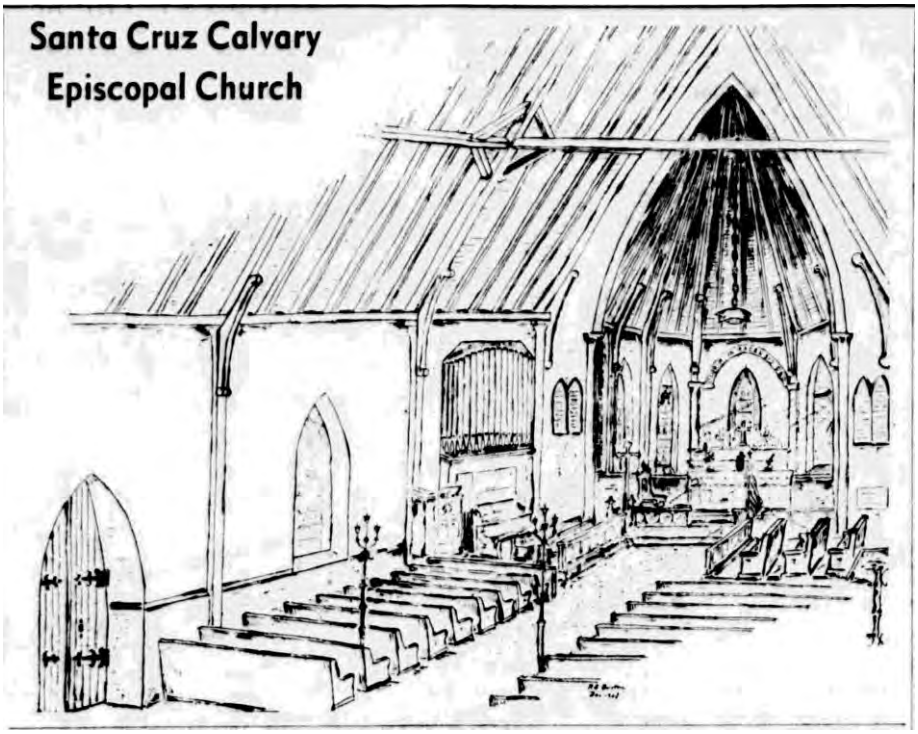
Photograph 4: View of the bronze plaque in front of the church entrance.

B10. Significance (Continued):

Photograph 5: View looking east at the front of the church or sanctuary.

Photograph 6: View of the vestibule leading into the church nave.

B10. Significance (Continued):



Photograph 7: Sketch of the interior of the church from the *Santa Cruz Sentinel*, December 25, 1938.

Photograph 8: View looking south at the north elevation of the church or sanctuary.

B10. Significance (Continued):

Photograph 9: View looking east at the north elevation of the church or sanctuary.

Photograph 10: View looking east at the Parish Hall or rectory and office.

B10. Significance (Continued):

Photograph 11: View of the rear of the church or sanctuary.

Photograph 12: View looking west at the east elevation of the Parish Hall. To the left are the classrooms.

B10. Significance (Continued):

Photograph 13: View looking south at the Parish Hall and classrooms in the distance.

Photograph 14: View looking west through the inner courtyard between the church, Parish Hall, and classrooms.

B10. Significance (Continued):

Photograph 15: View looking north with the church on the left and the Parish Hall on the right. Note the later addition to the church on the left, distinguished by leaded, rather than stained-glass windows.

Photograph 16: View looking west through the inner courtyard between the church and classrooms.

B10. Significance (Continued):

Photograph 17: View looking north at the church and the cross-gable addition facing the camera.

Photograph 18: View looking northeast at the Parish Hall with the church on the left.

B10. Significance (Continued):

Photograph 19: View looking north at the south elevation of the classrooms.

Photograph 20: View looking north across the parking lot planned for redevelopment with affordable housing. The classrooms and church can be seen in the distance, with the classrooms in the foreground.

Native American Heritage Commission
Native American Contacts List
November 1, 2021

Amah Mutsun Tribal Band
Valentin Lopez, Chairperson
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Galt ,CA 95632 North Valley Yokuts
vlopez@amahmutsun.org
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Amah Mutsun Tribal Band of Mission San Juan Bautista
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Indian Canyon Mutsun Band of Costanoan
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Muwekma Ohlone Indian Tribe of the SF Bay Area
Monica Arellano, Vice Chairwoman
20885 Redwood Road, Suite 232 Ohlone / Costanoan
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marellano@muwekma.org
(408) 205-9714

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Ct. Foothill Yokuts
Salinas ,CA 93906 Mono
kwood8934@aol.com Wuksache
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ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Court
Salinas, CA 93906

Email: kwood8934@aol.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairperson Woodrow,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

Proposed Project

The proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres located at 532 in the City of Santa Cruz, Santa Cruz County, California (APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18). The site is currently a parking lot. The project will consist of 64 affordable rental units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east.

Archaeological and Cultural Resources

The City of Santa Cruz would appreciate you providing information on any Native American resources that might be adversely affected by the development of this project.

If you have any questions or need additional information, please contact Jessica de Wit, 831-420-5108 or jdewit@cityofsantacruz.com.

Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

January 3, 2022

Rumsen Am:a Tur:ataj Ohlone
Dee Dee Manzanares Ybarra, Chairperson
14671 Farmington Street
Hesperia, CA 92345

Email: rumsenama@gmail.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairperson Lopez,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

Proposed Project

The proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres located at 532 in the City of Santa Cruz, Santa Cruz County, California (APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18). The site is currently a parking lot. The project will consist of 64 affordable rental units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east.

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If you have any questions or need additional information, please contact Jessica de Wit, 831-420-5108 or jdewit@cityofsantacruz.com.

Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Muwekma Ohlone Indian Tribe of the SF Bay Area
Monica Arellano
20885 Redwood Road, Suite 232
Castro Valley, CA 94546

Email: marellano@muwekma.org

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Ms. Arrellano,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

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Archaeological and Cultural Resources

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If you have any questions or need additional information, please contact Jessica de Wit, 831-420-5108 or jdewit@cityofsantacruz.com.

Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister, CA 95024

Email: ams@indiancanyon.org

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

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The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

Proposed Project

The proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres located at 532 in the City of Santa Cruz, Santa Cruz County, California (APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18). The site is currently a parking lot. The project will consist of 64 affordable rental units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east.

Archaeological and Cultural Resources

The City of Santa Cruz would appreciate you providing information on any Native American resources that might be adversely affected by the development of this project.

If you have any questions or need additional information, please contact Jessica de Wit, 831-420-5108 or jdewit@cityofsantacruz.com.

Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Indian Canyon Mutsun Band of Costanoan
Kanyon Sayers-Roods, MLD Contact
1615 Pearson Court
San Jose, CA 95122

Email: kanyon@kanyonkonsulting.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Ms. Sayers-Rood,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

Proposed Project

The proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres located at 532 in the City of Santa Cruz, Santa Cruz County, California (APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18). The site is currently a parking lot. The project will consist of 64 affordable rental units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east.

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Costanoan Ohlone Rumsen-Mutsen Tribe
Patrick Orozco, Chairman
644 Peachtree Drive
Watsonville, CA 95076

Email: yanapvoic97@gmail.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairman Orozco,

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Amah Mutsun Tribal Band
Valentin Lopez, Chairperson
P.O. Box 5272
Galt, CA 95632

Email: vlopez@amahmutsun.org

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairperson Lopez,

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Amah Mutsun Tribal Band of Mission San Juan Bautista
Irenne Zwierlein, Chairperson
789 Canada Road
Woodside, CA 94062

Email: amahmutsuntribal@gmail.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairperson Zwierlein,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

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If you have any questions or need additional information, please contact Jessica de Wit, 831-420-5108 or jdewit@cityofsantacruz.com.

Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

PARLIAMENTARIAN
Russell Attebery
Karuk

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Sara Dutschke
Miwok

COMMISSIONER
Buffy McQuillen
Yokayo Pomo, Yuki, Nomlaki

COMMISSIONER
Wayne Nelson
Luiseño

COMMISSIONER
Stanley Rodriguez
Kumeyaay

EXECUTIVE SECRETARY
Christina Snider
Pomo

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

December 30, 2021

Roy Hastings
R.L. Hastings & Associates, LLC

Submitted via Electronic Mail
Via Email to: roy@rlhastings.com

Re:532 Center Street, Santa Cruz, Santa Cruz County

Dear Mr. Hastings:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were positive. Please contact the Costanoan Ohlone Rumsen-Mutsen Tribe on the attached list for more information. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Katy.Sanchez@nahc.ca.gov

Sincerely,

Katy Sanchez

Katy Sanchez
Associate Environmental Planner

Attachment

Native American Heritage Commission
Native American Contacts List
December 28, 2021

Amah Mutsun Tribal Band
Valentin Lopez, Chairperson
P.O. Box 5272 Ohlone/Costanoan
Galt ,CA 95632 North Valley Yokuts
vlopez@amahmutsun.org
(916) 743-5833

Amah Mutsun Tribal Band of Mission San Juan Bautista
Irene Zwierlein, Chairperson
3030 Soda Bay Road Ohlone/Costanoan
Lakeport ,CA 95453
amahmutsuntribal@gmail.com
(650) 851-7489 Cell
(650) 332-1526 Fax

Costanoan Ohlone Rumsen-Mutsen Tribe
Patrick Orozco, Chairman
644 Peartree Drive Ohlone/Costanoan
Watsonville ,CA 95076
yanapvoic97@gmail.com
(831) 728-8471

Indian Canyon Mutsun Band of Costanoan
Kanyon Sayers-Roods
1615 Pearson Court Ohlone/Costanoan
San Jose ,CA 95122
408-673-0626

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28 Ohlone/Costanoan
Hollister ,CA 95024
ams@indiancanyons.org
(831) 637-4238

Muwekma Ohlone Indian Tribe of the SF Bay Area
Monica Arellano, Vice Chairwoman
20885 Redwood Road, Suite 232 Ohlone / Costanoan
Castro Valley ,CA 94546
marellano@muwekma.org
(408) 205-9714

Rumsen Am:a Tur:ataj Ohlone
Dee Dee Manzanares Ybarra, Chairperson
14671 Farmington Street Ohlone/Costanoan
Herperia ,CA 92345
rumsenama@gmail.com
(760) 403-1756

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Ct. Foothill Yokuts
Salinas ,CA 93906 Mono
kwood8934@aol.com Wuksache
(831) 443-9702

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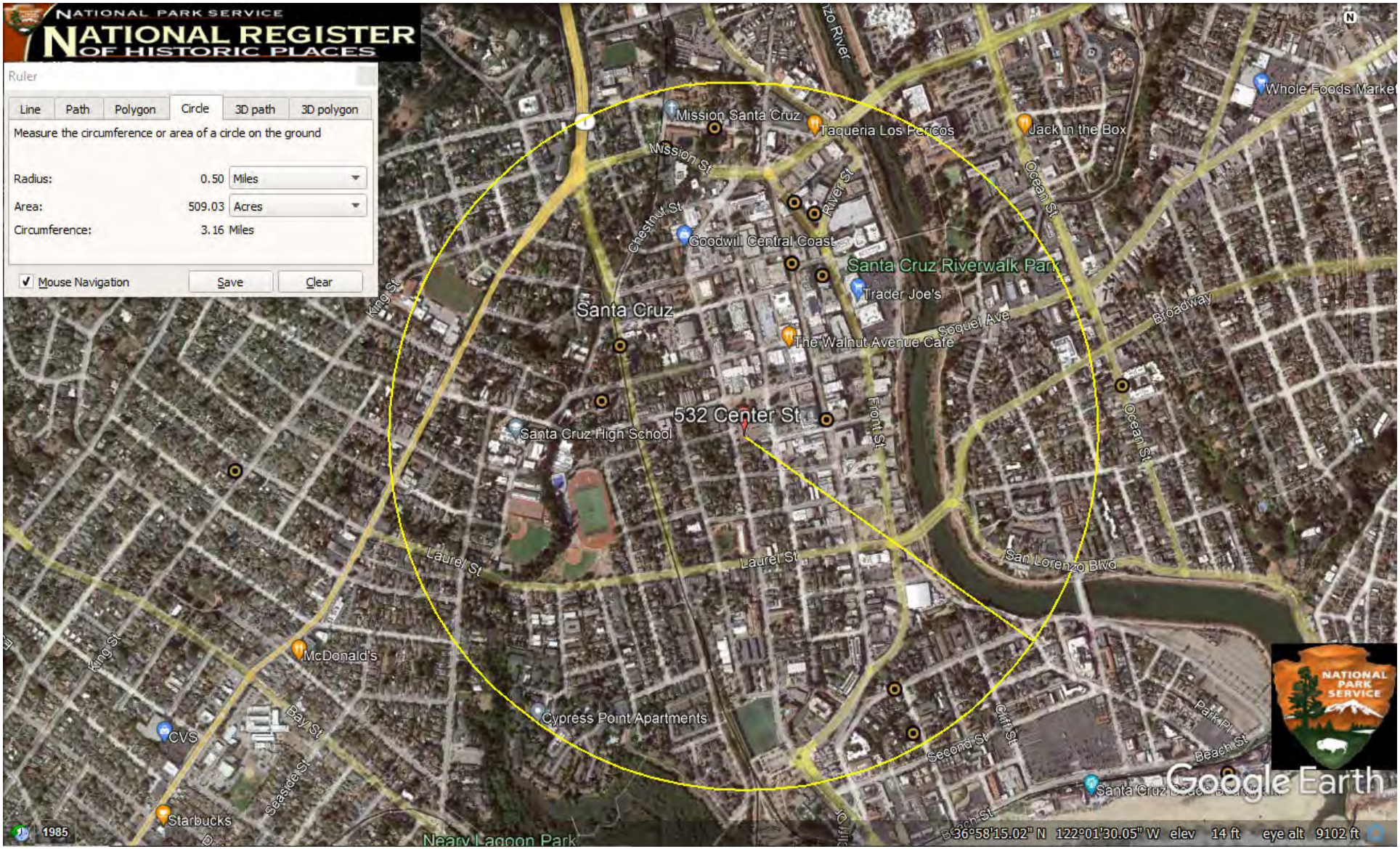
NATIONAL PARK SERVICE
NATIONAL REGISTER OF HISTORIC PLACES
Ruler
Line
Path
Polygon
Circle
3D path
3D polygon
Measure the circumference or area of a circle on the ground
Radius: 0.50 Miles
Area: 509.03 Acres
Circumference: 3.16 Miles
Mouse Navigation
Save
Clear
Mission Santa Cruz
Taqueria Los Pericos
Jack in the Box
Whole Foods Market
Mission St
Chestnut St
River St
Ocean St
Goodwill Central Coast
Santa Cruz Riverwalk Park
Trader Joe's
King St
Santa Cruz
Soquel Ave
Broadway
The Walnut Avenue Cafe
532 Center St
Front St
Santa Cruz High School
Laurel St
San Lorenzo Blvd
McDonald's
Bay St
CVS
Seaside St
Cypress Point Apartments
Cliff St
Second St
Park Pl
Beach St
Starbucks
Neary Lagoon Park
Google Earth
1985
36°58'15.02" N 122°01'30.05" W elev 14 ft eye alt 9102 ft

NATIONAL PARK SERVICE
NATIONAL REGISTER OF HISTORIC PLACES
Cope Row Houses
Historic Place Name: Cope Row Houses
Address: 412--420 Lincoln St.
City: Santa Cruz
County: Santa Cruz
State: CALIFORNIA
Geographic Coordinates:
Latitude: 36.97227
Longitude: -122.0313
NPS Reference Number: 82002274
Date Listed: 19820128
Notes:
Type: point
Geocode Match: 0
A Service of:
National Register of Historic Places
National Park Service
Directions: To here - From here
Ruler
Line
Path
Polygon
Circle
3D path
3D polygon
Measure the distance between two points on the ground
Map Length: 1,001.82 Feet
Ground Length: 1,001.86
Heading: 281.30 degrees
Mouse Navigation
Save
Clear
532 Center St
Santa Cruz Museum of Art & Histo
The Walnut Avenue Cafe
Downtown Santa Cruz Info Kiosk
Hula's Island Grill
The Catalyst
The Blue Lagoon
Zachary's
Locust St
Pacific Ave
Center St
Walnut Ave
Lincoln St
Soquel Ave
Front St
Riverside Ave
Broadway
Chestnut St
Image Landsat / Copernicus
Google Earth
1985
36°58'17.07" N 122°01'41.59" W elev 26 ft eye alt 3139 ft

National Register of Historic Places

Digital Archive on NPGallery (https://npgallery.nps.gov)

Your search returned 22 results, Showing page 1 of 2, Items 1 through 21

Photos	Text	Name
(/NRHP/AssetDetail?assetID=486861ee-545b-4a1a-b9dd-03cc210e4e97)	(/NRHP/AssetDetail?assetID=79e7beda-4c37-4873-8d0e-24ec09f5003b)	Bank of Santa Cruz County
(/NRHP/AssetDetail?assetID=b8d20aef-6916-459f-b11a-e0cdc6998375)	(/NRHP/AssetDetail?assetID=af928e95-bdbf-4b2e-a1ef-c20894d7a17a)	Branciforte Adobe
(/NRHP/AssetDetail?assetID=09ffcaa8-7d3f-47c3-bc86-14a00cacca9e)	(/NRHP/AssetDetail?assetID=9a39bdcc-3dbb-48d1-94a0-266ba0c8bcec)	Brown, Allan, Site
(/NRHP/AssetDetail?assetID=73938ce9-345a-429d-89b7-fd445a5d123b)	(/NRHP/AssetDetail?assetID=4bc7950c-3e0d-404c-973e-bbf40dbf1d5c)	Carmelita Court

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Cope Row Houses

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Cowell Lime Works Historic District

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(/NRHP/AssetDetail?assetID=0d9952da-8e13-468a-991e-ac8f30cfce66)

Garfield Park Branch Library

(/NRHP/AssetDetail?assetID=63b405ab-d664-4b39-b4bd-313774eb63e4)

(/NRHP/AssetDetail?assetID=bc902f6d-f837-482c-8543-2baf9aaf164c)

Glen Canyon Covered Bridge

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(/NRHP/AssetDetail?assetID=a598fc1f-d846-4819-9e8d-b3a60d208a71)

Golden Gate Villa

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Hinds, A. J., House

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Hotel Metropole

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Looff Carousel and Roller Coaster on the Santa Cruz Beach Boardwalk

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Looff Carousel and Roller Coaster on the Santa Cruz Beach Boardwalk

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Neary-Rodriguez Adobe

Octagon Building

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Robinson, Elias H., House

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(/NRHP/AssetDetail?assetID=de0dcc5b-de15-4a4d-96e3-2131e5f52bd2)

Sand Hill Bluff Site

(/NRHP/AssetDetail?assetID=f001b279-27f0-479d-b7c6-62c316385fa2)

(/NRHP/AssetDetail?assetID=67fdd8a8-6df1-4723-841b-b6815f81aa0b)

Santa Cruz Downtown Historic District

(/NRHP/AssetDetail?assetID=d3eef0e1-414b-4dcd-9378-c767b9ec73e2)

(/NRHP/AssetDetail?assetID=71d15f04-5437-4abd-a4dd-f93e0d51cc3c)

US Post Office--Santa Cruz Main

(/NRHP/AssetDetail?assetID=1ccdca41-f55b-42c1-adb8-fdb8c74ad091)

(/NRHP/AssetDetail?assetID=d5b8edd9-f71b-45ee-a8e9-1c3244cd6252)

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> (/NRHP/SearchResults/cc6a9231d09f41bd84e930e8a84fc776?page=2&view=list)

List View

National Register of Historic Places

Digital Archive on NPGallery (https://npgallery.nps.gov)

Your search returned 22 results, Showing page 2 of 2, Items 22 through 22

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List View

Photos	Text	Name
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1 (/NRHP/SearchResults/cc6a9231d09f41bd84e930e8a84fc776?page=1&view=list) 2 ()

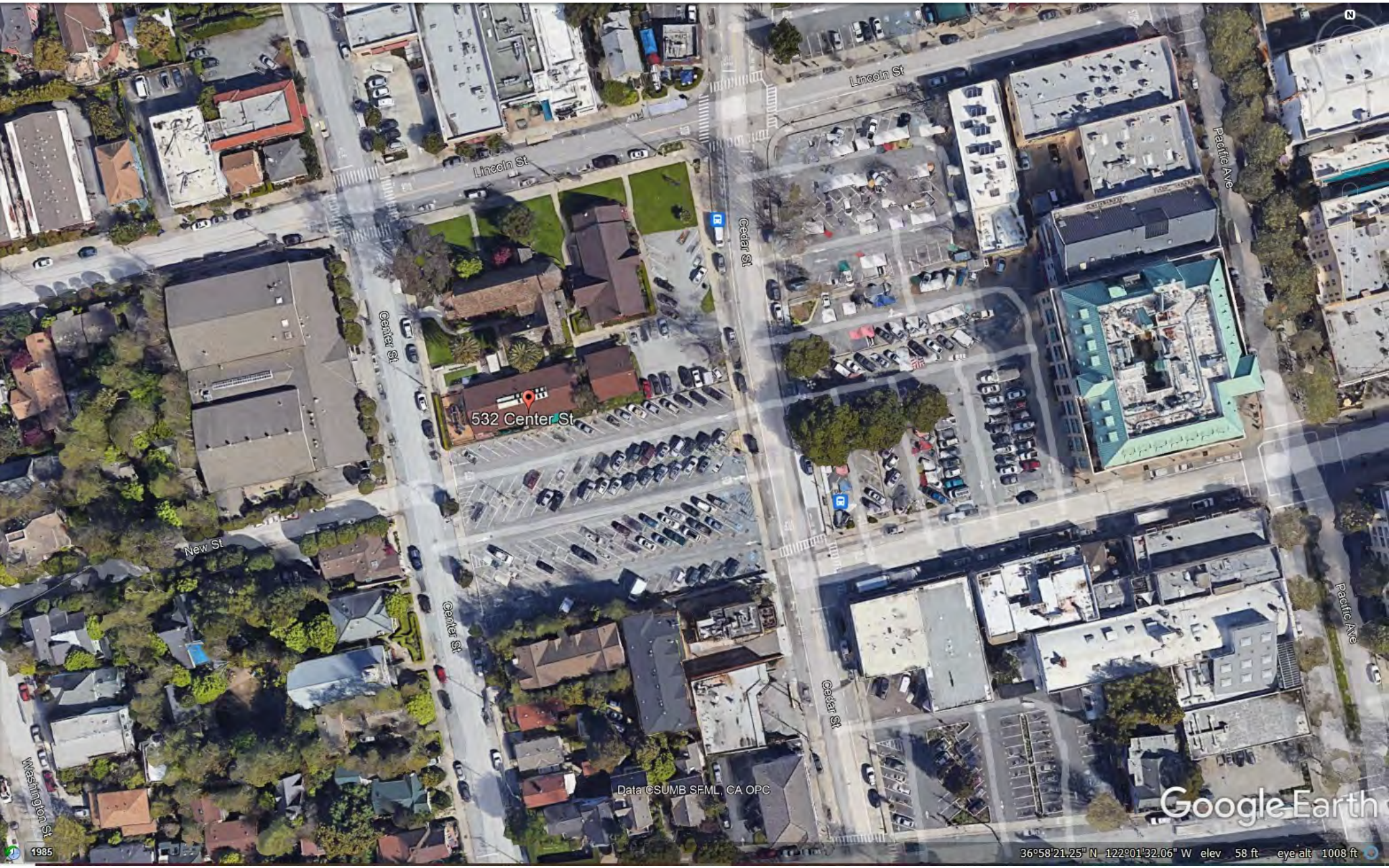
List View

ACCESSIBILITY (//www.nps.gov/aboutus/accessibility.htm)
PRIVACY POLICY (//www.nps.gov/aboutus/privacy.htm)
FOIA (//www.nps.gov/aboutus/foia/index.htm)
NOTICES (//www.nps.gov/aboutus/notices.htm)
DISCLAIMER (//www.nps.gov/aboutus/disclaimer.htm)

FAQ (//www.nps.gov/aboutus/faqs.htm)
NO FEAR ACT (//www.doi.gov/pmb/eeo/no-fear-act)
CONTACT US (//www.nps.gov/aboutus/contactus.htm)
USA.GOV (//www.usa.gov)

FACEBOOK (//www.facebook.com/nationalparkservice) YOUTUBE (//www.youtube.com/nationalparkservice) TWITTER (//www.twitter.com/natlparkservice)
INSTAGRAM (//www.instagram.com/nationalparkservice/) FLICKR (//www.flickr.com/photos/nationalparkservice)
ITUNES (//itunes.apple.com/WebObjects/MZStore.woa/wa/viewArtistLegacy?cc=us&id=216751324)

National Park Se (//www.nps.gov)
U.S. Department e Interior (//www.nps.gov)
(//www.doi.gov)


Lincoln St
Lincoln St
Pacific Ave
Cedar St
Center St
532 Center St
New St
Center St
Cedar St
Pacific Ave
Washington St
Data CSUMB SFML, CA OPC
Google Earth
1985
36°58'21.25" N 122°01'32.06" W elev 58 ft eye alt 1008 ft

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

January 11, 2022

Ms. Julianne Polanco
State Historic Preservation Officer
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816

RE: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Trigger: Receipt of HUD Project-based Vouchers

Dear Ms. Polanco;

The purpose of this letter is to complete the SHPO consulting requirements pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations found at 36 CFR Part 800 prior to the above-referenced project receiving HUD Project-based Vouchers (PBV) to partially fund the operations of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The use of federal funds in the project requires that a NEPA environmental review be conducted on the project site, which includes Section 106 consultation with SHPO.

Conclusion

The City of Santa Cruz has concluded that the proposed project will not cause any significant impact to archaeological or historic resources in the project area and, therefore, has made a finding of *"No Historic Properties Affected"* per CFR 36 Part 800.4 (d)(1) and that no additional studies or mitigations need to be undertaken. The City of Santa Cruz requests your concurrence in this finding.

Proposed Project

The proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres located at 532 in the City of Santa Cruz, Santa Cruz County, California (APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18). The site is currently a parking lot. The project will consist of 64 affordable rental units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing

(PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church and associated buildings to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east.

The City of Santa Cruz has multiple historic districts, one of which, noted below in the discussion of the CHRIS response, is located near the project site. The Downtown area, where this project is located, has a mixture of historic buildings and newer buildings as the area develops in keeping with the City's Downtown Plan.

Area of Potential Effect (APE)

The APE is the project and immediately adjacent properties around the project site.

California Historical Resources Information System (CHRIS)

A response letter from the California Historical Resources Information System (CHRIS) dated November 16, 2021, stated that the project site is located in an area considered to have a moderate potential for unrecorded Native American and a moderate to high potential for unrecorded historic-period archaeological resources. CHRIS found no cultural resource studies covering the Cedar Street Family Apartments project area and no recorded archaeological resources in the project area. CHRIS found that "[T]he State Office of Historic Preservation Built Environment Resources Directory (OHP BERD) . . . lists two recorded buildings or structures that face the proposed Cedar Street Family Apartments project area. At 532 Center Street, is the Calvary Episcopal Church (OTIS # 416954) listed with a 7R, meaning this resource was Identified in a Reconnaissance Level Survey or in an Area of Potential Effect (APE), but not evaluated. In addition, at 516 Center Street, is an unnamed building, circa 1930 (OTIS # 478663) listed with a 1D, meaning it is a Contributor to a multi-component resource like a district listed in the National Register (NR) by the Keeper, and a 2D, meaning this resource is a contributor to a multi-component resource determined eligible for the NR by the Keeper. Also listed in the California Register (CR). In addition to these inventories, the NWIC base maps show no recorded buildings or structures within the proposed Cedar Street Family Apartments project area, and one recorded historic district located adjacent to the project area, P-44-000939, the Santa Cruz Downtown Historic District."

The project address, 532 Center Street, is also the address of the Calvary Episcopal Church addressed above. The church was the subject of a previous Reconnaissance Level Survey, as noted above, and due to this project, the property was further assessed using the National Register of Historic Places (NRHP) Criteria for Evaluation as part of a *Cultural Resources Study* prepared by Historic Resource Associates (HRA). The Primary Record is attached. HRA reached the following conclusions:

"In applying NRHP Criterion A, the church represents one of the oldest secular institutions in Santa Cruz, and its significance to the community since its construction in the 1860s is well documented. Therefore, the church appears to be eligible for the NRHP under Criterion A, being the oldest surviving such structure in Santa Cruz. Under Criterion B, no documentation has been found to suggest the church is associated with a person or persons of significance in history of Santa Cruz, despite the fact the church may have been designed by Joseph Boston, whose wife donated the land on which the church is located today. The construction of the church appears to have been a community effort with donations from various individuals living in Santa Cruz during the 1860s. Under NRHP Criteria C, the church building is the oldest surviving structure of its type in Santa Cruz, retains adequate integrity to convey its historic appearance, and is an important example of Carpenter Gothic architecture. Similarly, the church appears to be eligible under National Register Criterion Consideration A, deriving primary significance from "architectural or artistic distinction or historical importance." The parish hall and school or classrooms do not appear to be eligible for the NRHP under any of the criteria, due to numerous additions and alterations post-1940.

In regards to potential effects, because the historic church is setback to the north from the proposed project and screened in part by a non-contributing part of the church, namely the school or classrooms, the project will not diminish the characteristics that make the church potentially eligible for the NRHP, such as its architecture and

function serving the greater Santa Cruz area."

Cultural Resources Survey

As discussed above, Historic Resource Associates (HRA) prepared a Cultural Resources Study on the project site in January 2022. In addition to the conclusions above in respect to the church, HRC concluded that "[F]ollowing a pedestrian survey of the project footprint, walking 1-5 meter transects, no prehistoric archaeological or historical archaeological sites were identified within the project footprint. The probability of discovering subsurface archaeological sites is low. No additional cultural resource study is recommended for the proposed project.

As the project site is currently a paved parking lot and the potential for discovering archaeological sites during a pedestrian survey is low, HRA stated that "[I]n the event that a concentration of artifacts or culturally modified soil deposits (including trash pits older than 50 years) should be encountered at any time during ground disturbing activities, all work must stop until a qualified archaeologist views the finds and makes a preliminary evaluation. If warranted, further archaeological work in the discovery area should be performed. Although unlikely, if human remains are encountered, all work must stop in the immediate vicinity of the discovery until the County Coroner and a qualified archaeologist evaluate the remains."

Native American Heritage Commission (NAHC)

Consultation with the NAHC was initiated on November 6, 2021. A response was not received from NAHC until December 30, 2021. That response stated that a Sacred Lands File for the area of potential effect was completed with positive results. NAHC did not provide details but recommended consultation with the Costanoan Ohlone Rumsen-Mutsen tribe for additional information. NAHC provided a list of eight (8) Native American contacts, including the Costanoan Ohlone Rumsen-Mutsen Tribe. As no response was received within 30 days, Native American consultation letters had already been sent to all contacts, including the Costanoan Ohlone Rumsen-Mutsen, on an NAHC list dated November 1, 2021, which had been received for another project in Santa Cruz. The one contact on the December 28, 2021, list which was not on the November 1, 2021, list was sent a consultation letter on January 3rd. The remainder of the tribal consultation period will run concurrent with this SHPO consultation.

National Register of Historic Places

An internet search of the National Register of Historic Places found twenty-two (22) results for registered historic sites within the City of Santa Cruz. The nearest registered historic site to the project site is the Cope Row Houses located approximately 1,000' west of the project site, outside of the APE.

I hope this information is helpful to you. Please feel free to contact me should you have any questions or comments about this project.

Sincerely,

Jessica de Wit, Housing & Community Development Division Manager
City of Santa Cruz

cc: R. L. Hastings & Associates, LLC
P.O. Box 552
Placerville, CA 95667

Enclosures:

USGS Topographic Map with Project Site outlined
Map of Area of Potential Effects (APE)
CHRIS response letter, dated November 16, 2021
Cultural Resources Study, dated January 3, 2021
Primary Record (DP-523)
NAHC response letter, dated December 30, 2021
NAHC Native American Contacts List, dated November 1, 2021
Tribal Consultation letters, dated December 16, 2021
NRHP Internet Search Results

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

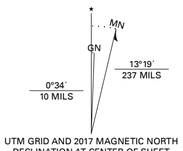
The National Map US Topo

SANTA CRUZ QUADRANGLE
CALIFORNIA - SANTA CRUZ COUNTY
7.5-MINUTE SERIES

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 10S

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery	NAIP,	June 2016 - October 2016
Roads	U.S. Census Bureau,	2016
Names	GNIS,	1981 - 2018
Hydrography	National Hydrography Dataset,	2005 - 2018
Contours	National Elevation Dataset,	1999
Boundaries	Multiple sources; see metadata file	2016 - 2017
Public Land Survey System	BLM,	2018
Wetlands	FWS National Wetlands Inventory	1981 - 1993



UTM GRID AND 2017 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
EF
Grid Zone Designation
10S

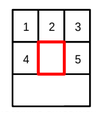
SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18

QUADRANGLE LOCATION



ADJOINING QUADRANGLES

1 Davenport
2 Felton
3 Laurel
4 Santa Cruz OE W
5 Soquel

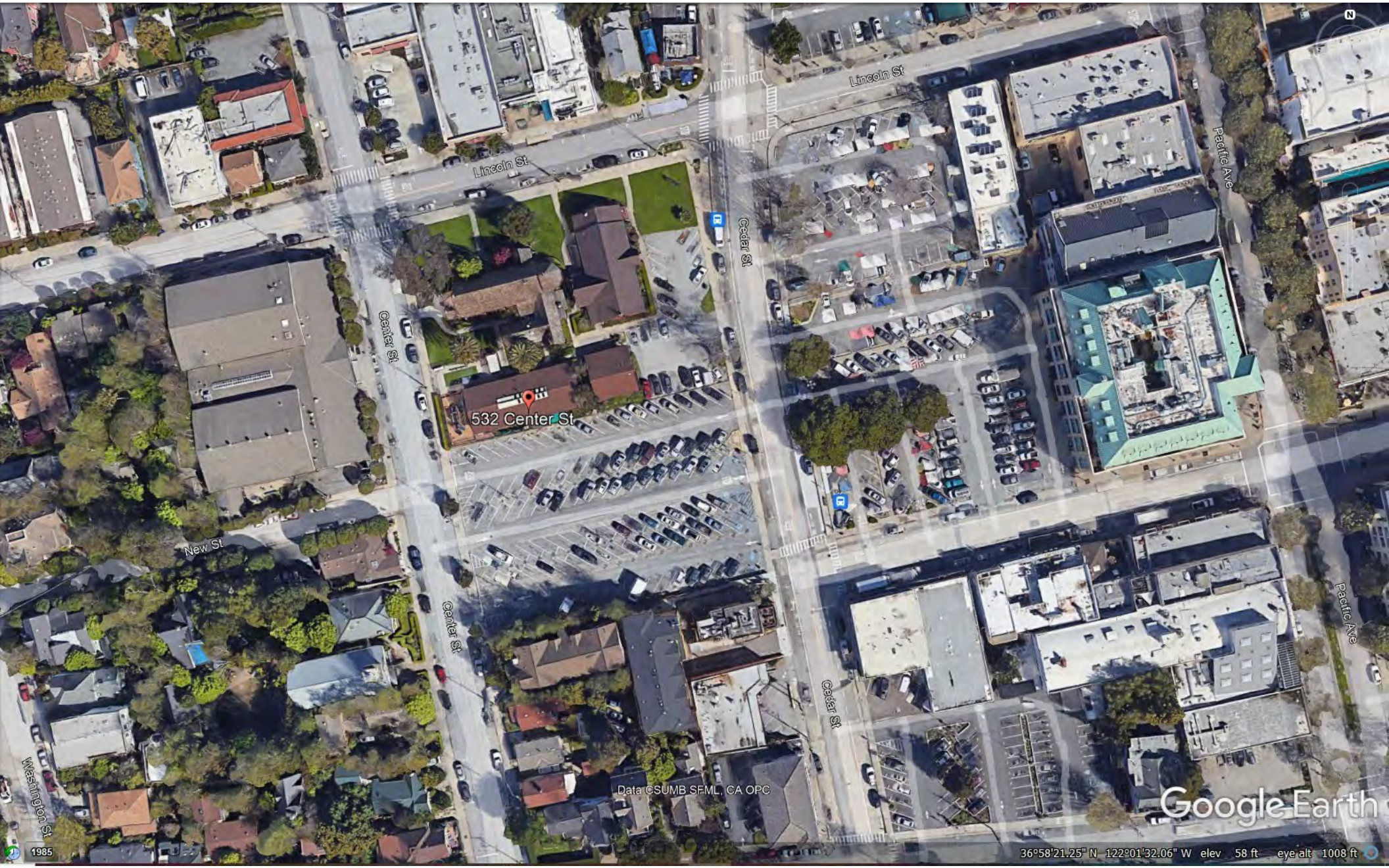
ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD

Interstate Route · US Route · State Route

SANTA CRUZ, CA
2018

NSN 7643016357679
NGA REF NO. USGSX24K339967


Lincoln St
Lincoln St
Pacific Ave
Cedar St
Center St
532 Center St
New St
Center St
Cedar St
Pacific Ave
Washington St
Data CSUMB SFML, CA OPC
Google Earth
1985
36°58'21.25" N 122°01'32.06" W elev 58 ft eye alt 1008 ft

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

ALAMEDA
COLUSA
CONTRA COSTA
DEL NORTE
HUMBOLDT
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLATA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
1400 Valley House Drive, Suite 210
Rohnert Park, California 94928-3609
Tel: 707.588.8455
nwic@sonoma.edu
http://nwic.sonoma.edu

November 16, 2021 NWIC File No.: 21-0714

Roy Hastings
R.L. Hastings & Associates, LLC
P.O. Box 552
Placerville, CA 95667

Re: Record search results for the proposed Cedar Street Family Apartments.

Dear Mr. Roy Hastings:

Per your request received by our office on the 8th of November, 2021, a rapid response records search was conducted for the above referenced project by reviewing pertinent Northwest Information Center (NWIC) base maps that reference cultural resources records and reports, historic-period maps, and literature for Santa Cruz County. An Area of Potential Effects (APE) map was provided depicting the Cedar Street Family Apartments project area and will be used to conduct this records search. Please note that use of the term cultural resources includes both archaeological resources and historical buildings and/or structures.

As per information provided to this office, the proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California (APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18). The site is currently a parking lot. The project will consist of 64 affordable units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east. The APE is the project and an approximately one-block radius around the project site. As per updated information provided to this office on the 16th of November, 2021, the APE is just the facing structures around the site on all sides.

Review of this information indicates that there has been no cultural resource studies that cover the Cedar Street Family Apartments project area. This Cedar Street Family Apartments project area contains no recorded archaeological resources. The State Office of Historic Preservation Built Environment Resources Directory (OHP BERD), which includes listings of the California Register of Historical Resources, California State Historical Landmarks, California State Points of Historical Interest, and the National Register of Historic Places, lists two recorded buildings or structures that face the proposed Cedar Street Family Apartments project area. At 532 Center Street, is the Calvary Episcopal Church (OTIS # 416954) listed with a 7R, meaning this resource was Identified in a Reconnaissance Level Survey or in an Area of Potential Effect

(APE), but not evaluated. In addition, at 516 Center Street, is an unnamed building, circa 1930 (OTIS # 478663) listed with a 1D, meaning it is a Contributor to a multi-component resource like a district listed in the National Register (NR) by the Keeper, and a 2D, meaning this resource is a contributor to a multi-component resource determined eligible for the NR by the Keeper. Also listed in the California Register (CR). In addition to these inventories, the NWIC base maps show no recorded buildings or structures within the proposed Cedar Street Family Apartments project area, and one recorded historic district located adjacent to the project area, P-44-000939, the Santa Cruz Downtown Historic District.

At the time of Euroamerican contact, the Native Americans that lived in the area were speakers of the Awaswas language, part of the Costanona/Ohlone language family (Levy 1978:485). There are no Native American resources in or adjacent to the proposed Cedar Street Family Apartments project area referenced in the ethnographic literature (Levy 1978:485, Levy 1976).

Based on an evaluation of the environmental setting and features associated with known sites, Native American resources in this part of Santa Cruz County have been found in areas marginal to Monterey Bay and Santa Cruz Harbor, and inland near intermittent and perennial watercourses, and near areas populated by oak, buckeye, manzanita, and pine, as well as near a variety of plant and animal resources. The Cedar Street Family Apartments project area is located in the town of Santa Cruz in an urban area approximately 0.6 miles north of Santa Cruz Harbor of Monterey Bay and approximately 0.2 miles west of San Lorenzo River. Current aerial maps indicate a paved parking lot adjacent to two streets, rows of trees, and two buildings. Given the similarity of these environmental factors, there is a moderate potential for unrecorded Native American resources to be within the proposed Cedar Street Family Apartments project area.

Review of historical literature and maps indicated historic-period activity within the Cedar Street Family Apartments project area. Early Sanborn Fire Insurance Maps of the City of Santa Cruz indicated the project area formerly contained between two and six buildings and/or structures (1886, 1892, 1905, 1928). With this in mind, there is a moderate to high potential for unrecorded historic-period archaeological resources to be within the proposed Cedar Street Family Apartments project area.

The 1952 photo revised 1987 Santa Cruz USGS 7.5-minute topographic quadrangle depicts an urban area, indicating the possibility of multiple buildings or structures within the APE of the Cedar Street Family Apartments project area. If present, these unrecorded buildings or structures may meet the Office of Historic Preservation's minimum age standard that buildings, structures, and objects 45 years or older may be of historical value.

RECOMMENDATIONS:

1) There is a moderate potential for Native American archaeological resources and a moderate to high potential for historic-period archaeological resources to be within the project area. We recommend a qualified archaeologist conduct further archival and field study to identify cultural resources. Field study may include, but is not limited to, pedestrian survey, hand auger sampling, shovel test units, or geoarchaeological analyses as well as other common methods used to identify the presence of archaeological resources. Please refer to the list of consultants who meet the Secretary of Interior's Standards at http://www.chrisinfo.org.

2) Our research indicates that there are two buildings or structures within the APE of the Cedar Street Family Apartments project area included in the OHP BERD; 532 Center Street, the Calvary Episcopal Church (OTIS # 416954), and 516 Center Street, an unnamed building, circa 1930 (OTIS # 478663). In addition, the APE contains one recorded historic district, P-44-000939, the Santa Cruz Downtown Historic District, and possibly other unrecorded resources that may meet the Office of Historic Preservation's minimum age standard that buildings, structures, and objects 45 years or older may be of historical value. Therefore, it is recommended that the agency responsible for Section 106 compliance consult with the Office of Historic Preservation regarding potential impacts to these buildings or structures:

Project Review and Compliance Unit
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816
(916) 445-7000

3) Review for possible historic-period buildings or structures has included only those sources listed in the attached bibliography and should not be considered comprehensive.

4) We recommend the lead agency contact the local Native American tribes regarding traditional, cultural, and religious heritage values. For a complete listing of tribes in the vicinity of the project, please contact the Native American Heritage Commission at (916)373-3710.

5) If archaeological resources are encountered **during construction,** work should be temporarily halted in the vicinity of the discovered materials and workers should avoid altering the materials and their context until a qualified professional archaeologist has evaluated the situation and provided appropriate recommendations. Project personnel should not collect cultural resources. Native American resources include chert or obsidian flakes, projectile points, mortars, and pestles; and dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials. Historic-period resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits or bottle dumps, often located in old wells or privies.

6) It is recommended that any identified cultural resources be recorded on DPR 523 historic resource recordation forms, available online from the Office of Historic Preservation's website: https://ohp.parks.ca.gov/?page_id=28351

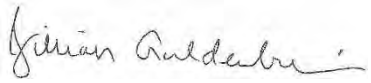
Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the California Historical Resources Information System (CHRIS) Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain

information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law.

Thank you for using our services. Please contact this office if you have any questions, (707) 588-8455.

Sincerely,



Jillian Guldenbrein
Researcher

LITERATURE REVIEWED

In addition to archaeological maps and site records on file at the Northwest Information Center of the Historical Resource File System, the following literature was reviewed:

Chase, John
1979 *The Sidewalk Companion to Santa Cruz Architecture*. Revised Edition. Paper Vision Press, Santa Cruz.

City Planning Department, Santa Cruz, California
1974 *Historic Preservation Plan, Santa Cruz, California.* City Planning Department, Santa Cruz, CA.

Department of Planning and Community Development, City of Santa Cruz
1989 *Santa Cruz Historic Building Survey – Vol. II.*

General Land Office
1874 Survey Plat for Township 11 South/Range 2 West.

Levy, Richard
1978 Costanoan. In *California*, edited by Robert F. Heizer, pp. 485-495. Handbook of North American Indians, vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Page, Charles Hall
1976 *Santa Cruz Historic Building Survey.* Moore's Graphic Art Service, Santa Cruz, CA.

Page, Charles Hall
1976 *Santa Cruz Renovation Manual, A Homeowner's Handbook.* Charles Hall Page & Associates, Inc. Santa Cruz, CA.

Sanborn Fire Insurance Maps
1886, 1892, 1905, 1928 Santa Cruz

State of California Department of Parks and Recreation
1976 *California Inventory of Historic Resources*. State of California Department of Parks and Recreation, Sacramento.

State of California Department of Parks and Recreation and Office of Historic Preservation
1988 *Five Views: An Ethnic Sites Survey for California*. State of California Department of Parks and Recreation and Office of Historic Preservation, Sacramento.

State of California Office of Historic Preservation **
2020 *Built Environment Resources Directory*. Listing by City (through March 3, 2020). State of California Office of Historic Preservation, Sacramento.

**Note that the Office of Historic Preservation's *Historic Properties Directory* includes National Register, State Registered Landmarks, California Points of Historical Interest, and the California Register of Historical Resources as well as Certified Local Government surveys that have undergone Section 106 review.

Cultural Resources Study

CEDAR STREET FAMILY APARTMENTS
ASSESSOR'S PARCEL NUMBERS 005-148-21 AND 005-148-22
AND PORTIONS OF 005-148-17 AND 005-148-18,
532 CENTER STREET, SANTA CRUZ,
SANTA CRUZ COUNTY, CALIFORNIA 95060

JANUARY 2022

Prepared for:
R. L. Hastings & Associates, LLC
P.O. Box 552
Placerville, CA 95667

Prepared by:
Historic Resource Associates
3142 Bird Rock Road
Pebble Beach, CA 93953

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ATTACHMENTS

DPR 523 Site Records
NWIC Record Search

Abstract

The project is being conducted under the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) and its implementing regulations found at 36 CFR Part 800 regarding the proposed Cedar Street Family Apartments, identified as Assessor's Parcel Numbers (APNs) 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18 and located at 532 Center Street, Santa Cruz, Santa Cruz County, California. The subject property is depicted on the 7.5' United States Geological Survey (USGS) *Santa Cruz, California* Topographic Quadrangle Map in Section 13 of Township 11 South, Range 2 West, Section 13, MDBM (Figure 1). The proposed 65-unit affordable housing project will be built on 2 full parcels and 2 partial parcels totaling approximately 0.77 acres. The site is currently a parking lot (Figure 2). The project area of potential effect (APE) has been determined to be a one block radius surrounding the project site.

On November 16, 2021, a record search (NWIC File # 21-0714) was conducted by staff at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) in Rohnert Park, California. According to the NWIC database, there have been no cultural resource studies that cover the project area, and the project site contains no recorded archaeological resources. The State Historic Preservation Office (SHPO) Built Environment Resources Directory (BERD) lists two recorded buildings or structures facing the proposed project site and within the APE. One of the buildings is the Calvary Episcopal Church (OTIS #416954), located at 532 Center Street and listed as 7R, meaning that the property was identified in a reconnaissance level survey, but was not formally evaluated for the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR). The second building is a 1930 building (OTIS #478663), located at 516 Center Street and listed as a 1D, meaning it is a contributor to a multi-component historic district listed in the NRHP by the Keeper. The Santa Cruz Downtown Historic District lies approximately 1 block to the east of the project site. Review of historic maps, such as Sanborn Fire Insurance Maps, indicate that the project site once included two to six buildings or structures dating from 1886-1928 (Figure 3). Taking into consideration the age of the former buildings or structures on the subject property, there is a relatively high potential for historic-period subsurface archaeological deposits in the project footprint.

On December 26, 2021, a pedestrian survey was carried out within the project APE. Photographs were taken of the project footprint, the Calvary Episcopal Church, and surrounding buildings and landscape features. The Calvary Episcopal Church was formally recorded on California Department of Parks and Recreation (DPR) forms and evaluated for listing on the NRHP for this federally funded project.

Introduction and Project Description

This cultural resources study was completed by Dana E. Supernowicz, M.A., RPA in accordance with state guidelines (California State Historic Preservation Office). The Principal Investigator meets and/or exceeds the qualifications described in the Secretary of the Interior's Professional Guidelines (Federal Register 48:190:44738-44739) (United States Department of the Interior 1983). Background research was conducted at the Northwest Information Center (NWIC), utilizing the California Historical Resources Information System (CHRIS); the California State Library, Sacramento; and the archives of Historic Resource Associates. The project is being conducted under the National

Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) regarding the Cedar Street Family Apartments affordable housing project. The project site is located in the community of Santa Cruz near the historic downtown, and is illustrated on the USGS 7.5-minute, *Santa Cruz, California* quadrangle map within Section 11 of Township 11 South, Range 1 West (Figure 1).

The proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres. The site is currently a parking lot (Figure 2). The project will consist of 64 affordable rental units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east. The project APE has been determined to be a one block radius surrounding the project site.

Subject Property

The subject parcel is developed with a paved asphalt level parking lot, at one time developed with several homes as delineated on Sanborn Fire Insurance Maps (Figures 4-8). The project site or parking lot abuts the Calvary Episcopal Church to the north; the Progressive Missionary Baptist Church, several older residences converted to commercial use, and the Girls and Boys Club of Santa Cruz to the west; an apartment building to the south; remodeled commercial buildings, a late nineteenth century residence converted to commercial use, and Jack's Restaurant or Diner to the north; and a large paved asphalt parking lot that abuts commercial buildings of various ages along Pacific Avenue to the east.

Environmental Setting

According to the United States Geological Survey (USGS) 7.5' *Santa Cruz, California* Topographic Quadrangle Map, the project site is located at an elevation of approximately 13' above mean sea level (amsl). The project site is level and lacks any vegetation.

Archaeology

The coastal region stretching from Santa Cruz to San Francisco has been the subject of numerous archaeological surveys and excavations since the early 1900s. The earliest of these investigations reflected an amateur archaeological approach, which included collecting museum specimens for display purposes or for private collections. In general, these studies were extremely limited in scope and provided little understanding of prehistoric culture of the Central Coast. Beginning in the late 1960s, academic research by students at San Francisco State University (and later San Jose State University) expanded the number of recorded archaeological sites along the coasts of San Mateo and Santa Cruz counties.

While much of this research was limited to site recording and limited sampling, a few important studies provided valuable information for the development of a regional chronology and an integrated understanding of prehistoric life (Roop 1976; Hylkema 1991). Hylkema's 1991 thesis was particularity important, as it not only provided the first integrated examination of prehistoric adaptations along the San Mateo-Santa Cruz coast, but it also provided the basis for comparisons of local economies with those of surrounding areas, including the San Francisco Bay, Monterey Bay and inland valleys (Environmental Science Associates 2001). Finally, studies driven by the requirements of the National Historic Preservation Act (NHPA) and California Environmental Quality Act (CEQA) since the 1970s have provided important data towards our understanding of the area's prehistory (Jones and Hildebrandt 1990; Fitzgerald and Ruby 1997; Environmental Science Associates 2001).

Archaeological and ethnographic studies indicate that the North Coast was possibly occupied from as early as the 10,000 years ago. The earliest evidence for occupation of the region comes from a site located in the Santa Cruz Mountains near Scotts Valley. This deeply buried site has been dated to 8000 BC and is the only evidence of what archaeologists refer to as the Paleo Indian period (Cartier 1993), a designation that subsumes all occupations dating earlier than 5000 BC. Progressively rising sea levels documented for this period may have obliterated additional evidence for occupation of the coast during this time. As with the climate, sea levels appear to have stabilized to current conditions by 5000 years ago (Environmental Science Associates 2001).

Evidence of habitation along the coast proper comes later, during the Lower Archaic period (3000-5000 BC), and from a site at Sand Hill Bluff (Jones and Hildebrandt 1990). This locale appears to have been occupied over a span of 5000 years, beginning about 6000 years ago. Habitation of both the coastal and interior regions in and surrounding Sand Hill Bluff is evidenced in numerous sites dating to the Middle Archaic (3000 - 1000 BC) and Upper Archaic (1000 BC - AD 1000). The latest prehistoric occupation appears to have occurred during what is known as the Emergent Period (AD 1000 - 1800), as evidenced at a site located at Davenport Landing (Fitzgerald and Ruby 1997) and at a site about 5 miles inland in the Santa Cruz Mountains (Hylkema 1991; Environmental Science Associates 2001).

Ethnography

Beginning immediately south of the Carquinez Strait, and continuing southward to Big Sur, was a region once occupied by the Costanoan peoples. Aboriginal groups of the San Francisco and Monterey Bay area came to be known collectively as Costanoan, a word derived from the Spanish word Costaños meaning 'coast people' (Levy 1977). The term Costanoan refers to a linguistic family consisting of eight languages: Karkin was spoken in a single tribelet on the southern edge of the Carquinez Strait; Chochenyo or East Bay Costanoan was spoken among the tribelets occupying the east shore of San Francisco Bay between Richmond and Mission San Jose, as well as the Livermore Valley; Tamyen or Santa Clara Costanoan was spoken around the south end of San Francisco Bay and in the lower Santa Clara Valley; Ramaytush or San Francisco Costanoan was spoken in San Mateo and San Francisco counties; Awaswas or Santa Cruz Costanoan was spoken among the people living along the ocean shore between Davenport and Aptos in Santa Cruz County; Mutsun was spoken among the tribelets of the Pajaro River drainage; Rumsen speakers occupied the lower Carmel, Sur, and lower Salinas rivers; and Chalon or Soledad was spoken on the Salinas River (Ibid).

Most of what we know about native inhabitants of the region has been pieced together from the Spanish exploring expeditions, ethnographic accounts in the 1920s and 1930s, and archaeological research. The Costanoan territory was occupied by approximately 50 separate and politically autonomous tribelets, each one occupying one or more permanent village sites and consisting of 50 to 500 persons. The Costanoans encountered by the Spanish were hunter-gatherers who managed their resources to ensure a sustained livelihood. They lived in sedentary communities in domed structures covered with thatched roofs, and relied for subsistence on nuts and seeds from various trees and plants, local fauna, and fish, particularly salmon, from the rivers and Pacific Ocean. Materials crafted by the Costanoans and used in subsistence activities included baskets, mortars, pestles, nets, net sinkers, anchors, and a variety of chipped stone tools.

Trade with the surrounding Plains Miwok, Sierra Miwok and Yokuts allowed nonindigenous materials and food (i.e. piñon nuts) to be brought into the area as well. In exchange, the Costanoan are thought to have exported bows, salt, and salmon to neighboring groups (Levy 1977). Economic reciprocity, in addition to intermarriage, is thought to have linked settlements together, some of which, by Spanish accounts, indicate stable and prosperous villages with as many as 200 people (Milliken 1993). Overall population density along this part of the coast was, nevertheless, very sparse.

For the first human inhabitants living along the Santa Cruz County coastline, there was a variety of natural resources that were available. Plants bearing edible seeds and/or leafy greens are known to have been used throughout the year, as revealed by plant remains from archaeological sites. In the spring, lupine was harvested for its edible green leaves, while chia provided seeds. During the late spring and summer, a variety of seed-bearing plants were gathered, including tarweed, goosefoot and elderberry. Soaproot was particularly important as it was used for food (edible root), fish poison, soap, and brushes (Fitzgerald and Ruby, 1997). Numerous species of trees and shrubs were also a source of nuts and berries, including baynut, hazelnut, and tan oak, all of which were harvested in the fall (Ibid). Buckeye, California bay laurel and coast live oaks were also considered to have been economically important (Hylkema 1991).

Acorns and grass seeds constituted a significant proportion of the native diet. Ethnographic accounts indicate that the natives sought to increase seed production of coast grasslands through intentional burning. Rediscovered as "prescribed burning" in modern times, this prehistoric practice also served to increase forage and attract large mammals, such as black tailed deer, which were regularly hunted (Jones and Hildebrandt 1990). Other animals in the aboriginal larder came from the coastal scrubland, oak woodlands and forests of the area, habitats for terrestrial mammals, reptiles, fish, and amphibians. Modern and historic use of the region has altered somewhat the ecology of the Central Coast, and reconstruction of prehistoric conditions is, at least partly, by inference. Species known to have been important to native peoples include a wide variety of small to medium mammals, including the jackrabbit, cottontail rabbit, kangaroo rat, ground squirrel, and badger.

Offshore vegetal resources such as kelp, seaweed and sea palm are known to have been exploited prehistorically. Native peoples collected these plants on-shore and roasted them for immediate consumption or dried and stored them for future use (Jones and Hildebrandt 1990). Shell refuse from an extensive menu of mussels, barnacles, limpets, chitons, abalone and clams are commonly found in

coastal archaeological sites. Studies have identified more than two hundred resident species of birds in the region but, perhaps more importantly, the cold and nutrient-rich waters immediately offshore lie astride the Pacific migratory waterfowl flyway Avifaunal remains from archaeological sites on the Santa Cruz coast indicate that waterbirds, such as canvasback duck, common merganser and blue winged teal were part of the prehistoric diet (Dietz et al. 1988). Migratory marine mammals known historically on the Central Coast were probably present prehistorically, and no doubt harbor seals, northern elephant seals, and sea lions were sources of protein and fat. These species were attracted by the same fish exploited by humans: Pacific mackerel, night smelt, white croaker, righteyed and lefteyed flounder and anchovy (Jones and Hildebrandt 1990).

The Rumsen were reportedly the first of the Costanoan peoples to be encountered by Spanish exploring expeditions in 1602 and between 1769 and 1776 (Levy 1977). Between 1770 and 1797, seven missions were established within Costanoan territory (Ibid). During the mission period, 1770-1835, significant changes occurred for the Costanoan people. The population was recruited into nearby missions and their traditional subsistence economy was replaced by an agricultural one. Analyses of mission baptismal records demonstrate that the last Costanoan tribelets living a traditional existence had disappeared by 1810 (Cook 1943; Levy 1977). The population declined from 10,000 in 1770 to less than 2,000 in 1832, due to the introduction of European diseases and falling birth rates. The mission culture that had absorbed and to some degree supported the Costanoans was short-lived. The secularization or abandonment of the missions by the Mexican government in 1832 caused the Costanoan to relocate to different areas and establish small settlements, fragmenting the survivors and separating them farther away from their cultural heritage. It is believed that the Costanoan languages were probably extinct by 1935 (Levy 1977).

History

The diverse range of natural resources in Santa Cruz County played an important role in settlement patterns during prehistoric, ethnographic, and historic times. In 1774 Father Francisco Palou accompanied an expedition to San Francisco Bay and beyond. Father Palou recommended the banks of the San Lorenzo River for the establishment of a mission. On September 25, 1791, Mission Santa Cruz was completed (Verardo and Verardo 1987:13). During the mid-1790s the Mission expanded and by 1831 mission lands contained over 8,000 head of cattle, creating a large trade in hides and tallow. The mission also included a large number of Native American neophytes, many of whom would remain in the Mission system throughout their adult lives (Verardo and Verardo 1987:14).

In 1832 the Mission system was secularized, and the Indians of the Mission were given Spanish surnames and goods were distributed among them. In the meantime, American interest in California and the Santa Cruz area had grown. During the 1840s settlement increased along the northern California coastline, including exploratory incursions by notable individuals, such as John Charles Freemont in 1846 (Verardo and Verardo 1987:19). Fremont enlisted American volunteers and formed a small battalion, which included Americans living in the Santa Cruz area. Fremont's brief incursion against Mexico, known as the Bear Flag Revolt, ended with the treaty of Guadalupe-Hidalgo in 1848, wherein Alta California became a territory of the United States.

With the discovery of gold at Coloma in January 1848, came a wave of new immigration to California and the Santa Cruz area. Tanneries sprang up along the coast, utilizing tan oak bark, which meant stripping the bark from the trees. Other industries included grist mills, saw mills, and small agriculture. In 1851, the first lime kiln was established in Santa Cruz County (Verardo and Verardo 1987:23). Another important industry that developed in the county was the production of "giant powder." In December 1861, the California Powder Works were established. The company was the first on the coast to produce nitro-cotton or smokeless powder for cannon. A great deal of the powder during the 1860s was shipped to the Central Pacific Railroad during its construction over the Sierra Nevada Mountains (Verardo and Verardo 1987:25). In 1876 the South Pacific Railroad, a narrow-gauge, ran between Felton and Santa Cruz. In 1879, direct service was extended from Santa Cruz to San Jose, Oakland, and the East Bay. By 1883, a line was extended through the Pajaro Valley (Ibid).

By the turn of the century, much of the natural wealth of Santa Cruz County had been exploited or was in jeopardy, including the vast stands of coastal redwood (*sequoia sempervirens*) that surrounded the community. Fortunately, through the efforts of Andrew P. Hill, a noted San Jose photographer, a tract of land north of Santa Cruz was set aside in 1904 as California's first state park. Originally known as Redwood State Park, the name of the state park was changed in the 1920s to Big Basin Redwoods State Park. Like other coastal communities in Santa Cruz County, Soquel, Aptos, and Santa Cruz would evolve during the first few decades of the twentieth century into resort communities. Assisted by better transportation systems, visitors from the Bay Area and Santa Clara Valley routinely came to the Santa Cruz coast for leisure and entertainment.

The historic context of the proposed project is tied to development of the Calvary Episcopal Church, which occupies a rectangular-shaped parcel immediately north of the project site. The church was built in 1864 and completed in 1865. The Carpenter Gothic Revival church is flanked to the east by the Parish Hall and to the south by classrooms that reportedly date to the 1950s. In the far east end of the property is a paved parking lot and to the south is a much larger parking lot.

The following history of the church was recounted by Eliza Boston in 1900, annotated in the Parish Register 1903 and transcribed by Carol Walker, parish archivist, in September 2014:

> The first service of the Protestant Episcopal Church was held in Santa Cruz, on Sunday May 11th 1862 by Rev. Dr. Ver Mehr. The second service was held on Sunday May 10th 1863 by Rev. C.B. Wyatt, Rector of Trinity Church, San Francisco. The Rev. C.F. Loop, a Missionary appointed by the Board of Missions Domestic, New York City, arrived in Santa Cruz and began regular services in the Court house, July 5th 1863. On Easter Monday [March 28th] 1864 Calvary Parish was formally organized and the Rev. C.F. Loop was elected Rector. On St. Peter's Day June 29th 1864 the corner stone of the Church Edifice was laid by the Rector assisted by the Rev. D.D. Chapin, of San José, and the Rev. Mr. Easton of San Mateo. The first service was held in the new Church Edifice [unfinished] on January 8th 1865. On Sunday October 27th 1867 the debt of $675 having been paid, the Church was solemnly consecrated to the worship and Service of Almighty God, by the Rt. Rev. Wm. I. Kip D.D. Bishop of California, assisted by the Rector and the Rev. A.L. Brewer of San Mateo. On September 4th 1868

> the Rector Rev. C.F. Loop sent his resignation to the Vestry of Calvary Church, which was accepted and also notified the Standing Committee, the Bishop being absent from the Diocese. During its first 100 years, Calvary Church continued to grow and reach out, not only to the city of Santa Cruz, but also to Episcopalians in the surrounding area. The clergy and laity of Calvary were largely responsible for creating and sustaining missionary work in the surrounding areas of Santa Cruz County, especially in helping to establish the present Episcopal churches at Ben Lomond, Aptos and Scotts Valley. In 2015, Calvary Church celebrated the 150th Anniversary of the first service held at the church with the play Lincoln's Eulogy written by parishioner Dana Bagshaw. This play told the story of how Calvary was involved in the Santa Cruz community in response to the death of President Abraham Lincoln. While parishioners prepared for the first service at Calvary Church to be held Easter Sunday, April 16, 1865, the news arrived that President Lincoln had been assassinated. The floral decorations were removed, and emblems of mourning were hung in the chancel. On April 19, the then-rector Rev. Loop held a special service in honor of the slain president. Accounts in the church records say he was a personal friend of Abraham Lincoln, and his address to the congregation was so eloquent that the City Fathers of Santa Cruz asked him to repeat it publicly the following week. Calvary's involvement in the community began here, at its inception (Calvary Episcopal Church Website 2021).

The above history provided by Eliza Boston in 1900, wife of Joseph Boston, who reportedly donated the land for the church, appears to be consistent with period newspaper accounts as described below. The earliest known photograph of the church appears to have been taken in 1866-1867. Historic newspapers indicate that Eliza Boston's husband, Joseph Boston, an avocational architect, designed the church, based upon a love for Anglican churches found in England.

According to an article that appeared in the *Santa Cruz Weekly Sentinel* on June 23, 1866, the site for the church, rectory, and school was donated by Mrs. Joseph Boston and the "church edifice" was erected. In the following year, according to the *Santa Cruz Weekly Sentinel* in November 1867:

> Calvary Church, Santa Cruz, which was consecrated by Bishop Kipp, on the 27th of October, is a beautiful and substantial edifice of wood, built upon a firm foundation of brick. The style is Gothic of the early English period. The plan is for nave, chancel, tower, porch and vestry-room. The tower is to be built hereafter on the north side. The interior dimensions of the nave are 64 feet by 25, with open timbered roof; the height from the floor to the apex is 37 feet. A wainscot, four feet high, surmounted by a heavy moulding runs round both nave and chancel. The sections of the roof divide the nave into four bays of sixteen feet each. The sides between the posts are plastered and painted a delicate tint of ochre; each bay having a window nine feet in length. The chancel, separated from the nave by a lofty gothic arch, is apsidal in form, 21 x 20 feet in depth; the walls are pierced by six lancet windows filled with rich colored glass, containing the principal Christian emblems. The west gable has a beautiful clustered window of three lights, headed by a trefoil three feet in diameter, soon to be filled with glass of exquisite design and workmanship, from the establishment of Henry Sharp, New York who has furnished the windows for the whole church. The altar is placed

> against the east wall under the central light, which contains the emblem of the Great Sacrifice – the cross of cavalry and the crown of thorns. At the right is the Bishop's chair, ornamented by elaborate carvings of black walnut. The chancel rail is upon the chard of the apse, outside of which are the stalls and lectern. A very beautiful Baptismal Font of Nova Scotia stone, made by Fishure & Bird, N.Y., stands outside the chancel arch, at the north side. The floor of the chancel is covered with Brussels carpet of ecclesiastical pattern. On entering the west door, the effect of the interior of this building is not only very pleasing but imposing. We feel that it is a fitting place to offer the sacrifice of prayer and praise, and worthy of being consecrated to the service of God. The whole cost of the building, including the windows, was about seven thousand dollars. By a recent effort on the part of the Rector, Rev. C.F. Loop, and his parishioners, the remaining debt of six hundred and seventy-five ($675) dollars, was paid. The lot upon which the church is built, containing over an acre, was the gift of Mrs. Joseph Boston (Santa Cruz Weekly Sentinel, November 16, 1867).

During the 1870s, prior to his death, Joseph Boston, his wife, and family were living on Mission Street in Santa Cruz (*Santa Cruz Weekly Sentinel*, October 24, 1874). Based upon a newspaper article published on July 1, 1893 in the *Santa Cruz Surf* newspaper for Parish Day, the cornerstone for the church was laid on June 29, 1864, and the first rector was Rev. C.F. Loop.

In 1914, the church celebrated its Golden Jubilee with a Souvenir edition of the church history published in the parish paper known as the Ivy Leaf. From the late-nineteenth century through the first half of the twentieth century, the importance of the church to citizens of Santa Cruz is well documented in local newspapers.

Prior Cultural Resource Surveys

On November 16, 2021, a record search (NWIC File # 21-0714) was conducted by staff at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) in Rohnert Park, California. According to the NWIC database, there have been no cultural resource studies that encompass the project area, and the project site contains no recorded archaeological resources. The State Historic Preservation Office (SHPO) Built Environment Resources Directory (BERD) lists two recorded buildings or structures facing the proposed project site and within the APE. One of the buildings is the Calvary Episcopal Church (OTIS #416954), located at 532 Center Street and listed as 7R, meaning that the property was identified in a reconnaissance level survey, but was not formally evaluated for the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR). The second building is a 1930 building (OTIS #478663), located at 516 Center Street and listed as a 1D, meaning it is a contributor to a multi-component historic district listed in the NRHP by the Keeper. The Santa Cruz Downtown Historic District lies approximately 1 block to the east of the project site. Review of historic maps, such as Sanborn Fire Insurance Maps, indicate that the project site once included two to six buildings or structures dating from 1886-1928 (Figure 3). Taking into consideration the age of the former buildings or structures on the subject property, there is a relatively high potential for historic-period subsurface archaeological deposits in the project footprint.

Known Archaeological and Historical Sites

According to NWIC records, there were no prehistoric archaeological or historical archaeological sites identified in the project footprint.

Tribal Consultation

On December 30, 2021, the Native American Heritage Commission (NAHC) responded to a record search request by R.L. Hastings & Associates, LLC. The NAHC submitted the following contacts: Valentin Lopez, Chairperson, Amah Mutson Tribal Band; Irene Zwierlein, Chairperson, Amah Mutson Tribal Band of Mission San Juan Bautista; Patrick Orozoo, Chairman, Costanoan Ohlone Rumsen-Mutsen Tribe; Kanyon Savers-Roods, Indian Canyon Mutsun Band of Costanoan; Ann Marie Savers, Chairperson, Indian Canyon Mutsun Band of Costanoan; Monica Areilano, Vice Chairwoman, Muwekma Ohlone Indian Tribe of SF Bay Area; De Dee Manzanares Ybarra, Chairperson, Ohlone/Costanoan; and Kenneth Woodrow, Chairperson, Wuksache Indian Tribe/Eshom Valley Band.

National/State Register Files

There were no built environment properties identified within the project footprint. The nearest National or State Registered historic property is a 1930 building (OTIS #478663), located at 516 Center Street and listed as a 1D, meaning it is a contributor to a multi-component historic district listed in the NRHP by the Keeper. The Santa Cruz Downtown Historic District lies approximately 1 block to the east of the project site.

Historic Map and Aerial Photograph Review

A review of historic topographic quadrangle maps from 1954-2021, aerial photographs from 1950-2021, and Sanborn Fire Insurance Map from 1886-1950, indicate the evolution of the project site and the Calvary Episcopal Church. In 1886, the project site was developed with an "L" shaped church at the corner of Center and Lincoln Streets with two single-family residences to the east bordering Cedar Street, which at the time was no more than an alley. By 1892, little had changed, with the exception of the front double-gable entryway leading into the church having been built and a privy placed south of the church, where the school or classrooms were later constructed. Between 1892 and 1928, the Parish Hall was built east of the church in a similar configuration as it is today, with the exception of an addition to the north. In addition, between 1892 and 1928, classrooms were constructed to the south of the church and Parish Hall, along with a residence southwest of the classrooms fronting Center Street and a shed or garage in the rear of the parcel fronting Cedar Street. In 1950, the revised Sanborn Fire Insurance Map depicts the property much the same as it was in 1928. During the 1950s, aerial photographs illustrate the expansion of the church with a cross-gable wing projecting west from the south wing of the church, expansion of the school or classrooms to the south, and, as previously noted, enlargement to the north of the Parish Hall. The residence to the southwest on the parcel was demolished, as was the shed or garage in the rear of the parcel, both of which appear to lie along the northern edge of the current parking lot.

Archaeological and Historical Sensitivity

The precontact sensitivity of the project has been determined to be low, taking into account past disturbances to the project footprint, such as grading, compaction, and former soils displacement. Historical archaeological features, however, are likely to be present in the project footprint associated with former residential houses dating to the late-nineteenth century.

Pedestrian Survey

A pedestrian survey of the project area was completed by Dana E. Supernowicz, M.A., RPA on December 26, 2021. The surface reconnaissance focused on assessing and photographing the general surface conditions found within the project area. The proposed impact area's archaeological potential was evaluated based on several factors, including proximity to recorded sites, creeks, rivers, and wetlands; the presence of early historic development; as well as disturbances, such as grading, fill slopes, and cutting. Ground surfaces within the entire project site are covered with asphalt paving.

Conclusion and Recommendations

Following a pedestrian survey of the project footprint, walking 1-5 meter transects, no prehistoric archaeological or historical archaeological sites were identified within the project footprint. The probability of discovering subsurface archaeological sites is low. No additional cultural resource study is recommended for the proposed project.

The property was assessed using the National Register of Historic Places (NRHP) Criteria for Evaluation, described as the quality of significance in American history, architecture, archaeology, and culture found in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association, and meets one of the following criteria:

Criterion A: Are associated with events that have made a significant contribution to the broad patterns of our history; or

Criterion B: Are associated with the lives of persons significant in our past; or

Criterion C: Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

National Register criteria considerations (36 CFR §60.4) Consideration A: A religious property according to National Register guidelines, "requires additional justification (for nomination) because of the necessity to avoid any appearance of judgement by government about the merit of any religion or belief." However, religious properties may qualify if they are integral parts of districts that do meet the criteria or if they fall within the following category - "a religious property deriving primary significance from architectural or artistic distinction or historical importance."

The Calvary Episcopal Church remained an important part of the secular and social history of Santa Cruz through the 1930s. Thus, the period of significance for the property extends from its completion in 1865 to 1940, because improvement made during this period contribute to the history of the church. Therefore, despite the addition of the double-gable entrance in the front of the church after 1886 and prior to 1892, thus eliminating the main entrance along Lincoln Street to a side entrance, and the cross-gable addition on the south end of the church after 1950, the church retains adequate integrity to convey its historic significance. This is apparent in the post-1950 addition, due to the care taken to construct the addition using materials and a design sympathetic to the original church, without entirely duplicating historic fabric on the original, giving a false sense of history. The Parish Hall and the School or Classrooms, however, appear to have undergone the most dramatic alterations since they were constructed and consequently the integrity of both buildings has been compromised.

In applying NRHP Criterion A, the church represents one of the oldest secular institutions in Santa Cruz, and its significance to the community since its construction in the 1860s is well documented. Therefore, the church appears to be eligible for the NRHP under Criterion A, being the oldest surviving such structure in Santa Cruz. Under Criterion B, no documentation has been found to suggest the church is associated with a person or persons of significance in history of Santa Cruz, despite the fact the church may have been designed by Joseph Boston, whose wife donated the land on which the church is located today. The construction of the church appears to have been a community effort with donations from various individuals living in Santa Cruz during the 1860s. Under NRHP Criteria C, the church building is the oldest surviving structure of its type in Santa Cruz, retains adequate integrity to convey its historic appearance, and is an important example of Carpenter Gothic architecture. Similarly, the church appears to be eligible under National Register Criterion Consideration A, deriving primary significance from "architectural or artistic distinction or historical importance." The parish hall and school or classrooms do not appear to be eligible for the NRHP under any of the criteria, due to numerous additions and alterations post-1940.

In regards to potential effects, because the historic church is setback to the north from the proposed project and screened in part by a non-contributing part of the church, namely the school or classrooms, the project will not diminish the characteristics that make the church potentially eligible for the NRHP, such as its architecture and function serving the greater Santa Cruz area.

In the event that a concentration of artifacts or culturally modified soil deposits (including trash pits older than 50 years) should be encountered at any time during ground disturbing activities, all work must stop until a qualified archaeologist views the finds and makes a preliminary evaluation. If warranted, further archaeological work in the discovery area should be performed. Although unlikely, if human remains are encountered, all work must stop in the immediate vicinity of the discovery until the County Coroner and a qualified archaeologist evaluate the remains.

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FIGURES

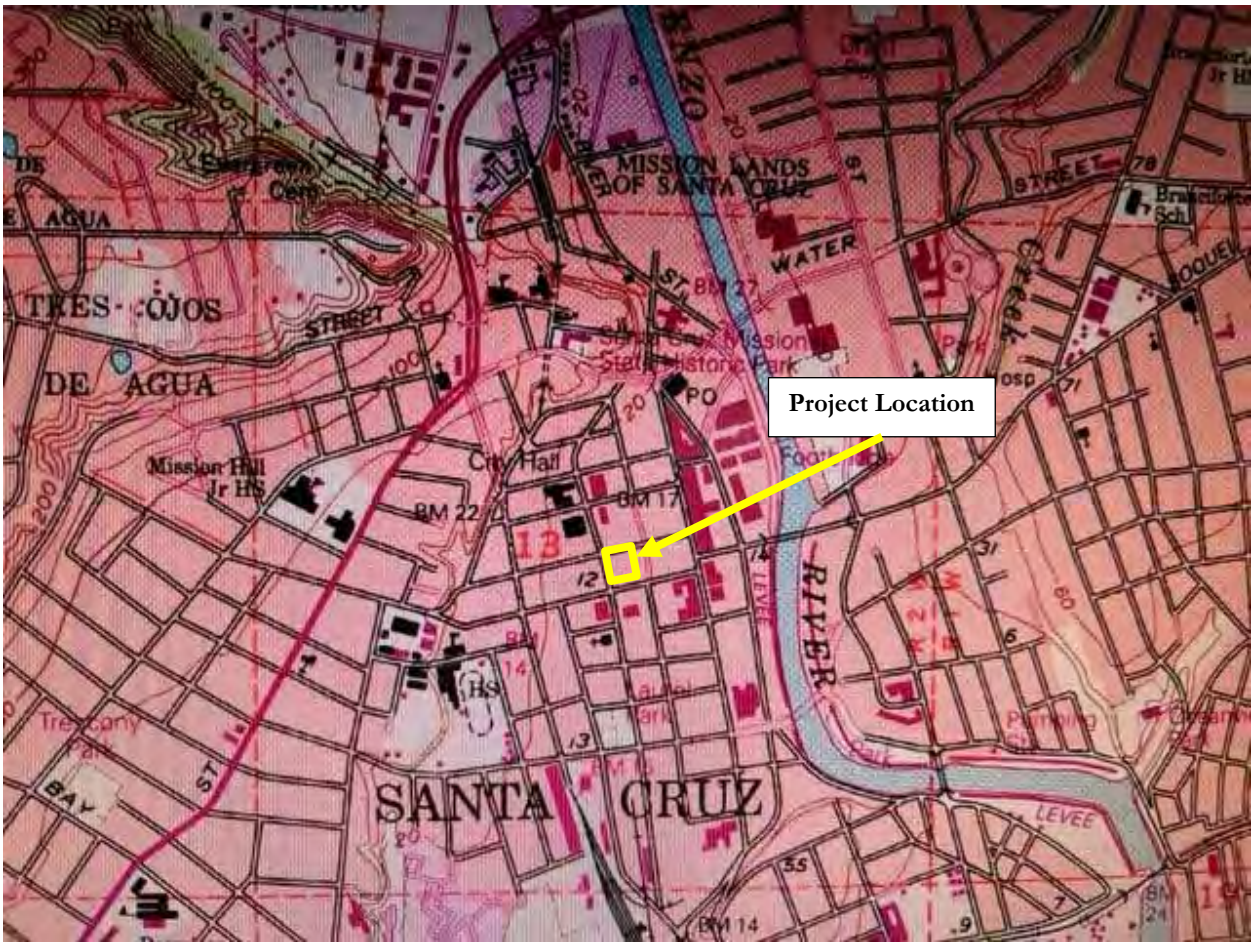


Figure 1: Project Location Map
(USGS 7.5' *Santa Cruz, CA* Topographic Map 1954).

Figure 2: Project Aerial Vicinity Map (Google Earth 2021).

Figure 3: Project Aerial Location and Historic Properties Map (Google Earth 2021).

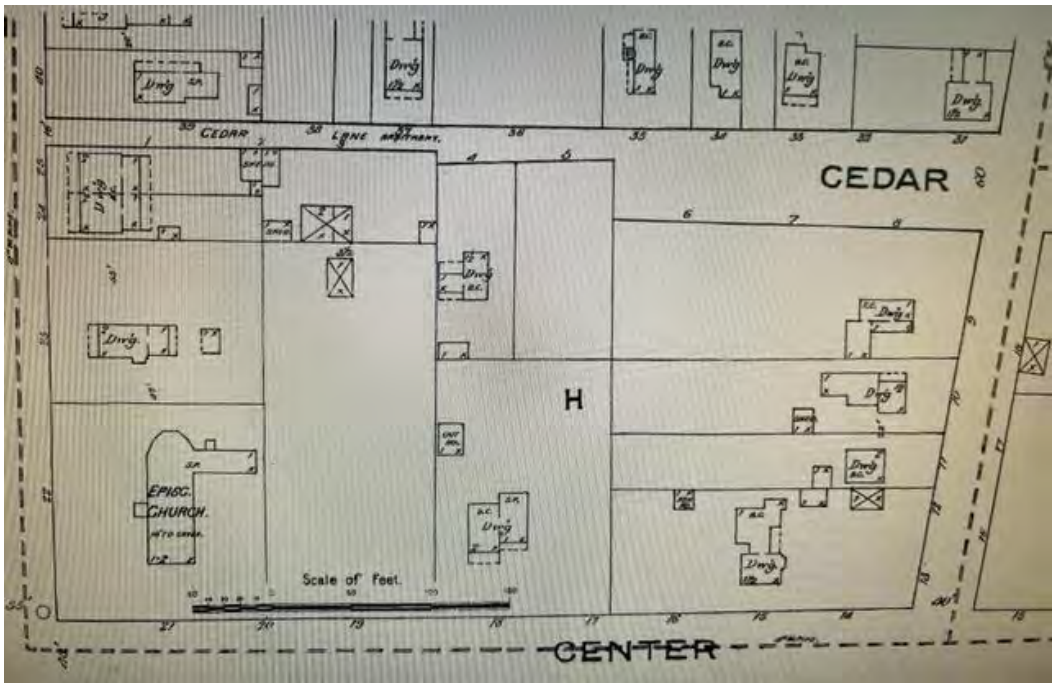


Figure 4: Sanborn Fire Insurance Map.
(Santa Cruz, CA 1886)

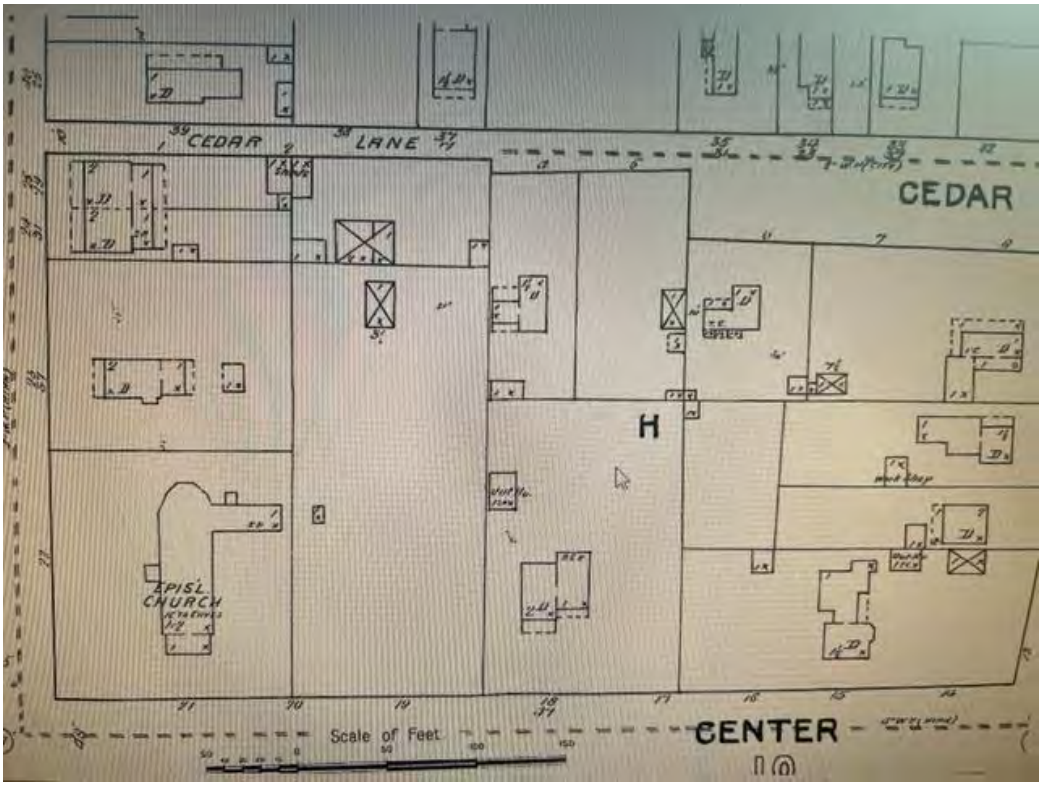


Figure 5: Sanborn Fire Insurance Map
(Santa Cruz, CA 1892).

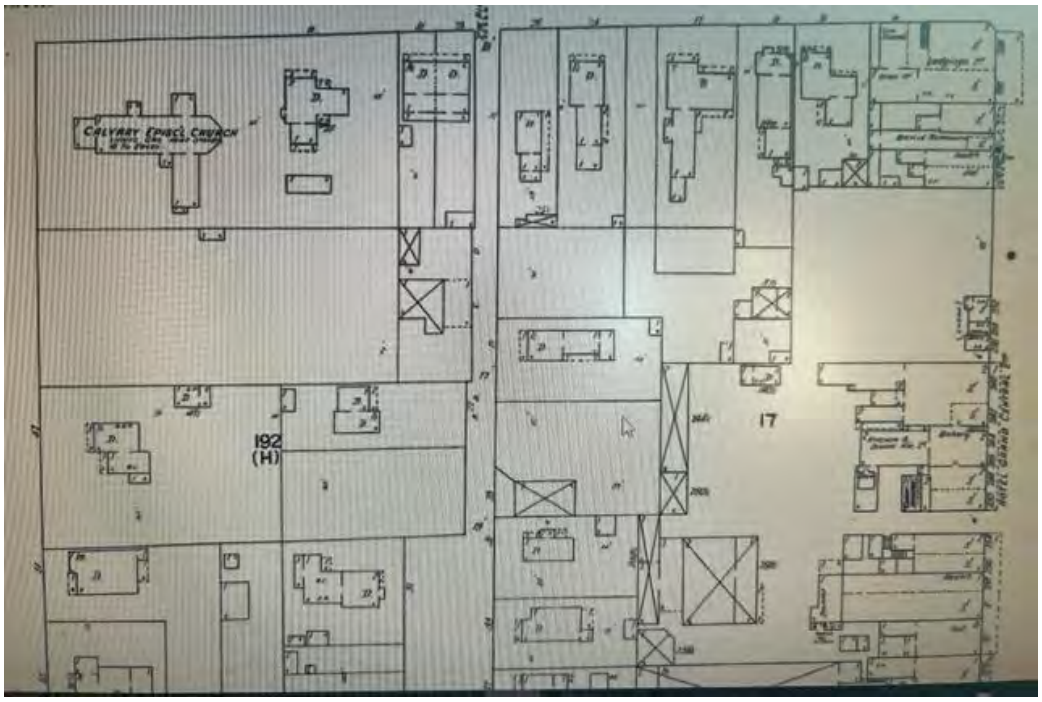


Figure 6: Sanborn Fire Insurance Map (Santa Cruz, CA 1905).

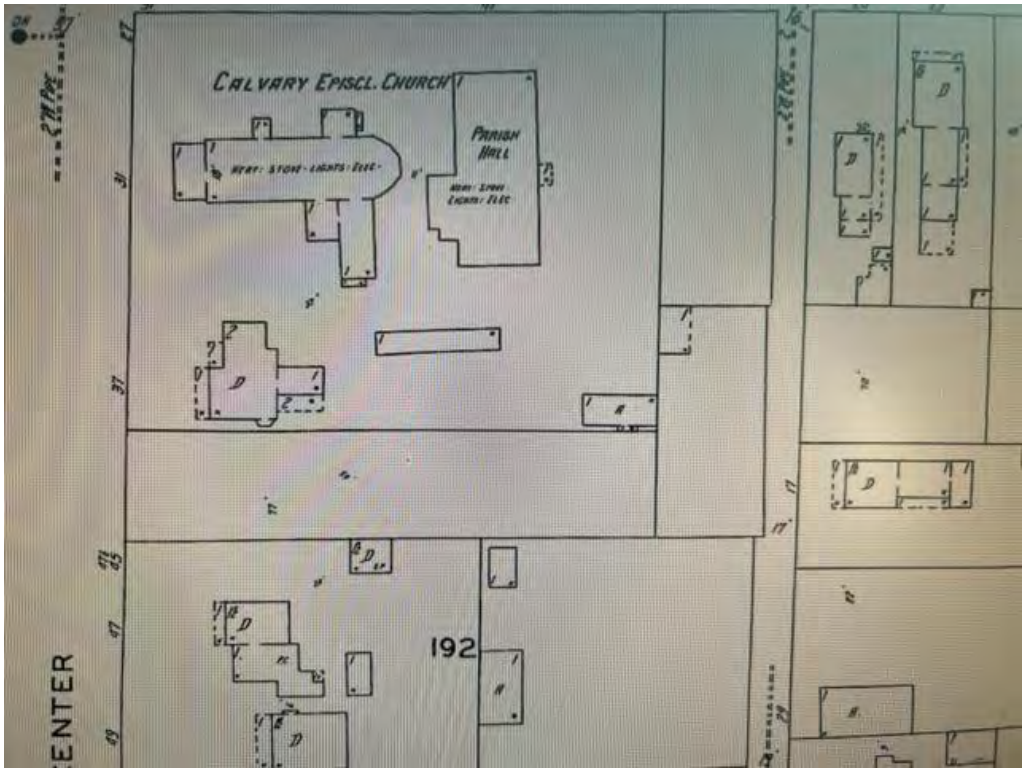


Figure 7: Sanborn Fire Insurance Map (Santa Cruz, CA 1928).

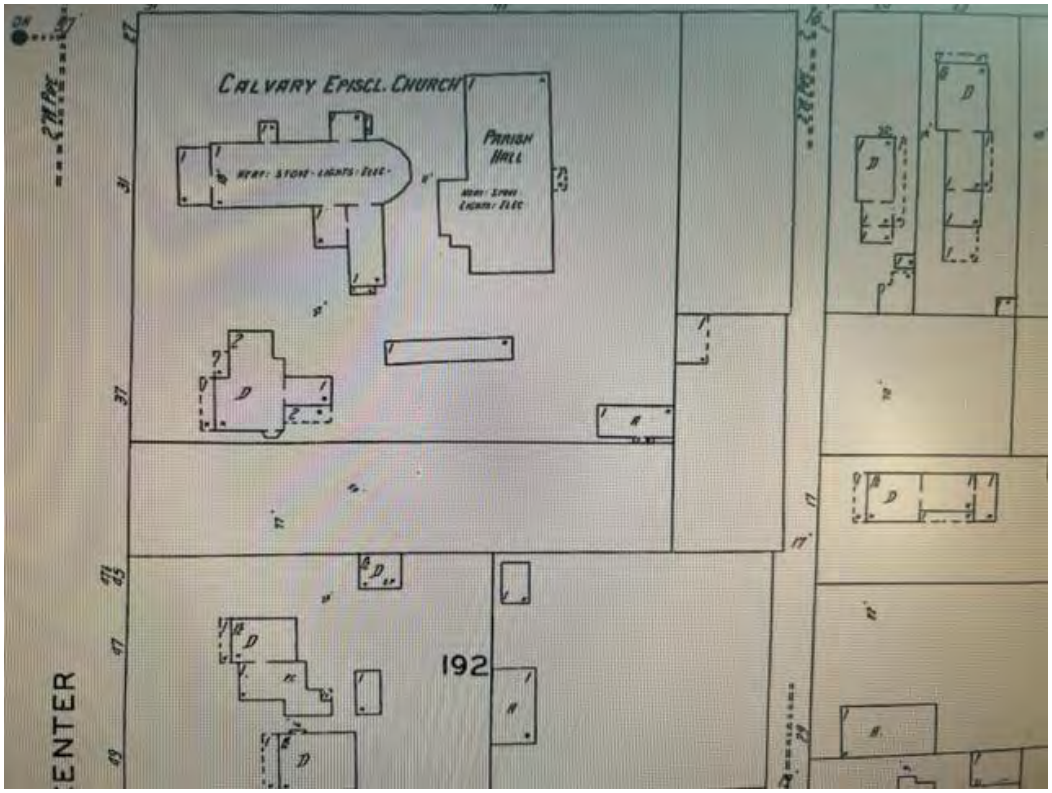


Figure 8: Sanborn Fire Insurance Map (Santa Cruz, CA 1928-revised 1950).

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #: _____
HRI # _____
Trinomial _____
NRHP Status Code: _____
Other Listings _____
Review Code ____ Reviewer _____ Date _____

 ***Resource Name or #:** (Assigned by recorder) Calvary Episcopal Church

P1. Other Identifier: Calvary Church

***P2. Location:** ☐ Not for Publication ■ Unrestricted ***a. County:** Santa Cruz

b. USGS 7.5' Quadrangle: Santa Cruz, CA 1954

c. Address: 532 Center Street **City:** Santa Cruz **Zip**: 95060

d. UTM: N/A

e. Other Locational Data (APN #): The church is sited at the northeast corner of Center and Lincoln Street in downtown Santa Cruz, APN 005-148-21 and 005-148-22 and Portions of 005-148-17, 005-148-18, and 5731-019-100.

***P3a. Description:** The subject property, commonly known as the Calvary Episcopal Church, was built in 1864 and completed in 1865. The Carpenter Gothic Revival church is flanked to the east by the Parish Hall and to the south by classrooms that reportedly date to the 1950s. In the far east end of the property is a paved parking lot and to the south is much larger parking lot. Architectural defining characteristics of the church or sanctuary include a steep gable wood shake roof with two parallel single-story gable roofs forming the entry vestibule, and an intersecting gable roof in the rear of the church that returns towards the front of the church facing Center Street with another steep gable roof clad with wood shakes. The north elevation of the church along Lincoln Street forming the nave, features a gablet on the north center of the left vestibule roof, an enclosed secondary gable roof entrance near the center of the church, and a tall intersecting gable near the rear of the church. The rear or chancel of the church features a unique apsidal style bay filled with Gothic influenced stained-glass windows in each panel. The upper roof forms a modest hip with a small cross affixed to it. The exterior walls of the church are sided with horizontal wood clapboard. The sidewalls feature wooden buttresses that divide individual stained-glass Gothic windows. The front entrance is characterized by the two gables with wooden buttresses that flank each of the two double-arched (replacement) entry doors. Between the two sets of doors are three arched stained-glass windows. The church is accessed via replaced concrete stairs with steel hand rails. The top of the front gable includes a small wooden cross as do the two gable entrances. The intersecting gable addition on the south side of the church or sanctuary features a bank of (replacement) fixed plate glass windows that face Center Street. The detached rectory and office or administration building on the east side of the church features a more modest intersecting gable roof with contemporary Gothic inspired wood windows along its north elevation. The building appears to have a basement evidenced by windows along the skirt of the building and two entrances facing the rear of the church. The main entrance to the building faces the parking lot and Cedar Street. The building is sided with horizontal wood clapboard similar to the church and features wood-sash windows, the main entrance having Gothic arch surrounding two wooden double doors. To the west of the rectory and office are classrooms in a shallow gable rectangular-shaped building that runs east to west bordering the parking lot to the west. The church grounds are fully landscaped with lawns, shrubs, several mature palm trees, concrete walkways, and metal fencing.

***P3b. Resource Attributes:** HP16 - Religious Buildings

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

P5b. Description of Photo: View northwest at the Calvary Episcopal Church from Center Street.

***P6. Date Constructed/Age and Sources:** ■ Historic The church or sanctuary was reportedly built in 1864 and completed in 1865. The Parish Hall was built between 1892 and 1905 with later additions, and the school or classrooms were built between 1905 and 1928 with later additions and alterations (Santa Cruz Historic Building Survey, 1976, p. 65; historic aerial photographs, newspapers, Sanborn Fire Insurance Maps).

***P7. Owner and Address:** Calvary Episcopal Church, 532 Center Street, Santa Cruz, CA 95060.

***P8. Recorded by:** Dana E. Supernowicz, Architectural Historian, Historic Resource Associates, 3142 Bird Rock Road, Pebble Beach, CA 93953.

***P9. Date Recorded:** January 2022

***P10. Type of Survey:** ■ Architectural

***P11. Report Citation:** Cultural Resources Study, Cedar Street Family Apartments, Assessor's Parcel Numbers 005-148-21 and 005-148-22 and Portions of 005-148-17 and 005-148-18, 532 Center Street, Santa Cruz, Santa Cruz County, California 95060. Prepared for R.L. Hastings & Associates, LLC, P.O. Box 552, Placerville, CA 95667. Prepared by Historic Resource Associates, 3102 Bird Rock Road, Pebble Beach, CA 93953. January 2022.

***Attachments:** Building, Structure, and Object Record; Photograph Record.

B1. Historic Name: Calvary Church
B2. Common Name: Calvary Episcopal Church
B3. Original Use: Church **B4. Present Use:** Same
***B5. Architectural Style:** Carpenter Gothic
***B6. Construction History:** Based upon church records, an historical building survey of Santa Cruz, historical aerials, and newspapers, the church or sanctuary was constructed in 1864 and completed in 1865/1866. A review of historic topographic quadrangle maps from 1954-2020, aerial photographs from 1950-2021, and Sanborn Fire Insurance Maps from 1886-1950, reveal the evolution of the project site and the Calvary Episcopal Church. In 1886, the project site was developed with an "L" shaped church at the corner of Center and Lincoln Streets with two single-family residences to the east bordering Cedar Street, which at the time was no more than an alley. By 1892, little had changed, with the exception of the front double-gable entryway leading into the church having been built and a privy placed south of the church, where the school or classrooms were later constructed. Between 1892 and 1928, the Parish Hall was built east of the church in a similar configuration as it is today, with the exception of an addition to the north. In addition, between 1892 and 1928, classrooms were built to the south of the church and Parish Hall, along with a residence southwest of the classrooms fronting Center Street and a shed or garage in the rear of the parcel fronting Cedar Street. In 1950, the revised Sanborn Fire Insurance Map depicts the property much the same as it was in 1928. During the 1950s, aerial photographs illustrate the expansion of the church with a cross-gable wing projecting west from the south wing of the church, expansion of the school or classrooms to the south, and, as previously noted, enlargement to the north of the Parish Hall. The residence to the southwest on the parcel was demolished, as was the shed or garage in the rear of the parcel, both of which appear to lie along the northern edge of the current parking lot.
***B7. Moved?** ■ No ☐ Yes ☐ Unknown **Date:** N/A **Original Location:**
***B8. Related Features:** The historic downtown district of Santa Cruz is located one block to the east. To the north is a previously developed paved parking lot, and single-family houses and businesses flanking Center Street between Lincoln and Elm Street.
B9a. Architect: Possibly Joseph Boston **B9b. Builder:** Undetermined
***B10. Significance: Theme:** Religion/Socio-Cultural/Carpenter Gothic Architecture **Area:** Santa Cruz
Period of Significance: 1865-1866 **Property Type:** Church **Applicable Criteria:** A, B & C
The indigenous Ohlone people occupied the land that would become Santa Cruz when the Spanish arrived in California in 1769. Beginning in the 1790s, the future city accommodated a Spanish mission and a secular pueblo, but the area remained sparsely populated until the 1840s, when American settlers began to arrive in the area, then under Mexican rule. By the time the American government took possession of California in 1848, a commercial center developed in the flatlands south of the former mission. As more settlers arrived, various industries developed in Santa Cruz, including a sawmill, a kiln, and a foundry. Powder manufacturing and lumber became the city's primary early industries, and Santa Cruz County became a major supplier of wood to San Francisco as its northern neighbor developed into a major city. The arrival of community services to Santa Cruz, such as churches, facilitated the city's growth into a comfortable residential community. Early churches included United Methodist Church, founded in 1848, and Calvary Episcopal Church, founded in 1862. A railroad line connected Santa Cruz to nearby Watsonville and Gilroy in 1876, allowing Santa Cruz to be more accessible to tourists. In the 1880s, hotels, baths, and amusements were constructed to attract visitors who would sometimes stay weeks at a time. In 1894, the city received national publicity with an article in Harper's Weekly and by the turn of the century, Santa Cruz became one of the West Coast's major seaside resort towns. President Teddy Roosevelt visited Santa Cruz in 1903 and the Santa Cruz Boardwalk opened in 1907. Along with an increasing number of seasonal visitors, the year-round population increased as well. New residential neighborhoods developed in disarranged grids east and west of downtown, in the West Cliffs area and in Seabright. These neighborhoods were linked with a streetcar system. In 1915, a highway opened to Santa Cruz, changing the nature of tourism in the city. Visitors came for shorter periods of time, and auto camps, motels, and other car-centered accommodations were developed. While tourism slowed in the first decades of the twentieth century, the University of California system announced plans to expand with new campuses in 1957. In 1965, the University of California, Santa Cruz opened in the bluffs overlooking the city (Page & Turnbull, Inc. 2019) (refer to BSO Page 3 of 17).
B11. Additional Resource Attributes: None
B12 References: Calvary Episcopal Church Website. "History." www.calvarysantacurz.org. Accessed December 29, 2021; Charles Hall Page & Associates, Inc. Santa Cruz Historic Building Survey. Prepared for the City of Santa Cruz. 1976; Cocke, Thomas et al. "Recording a Church: An Illustrated Glossary." *Practical Handbook in Archaeology 7*. Council for British Archaeology, 1996 (reprinted 1999); McAlester, Virginia and Lee. *A Field Guide to American Houses.* New York: Alfred A. Knopf. 1990; Page & Turnbull, Inc. Garfield Park Christian Church, Santa Cruz, California DPR forms. May 23, 2019; Rose, Michael S. *The Renovation Manipulation: The Church Counter-Renovation Handbook*. Hope of Saint Monica, Inc. 2001; Sanborn Fire Insurance Maps, Santa Cruz, California 1886, 1892, 1905, 1928, and 1928-revised 1950; *Santa Cruz Sentinel*, Newspaper, Santa Cruz, California, December 25, 1938, September 11, 2018; *Santa Cruz Surf*, Newspaper, Santa Cruz, California, July 1, 1893; *Santa Cruz Weekly Sentinel*, Newspaper, Santa Cruz, California, June 23, 1866, November 16, 1867, and October 24, 1874.
B13. Remarks:
B14. Evaluator: Dana E. Supernowicz, Historic Resource Associates, 3142 Bird Rock Road, Pebble Beach, CA 93953.
Date of Evaluation: January 2022

(This space reserved for official comments.)

B10. Significance (Continued):

Figure 1: 3D Google Earth Photograph of the Calvary Episcopal Church looking north.

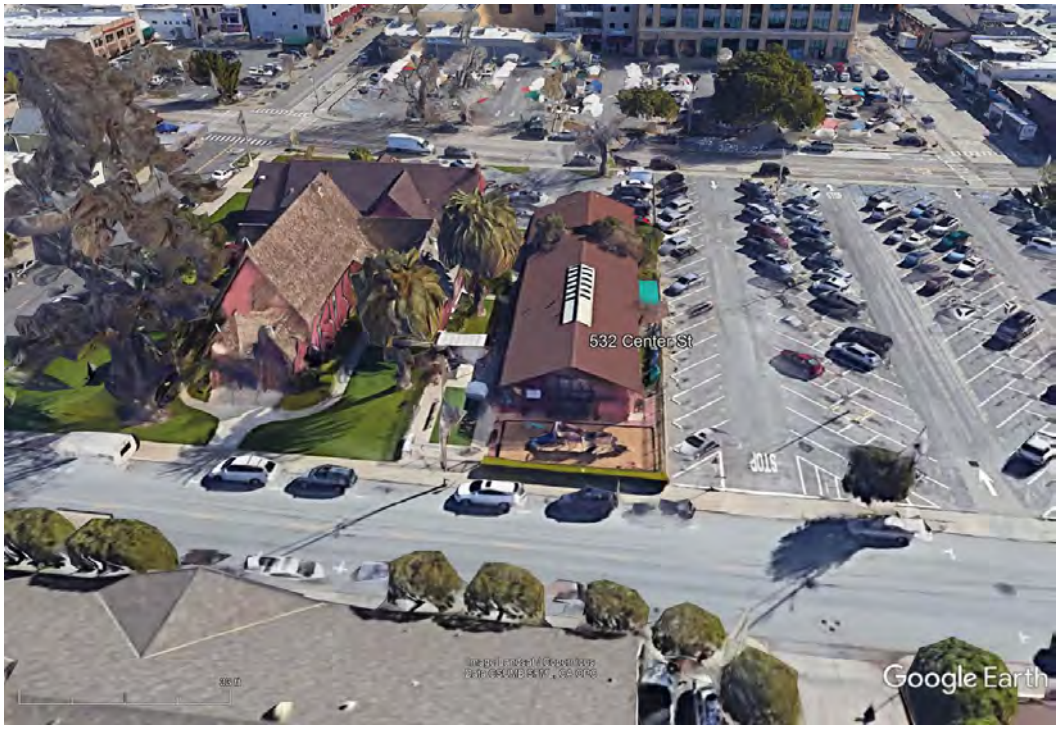


Figure 2: 3D Google Earth Photograph of the Calvary Episcopal Church looking east towards downtown Santa Cruz.

B10. Significance (Continued):

The following history of the church was recounted by Eliza Boston in 1900, annotated in the Parish Register 1903 and transcribed by Carol Walker, parish archivist, in September 2014:

> The first service of the Protestant Episcopal Church was held in Santa Cruz, on Sunday May 11th 1862 by Rev. Dr. Ver Mehr. The second service was held on Sunday May 10th 1863 by Rev. C.B. Wyatt, Rector of Trinity Church, San Francisco. The Rev. C.F. Loop, a Missionary appointed by the Board of Missions Domestic, New York City, arrived in Santa Cruz and began regular services in the Court house, July 5th 1863. On Easter Monday [March 28th] 1864 Calvary Parish was formally organized and the Rev. C.F. Loop was elected Rector. On St. Peter's Day June 29th 1864 the corner stone of the Church Edifice was laid by the Rector assisted by the Rev. D.D. Chapin, of San José, and the Rev. Mr. Easton of San Mateo. The first service was held in the new Church Edifice [unfinished] on January 8th 1865. On Sunday October 27th 1867 the debt of $675 having been paid, the Church was solemnly consecrated to the worship and Service of Almighty God, by the Rt. Rev. Wm. I. Kip D.D. Bishop of California, assisted by the Rector and the Rev. A.L. Brewer of San Mateo. On September 4th 1868 the Rector Rev. C.F. Loop sent his resignation to the Vestry of Calvary Church, which was accepted and also notified the Standing Committee, the Bishop being absent from the Diocese. During its first 100 years, Calvary Church continued to grow and reach out, not only to the city of Santa Cruz, but also to Episcopalians in the surrounding area. The clergy and laity of Calvary were largely responsible for creating and sustaining missionary work in the surrounding areas of Santa Cruz County, especially in helping to establish the present Episcopal churches at Ben Lomond, Aptos and Scotts Valley. In 2015, Calvary Church celebrated the 150th Anniversary of the first service held at the church with the play *Lincoln's Eulogy* written by parishioner Dana Bagshaw. This play told the story of how Calvary was involved in the Santa Cruz community in response to the death of President Abraham Lincoln. While parishioners prepared for the first service at Calvary Church to be held Easter Sunday, April 16, 1865, the news arrived that President Lincoln had been assassinated. The floral decorations were removed, and emblems of mourning were hung in the chancel. On April 19, the then-rector Rev. Loop held a special service in honor of the slain president. Accounts in the church records say he was a personal friend of Abraham Lincoln, and his address to the congregation was so eloquent that the City Fathers of Santa Cruz asked him to repeat it publicly the following week. Calvary's involvement in the community began here, at its inception (Calvary Episcopal Church Website 2021).

The above history provided by Eliza Boston in 1900, wife of Joseph Boston, reportedly donated the land for the church, appears to be consistent with period newspaper accounts as described below. Figure 3, is the earliest know photograph of the church (circa 1865-1866. Historic newspapers indicate that Eliza Boston's husband, Joseph Boston, an avocational architect, designed the church.

Figure 3: View looking northwest at Calvary Episcopal Church Santa Cruz, circa 1865-1866 shortly after its construction (Courtesy *Santa Cruz Sentinel*, September 11, 2018).

B10. Significance (Continued):

Based on an article that appeared in the *Santa Cruz Weekly Sentinel* on June 23, 1866, the site for the church, rectory, and school were donated by Mrs. Joseph Boston, and in the past year the "church edifice" was erected. In the following year, according to the *Santa Cruz Weekly Sentinel* in November 1867:

> Calvary Church, Santa Cruz, which was consecrated by Bishop Kipp, on the 27th of October, is a beautiful and substantial edifice of wood, built upon a firm foundation of brick. The style is Gothic of the early English period. The plan is for nave, chancel, tower, porch and vestry-room. The tower is to be built hereafter on the north side. The interior dimensions of the nave are 64 feet by 25, with open timbered roof; the height from the floor to the apex is 37 feet. A wainscot, four feet high, surmounted by a heavy moulding runs round both nave and chancel. The sections of the roof divide the nave into four bays of sixteen feet each. The sides between the posts are plastered and painted a delicate tint of ochre; each bay having a window nine feet in length. The chancel, separated from the nave by a lofty gothic arch, is apsidal in form, 21 x 20 feet in depth; the walls are pierced by six lancet windows filled with rich colored glass, containing the principal Christian emblems. The west gable has a beautiful clustered window of three lights, headed by a trefoil three feet in diameter, soon to be filled with glass of exquisite design and workmanship, from the establishment of Henry Sharp, New York who has furnished the windows for the whole church. The altar is placed against the east wall under the central light, which contains the emblem of the Great Sacrifice – the cross of cavalry and the crown of thorns. At the right is the Bishop's chair, ornamented by elaborate carvings of black walnut. The chancel rail is upon the chard of the apse, outside of which are the stalls and lectern. A very beautiful Baptismal Font of Nova Scotia stone, made by Fishure & Bird, N.Y., stands outside the chancel arch, at the north side. The floor of the chancel is covered with Brussels carpet of ecclesiastical pattern. On entering the west door, the effect of the interior of this building is not only very pleasing but imposing. We feel that it is a fitting place to offer the sacrifice of prayer and praise, and worthy of being consecrated to the service of God. The whole cost of the building, including the windows, was about seven thousand dollars. By a recent effort on the part of the Rector, Rev. C.F. Loop, and his parishioners, the remaining debt of six hundred and seventy-five ($675) dollars, was paid. The lot upon which the church is built, containing over an acre, was the gift of Mrs. Joseph Boston (*Santa Cruz Weekly Sentinel*, November 16, 1867).

During the 1870s, prior to his death, Joseph Boston, his wife, and family were living on Mission Street in Santa Cruz (*Santa Cruz Weekly Sentinel*, October 24, 1874). Based upon a newspaper article published on July 1, 1893 in the *Santa Cruz Surf* newspaper for Parish Day, the cornerstone for the church was laid on June 29, 1864, and the first rector was Rev. C.F. Loop.

Figure 4: Historic photograph of the Calvary Episcopal Church looking northeast, circa 1930 (Courtesy Calisphere Website).

B10. Significance (Continued):

Figure 5: Photograph of the Calvary Episcopal Church looking northeast, 2021. The front gable on the right was added after 1950.

Figure 6: View looking west at the north elevation of the Calvary Episcopal Church and Parish Hall, 2021.

B10. Significance (Continued):

In 1914, the church celebrated its Golden Jubilee with a Souvenir edition of the church history published in the parish paper known as the Ivy Leaf. From the late-nineteenth century through the first half of the twentieth century, the church's importance to citizens of Santa Cruz is well documented in local newspapers. The church is a registered historic property in the City of Santa Cruz having been documented in the city's first historic property survey in the 1970s. In 1971, the California Heritage Council, awarded the church by creating a bronze plaque commemorating the property, which is situated in front of the church along Center Street. A metal enamel sign was placed on the north side of the church by the Santa Cruz Historical Society. The church is pictured in Volume I of the Santa Cruz Historic Building Survey (Charles Hall Page & Associates 1976: 65), and is listed in the State Historic Preservation Office (SHPO) Built Environment Resources Directory (BERD) as a 7R status code, meaning it was not formally evaluated.

SIGNIFICANCE STATEMENT

The property was assessed using the National Register of Historic Places (NRHP) Criteria for Evaluation, described as the quality of significance in American history, architecture, archaeology, and culture found in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association, and meets one of the following criteria:

Criterion A: Are associated with events that have made a significant contribution to the broad patterns of our history; or

Criterion B: Are associated with the lives of persons significant in our past; or

Criterion C: Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

National Register criteria considerations (36 CFR §60.4) Consideration A: A religious property according to National Register guidelines, "requires additional justification (for nomination) because of the necessity to avoid any appearance of judgement by government about the merit of any religion or belief." However, religious properties may qualify if they are integral parts of districts that do meet the criteria or if they fall within the following category - "a religious property deriving primary significance from architectural or artistic distinction or historical importance."

The Calvary Episcopal Church remained an important part of the secular and social history of Santa Cruz through the 1930s. Thus, the period of significance for the property extends from its completion in 1865 to 1940, because improvement made during this period contribute to the history of the church. Therefore, despite the addition of the double-gable entrance in the front of the church after 1886 and prior to 1892, thus eliminating the main entrance along Lincoln Street, which became a side entrance, and the cross-gable addition on the south end of the church after 1950, the church retains adequate integrity to convey its historic significance. This is apparent in the post-1950 addition, due to the care taken to construct the addition using materials and a design sympathetic to the original church, without entirely duplicating historic fabric on the original, giving a false sense of history. The Parish Hall and the School or Classrooms, however, appear to have undergone the most dramatic alterations since they were constructed and consequently the integrity of both buildings has been compromised.

In applying NRHP Criterion A, the church represents one of the oldest secular institutions in Santa Cruz, and its significance to the community since its construction in the 1860s is well documented. Therefore, the church appears to be eligible for the NRHP under Criterion A, being the oldest surviving such structure in Santa Cruz. Under Criterion B, no documentation has been found to suggest the church is associated with a person or persons of significance in history of Santa Cruz, despite the fact the church may have been designed by Joseph Boston, whose wife donated the land on which the church is located today. The construction of the church appears to have been a community effort with donations from various individuals living in Santa Cruz during the 1860s. Under NRHP Criteria C, the church building is the oldest surviving structure of its type in Santa Cruz, retains adequate integrity to convey its historic appearance, and is an important example of Carpenter Gothic architecture. Similarly, the church appears to be eligible under National Register Criterion Consideration A, deriving primary significance from "architectural or artistic distinction or historical importance." The parish hall and school or classrooms do not appear to be eligible for the NRHP under any of the criteria, due to numerous additions and alterations post-1940.

B10. Significance (Continued):

PHOTOGRAPH RECORD

Photograph 1: View looking northeast at the church or sanctuary from Center Street.

Photograph 2: View looking southwest at the Parish Hall.

B10. Significance (Continued):

Photograph 3: View looking east at the west elevation the church or sanctuary showing the cross-gable extension.

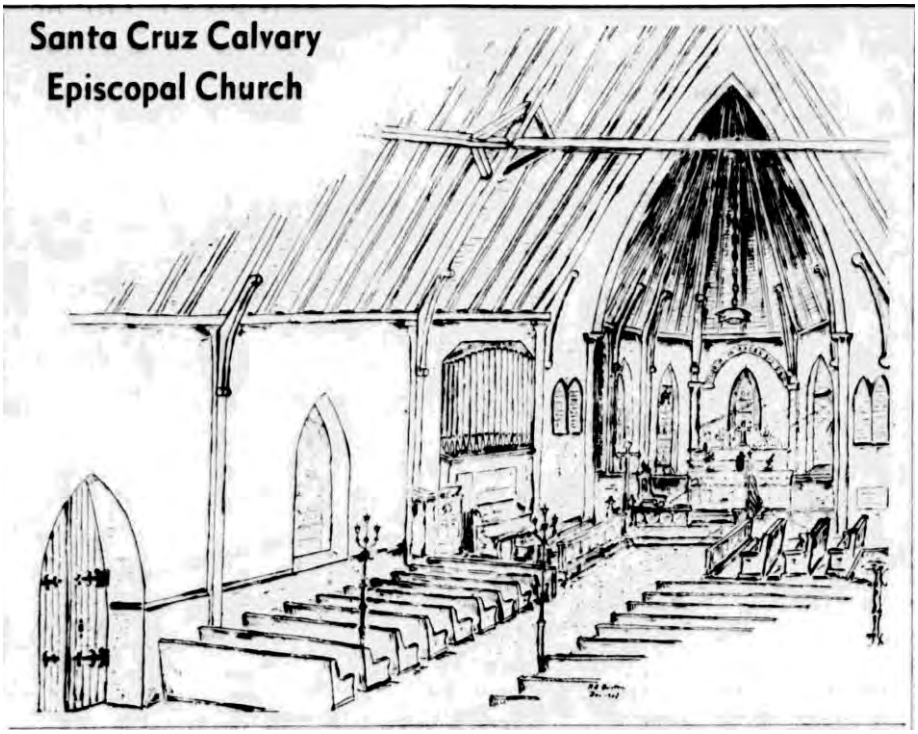
Photograph 4: View of the bronze plaque in front of the church entrance.

B10. Significance (Continued):

Photograph 5: View looking east at the front of the church or sanctuary.

Photograph 6: View of the vestibule leading into the church nave.

B10. Significance (Continued):



Photograph 7: Sketch of the interior of the church from the *Santa Cruz Sentinel*, December 25, 1938.

Photograph 8: View looking south at the north elevation of the church or sanctuary.

B10. Significance (Continued):

Photograph 9: View looking east at the north elevation of the church or sanctuary.

Photograph 10: View looking east at the Parish Hall or rectory and office.

B10. Significance (Continued):

Photograph 11: View of the rear of the church or sanctuary.

Photograph 12: View looking west at the east elevation of the Parish Hall. To the left are the classrooms.

B10. Significance (Continued):

Photograph 13: View looking south at the Parish Hall and classrooms in the distance.

Photograph 14: View looking west through the inner courtyard between the church, Parish Hall, and classrooms.

B10. Significance (Continued):

Photograph 15: View looking north with the church on the left and the Parish Hall on the right. Note the later addition to the church on the left, distinguished by leaded, rather than stained-glass windows.

Photograph 16: View looking west through the inner courtyard between the church and classrooms.

B10. Significance (Continued):

Photograph 17: View looking north at the church and the cross-gable addition facing the camera.

Photograph 18: View looking northeast at the Parish Hall with the church on the left.

B10. Significance (Continued):

Photograph 19: View looking north at the south elevation of the classrooms.

Photograph 20: View looking north across the parking lot planned for redevelopment with affordable housing. The classrooms and church can be seen in the distance, with the classrooms in the foreground.

Native American Heritage Commission
Native American Contacts List
November 1, 2021

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Wuksache Indian Tribe/Eshom Valley Band
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ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Court
Salinas, CA 93906

Email: kwood8934@aol.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairperson Woodrow,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

Proposed Project

The proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres located at 532 in the City of Santa Cruz, Santa Cruz County, California (APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18). The site is currently a parking lot. The project will consist of 64 affordable rental units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east.

Archaeological and Cultural Resources

The City of Santa Cruz would appreciate you providing information on any Native American resources that might be adversely affected by the development of this project.

If you have any questions or need additional information, please contact Jessica de Wit, 831-420-5108 or jdewit@cityofsantacruz.com.

Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

January 3, 2022

Rumsen Am:a Tur:ataj Ohlone
Dee Dee Manzanares Ybarra, Chairperson
14671 Farmington Street
Hesperia, CA 92345

Email: rumsenama@gmail.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairperson Lopez,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

Proposed Project

The proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres located at 532 in the City of Santa Cruz, Santa Cruz County, California (APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18). The site is currently a parking lot. The project will consist of 64 affordable rental units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east.

Archaeological and Cultural Resources

The City of Santa Cruz would appreciate you providing information on any Native American resources that might be adversely affected by the development of this project.

If you have any questions or need additional information, please contact Jessica de Wit, 831-420-5108 or jdewit@cityofsantacruz.com.

Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Muwekma Ohlone Indian Tribe of the SF Bay Area
Monica Arellano
20885 Redwood Road, Suite 232
Castro Valley, CA 94546

Email: marellano@muwekma.org

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Ms. Arrellano,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

Proposed Project

The proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres located at 532 in the City of Santa Cruz, Santa Cruz County, California (APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18). The site is currently a parking lot. The project will consist of 64 affordable rental units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east.

Archaeological and Cultural Resources

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If you have any questions or need additional information, please contact Jessica de Wit, 831-420-5108 or jdewit@cityofsantacruz.com.

Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister, CA 95024

Email: ams@indiancanyon.org

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairperson Sayers,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

Proposed Project

The proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres located at 532 in the City of Santa Cruz, Santa Cruz County, California (APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18). The site is currently a parking lot. The project will consist of 64 affordable rental units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east.

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Indian Canyon Mutsun Band of Costanoan
Kanyon Sayers-Roods, MLD Contact
1615 Pearson Court
San Jose, CA 95122

Email: kanyon@kanyonkonsulting.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Ms. Sayers-Rood,

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Costanoan Ohlone Rumsen-Mutsen Tribe
Patrick Orozco, Chairman
644 Peachtree Drive
Watsonville, CA 95076

Email: yanapvoic97@gmail.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairman Orozco,

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Amah Mutsun Tribal Band
Valentin Lopez, Chairperson
P.O. Box 5272
Galt, CA 95632

Email: vlopez@amahmutsun.org

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Amah Mutsun Tribal Band of Mission San Juan Bautista
Irenne Zwierlein, Chairperson
789 Canada Road
Woodside, CA 94062

Email: amahmutsuntribal@gmail.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairperson Zwierlein,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

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If you have any questions or need additional information, please contact Jessica de Wit, 831-420-5108 or jdewit@cityofsantacruz.com.

Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

PARLIAMENTARIAN
Russell Attebery
Karuk

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Sara Dutschke
Miwok

COMMISSIONER
Buffy McQuillen
Yokayo Pomo, Yuki, Nomlaki

COMMISSIONER
Wayne Nelson
Luiseño

COMMISSIONER
Stanley Rodriguez
Kumeyaay

EXECUTIVE SECRETARY
Christina Snider
Pomo

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

December 30, 2021

Roy Hastings
R.L. Hastings & Associates, LLC

Submitted via Electronic Mail
Via Email to: roy@rlhastings.com

Re:532 Center Street, Santa Cruz, Santa Cruz County

Dear Mr. Hastings:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were positive. Please contact the Costanoan Ohlone Rumsen-Mutsen Tribe on the attached list for more information. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Katy.Sanchez@nahc.ca.gov

Sincerely,

Katy Sanchez

Katy Sanchez
Associate Environmental Planner

Attachment

Native American Heritage Commission
Native American Contacts List
December 28, 2021

Amah Mutsun Tribal Band
Valentin Lopez, Chairperson
P.O. Box 5272 Ohlone/Costanoan
Galt ,CA 95632 North Valley Yokuts
vlopez@amahmutsun.org
(916) 743-5833

Amah Mutsun Tribal Band of Mission San Juan Bautista
Irene Zwierlein, Chairperson
3030 Soda Bay Road Ohlone/Costanoan
Lakeport ,CA 95453
amahmutsuntribal@gmail.com
(650) 851-7489 Cell
(650) 332-1526 Fax

Costanoan Ohlone Rumsen-Mutsen Tribe
Patrick Orozco, Chairman
644 Peartree Drive Ohlone/Costanoan
Watsonville ,CA 95076
yanapvoic97@gmail.com
(831) 728-8471

Indian Canyon Mutsun Band of Costanoan
Kanyon Sayers-Roods
1615 Pearson Court Ohlone/Costanoan
San Jose ,CA 95122
408-673-0626

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28 Ohlone/Costanoan
Hollister ,CA 95024
ams@indiancanyons.org
(831) 637-4238

Muwekma Ohlone Indian Tribe of the SF Bay Area
Monica Arellano, Vice Chairwoman
20885 Redwood Road, Suite 232 Ohlone / Costanoan
Castro Valley ,CA 94546
marellano@muwekma.org
(408) 205-9714

Rumsen Am:a Tur:ataj Ohlone
Dee Dee Manzanares Ybarra, Chairperson
14671 Farmington Street Ohlone/Costanoan
Herperia ,CA 92345
rumsenama@gmail.com
(760) 403-1756

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Ct. Foothill Yokuts
Salinas ,CA 93906 Mono
kwood8934@aol.com Wuksache
(831) 443-9702

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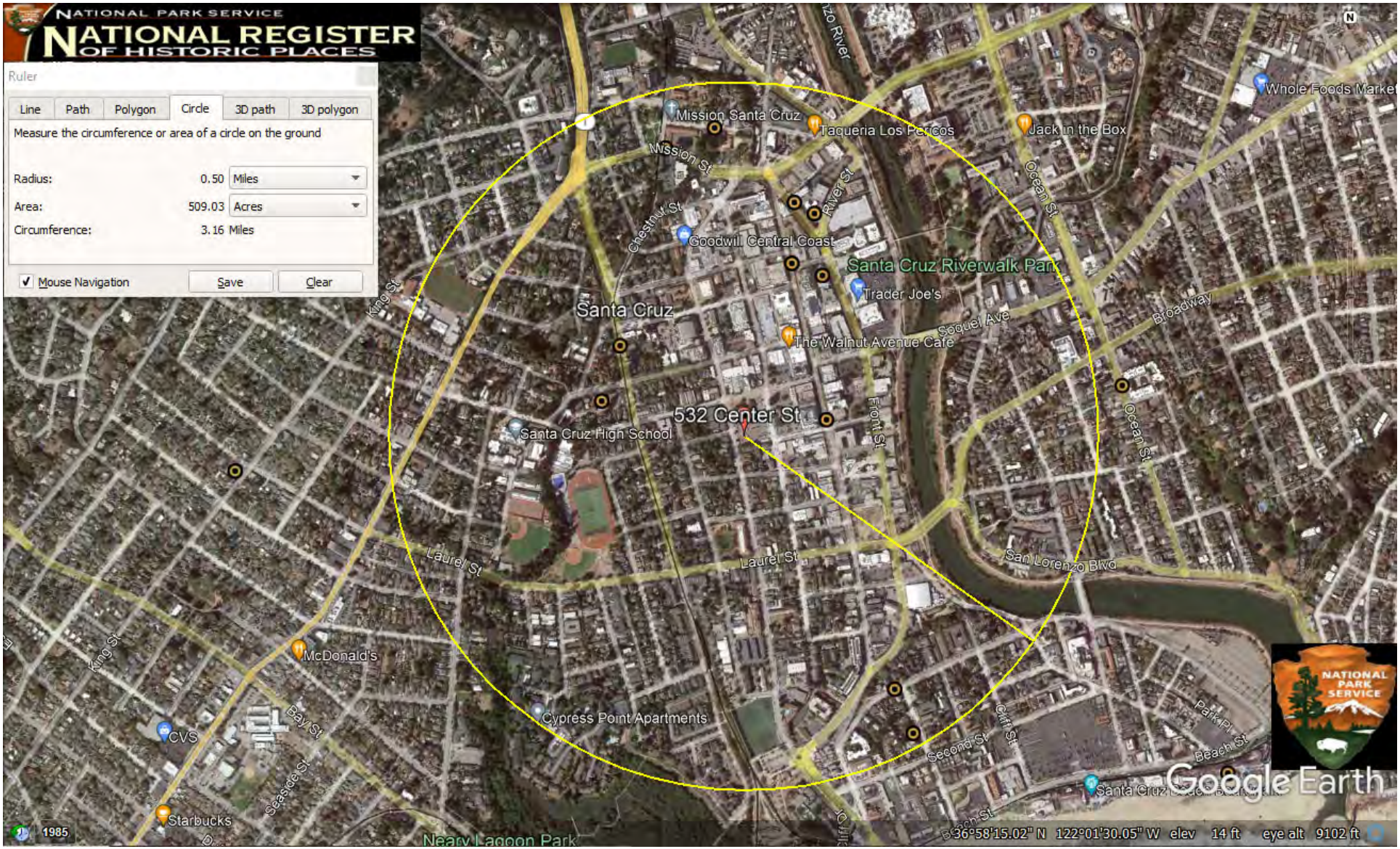

NATIONAL PARK SERVICE
NATIONAL REGISTER OF HISTORIC PLACES
Ruler
Line
Path
Polygon
Circle
3D path
3D polygon
Measure the circumference or area of a circle on the ground
Radius: 0.50 Miles
Area: 509.03 Acres
Circumference: 3.16 Miles
Mouse Navigation
Save
Clear
Mission Santa Cruz
Taqueria Los Pericos
Jack in the Box
Whole Foods Market
Mission St
Chestnut St
River St
Ocean St
Goodwill Central Coast
Santa Cruz Riverwalk Park
Trader Joe's
King St
Santa Cruz
Soquel Ave
Broadway
The Walnut Avenue Cafe
532 Center St
Front St
Santa Cruz High School
Laurel St
San Lorenzo Blvd
McDonald's
Bay St
CVS
Seaside St
Cypress Point Apartments
Cliff St
Second St
Park Pl
Beach St
Starbucks
Neary Lagoon Park
Google Earth
1985
36°58'15.02" N 122°01'30.05" W elev 14 ft eye alt 9102 ft

NATIONAL PARK SERVICE
NATIONAL REGISTER OF HISTORIC PLACES
Cope Row Houses
Historic Place Name: Cope Row Houses
Address: 412--420 Lincoln St.
City: Santa Cruz
County: Santa Cruz
State: CALIFORNIA
Geographic Coordinates:
Latitude: 36.97227
Longitude: -122.0313
NPS Reference Number: 82002274
Date Listed: 19820128
Notes:
Type: point
Geocode Match: 0
A Service of:
National Register of Historic Places
National Park Service
Directions: To here - From here
Ruler
Line
Path
Polygon
Circle
3D path
3D polygon
Measure the distance between two points on the ground
Map Length: 1,001.82 Feet
Ground Length: 1,001.86
Heading: 281.30 degrees
Mouse Navigation
Save
Clear
532 Center St
Santa Cruz Museum of Art & Histo
The Walnut Avenue Cafe
Downtown Santa Cruz Info Kiosk
Hula's Island Grill
The Catalyst
The Blue Lagoon
Zachary's
Locust St
Pacific Ave
Center St
Walnut Ave
Lincoln St
Soquel Ave
Front St
Riverside Ave
Broadway
Chestnut St
Image Landsat / Copernicus
Google Earth
1985
36°58'17.07" N 122°01'41.59" W elev 26 ft eye alt 3139 ft

National Register of Historic Places

Digital Archive on NPGallery (https://npgallery.nps.gov)

Your search returned 22 results, Showing page 1 of 2, Items 1 through 21

Photos	Text	Name
(/NRHP/AssetDetail?assetID=486861ee-545b-4a1a-b9dd-03cc210e4e97)	(/NRHP/AssetDetail?assetID=79e7beda-4c37-4873-8d0e-24ec09f5003b)	Bank of Santa Cruz County
(/NRHP/AssetDetail?assetID=b8d20aef-6916-459f-b11a-e0cdc6998375)	(/NRHP/AssetDetail?assetID=af928e95-bdbf-4b2e-a1ef-c20894d7a17a)	Branciforte Adobe
(/NRHP/AssetDetail?assetID=09ffcaa8-7d3f-47c3-bc86-14a00cacca9e)	(/NRHP/AssetDetail?assetID=9a39bdcc-3dbb-48d1-94a0-266ba0c8bcec)	Brown, Allan, Site
(/NRHP/AssetDetail?assetID=73938ce9-345a-429d-89b7-fd445a5d123b)	(/NRHP/AssetDetail?assetID=4bc7950c-3e0d-404c-973e-bbf40dbf1d5c)	Carmelita Court

(/NRHP/AssetDetail?assetID=defc995f-969c-4995-b937-03ef14e5fc6e)

(/NRHP/AssetDetail?assetID=5d87004c-6705-4266-adb0-c73ec02ad44f)

Cope Row Houses

(/NRHP/AssetDetail?assetID=07f0f765-11de-48aa-8584-a8acd360c137)

(/NRHP/AssetDetail?assetID=ea3cde24-7770-4c61-9eea-74c6aea1d8d4)

Cowell Lime Works Historic District

(/NRHP/AssetDetail?assetID=72ccc913-4a89-4144-919f-56593d3ae318)

(/NRHP/AssetDetail?assetID=0d9952da-8e13-468a-991e-ac8f30cfce66)

Garfield Park Branch Library

(/NRHP/AssetDetail?assetID=63b405ab-d664-4b39-b4bd-313774eb63e4)

(/NRHP/AssetDetail?assetID=bc902f6d-f837-482c-8543-2baf9aaf164c)

Glen Canyon Covered Bridge

(/NRHP/AssetDetail?assetID=882498e3-e11c-4754-8e03-23100c6c4594)

(/NRHP/AssetDetail?assetID=a598fc1f-d846-4819-9e8d-b3a60d208a71)

Golden Gate Villa

(/NRHP/AssetDetail?assetID=163f2719-d8d8-4cee-9b43-522395f594c9)

(/NRHP/AssetDetail?assetID=2014b7b4-8315-4450-8a9b-0b743373ed64)

Hinds, A. J., House

(/NRHP/AssetDetail?assetID=4fa114b9-7e1d-41fa-8679-5d5cf50b9eee)

(/NRHP/AssetDetail?assetID=ae655d54-49e5-4d13-b82e-e21ea33a8c74)

Hotel Metropole

(/NRHP/AssetDetail?assetID=de2e49b3-b5e7-47b1-86b1-8da1a3a3e6dd)

(/NRHP/AssetDetail?assetID=e7ca12f8-27d3-4af2-bacb-9fd36f6c4571)

Live Oak Ranch

(/NRHP/AssetDetail?assetID=5d63544d-545e-45e6-9c68-cee8314afb0a)

(/NRHP/AssetDetail?assetID=5737c95c-c828-4f90-8f4e-badc82b724d4)

Looff Carousel and Roller Coaster on the Santa Cruz Beach Boardwalk

(/NRHP/AssetDetail?assetID=d4410899-cda3-4e3e-8ec1-992f05a88da1)

(/NRHP/AssetDetail?assetID=5f5ef64a-3f2f-4d5b-87d0-a09acbfb8aea)

Looff Carousel and Roller Coaster on the Santa Cruz Beach Boardwalk

(/NRHP/AssetDetail?assetID=4b9e3541-7363-4112-a964-4215f3726881)

(/NRHP/AssetDetail?assetID=a1d62ea0-01e2-4aec-966d-ace5ebb13aea)

Mission Hill Area Historic District

(/NRHP/AssetDetail?assetID=69e67640-429d-4f81-8851-7251b18b4317)

(/NRHP/AssetDetail?assetID=aa58158b-79a2-4a66-9fc9-d43b1fd7dc9c)

Neary-Rodriguez Adobe

Octagon Building

(/NRHP/AssetDetail?assetID=ae689ab3-95e4-462b-a724-db338f675696)

(/NRHP/AssetDetail?assetID=d4a1c7fc-58b4-44f1-8b19-5b23766f7a95)

Robinson, Elias H., House

(/NRHP/AssetDetail?assetID=b6452e3e-d690-4946-850d-0cb7ca30a008)

(/NRHP/AssetDetail?assetID=de0dcc5b-de15-4a4d-96e3-2131e5f52bd2)

Sand Hill Bluff Site

(/NRHP/AssetDetail?assetID=f001b279-27f0-479d-b7c6-62c316385fa2)

(/NRHP/AssetDetail?assetID=67fdd8a8-6df1-4723-841b-b6815f81aa0b)

Santa Cruz Downtown Historic District

(/NRHP/AssetDetail?assetID=d3eef0e1-414b-4dcd-9378-c767b9ec73e2)

(/NRHP/AssetDetail?assetID=71d15f04-5437-4abd-a4dd-f93e0d51cc3c)

US Post Office--Santa Cruz Main

(/NRHP/AssetDetail?assetID=1ccdca41-f55b-42c1-adb8-fdb8c74ad091)

(/NRHP/AssetDetail?assetID=d5b8edd9-f71b-45ee-a8e9-1c3244cd6252)

1 () 2 (/NRHP/SearchResults/cc6a9231d09f41bd84e930e8a84fc776?page=2&view=list)

> (/NRHP/SearchResults/cc6a9231d09f41bd84e930e8a84fc776?page=2&view=list)

List View

National Register of Historic Places

Digital Archive on NPGallery (https://npgallery.nps.gov)

Your search returned 22 results, Showing page 2 of 2, Items 22 through 22

< (/NRHP/SearchResults/cc6a9231d09f41bd84e930e8a84fc776?page=1&view=list)

1 (/NRHP/SearchResults/cc6a9231d09f41bd84e930e8a84fc776?page=1&view=list) 2 ()

List View

Photos	Text	Name
		Veterans Memorial Building
(/NRHP/AssetDetail?assetID=37029594-4e1c-43eb-bdb2-f55303696269)	(/NRHP/AssetDetail?assetID=da66378e-0702-4d38-a50b-180b3685c50c)	

< (/NRHP/SearchResults/cc6a9231d09f41bd84e930e8a84fc776?page=1&view=list)

1 (/NRHP/SearchResults/cc6a9231d09f41bd84e930e8a84fc776?page=1&view=list) 2 ()

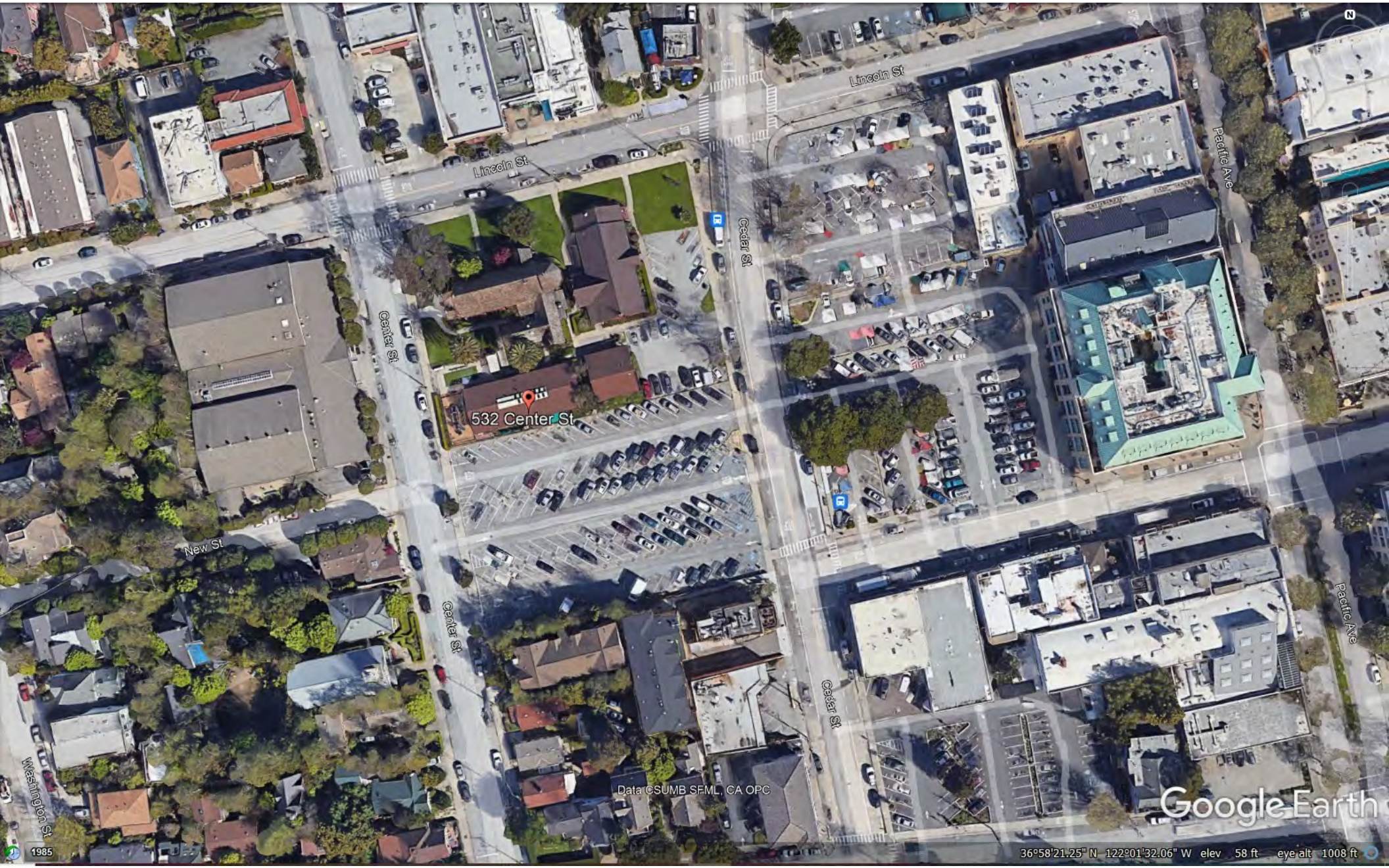
List View

ACCESSIBILITY (//www.nps.gov/aboutus/accessibility.htm)
PRIVACY POLICY (//www.nps.gov/aboutus/privacy.htm)
FOIA (//www.nps.gov/aboutus/foia/index.htm)
NOTICES (//www.nps.gov/aboutus/notices.htm)
DISCLAIMER (//www.nps.gov/aboutus/disclaimer.htm)

FAQ (//www.nps.gov/aboutus/faqs.htm)
NO FEAR ACT (//www.doi.gov/pmb/eeo/no-fear-act)
CONTACT US (//www.nps.gov/aboutus/contactus.htm)
USA.GOV (//www.usa.gov)

FACEBOOK (//www.facebook.com/nationalparkservice) YOUTUBE (//www.youtube.com/nationalparkservice) TWITTER (//www.twitter.com/natlparkservice)
INSTAGRAM (//www.instagram.com/nationalparkservice/) FLICKR (//www.flickr.com/photos/nationalparkservice)
ITUNES (//itunes.apple.com/WebObjects/MZStore.woa/wa/viewArtistLegacy?cc=us&id=216751324)

National Park Se (//www.nps.gov)
U.S. Department e Interior (//www.nps.gov)
(//www.doi.gov)


Lincoln St
Lincoln St
Pacific Ave
Cedar St
Center St
532 Center St
New St
Center St
Cedar St
Pacific Ave
Washington St
Data CSUMB SFML, CA OPC
Google Earth
1985
36°58'21.25" N 122°01'32.06" W elev 58 ft eye alt 1008 ft

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Amah Mutsun Tribal Band of Mission San Juan Bautista
Irenne Zwierlein, Chairperson
789 Canada Road
Woodside, CA 94062

Email: amahmutsuntribal@gmail.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairperson Zwierlein,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

Proposed Project

The proposed 65-unit affordable housing project will be built on 2 full and 2 partial parcels totaling approximately 0.77 acres located at 532 in the City of Santa Cruz, Santa Cruz County, California (APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18). The site is currently a parking lot. The project will consist of 64 affordable rental units and one manager's unit. Sixteen units will be reserved as Permanent Supportive Housing (PSH), targeting homeless residents and eight of the units will operate with PBVs through the HACSC. The project will also offer 5,000 square feet of ground-floor commercial space. Surrounding site uses include Calvary Episcopal Church to the north, multifamily residential and commercial buildings to the south, commercial buildings to the west, and a parking lot to the east.

Archaeological and Cultural Resources

The City of Santa Cruz would appreciate you providing information on any Native American resources that might be adversely affected by the development of this project.

If you have any questions or need additional information, please contact Jessica de Wit, 831-420-5108 or jdewit@cityofsantacruz.com.

Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Amah Mutsun Tribal Band
Valentin Lopez, Chairperson
P.O. Box 5272
Galt, CA 95632

Email: vlopez@amahmutsun.org

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Costanoan Ohlone Rumsen-Mutsen Tribe
Patrick Orozco, Chairman
644 Peachtree Drive
Watsonville, CA 95076

Email: yanapvoic97@gmail.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairman Orozco,

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Indian Canyon Mutsun Band of Costanoan
Kanyon Sayers-Roods, MLD Contact
1615 Pearson Court
San Jose, CA 95122

Email: kanyon@kanyonkonsulting.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Ms. Sayers-Rood,

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister, CA 95024

Email: ams@indiancanyon.org

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Muwekma Ohlone Indian Tribe of the SF Bay Area
Monica Arellano
20885 Redwood Road, Suite 232
Castro Valley, CA 94546

Email: marellano@muwekma.org

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Ms. Arrellano,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

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If you have any questions or need additional information, please contact Jessica de Wit, 831-420-5108 or jdewit@cityofsantacruz.com.

Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

January 3, 2022

Rumsen Am:a Tur:ataj Ohlone
Dee Dee Manzanares Ybarra, Chairperson
14671 Farmington Street
Hesperia, CA 92345

Email: rumsenama@gmail.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairperson Lopez,

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

ECONOMIC DEVELOPMENT DEPARTMENT
337 Locust Street • Santa Cruz, CA 95060 • (831) 420-5150 • **www.cityofsantacruz.com**

December 16, 2021

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Court
Salinas, CA 93906

Email: kwood8934@aol.com

RE: Native American Consultation Request

Subject Property: Cedar Street Family Apartments
532 Center Street, Santa Cruz, Santa Cruz County, CA 95060
USGS Santa Cruz Quad - T11S, R2W, Section 13
APNs: 005-148-21 and 005-148-22 and portions of 005-148-17 and 005-148-18

Dear Chairperson Woodrow,

The proposed affordable housing Project has received a commitment of HUD funds in the form of 8 Project-Based Vouchers (PBV) from the Housing Authority of the County of Santa Cruz (HACSC) to fund the construction of a 65-unit affordable housing project to be located at 532 Center Street in the City of Santa Cruz, Santa Cruz County, California. The receipt of federal funds requires that a NEPA environmental review be conducted on the project site. R. L. Hastings & Associates is preparing the NEPA environmental review on behalf of the City of Santa Cruz.

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Sincerely,

Jessica de Wit
Housing & Community Development Division Manager

Santa CruzMap
Layer List
2030 Archaeological Areas
Historical Archaeological Sensitivity
Coastal Zone (Grouped)
Code Enforcement Target Areas
Contours
Creeks Plan (grouped)
Downtown Parking District
Downtown Plan (Grouped)
FEMA Flood Hazard
2030 Fire
2030 General Plan
GP Area Plans (Grouped)
Historic Building
National Historic District
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2030 Monarch Butterflies
Recorded Maps
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Urban Sustainability Areas
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TAYLOR ST
NEW ST
CATHCART ST
ELM ST
MAPLE ST
LAUREL ST
BIRCH LN
SANTA CRUZ HIGH
LAUREL PARK
WASHINGTON ST
CENTER ST
CEDAR ST
CHESTNUT ST
MYRTLE ST
PACIFIC AV
RIVER STREET
FRONT ST
COMMERCIAL
PEARL ST
FRAZIER LEWIS LANE
CHRYSTAL TE
TOWNE TE
GROVE AV
CALIFORNIA ST
WEEKS AV
RIGG ST

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Park Maintenance District
Opportunity Zone
Planning
2030 Archaeological Areas Update
2030 Archaeological Areas
Historical Archaeological Sensitivity
Highly Sensitive
Sensitive - Exemption May Apply
Coastal Zone (Grouped)
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Downtown Plan Area
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FRONT ST
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SPRUCE ST
LAUREL PARK
San Lorenzo River
MI MI DE MARTA PARK
SAN LORENZO RIVER WALKWAY
Outlook

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SPRUCE ST
BROADWAY
San Lorenzo River
LAUREL PARK

Chapter 9.36
NOISE

Sections:

9.36.010 Curfew-Offensive noise.
9.36.020 Unreasonably disturbing noises.
9.36.025 Public health and safety.
9.36.030 Subsequent offense within forty-eight hours.
9.36.040 Enforcement.

9.36.010 CURFEW - OFFENSIVE NOISE.

(a)No person shall between the hours of 10:00 p.m. and 8:00 a.m. make, cause, suffer or permit to be made any offensive noise (1) which is made within one hundred feet of any building or place regularly used for sleeping purposes, or (2) which disturbs, or would tend to disturb, any person within hearing distance of such noise.

(b)"Offensive noise" means any noise which is loud, boisterous, irritating, penetrating, or unusual, or that is unreasonably distracting in any other manner, such that it is likely to disturb people in the vicinity of such noise, and includes, but is not limited to, noise made by barking or howling dogs, by an individual alone or by a group of people engaged in any business, meeting, gathering, game, dance, or amusement, or by any appliance, contrivance, device, structure, construction, ride, machine, implement, or instrument.

(c)Subsection (a) above shall not apply between the hours of 7:00 a.m. and 8:00 a.m. to any person engaged in performance of a contract for public works awarded by the city of Santa Cruz where the director of public works determines that the project has the potential to disrupt traffic and that this disruption could be alleviated by authorizing construction work to commence at 7:00 a.m. or that due to time constraints on project completion it is necessary to allow the contractor to begin work at 7:00 a.m.

(d)Subsection (a) above shall not apply to any person engaged in performance of a contract for public works awarded by the city of Santa Cruz, in the event of emergency and if the city manager of the city of Santa Cruz so authorizes such work.

(Ord. 97-05 § 1, 1997: Ord. 96-23 § 1, 1996: Ord. 80-29 § 1, 1980; prior code § 4274).

9.36.020 UNREASONABLY DISTURBING NOISES.

No person shall make, cause, suffer or permit to be made any noises or sounds (a) which are unreasonably disturbing or physically annoying to people of ordinary sensitiveness or which are so harsh or so prolonged or unnatural or unusual in their use, time or place as to cause physical discomfort to any person, and (b) which are not necessary in connection with an activity which is otherwise lawfully conducted. As used in this section, "lawfully conducted activities" shall include, but not be limited to, any and all activities conducted by the city for public health, safety or welfare purposes.

(Ord. 93-08 § 1, 1993: Ord. 80-29 § 1, 1980; prior code § 4275.1).

9.36.025 PUBLIC HEALTH AND SAFETY.

This chapter shall not apply to refuse collection, recyclable collection or street sweeping activities undertaken by, or pursuant to contract with, the city of Santa Cruz. Similarly, this chapter shall not apply to any other activity undertaken by the city, another governmental agency, or city contractor, for public health and safety purposes when, in the judgment of the city or governmental agency, such activity cannot be undertaken effectively or efficiently in compliance with the regulations set forth in this chapter.

(Ord. 2003-37 § 1, 2003).

9.36.030 SUBSEQUENT OFFENSE WITHIN FORTY-EIGHT HOURS.

Any person who violates any section of this chapter and is cited for such a violation, and who within forty-eight hours after receiving such a citation again violates the same section, is guilty of a misdemeanor. A person is cited for a violation when he or she is issued and signs an infraction or misdemeanor citation, or when he or she is arrested and booked, or when a complaint is filed and the person is notified of the filing of such a complaint.

(Ord. 80-29 § 1, 1980).

9.36.040 ENFORCEMENT.

The provisions of this chapter are enforceable without reference to the regulations concerning noise set forth in the Zoning Ordinance and the fact that the city officer issuing a citation has not obtained a scientific noise measurement prior to issuing the citation shall not constitute a defense.

(Ord. 93-52 § 2, 1993: Ord. 80-35 § 1, 1980).

Chapter 9.37
CHARGES FOR SPECIAL SECURITY SERVICES AT LOUD OR UNRULY GATHERINGS

Sections:

9.37.010 Definitions.
9.37.020 Response to loud or unruly gatherings.
9.37.030 Cost recovery for special security services.
9.37.040 Billing and collection.
9.37.050 Violations/Fines.
9.37.060 Service of alcoholic beverages to minors.

9.37.010 DEFINITIONS.

The following terms used in this chapter shall have the meanings set forth in this section.

(a) "Responsible person(s)" shall mean a person(s) with a right of possession in the property on which a loud or unruly gathering is conducted, including, but not limited to, an owner or tenant of the property if the gathering is on private property, or a permittee if the gathering is a permitted gathering on public property, or any person(s) accepting responsibility for such a gathering. "Responsible person" shall additionally include the landlord of another responsible person and the parents and/or legal guardians of responsible persons under the age of 21 years. To incur liability for special security service charges imposed by this chapter the responsible person need not be present at the loud or unruly gathering resulting in the emergency response giving rise to the imposition of special security service charges. This chapter therefore imposes vicarious as well as direct liability upon responsible persons.

(b) "Special security services" shall mean the provision of any police, fire or other emergency response service to a loud or

unruly gathering within twelve months of a first response as provided in this chapter.

(c) "Loud or unruly gathering" shall mean a gathering of two or more persons on private property or a permitted gathering of two or more persons on public property whose loud or unruly conduct constitutes a threat to public health, safety, quiet enjoyment of residential property or general welfare, including violations of Chapter 9.36. This term excludes incidents of domestic violence. A loud or unruly gathering shall constitute a public nuisance.

(Ord. 2005-20 § 1, 2005: Ord. 89-03 § 1, 1989).

9.37.020 RESPONSE TO LOUD OR UNRULY GATHERINGS.

When a police officer responds to a first loud or unruly gathering at premises in the city with a given address, the officer shall inform any responsible person at the scene that:

(a) The officer has determined that a loud or unruly gathering exists; and

(b) Responsible persons will be charged for the cost of any special security services required for subsequent responses to the scene within the next twelve months.

Only one warning will be given pursuant to this section before the city assesses special security service costs pursuant to Section 9.37.030. If a responsible person cannot be identified at the scene, the police department may issue a warning to one of the other responsible persons identified in Section 9.37.010(a) or subsequently return to the scene and issue the warning to a then-present responsible person. To the extent feasible, each warning shall be documented in the form of a letter and mailed by the city to each responsible person. Warnings given to responsible persons who do not reside at the premises in question shall be delivered by certified mail.

(Ord. 2008-05 § 1, 2008: Ord. 2005-20 § 2, 2005: Ord. 89-03 § 1, 1989).

9.37.030 COST RECOVERY FOR SPECIAL SECURITY SERVICES.

(a) When the police department or fire department or other city emergency responder responds to a loud or unruly gathering at premises with a given address in the city within twelve months of a warning given to a responsible person for those premises pursuant to Section 9.37.020, or while any such warning remains in effect pursuant to Section 9.37.050, all responsible persons shall be jointly and severally liable for the city's costs of providing special security service for that response and all subsequent responses during that warning period.

(b) (i) A tenant/responsible person who is a member of a multi-tenant/responsible person household may request a determination from the city that, in relation to his or her fellow tenants/responsible persons, he or she is not primarily liable for city costs assessed to responsible persons pursuant to subsection (a).

(ii) At a minimum the determination request shall document by clear and convincing evidence that the requesting tenant/responsible person was not on or about the premises at any time during the loud or unruly gathering or during the twenty-four (24) hour period preceding the city response to the loud or unruly gathering and that the requesting tenant/responsible person had no prior knowledge of the gathering that ultimately resulted in the city response and cost assessment.

(iii) The determination request shall be submitted in writing to the city official designated by the City Manager to hear and rule upon such requests.

(iv) The written determination request shall be submitted within fifteen (15) calendar days of the date of the city cost invoice to the requesting tenant/responsible person; late determination requests shall not be considered.

(v) The decision of the designated city official on the request determination shall be final.

(vi) A city determination that the requesting tenant/responsible person is not primarily liable shall operate to preclude the city from undertaking further cost collection action against the requesting tenant/responsible person but shall not operate to bar any other responsible person, including landlords, parents or legal guardians, from seeking contribution or indemnity for such costs from the requesting tenant/responsible person.

(c) Landlords shall be prohibited from charging tenants a deposit against potential cost assessments levied pursuant to subsection (a) where the tenants, during the current or any previous lease agreement with the landlord for the premises which are the subject of the lease agreement, have

not been cited and convicted for violating this chapter. Upon any such citation and conviction, the landlord shall be authorized to charge such a deposit. For purposes of this subsection, a no contest plea and payment of a fine for violating this chapter shall constitute a conviction.
(Ord. 2008-05 § 2, 2008: Ord. 2005-20 § 3, 2005: Ord. 89-03 § 1, 1989).

9.37.040 BILLING AND COLLECTION.

Charges for special security service shall include a reasonable charge for the emergency responder's time and actual costs of any equipment used or damaged in connection with the response, together with an additional thirty-three percent of the special security charge for administrative overhead. These charges shall be computed and a bill submitted to the responsible person(s). The chief of police shall promulgate notice and billing procedures for this purpose. The bill shall be a debt owed to the city and failure to pay that bill within thirty days is a violation of this code. If the city is obliged to initiate litigation or other proceedings authorized by Title 4 of this code to recover this debt, the responsible person shall be liable for:

(a) Costs of suit;

(b) Attorney's fees; and

(c) Costs of collection.

(Ord. 2005-20 § 4, 2005: Ord. 89-03 § 1, 1989).

9.37.050 VIOLATIONS/FINES.

(a) It shall be an infraction for a responsible person to conduct or allow a loud or unruly gathering on premises owned by the responsible person or on premises rented by or to the responsible person. A third or subsequent violation within a twelve-month period shall constitute a misdemeanor.

(b) Fines.

(1) A first violation of this section shall be punishable by a fine of $250.00.

(2) A second violation of this section at a given address in the city within a given twelve-month period shall be punishable by a fine of $500.00.

(3) A third or subsequent violation of this section at a given address in the city within a given twelve-month period shall be punishable by a fine of $1,000.00.

(c) The fines prescribed at subsection (b) are in addition to any special security service charges that may be assessed pursuant to this chapter.

(d) The second, third or subsequent violation fines prescribed at subsections (b)(2) and (b)(3) are payable whether or not the responsible person at the time of the current loud or unruly gathering is the same person who was the responsible person for any prior loud or unruly gathering at those premises.

(e) The fine schedule prescribed at subsection (b) is a "rolling schedule" meaning that in calculating the fine payable the police department or city attorney shall count backward starting from the date of the most recent loud or unruly gathering to determine how many prior loud or unruly gatherings have taken place at the premises in question during the statutory twelve-month period. A warning given pursuant to Section 9.37.020 shall remain in effect for the premises at a given address until a full twelve-month period has elapsed during which there have been no loud or unruly gatherings at those premises.
(Ord. 2005-20 § 5, 2005).

9.37.060 SERVICE OF ALCOHOLIC BEVERAGES TO MINORS.

The city council hereby finds that the service of alcohol to minors at loud and unruly gatherings and the consumption of alcohol by minors at loud or unruly gatherings has in the past and continues to pose a threat to the health and safety of all persons who reside in the city and also causes significant disruption of city residents' quiet enjoyment of their households, especially in the city's residential neighborhoods. In addition, such conduct on behalf of persons who serve alcohol to minors and minors who consume alcohol at loud or unruly gatherings results in the expenditure of a disproportionate percentage of the city's police, fire and public safety resources which are underwritten primarily by general municipal taxes paid to the city by its taxpayers and residents. It is therefore the policy of the city council that in responding to loud or unruly gatherings, the city police department shall strictly

enforce any and all applicable state laws pertaining to the service of alcohol to minors, and the consumption of alcohol by minors, and with respect to minors in possession of alcohol, the police department shall establish a “no tolerance” protocol by which the police department contacts, or causes the minor’s school to contact, the minor’s parents or legal guardians whenever the minor is found to be in possession of alcohol or narcotics or found to be intoxicated at a loud or unruly gathering. Where the minor’s school has an internal student disciplinary office any such incident shall likewise be reported to that office.
(Ord. 2005-20 § 6, 2005).

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Acoustical and Audiovisual Consultants

BACKGROUND REPORT FOR:

City of Santa Cruz General Plan Noise Element Update

Santa Cruz, CA

RGDL Project #: 06-047-1

PREPARED FOR:

City of Santa Cruz
Planning and Community Development
809 Center Street, Room 106
Santa Cruz, CA 95060

PREPARED BY:

Harold Goldberg, P.E.

DATE:

30 November 2007

1. Introduction

The City of Santa Cruz is preparing an update to its General Plan. As part of this process the Noise Element will be updated. The following report provides background information on noise sources within the City, measurements that were made to document noise levels throughout the City, and noise contours for existing conditions.

2. Environmental Noise Fundamentals

Noise can be defined as unwanted sound. It is commonly measured with an instrument called a sound level meter. The sound level meter captures the sound with a microphone and converts it into a number called a sound level. Sound levels are expressed in units of decibels. To correlate the microphone signal to a level that corresponds to the way humans perceive noise, the A-weighting filter is used. A-weighting de-emphasizes low-frequency and very high-frequency sound in a manner similar to human hearing. The use of A-weighting is required by most local General Plans as well as federal and state noise regulations (e.g. Caltrans, EPA, OSHA and HUD). The abbreviation dBA is sometimes used when the A-weighted sound level is reported.

Because of the time-varying nature of environmental sound, there are many descriptors that are used to quantify the sound level. Although one individual descriptor alone does not fully describe a particular noise environment, taken together, they can more accurately represent the noise environment. The maximum instantaneous noise level (L_{max}) is often used to identify the loudness of a single event such as a car passby or airplane flyover. To express the average noise level the L_{eq} (equivalent noise level) is used. The L_{eq} can be measured over any length of time but is typically reported for periods of 15 minutes to 1 hour. The background noise level (or residual noise level) is the sound level during the quietest moments. It is usually generated by steady sources such as distant freeway traffic. It can be quantified with a descriptor called the L_{90} which is the sound level exceeded 90 percent of the time.

To quantify the noise level over a 24-hour period, the Day/Night Average Sound Level (DNL or L_{dn}) or Community Noise Equivalent Level (CNEL) is used. These descriptors are averages like the L_{eq} except they include a 10 dB penalty during nighttime hours (and a 5 dB penalty during evening hours in the CNEL) to account for peoples increased sensitivity during these hours.

In environmental noise, a change in noise level of 3 dB is considered a just noticeable difference. A 5 dB change is clearly noticeable, but not dramatic. A 10 dB change is perceived as a halving or doubling in loudness.

3. Noise Sources in Santa Cruz

The most widespread and dominant noise source in Santa Cruz is traffic. Noise from traffic is audible from almost all areas of the city and most times of the day. Other noise sources such as railroads, industry and the Boardwalk tend to be localized and limited to certain locations and times of the day or year. The following is a discussion of the most common noise sources in Santa Cruz.

3.1. Traffic

The noisiest roadways are those with the greatest traffic volumes and highest travel speeds. For example, the freeways (State Route 1 and State Route 17) generate noise which affects large areas. The noise from arterials affects the development that is directly adjacent but the affects are significantly reduced beyond the first row of buildings. Examples are Mission Street (State Route 1), Water Street, Soquel Avenue, Ocean Street, Broadway, River Street, Bay Street and Laurel Street.

Soundwalls along freeways reduce noise levels at the land uses behind them. Typical noise reductions are in the 5 to 15 dBA range depending on the location of the noise receptor. Soundwalls have been or are being installed along much of the length of the State Route 1 freeway in Santa Cruz as part of the State Route 1/17 Widening of Merge Lanes project. The environmental document for this project[1] contains extensive existing and future noise level data for noise sensitive land uses (primarily residences) with and without the proposed soundwalls.

3.2. Railraod

The railroad tracks that cross the southern portion of the City in an east/west direction are used for freight trains a few times a week and generally during daytime hours. During the summer (and limited days during the winter holidays) recreational trains access the Boardwalk along the tracks that cross the City in a north/south direction along Chestnut Street. There are generally two round trip excursions per day. The trains travel at relatively low speeds through the City and the major noises are the rumble from the locomotive and the whistles that must be sounded before and during each at-grade roadway crossing.

Locomotives typically produce maximum noise levels (L_{max}) of 88 dBA at a distance of 50 feet and whistles produce an L_{max} of 105 dBA at 50 feet[2]. If there are two round trips a day, this corresponds to an L_{dn} of 49 dBA. The L_{dn} would increase to 65 dBA near grade crossings since the train would be required to sound its warning horn (whistle).

3.3. Aircraft

There are no airfields or airports in Santa Cruz and, therefore, airplane noise is limited to overflights. There is an emergency helipad at Dominican Hospital just outside of the northeast corner of the City Limits.

3.4. Industrial Uses

Much of the industrial land use in the City is located north of State Route 1 and west of River Street (State Route 9). Concrete production and distribution is a common noise source in this area. Measurements along Coral Street indicate that the steady noise level from machinery at the Graniterock facility is 65 to 67 dBA at a distance of 185 feet.

3.5. Boardwalk

The Santa Cruz Beach Boardwalk is the predominant noise source in the beach area during the summer months. Major noise sources include roller coasters, people screaming and outdoor concerts. Noise measurements conducted for the Beach Area/South of Laurel Master Plan EIR[3] indicated that roller coasters generate maximum noise levels (L_{max}) of 69 to 78 dBA at the residences and businesses across Beach Street. The DNL along Leibrandt Street was 68 dBA. Along East Cliff Drive, homes on the bluff overlooking the boardwalk, were exposed to an L_{max} of 60 to 65 dBA from music at the bandstand and 65 to 70 dBA from the screams of people on the wooden roller coaster (Giant Dipper).

4. Measurements of Existing Conditions

A noise measurement program was conducted to quantify noise levels throughout the City. For traffic noise, ten locations were selected to represent existing traffic noise levels on the busier roads (see Figure 1). a One continuous “long term” 24-hour noise measurement and one “short-term” 15-minute measurement were conducted at each of the ten locations. The short-term noise measurement was conducted at the typical setback of the nearby land uses (typically residences) while the long-term noise monitor was mounted to an existing utility pole or tree.

The short-term measurement results were correlated with simultaneous measurements at the long-term monitoring location to determine the DNL at the typical setback of land uses in the vicinity of the long-term noise monitor. Table 1 shows the results of the short-term noise measurements and the correlated DNL. Figures 2a through 2j show the hourly plot of the measured noise levels at the long-term noise monitors.

Figure 1: Noise Measurement Locations

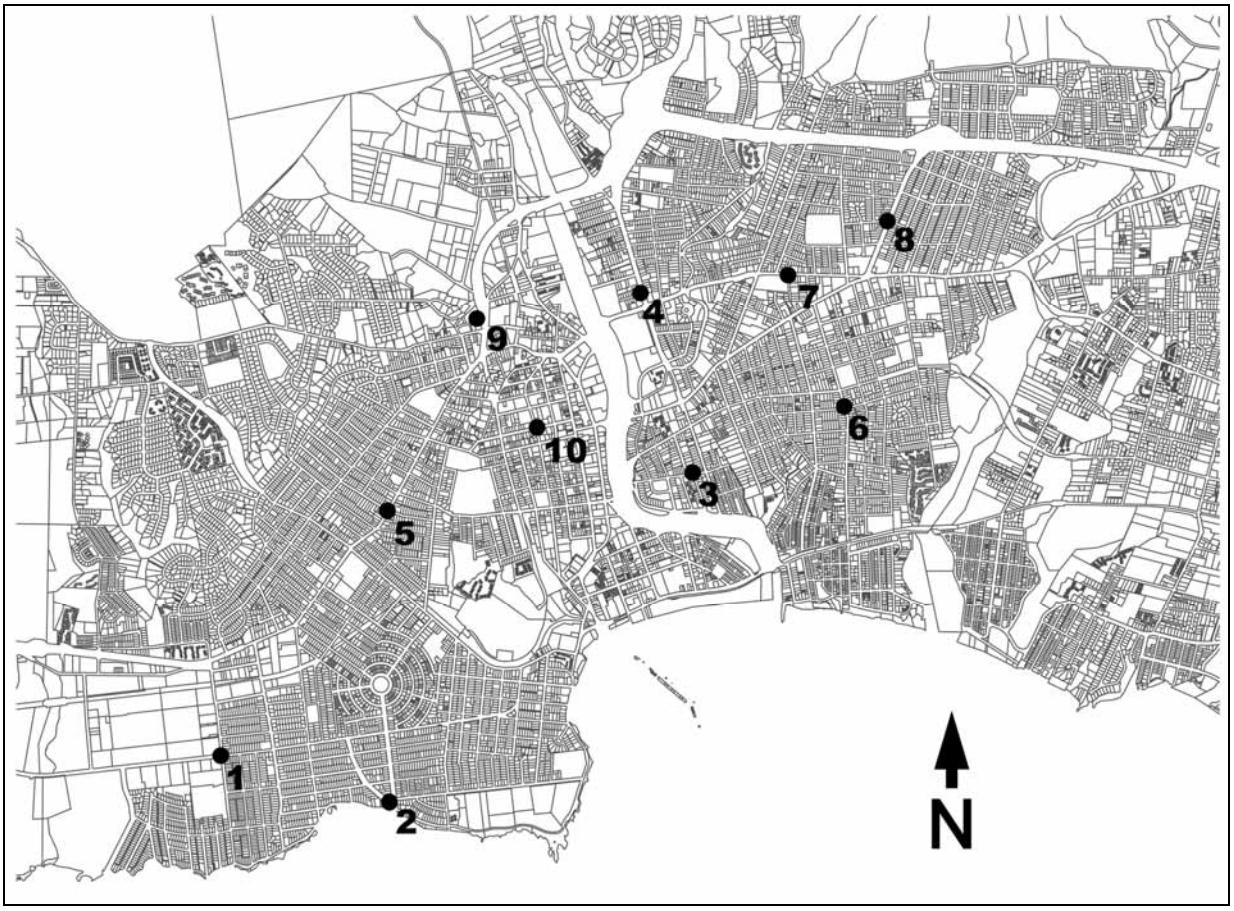


Table 1: Short-term Noise Measurement Results

Location		Date/Time	A-weighted Sound Level, dBA				
			L_{eq}	L_{10}	L_{50}	L_{90}	DNL*
1	Swift Street at Jeter Street	11/28/06 1:30 - 1:45 PM	65	69	62	51	66
2	West Cliff Drive at Woodrow Avenue	11/28/06 3:15 - 3:30 PM	56	48	47	46	56
3	Barson Street at Canfield Avenue	11/28/06 2:45 - 3:00 PM	60	65	54	48	62
4	Ocean Street south of Hubbard Street	11/28/06 2:15 - 2:30 PM	71	74	69	62	73
5	Mission Street At Van Ness Avenue	11/28/06 1:00 - 1:15 PM	70	69	67	64	75
6	Seabright Avenue at Windsor Street	11/30/06 11:30 - 11:45 AM	63	67	60	48	66
7	Water Street at Benito Avenue	11/30/06 12:00 - 12:15 PM	67	69	64	58	69
8	Morrissey Boulevard at Hammond Avenue	11/30/06 12:30 - 12:45 PM	66	69	65	56	67
9	Highway 1 at High Street	11/30/06 1:30 - 1:45 PM	70	73	69	59	73
10	Center Street at New Street	11/30/06 2:00 - 2:15 PM	63	64	56	48	63

*DNL calculated by correlating with simultaneous measurement at 24-hour noise monitor.

Figure 2a: Long-term Noise Measurement Results
Location 1 – Swift Street at Jeter Street

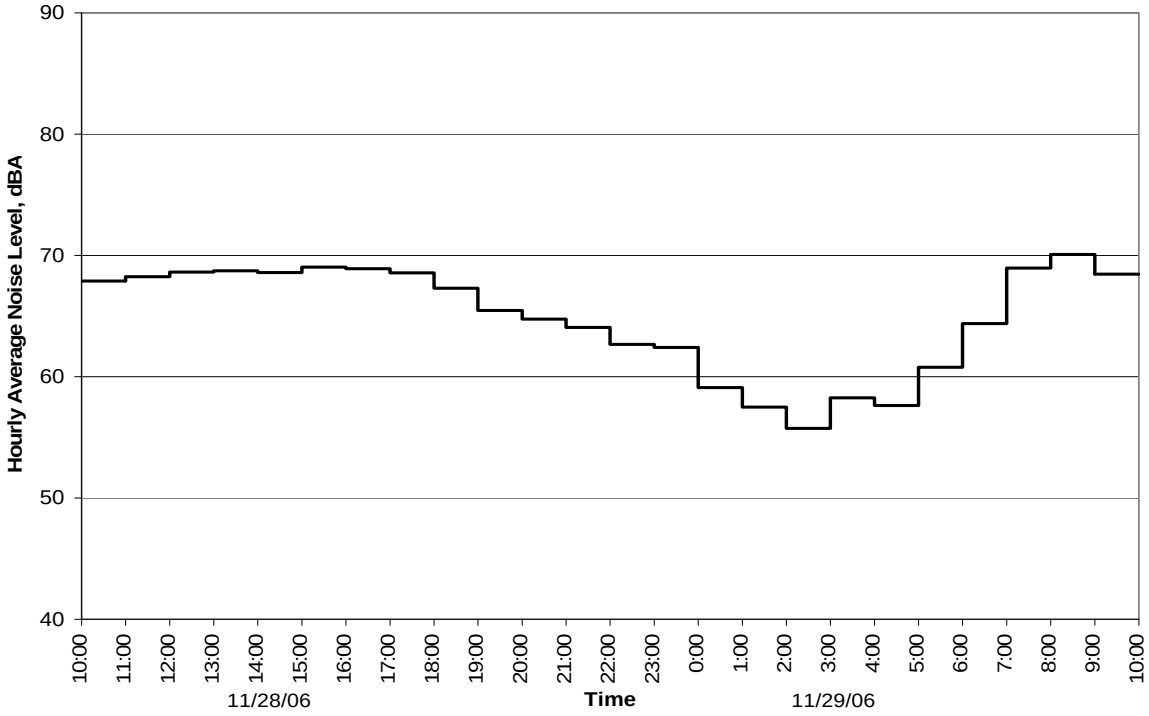


Figure 2b: Long-term Noise Measurement Results
Location 2 – West Cliff Drive at Woodrow Avenue

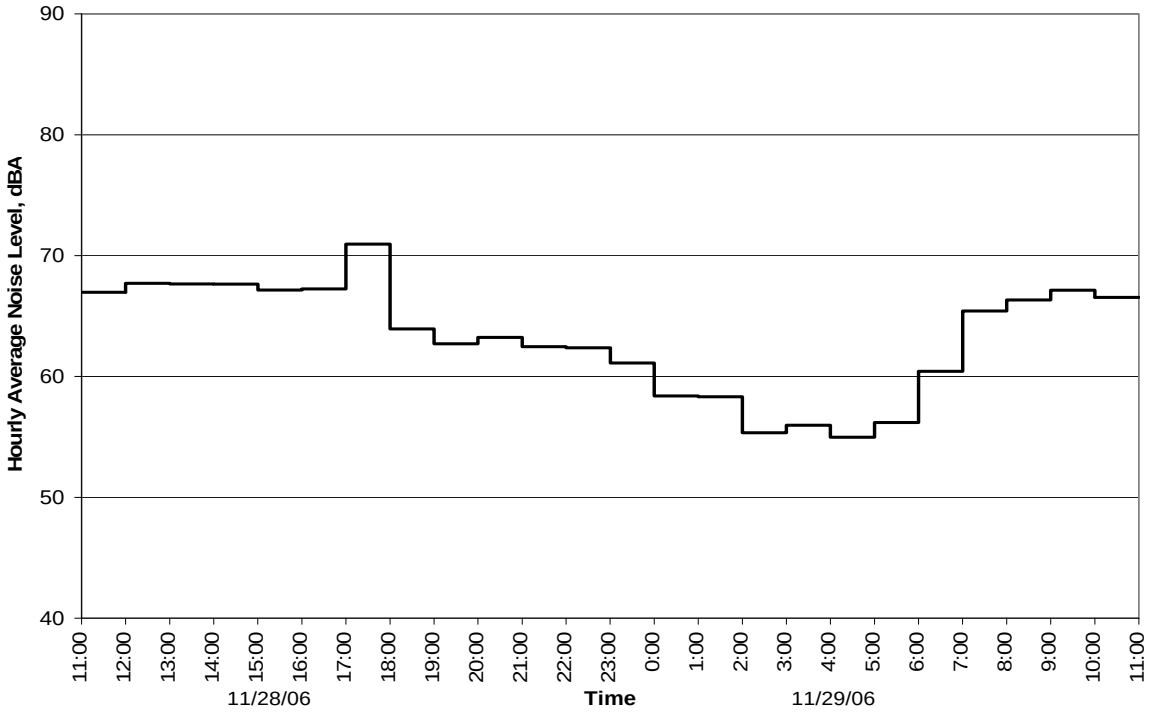


Figure 2c: Long-term Noise Measurement Results
Location 3 – Barson Street at Canfield Avenue

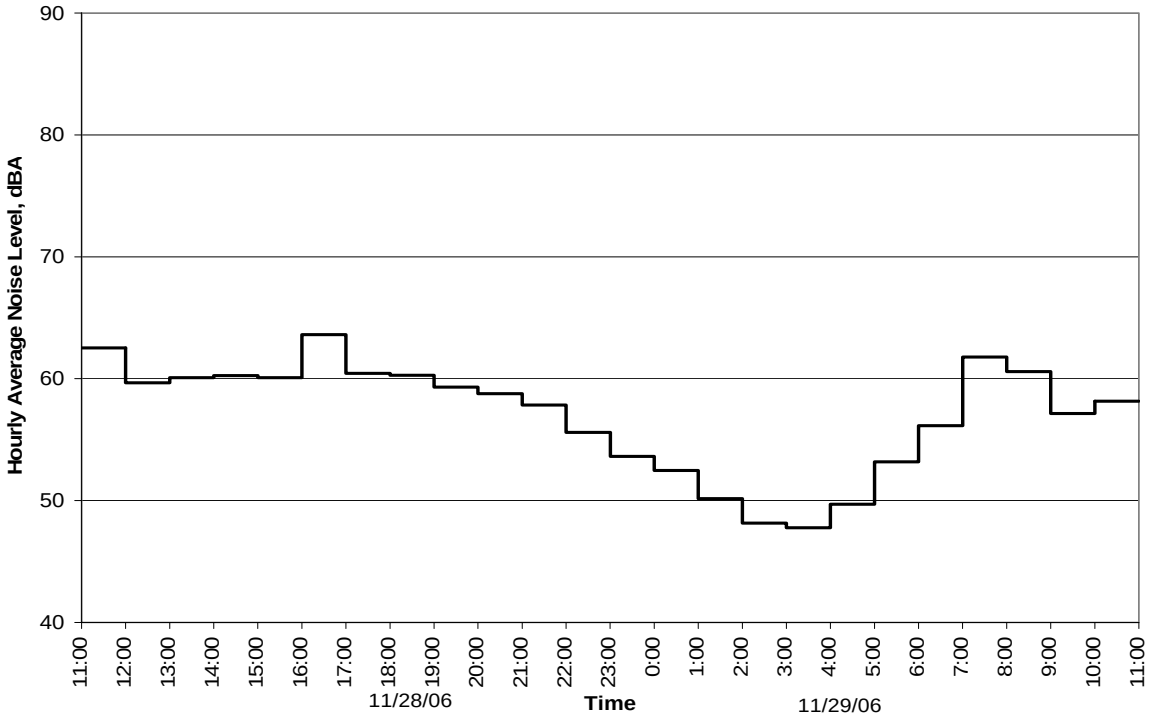


Figure 2d: Long-term Noise Measurement Results
Location 4 – Ocean Street south of Hubbard Street

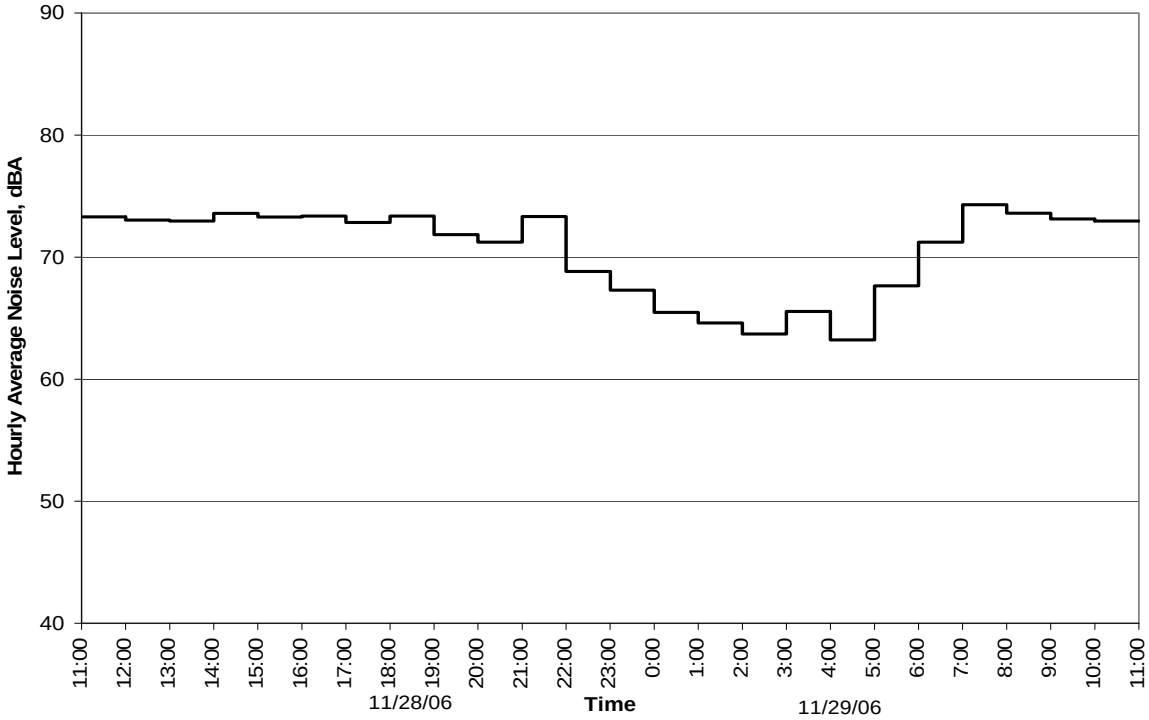


Figure 2e: Long-term Noise Measurement Results
Location 5 – Mission Street at Van Ness Avenue

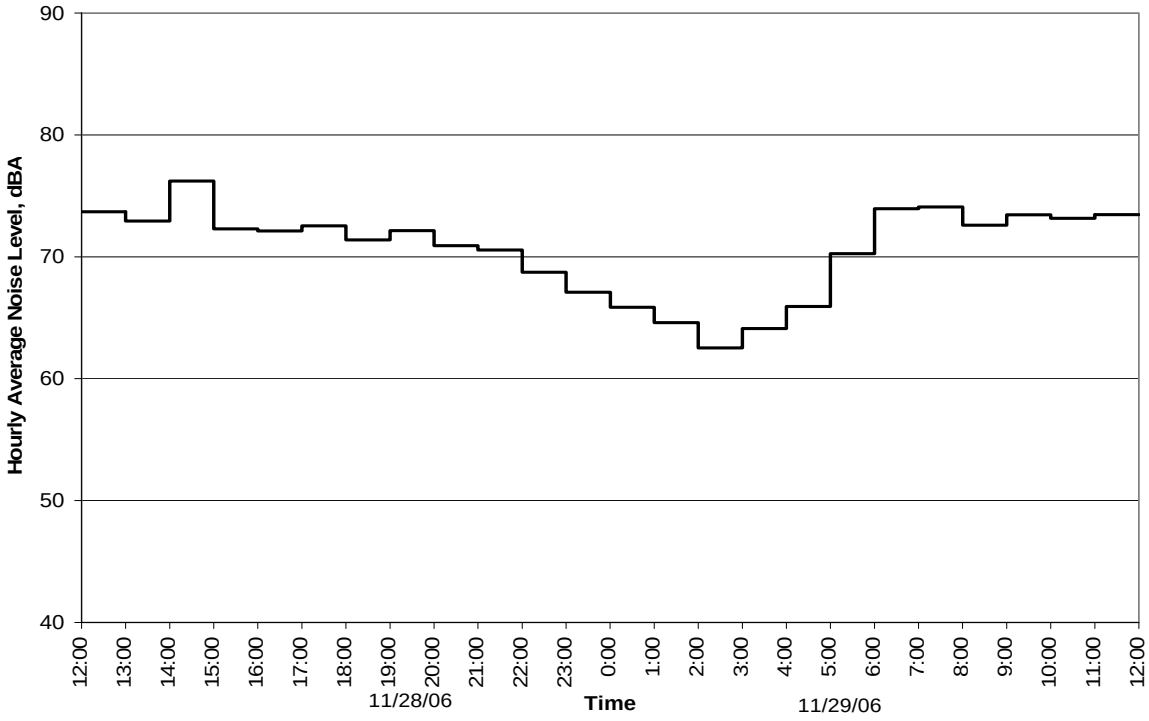


Figure 2f: Long-term Noise Measurement Results
Location 6 – Seabright Avenue at Windsor Street

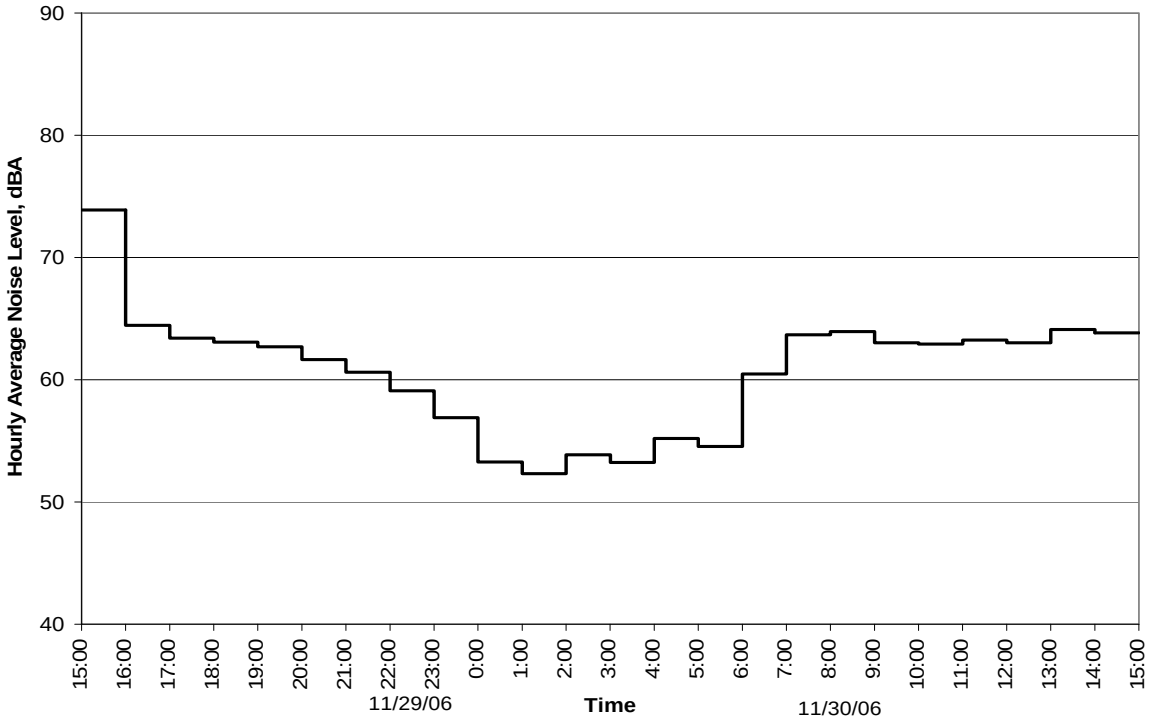


Figure 2g: Long-term Noise Measurement Results
Location 7 – Water Street at Benito Avenue

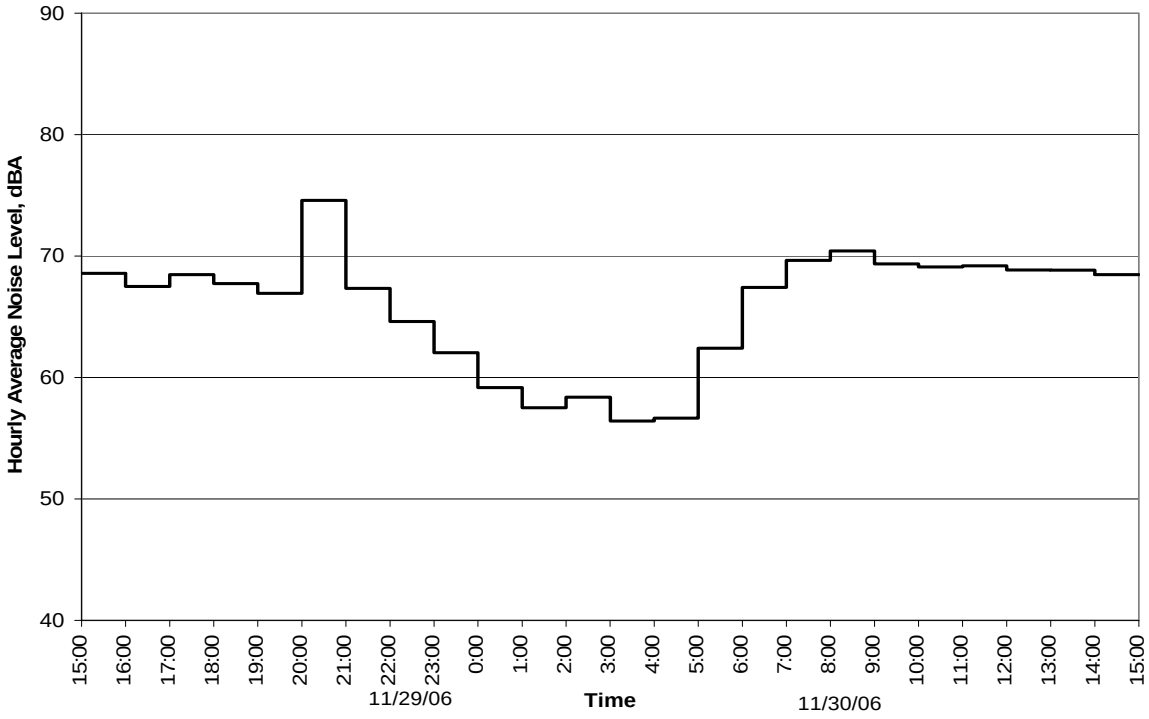


Figure 2h: Long-term Noise Measurement Results
Location 8 – Morrissey Boulevard at Hammond Avenue

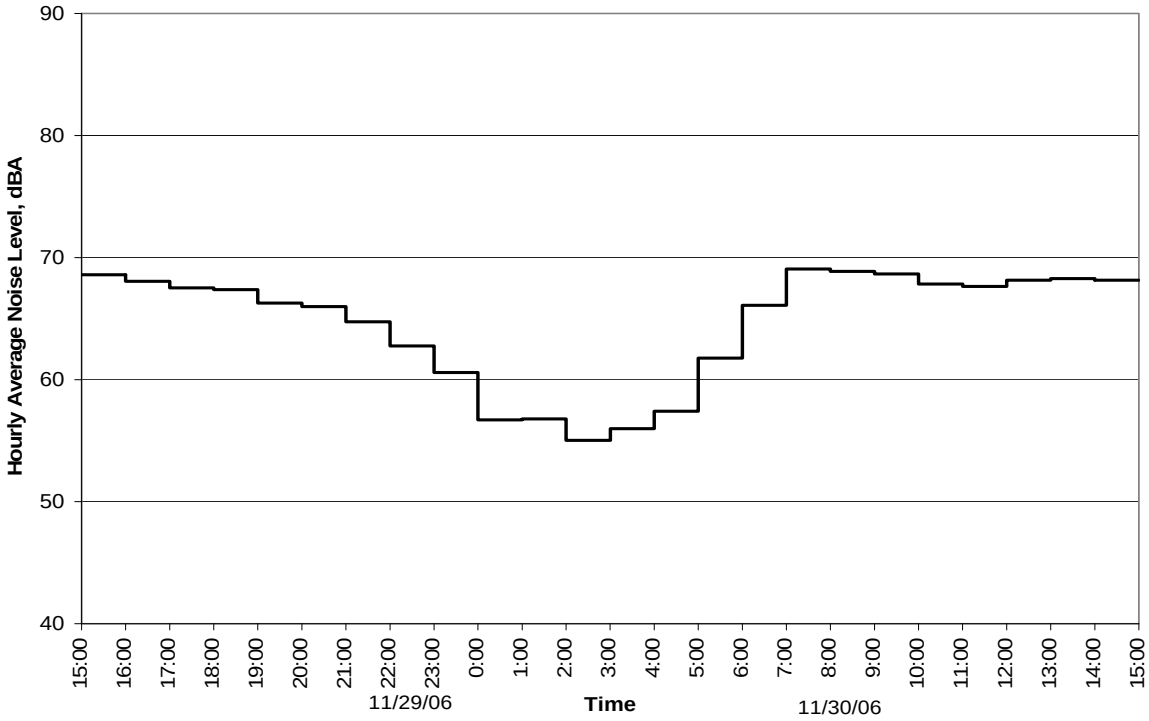


Figure 2i: Long-term Noise Measurement Results
Location 9 – Highway 1 at High Street

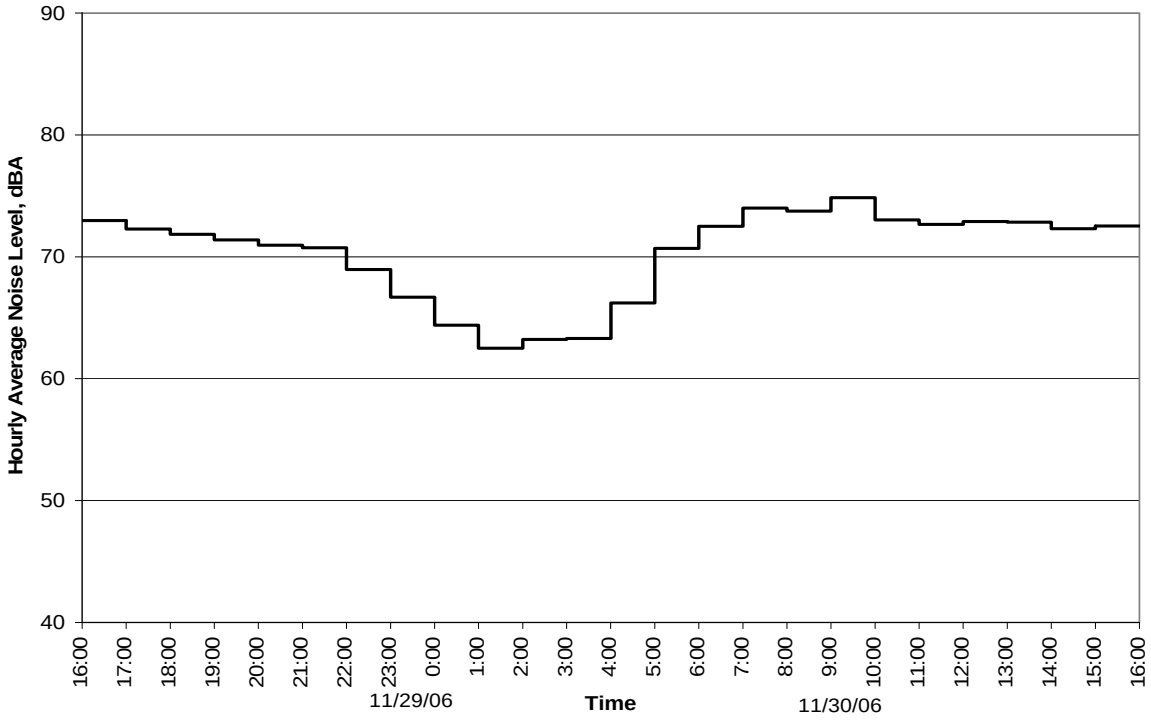
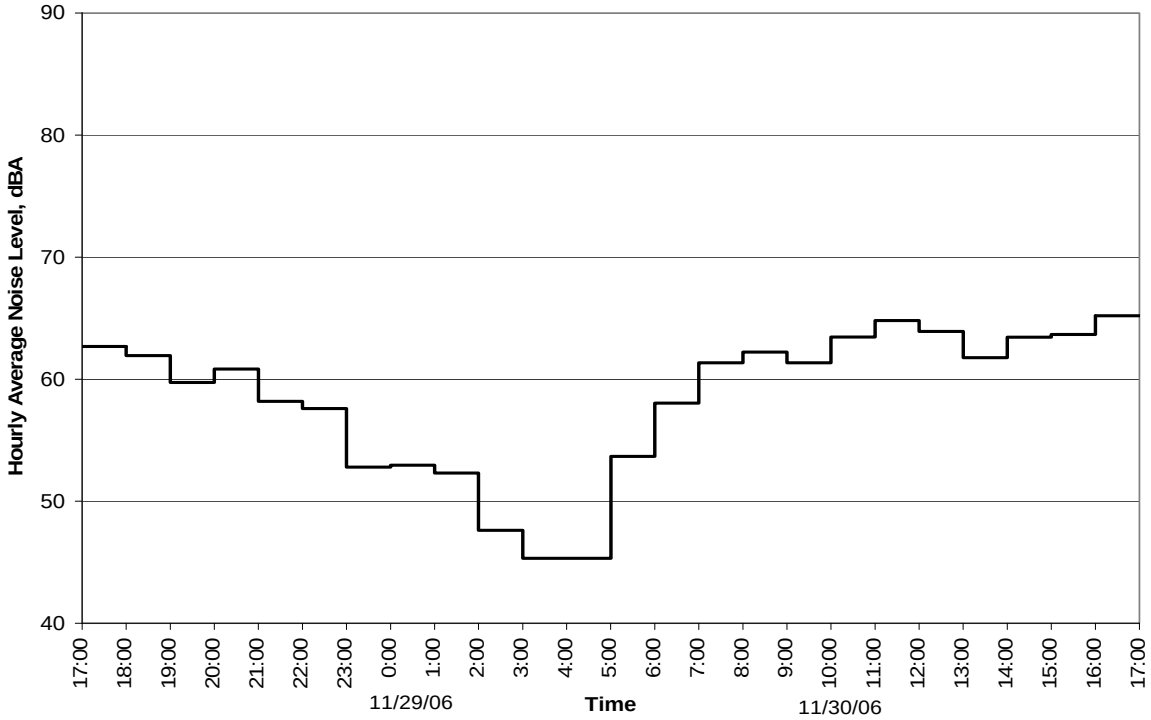


Figure 2j: Long-term Noise Measurement Results
Location 10 – Center Street at New Street



5. Existing Noise Contours

A noise contour map is a useful way to describe the noise environment of a large geographical area using a single graphical map. A noise contour map is similar to a topographic map. Whereas the contour lines of a topographic map represent a specific elevation in feet or meters, the contour lines of a noise contour map represent a specific noise level in decibels (dBA). Existing traffic noise contours are presented in Figure 3. The noise contours are shown for DNL values of 60, 65 and 70 dBA.

The traffic noise contours are based on calculations using the Federal Highway Administration's Traffic Noise Model[4] (TNM 2.5). TNM 2.5 calculates the traffic noise level based on input such as traffic volume, truck percentage and travel speeds. The traffic data for the local roads used as input to the TNM 2.5 model is based on the existing traffic data developed by the City of Santa Cruz for the General Plan Update and supplemented by observations made in the field. The traffic data for the freeways is based on counts published by Caltrans[5].

The traffic noise contours do not take into account the acoustical shielding provided by buildings or fences along the roadways. However, along the portions of State Route 1 freeway, the effects of recently constructed soundwalls are included. The soundwall locations are based on the environmental document for the freeway widening project[1]. The soundwalls are assumed to reduce the noise levels by 5 dBA.

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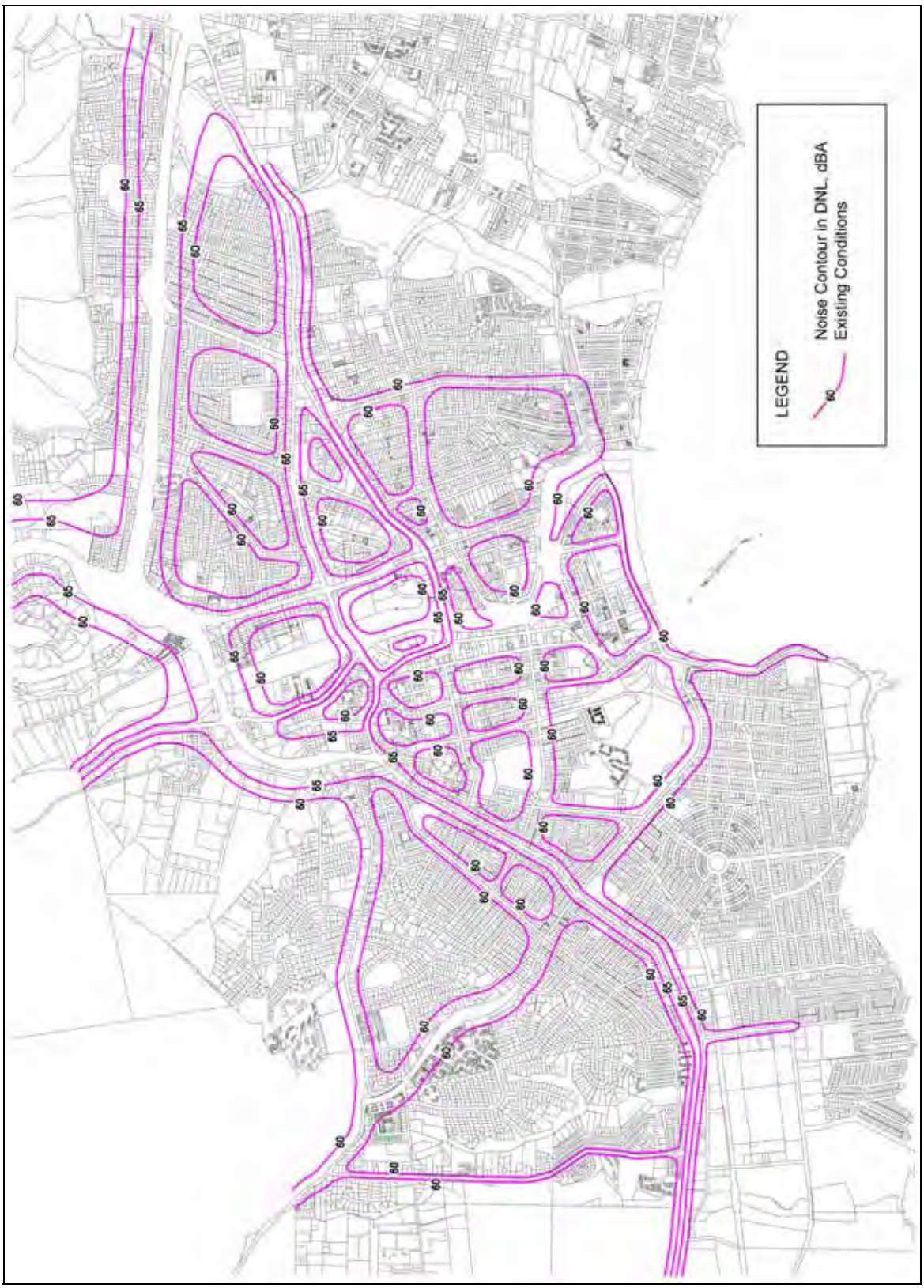
Figure 3: Existing Noise Contours



References

[1] *Negative Declaration and finding of No Significant Impact Route 1/17 Widening for Merge Lanes*, Caltrans, 2002?

[2] *Transit Noise and Vibration Impact Assessment*, Federal Transit Administration, April 1995, Chapter 6.

[3] *Beach Area/South of Laurel Master Plan Program EIR Noise Analysis, Prepared for David J. Powers & Associates*, Harold S. Goldberg, P.E., Charles M. Salter Associates, 1998

[4] *Federal Highway Administration's Traffic Noise Model (FWHA TNM) Version 2.5*, US Department of Transportation John A. Volpe National Transportation Systems Center, Acoustics Facility, Feb 2004

[5] *2005aadt.xls, 2005truck.xls*, Caltrans Website http://traffic-counts.dot.ca.gov, 2006

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Acoustical and Audiovisual Consultants

FUTURE NOISE CONTOURS FOR:

City of Santa Cruz General Plan Noise Element Update

Santa Cruz, CA

RGDL Project #: 06-047-1

PREPARED FOR:

City of Santa Cruz
Planning and Community Development
809 Center Street, Room 106
Santa Cruz, CA 95060

PREPARED BY:

Harold Goldberg, P.E.

DATE:

29 November 2010

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A noise contour map is a useful way to describe the noise environment of a large geographical area using a single graphical map. A noise contour map is similar to a topographic map. Whereas the contour lines of a topographic map represent a specific elevation in feet or meters, the contour lines of a noise contour map represent a specific noise level in decibels (dBA). Future traffic noise contours are presented in Figure 1. The noise contours are shown for DNL values of 60, 65 and 70 dBA.

The traffic noise contours are based on calculations using the Federal Highway Administration's Traffic Noise Model[1] (TNM 2.5). TNM 2.5 calculates the traffic noise level based on input such as traffic volume, truck percentage and travel speeds. The traffic data for the local roads used as input to the TNM 2.5 model is based on the General Plan Buildout traffic data developed as part of the General Plan Update. The traffic data for the freeways is based on counts published by Caltrans[2] and an AMBAG growth rate of 0.38% per year.

The traffic noise contours do not take into account the acoustical shielding provided by buildings or fences along the roadways. However, along the portions of State Route 1 freeway, the effects of recently constructed soundwalls are included. The soundwall locations are based on the environmental document for the freeway widening project[1]. The soundwalls are assumed to reduce the noise levels by 5 dBA.

The future noise contours are shown in tabular form in Tables 1 and 2. These tables also show the increase in traffic noise levels between the existing and future conditions.

1: Future Noise Contours and Increase in Noise

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 50 ft from Center of Roadway (dBA)	L_{dn} at 50 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Bay St. (Bay Dr.)						
-High to Nobel-Iowa	67	67	0.1	240	85	--
-Nobel-Iowa to Escalona	67	67	0.4	260	95	--
-Escalona to King	67	67	0.4	260	90	--
-King to Mission	65	67	1.5	240	85	--
-Mission to California St	65	65	0.2	160	50	--
-California St to California Ave	66	67	0.9	240	85	--
-California Ave to West Cliff	65	66	0.9	200	70	--
Branciforte						
-Goss to Water	64	65	1.0	160	50	--
-Water to Soquel	64	65	0.8	160	50	--
-Soquel to Broadway	61	62	0.8	90	--	--
California St						
-Laurel to Bay	63	63	0.4	110	--	--
Front						
-Mission/Water to Cooper of	63	65	1.5	160	50	--
-Soquel to Cathcart	66	67	1.3	260	90	--
-Cathcart to Metro Center	65	66	1.2	220	70	--
-Metro Center to Laurel	65	66	1.2	200	70	--
Center						
-Mission to Laurel	63	64	0.7	140	--	--
-Laurel to Pacific	60	60	0.7	55	--	--
Seabright						
-Water to Soquel	60	60	-0.4	50	--	--
-Soquel to Broadway	63	64	0.7	140	--	--
-Broadway to Murray	63	64	0.8	130	--	--
Ocean						
-Ocean/Plymouth to Kennan/Washburn	68	70	1.4	320	160	50
-Kennan/Washburn to Water	69	71	1.3	360	190	60
-Water to Soquel	68	69	1.3	320	150	--
-Soquel to Broadway	66	68	1.8	280	120	--
-Broadway to San Lorenzo/East Cliff	65	66	1.4	220	70	--
Riverside						
-San Lorenzo to Third	66	67	1.1	240	85	--

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 50 ft from Center of Roadway (dBA)	L_{dn} at 50 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Riverside						
-Third to Second	62	63	0.7	100	--	--
Chestnut						
-Laurel to Mission	62	63	0.9	110	--	--
River						
-Encinal to Fern	66	69	2.6	300	140	--
-Fern to Rte 1	67	70	2.6	340	170	50
-Rte 1 to Potrero	66	68	2.1	280	120	--
-Potrero to N Pacific River	65	68	2.6	260	110	--
-N Pacific River to Water	64	67	2.3	240	75	--
-Water to Soquel	64	65	1.1	180	55	--
Pacific						
Mission to Laurel	60	62	1.5	80	--	--
-Laurel to Center	59	60	0.8	50	--	--
-Center to Beach	64	65	1.0	160	50	--
Market						
-Isbel-Goss to Water	62	64	1.5	140	--	--
High						
-Western to Bay	65	66	0.2	190	60	--
-Bay to Moore	66	66	0.3	200	70	--
-Moore to Laurent	66	66	0.3	200	70	--
Mission/Water						
-Shaffer to Western	65	65	0.4	180	55	--
-Western to Swift	65	66	0.9	200	70	--
-Swift to Miramar	67	69	2.0	320	150	--
-Miramar to Younglove	67	70	2.4	340	170	50
-Younglove to Bay	68	70	2.2	340	180	60
-Bay to Laurel	69	71	2.8	400	240	75
-Laurel to Walnut	68	71	2.9	360	190	60
-Walnut to King-Union	68	71	2.3	360	190	60
-King-Union to Chestnut-Hwy 1	70	72	1.8	400	240	80
-Chestnut-Hwy 1 to Center	65	67	2.2	260	90	--
-Center to N. Pacific	67	69	1.9	300	130	--
-N.Pacific to River	66	68	2.1	280	120	--
-River to Ocean	68	70	2.1	340	170	50
-Ocean to Market	68	70	1.7	340	180	55
-Market to N.Branciforte	69	70	1.4	340	180	55
-N.Branciforte to Seabright	68	69	1.1	300	130	--
-Seabright to Morrissey	69	70	0.7	320	160	50

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 50 ft from Center of Roadway (dBA)	L_{dn} at 50 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Walnut/Soquel						
-Mission to Front	63	63	-0.1	120	--	--
-Front to River	65	66	1.3	220	70	--
-River to Riverside-Dakota	66	67	1.4	260	95	--
-Riverside-Dakota to Ocean	66	67	1.3	260	95	--
-Ocean to Branciforte	66	68	1.6	260	100	--
-Branciforte to Seabright	67	68	1.0	260	100	--
-Seabright to Morrissey	69	69	0.7	320	150	--
-Morrissey to Frederick	69	70	1.0	340	180	55
Frederick to Trevthan-Hagemann	70	71	1.0	360	190	60
Trevthan-Hagemann to Park	70	70	0.8	340	180	60
-Park to Capitola	69	70	0.8	340	180	55
-Capitola to La Fonda	66	67	0.5	240	85	--
Laurel/Broadway						
-King to Mission	60	62	1.8	90	--	--
-Mission to California	67	67	0.0	240	75	--
-California to Chestnut	66	68	1.5	260	110	--
-Chestnut to Center	66	68	1.5	260	100	--
-Center to Cedar	66	68	1.6	260	110	--
-Cedar to Pacific	66	68	1.3	260	110	--
-Pacific to Front	67	68	1.3	260	110	--
-Front to San Lorenzo	67	69	1.3	300	130	--
-San Lorenzo to Ocean	65	67	1.6	240	75	--
-Ocean to S.Branciforte	65	66	1.3	220	70	--
-S.Branciforte to Seabright	65	66	1.0	200	70	--
San Lorenzo/East Cliff/Murray						
-Laurel-Broadway to Riverside	64	65	0.9	160	50	--
-Riverside to Ocean	66	68	1.1	260	100	--
-Ocean to Seabright	67	68	0.6	260	100	--
West Cliff/Beach						
Swanton to Bay	62	63	0.3	100	--	--
-Bay to Pacific	64	65	0.8	160	50	--
-Pacific to Cliff	60	61	1.2	70	--	--
-Cliff to Riverside	59	61	1.9	70	--	--
King/Union						
-Bay to Laurel	63	63	0.6	120	--	--
-Laurel to Storey	62	63	0.8	120	--	--
-Storey to Mission	64	65	1.1	180	55	--

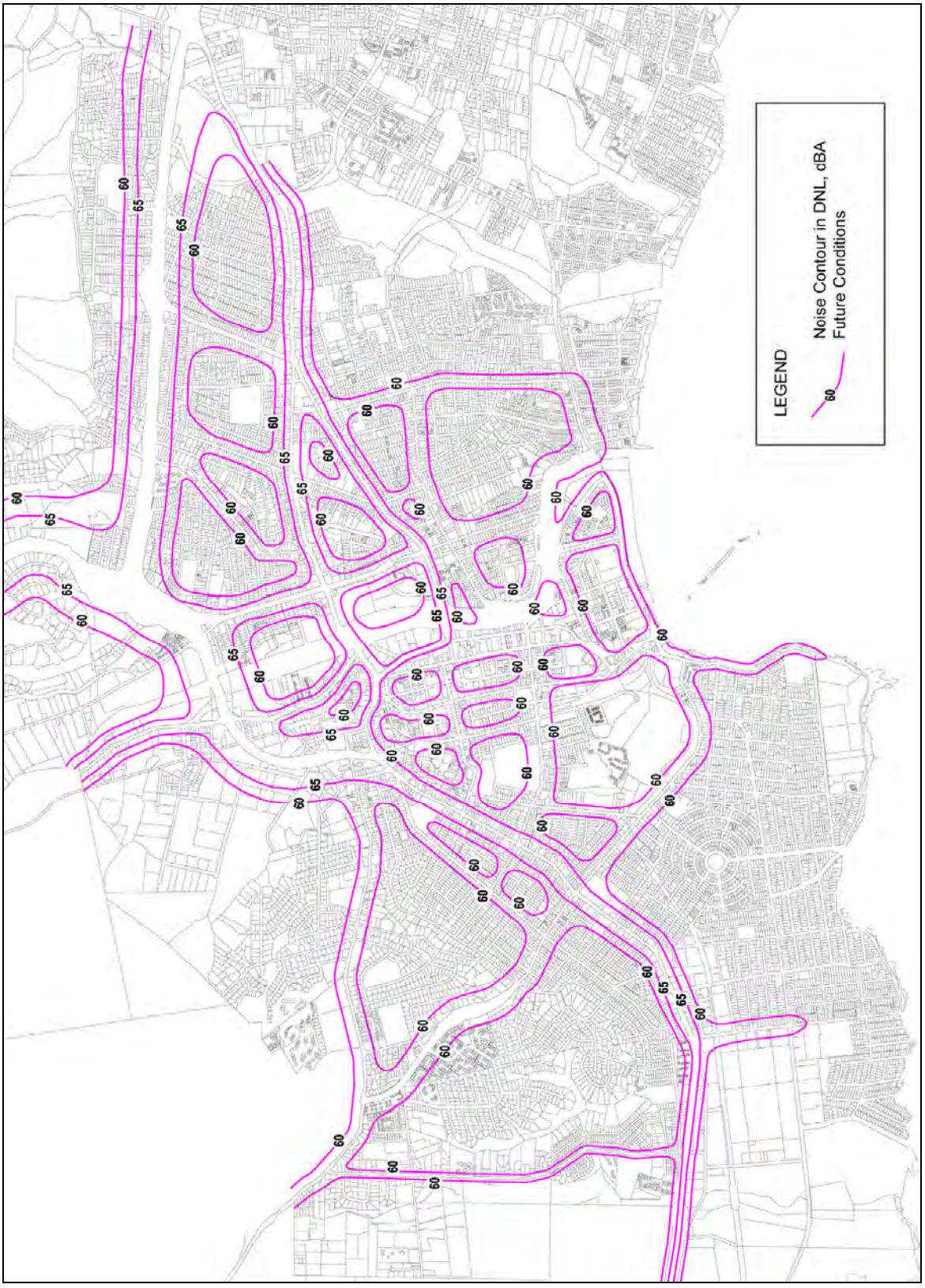
Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 50 ft from Center of Roadway (dBA)	L_{dn} at 50 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Western						
-High to Hwy1	60	62	1.3	80	--	--
Swift						
-Mission to Delaware	62	65	3.0	180	55	--
Morrissey						
-Fairmount to Soquel	66	67	0.5	240	85	--
Third Street						
Front to Riverside	64	64	0.3	140	--	--
Riverside to Beach	63	64	1.2	150	--	--
Seventh						
- Soquel to Capitola		64	NA	130	--	--
- Capitola to Brommer		65	NA	160	50	--
- Brommer to Eaton		65	NA	160	50	--
- Eaton to Cliff		65	NA	180	55	--

Table 1: Future Noise Contours and Increase in Noise - Freeways

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 100 ft from Center of Roadway (dBA)	L_{dn} at 100 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Hwy 1						
-Soquel to Morrissey	79	80	0.4	1050	650	400
-Morrissey to Emeline	74	75	0.4	650	400	240
-Emeline to Hwy 17	74	75	0.4	650	400	240
-Hwy 17 to Hwy 9	77	77	0.4	850	550	320
-Hwy 9 to Mission	76	76	0.4	750	480	300
Hwy 17						
-Begin Freeway to Pasatiempo	78	78	0.4	900	550	340

Rosen Goldberg Der & Lewitz, Inc.
1100 Larkspur Landing Circle #375 ◆ Larkspur CA 94939 ◆ Tel 415 464 0150 ◆ Fax 415 464 0155 ◆ RGDLacoustics.com

Figure 1: Future Noise Contours



[1] *Federal Highway Administration's Traffic Noise Model (FWHA TNM) Version 2.5*, US Department of Transportation John A. Volpe National Transportation Systems Center, Acoustics Facility, Feb 2004

[2] *2005aadt.xls, 2005truck.xls*, Caltrans Website http://traffic-counts.dot.ca.gov, 2006

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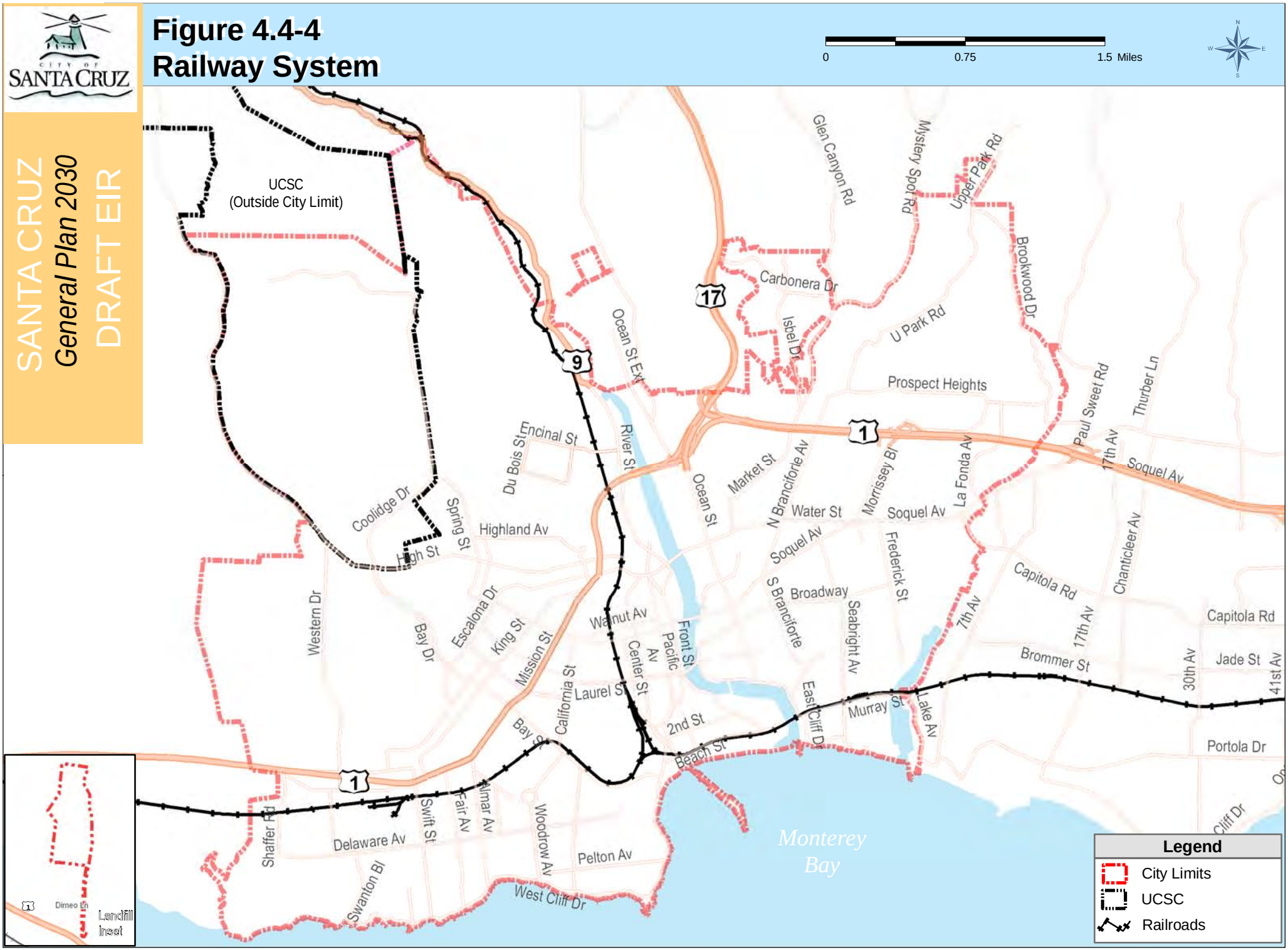
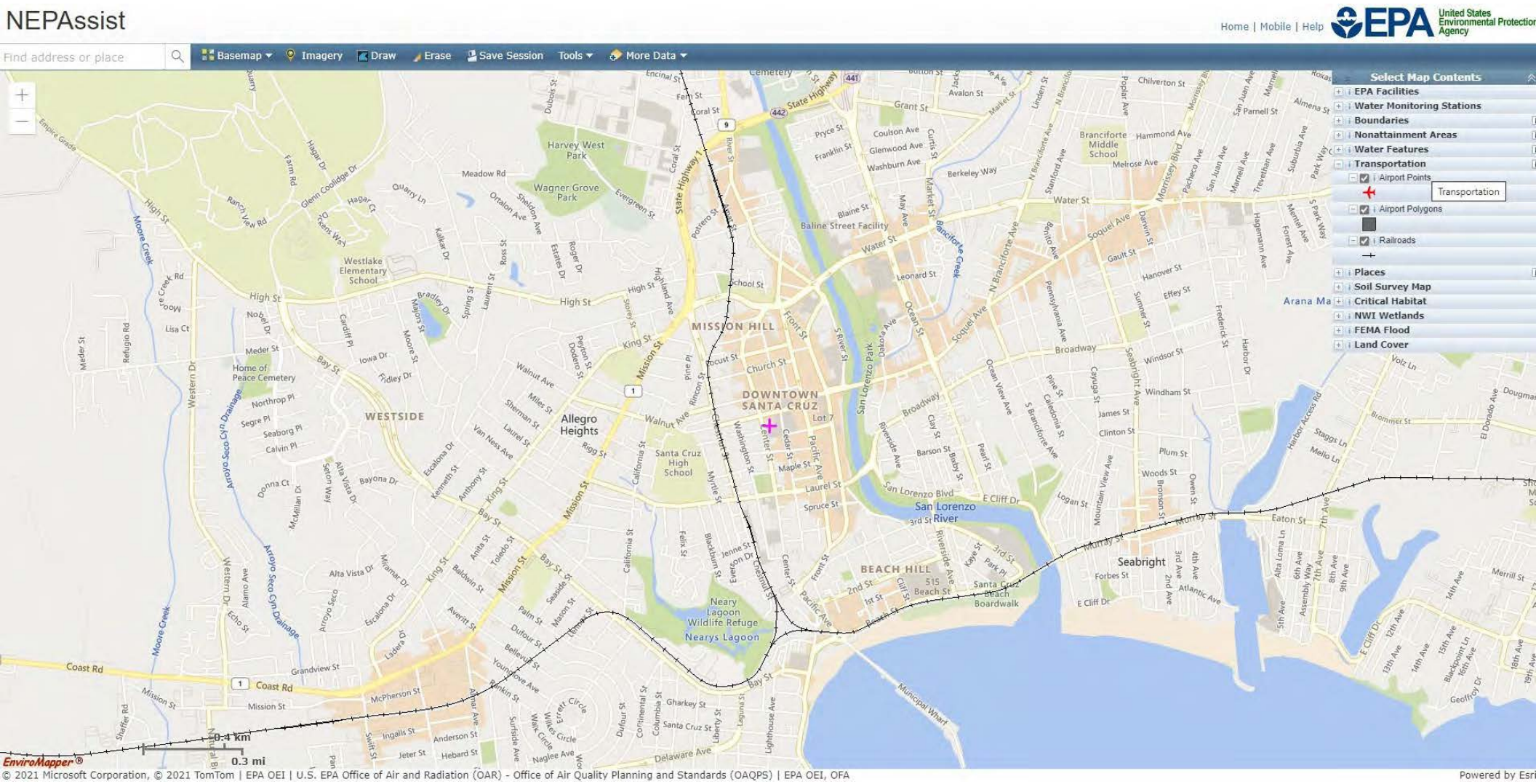
Figure 4.4-4
Railway System




NEPAssist
Home | Mobile | Help
EPA United States Environmental Protection Agency
Find address or place
Basemap
Imagery
Draw
Erase
Save Session
Tools
More Data
Select Map Contents
EPA Facilities
Water Monitoring Stations
Boundaries
Nonattainment Areas
Water Features
Transportation
Airport Points
Transportation
Airport Polygons
Railroads
Places
Soil Survey Map
Critical Habitat
NWI Wetlands
FEMA Flood
Land Cover
MISSION HILL
DOWNTOWN SANTA CRUZ
WESTSIDE
BEACH HILL
Allegro Heights
Harvey West Park
Wagner Grove Park
Westlake Elementary School
Santa Cruz High School
Neary Lagoon Wildlife Refuge
Nearys Lagoon
San Lorenzo River
Seabright
Baline Street Facility
Santa Cruz Beach Boardwalk
Municipal Wharf
Branciforte Middle School
Home of Peace Cemetery
Arana Ma
State Highway 1
Mission St
Coast Rd
Water St
Soquel Ave
Broadway
Walnut Ave
Bay St
Moore Creek
Arroyo Seco Cyn Drainage
0.4 km
0.3 mi
EnviroMapper®
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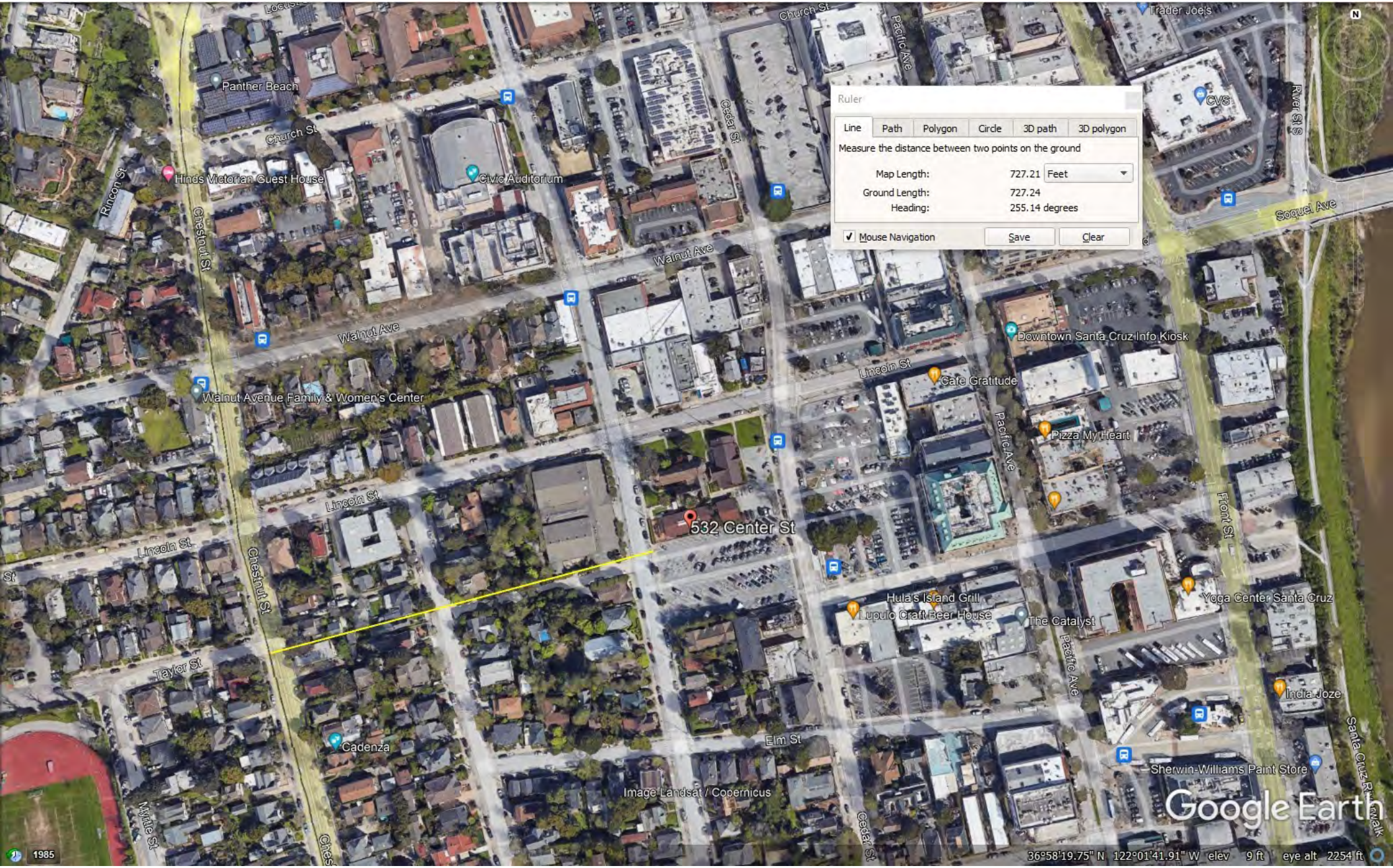
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Mouse Navigation
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Panther Beach
Hinds Victorian Guest House
Civic Auditorium
Walnut Avenue Family & Women's Center
Downtown Santa Cruz Info Kiosk
Cafe Gratitude
Pizza My Heart
Hula's Island Grill
Lupulo Craft Beer House
The Catalyst
Yoga Center Santa Cruz
India Joze
Sherwin-Williams Paint Store
Cadenza
Trader Joe's
CVS
Church St
Walnut Ave
Lincoln St
Taylor St
Elm St
Soquel Ave
Pacific Ave
Cedar St
Chestnut St
Rincon St
Front St
River St
Myrtle St
Santa Cruz Riverwalk
Image Landsat / Copernicus
Google Earth
1985
36°58'19.75" N 122°01'41.91" W elev 9 ft eye alt 2254 ft

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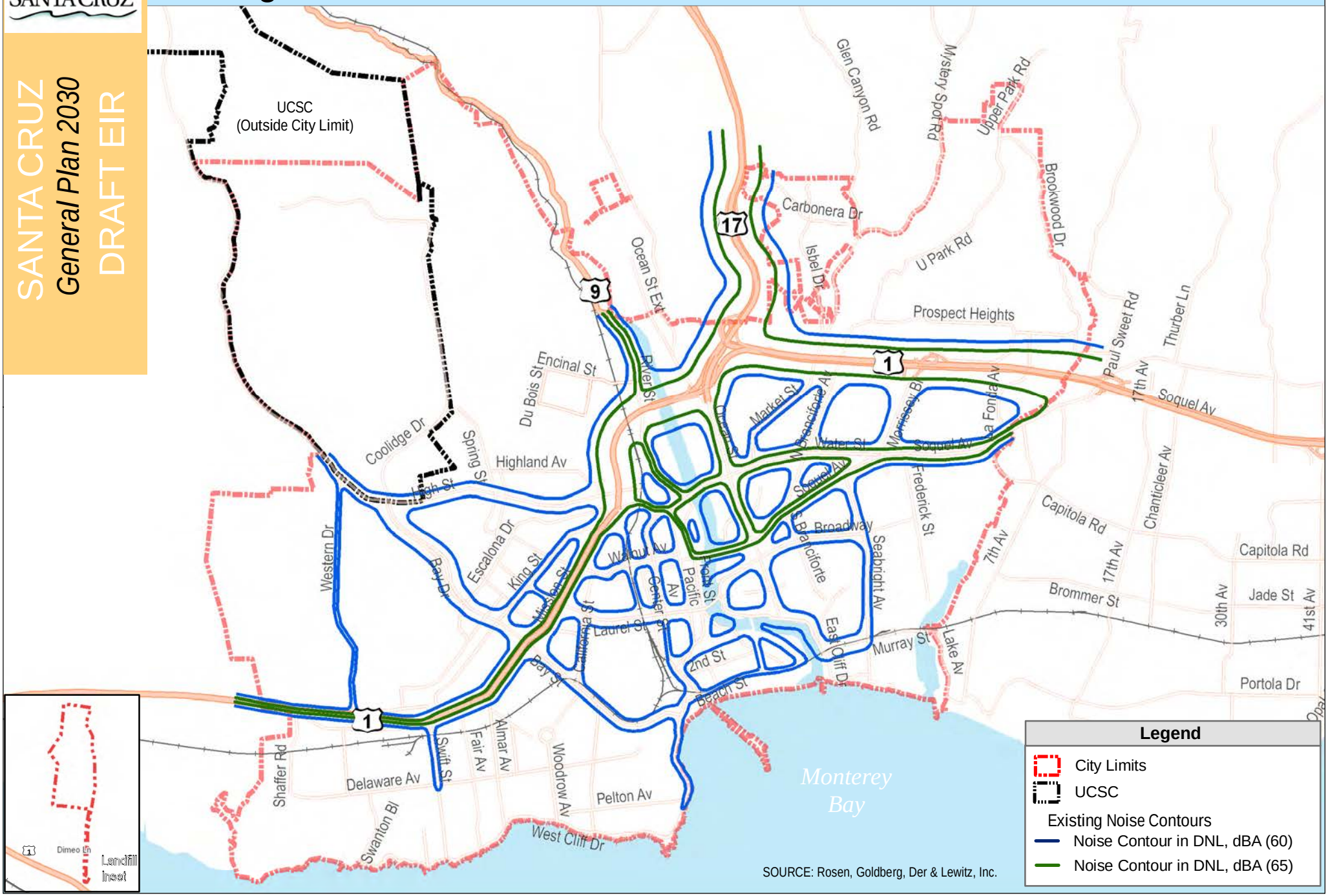
Figure 4.13-1
Existing Noise Contours



SOURCE: Rosen, Goldberg, Der & Lewitz, Inc.

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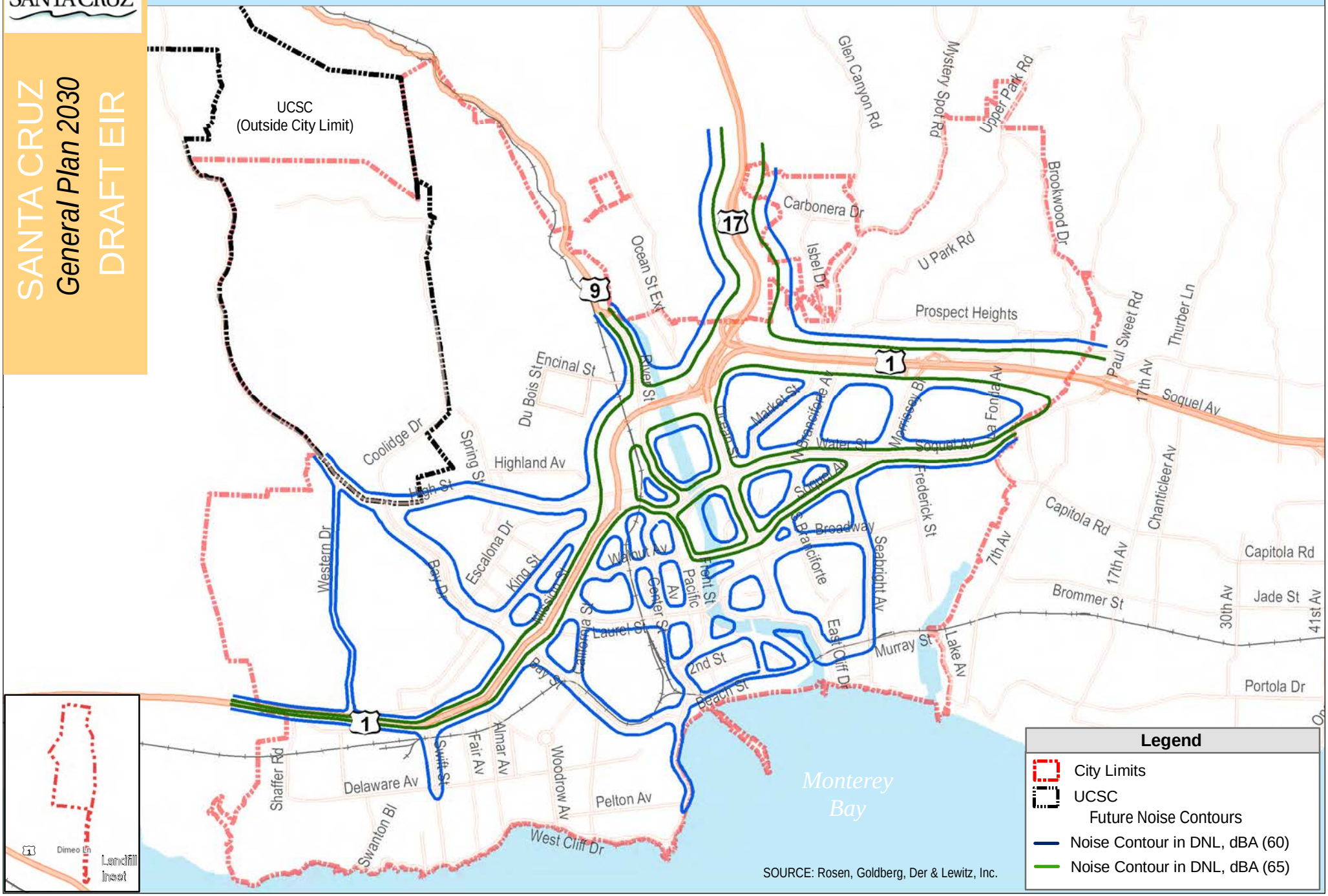
Figure 4.13-2
Future Noise Contours



Santa Cruz County Average Daily Traffic Counts

(2010 through 2016)

AREA	STREET:	From Street	To Street	Latest Count	Date	Prev Count	Date
C=Capitola, CO=Unincorporated County, SC=Santa Cruz, SV=Scotts Valley, W=Watsonville							
C							
	41ST AVE	SP RR	Clares	13,732	Feb, 2015	22,554	Jul, 2011
	41ST AVE	Capitola Rd	Strawberry Ln	22,272	Jul, 2015		
	41ST AVE	Clares	SHWY 1	40,804	Jul, 2015	43,755	Mar, 2015
	41st Ave.	S/O	Cory St.	24,232	May, 2011		
	49TH AVE	CAPITOLA RD	WHARF RD	5,336	Feb, 2015		
	BAY AVE	MONTEREY AVE	SHWY 1	11,749	Oct, 2016	7,724	Feb, 2015
	BROMMER ST	BULB AVE	41ST AVE	6,664	Oct, 2016	7,896	Oct, 2013
	CAPITOLA AVE	CLIFF DR	SHWY 1	3,534	Feb, 2015		
	CAPITOLA RD	41ST AVE	45TH AVE	11,024	Feb, 2015	13,489	Jul, 2011
	CAPITOLA RD	45TH AVE	WHARF RD	10,526	Feb, 2015	10,378	Jul, 2011
	CAPITOLA RD	30th AVE	41ST AVE	15,262	Oct, 2016	17,267	Feb, 2015
	CLARES ST	41ST AVE	WHARF RD	5,348	Feb, 2015		
	Clares St.	Capitola Rd	41st Ave	15,978	Feb, 2015		
	CLIFF DR	WHARF RD	CAPITOLA AVE	16,033	Oct, 2016	12,394	Jul, 2015
	CLIFF DR	PORTOLA RD	WHARF RD	7,844	Oct, 2013		
	ESPLANADE	CLIFF DR	LAWN WAY	1,822	Feb, 2012		
	FORTY SECOND AVE	CAPITOLA RD	CLARES ST	1,480	Feb, 2015		
	FORTY SEVENTH AVE	TOPAZ ST	CAPITOLA RD	1,182	Oct, 2013		
	JADE ST	41ST AVE	45TH AVE	4,766	Oct, 2013		
	KENNEDY DR	MONTEREY AVE	PARK AVE	4,202	Oct, 2013		
	MONTEREY AVE	BAY AVE	KENNEDY DR	3,507	Oct, 2013		
	Monterey Ave.	N/O	Park Ave.	3,656	Feb, 2015	5,670	Jul, 2011
	Monterey Ave.	Lawn St	Park Ave	8,974	Oct, 2013	9,664	Feb, 2012
	PARK AVE	MONTEREY AVE	SHWY 1	8,381	Jul, 2015	7,498	Oct, 2013
	Porter St.	CPTL CL (1)	SOQUEL-WHARF RD	21,839	Dec, 2010		
	SOMMERFIELD AVE	CAPITOLA RD	BROWN RANCH RD	177	Feb, 2015		
	Soquel Dr	W/O	Capitola Ave	20,349	Oct, 2016		
	SR 1	CAPITOLA BAY AVENUE I	CAPITOLA 41ST AVENU	75,775	Jan, 2014		
	SR 1	STATE PARK DRIVE INTE	CAPITOLA PARK AVENU	88,270	Jan, 2014	86,416	Nov, 2010
	TOPAZ ST E	45 TH AVE	49 TH AVE	1,086	Feb, 2015		
	WHARF RD	CLIFF DR	CAPITOLA RD	4,672	Feb, 2015	6,377	Jul, 2011
	WHARF RD	CAPITOLA RD	SHWY 1	5,934	Feb, 2015		
CO							
	17th Ave.	S/O	Capitola Rd.	10,385	Jul, 2015		

AREA	STREET:	From Street	To Street	Latest Count	Date	Prev Count	Date
C=Capitola, CO=Unincorporated County, SC=Santa Cruz, SV=Scotts Valley, W=Watsonville							
	17th Ave.	S/O	Brommer St.	10,344	Jul, 2015		
	17th Ave.	N/O	Brommer St.	11,692	Oct, 2016	10,181	Oct, 2014
	41ST AVE	PORTOLA DR	SP RR	12,160	Oct, 2016	12,425	Jul, 2015
	41ST AVE	SHWY 1	.11 N OF SHWY 1	14,551	Feb, 2015	16,799	Feb, 2012
	7th Ave.	N/O	Eaton St.	10,969	Jul, 2015		
	7th Ave.	S/O	Brommer St.	11,154	Oct, 2016		
	Alba Rd.	.55 E OF EMPIRE GRD	WESTERN WY	2,842	Jul, 2011		
	Amesti Rd.	S/O	Rianda Rd.	2,900	Oct, 2010		
	Bear Creek Rd.	W/O	Skyline Blvd	2,724	Oct, 2010		
	Bonita Dr.	Freedom Blvd	Vista Del Mar	1,072	Jul, 2011		
	Brommer St.	E/O	7th Ave.	7,752	Oct, 2016		
	Brommer St.	W/O	17th Ave.	7,680	Oct, 2016	7,598	Oct, 2014
	Cabrillo College Dr.	Park Ave	Soquel Dr	8,702	Oct, 2016	3,914	Jul, 2011
	Calabasas Rd.	S/O	Koenig Rd.	575	Oct, 2010		
	Capitola Ave	N/O	Hwy 1	4,750	May, 2011		
	CAPITOLA RD	17TH AVE	30th AVE	16,695	Jul, 2011		
	CAPITOLA RD	7th Ave.	17TH AVE	15,502	Oct, 2016	15,349	Jul, 2011
	CAPITOLA RD	SOQUEL AVE	7TH AVE	13,864	Jan, 2014	16,861	Jul, 2011
	CARLTON RD	COWARD RD	SHWY 129	2,424	Jul, 2011		
	Center Ave.	E/O	State Park Dr.	5,036	Oct, 2016		
	CHANTICLEER AVE	N/O	Capitola Rd	4,875	Aug, 2015		
	CHITTENDEN RD	at	San Benito Cty line	10,940	Aug, 2015	11,308	May, 2015
	Commercial Wy	W/O	Mission Dr.	2,173	May, 2011		
	CONGRESS SPRINGS R	E/O	Skyline Blvd	4,916	Aug, 2015	2,632	Jun, 2015
	East Cliff Dr.	W/O	17th Ave.	13,626	Oct, 2016		
	East Cliff Dr.	E/O	7th Ave.	13,785	Jul, 2015		
	Empire Grade	S/O	Heller Dr.	10,689	Oct, 2010		
	FELTON EMPIRE RD	2301 EMPIRE GRADE	URL .03 NW/KRAZY ACR	2,079	Jul, 2011		
	Freedom Blvd	S/O	Valencia Rd	15,226	Oct, 2016		
	Freedom Blvd.	N/O	Scurich Ln.	9,715	Oct, 2010		
	Freedom Blvd.	N/O	Soquel Dr.	16,015	Aug, 2015		
	GLEN ARBOR RD	SHWY 9	GLEN ARBOR RD	4,337	Jul, 2011		
	GRAHAM HILL RD	3302 MT HERMON RD	33116 LOCKWOOD LN	6,749	Jul, 2011		
	GRAHAM HILL RD	SHWY 9	MT HERMON RD	27,896	Feb, 2012		
	GRANITE CREEK RD	SHWY 17	LIONS FIELD DR	938	Feb, 2015		
	GREEN VALLEY RD	CASSERLY RD	URL .07 N/PIONEER RD	3,471	Jul, 2011		
	Green Valley Rd.	N/O	Holohan Rd	20,867	Oct, 2010		
	HARKINS SLOUGH RD	.04M W/SHWY 1	GREEN VLY RD	598	Feb, 2015	5,357	Jul, 2011

AREA	STREET:	From Street	To Street	Latest Count	Date	Prev Count	Date
C=Capitola, CO=Unincorporated County, SC=Santa Cruz, SV=Scotts Valley, W=Watsonville							
	Highway 1 Offramp	Westbound	Rooney St	1,872	Nov, 2010		
	Highway 1 Offramp	Eastbound	Fairmount Ave	5,272	Nov, 2010		
	Highway 1 Offramp	Westbound	Morrissey Blvd	9,220	Nov, 2010		
	Highway 1 Off-Ramp	Westbound	Larkin Valley Rd.	1,313	Nov, 2010		
	Highway 1 Off-Ramp	Westbound	State Park Ave. (loop)	6,765	Nov, 2010		
	Highway 1 Off-Ramp	Eastbound	State Park Ave.	8,160	Nov, 2010		
	Highway 1 Off-Ramp	Westbound	Park Ave.	4,390	Nov, 2010		
	Highway 1 Off-Ramp	Eastbound	San Andreas Rd.	4,491	Nov, 2010		
	Highway 1 Off-Ramp	Eastbound	Park Ave.	7,650	Nov, 2010		
	Highway 1 Onramp	Eastbound	Fairmount Ave	2,531	Nov, 2010		
	Highway 1 On-Ramp	Eastbound	State Park Ave. (loop)	4,824	Nov, 2010		
	Highway 1 On-Ramp	Westbound	State Park Ave. (loop)	2,253	Nov, 2010		
	Highway 1 On-Ramp	Eastbound	State Park Ave.	1,609	Nov, 2010		
	Highway 1 On-Ramp	Westbound	Morrissey Blvd	4,918	Nov, 2010		
	Highway 1 On-Ramp	Westbound	State Park Ave.	6,193	Nov, 2010		
	Highway 1 On-Ramp	Eastbound	San Andreas Rd.	1,315	Nov, 2010		
	Highway 1 On-Ramp	Westbound	Rooney St	1,175	Nov, 2010		
	Highway 1 On-Ramp	Eastbound	Park Ave.	4,101	Nov, 2010		
	Highway 1 On-Ramp	Eastbound	Morrissey Blvd	4,927	Nov, 2010		
	Highway 1 On-Ramp	Westbound	Larkin Valley Rd.	4,322	Nov, 2010		
	Highway 1 On-Ramp	Westbound	Park Ave.	8,659	Nov, 2010		
	HOLOHAN RD	GREEN VALLEY RD	SHWY 152	16,704	Jul, 2011		
	Holohan Rd.	E/O	Green Valley Rd.	17,036	May, 2011		
	Larkin Valley Rd.	N/O	Buena Vista Dr.	1,046	Oct, 2010		
	LEE RD	RIVERSIDE DR	BEACH RD	7,682	Jul, 2011		
	LEE RD	RIVERSIDE DR	BEACH RD	7,682	Jul, 2011		
	Lee Rd.	Riverside Rd	Beach Rd	7,682	Jul, 2011		
	Lee Rd.	Riverside Rd	Beach Rd	7,682	Jul, 2011		
	Main St	W/O	Rodriguez St.	26,644	Oct, 2016	29,749	Oct, 2014
	Maple Ave	W/O	Union St.	4,764	Oct, 2016	3,486	Oct, 2014
	McGregor Dr	E/O	Park Ave	7,576	Oct, 2016		
	McGregor Dr	N/O	Searidge Rd	3,986	Oct, 2016		
	MT HERMON RD	GRAHAM HILL RD	SPRR	18,504	Feb, 2012		
	MT HERMON RD	SPRR	.17 N/LOCKHART GULCH	19,133	Feb, 2012		
	Park Ave.	Soquel Dr	S/Hwy 1	20,100	Oct, 2010		
	Paul Sweet Rd.	N/O	Hwy 1	2,768	May, 2011		
	POLO DR	SOQUEL DR	.20 N OF SOQUEL DR	644	Jul, 2011		
	PORTER ST	CPTL CL (1)	SOQUEL-WHARF RD	12,611	Jul, 2011		

AREA	STREET:	From Street	To Street	Latest Count	Date	Prev Count	Date
C=Capitola, CO=Unincorporated County, SC=Santa Cruz, SV=Scotts Valley, W=Watsonville							
	PORTER ST	SOQUEL-WHARF RD	SOQUEL DR	10,830	Oct, 2016	11,582	Oct, 2014
	PORTOLA DR	Coastview Dr	23rd St	10,743	Jul, 2015		
	Portola Dr.	E/O	24th Ave.	12,093	Jul, 2015		
	Portola Dr.	W/O	41st Ave.	16,056	Oct, 2016	13,877	Oct, 2014
	Portola Dr.	E/O	41st Ave.	6,388	Jul, 2015		
	QUAIL HOLLOW RD	VISTA ROBLES DR	E ZAYANTE RD	2,067	Jul, 2011		
	Rio Del Mar Blvd	S/O	Club House Dr.	17,900	Oct, 2016	9,109	Aug, 2015
	RIVERSIDE DR	LEE RD	SHWY 1	10,164	Jul, 2011		
	Riverside Dr.	W/O	Industrial	20,756	May, 2011		
	San Andreas Rd.	N/O	Seascape Blvd.	10,332	Oct, 2016		
	San Andreas Rd.	btwn	Crest/Spring Vly Dr	2,667	Oct, 2010		
	SKYLINE BLVD	at	San Mateo County Line	2,170	Aug, 2015	1,468	Jun, 2015
	Soquel Ave	W/O	Fredrick St	29,406	May, 2010		
	SOQUEL AVE	7th AVE	Rodeo Gulch	19,251	Jul, 2011		
	Soquel Ave.	E/O	Seabright Ave.	17,324	Oct, 2016		
	Soquel Ave.	W/O	17th Ave.	19,522	Oct, 2016		
	Soquel Ave.	E/O	S. Rodeo Gulch	6,932	Oct, 2016	7,560	Nov, 2010
	SOQUEL DR	Rodeo Gulch	41 st AVE	23,618	Oct, 2016	18,532	Jul, 2015
	Soquel Dr	W/O	State Park Dr.	20,414	Oct, 2016		
	SOQUEL DR	Lower Perimeter Rd	Cabrillo College Dr	11,547	Jul, 2015		
	Soquel Dr.	E/O	Main St.	11,599	Jul, 2015		
	Soquel Dr.	W/O	Soquel-SJ Rd.	17,190	Oct, 2016	18,095	Oct, 2014
	Soquel Dr.	W/O	Mission Dr.	22,642	Oct, 2016	22,541	May, 2011
	Soquel Dr.	E/O	Park Ave.	20,066	Oct, 2016		
	Soquel Dr.	Spreckles Dr	Aptos Ranch Rd	16,332	Jul, 2015		
	Soquel Dr.	W/O	Rio Del Mar Blvd	10,580	Oct, 2016		
	Soquel Dr.	E/O	State Park Dr.	20,080	Oct, 2016		
	Soquel-Wharf Rd.	N/O	Highway 1	7,824	Oct, 2010		
	Soquel-Wharf Rd.	S/O	Robertson	3,124	Oct, 2010		
	Spreckles Dr.	N/O	Treasure Island	6,730	Oct, 2010		
	SR 1	SOQUEL AVENUE	SANTA CRUZ MORRISS	84,998	Nov, 2010		
	SR 1	LARKIN VALLEY ROAD	FREEDOM BOULEVARD	69,909	Nov, 2010		
	SR 1	FREEDOM BOULEVARD IN	RIO DEL MAR N/O FREE	82,348	Jan, 2014		
	SR 129	ROGGE LANE	PESCADERO RD	11,916	Jan, 2014		
	SR 129	JCT. RTE. 1	MAIN ST	22,058	Jan, 2014		
	SR 129	WATSONVILLE BLACKBUR	LAKEVIEW ROAD	13,325	Jan, 2014		
	SR 152	at	Santa Clara County Line	5,551	Aug, 2015	5,208	May, 2015
	SR 152	BECK AVENUE	HOLOHAN/COLLEGE RO	16,563	Jan, 2014		

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	SR 236	BOULDER CREEK JCT. R	FERNWOOD PL	6,366	Jan, 2014		
	SR 35	BEAR CREEK ROAD	SANTA CRUZ SANTA CL	10,757	Jan, 2014		
	SR 35	S/O	SR 17	6,468	Aug, 2015	8,179	Jun, 2015
	SR 35	N/O	SR 17	2,174	Aug, 2015	2,617	Jun, 2015
	SR 9	BOULDER CREEK RIVER	BOULDER CREEK SOUT	12,548	Jan, 2014		
	SR 9	FELTON GRAHAM HILL RO	BEN LOMOND GLEN AR	21,727	Jan, 2014		
	State Park Dr.	S/O	Soquel Dr.	25,122	Oct, 2016		
	State Park Dr.	at	RR crossing	11,340	Jul, 2015		
	Valencia Dr.	.65 Trout Gulch	Freedom Blvd	1,548	Jul, 2011		
	Walnut St.	W/O	Daubenbiss Ave	3,354	Oct, 2010		
SC							
	ALMAR AVE	W CLIFF DR	SHWY 1	2,987	Sep, 2013		
	ALTA VISTA DR	ARROYO SECO	NOBEL DR	1,834	Oct, 2013	1,388	Jul, 2011
	ARROYO SECO	GRANDVIEW ST	ALTA VISTA DR	862	Sep, 2013		
	BARSON ST	CAMPBELL ST	OCEAN ST	2,750	Oct, 2013		
	BAY ST	W CLIFF DR	MISSION ST (1)	7,808	Sep, 2013		
	BAY ST	ESCALONA DR	HIGH ST	10,488	Oct, 2016	12,490	Oct, 2014
	BAY ST	MISSION ST (1)	ESCALONA DR	12,226	Sep, 2013	9,685	Jul, 2011
	BAYONA DR	ALTA VISTA DR	ESCALONA DR	1,038	Sep, 2013		
	BEACH ST	RIVERSIDE AVE	3RD ST	3,036	Oct, 2013		
	BEACH ST	W CLIFF DR	RIVERSIDE AVE	2,057	Oct, 2013		
	BRANCIFORTE DR	GOSS AVE	.09 N OF GOSS AVE	4,916	Jan, 2014	5,728	Jul, 2011
	BRANCIFORTE DR	.04 S OF GLN CYN RD	GLEN CANYON RD	4,646	Jan, 2014		
	BROADWAY	SAN LORENZO BLVD	FREDERICK ST	8,820	Feb, 2015		
	Broadway	E/O	Seabright Ave	6,022	Oct, 2016		
	CALIFORNIA AVE	BAY ST	LAUREL ST	7,272	Sep, 2013		
	CALIFORNIA AVE	ERRETT CIRCLE	BAY ST	5,040	Sep, 2013		
	CEDAR ST	LINCOLN ST	CENTER ST	6,224	Sep, 2013		
	CEDAR ST	LAUREL ST	LINCOLN ST	6,590	Jul, 2015	3,659	Feb, 2015
	CENTER ST	WASHINGTON ST	MISSION ST	4,352	Oct, 2013		
	CHESTNUT ST	LAUREL	MISSION ST	5,084	Sep, 2013		
	CORAL ST	SHWY 9	HARVEY WEST BLVD	2,969	Oct, 2013		
	DELAWARE AVE	NATURAL BRIDGES DR	SANTA CRUZ ST	4,044	Sep, 2013		
	DU BOIS ST	HARVEY WEST BLVD	ENCINAL ST	1,388	Sep, 2013		
	EAST CLIFF DR	MURRAY ST	.13 S OF MURRAY ST	1,376	Jan, 2014		
	ELK ST	GOSS AVE	ROONEY ST	1,555	Feb, 2015		
	EMELINE AVE	GRANT ST	.16 N OF SHWY 1	2,574	Feb, 2015	3,881	May, 2011
	ENCINAL ST	DU BOIS ST	SHWY 9	5,236	Oct, 2013		

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	ERRETT CIRCLE	CALIFORNIA AVE	CALIFORNIA AVE	2,695	Oct, 2013		
	ESCALONA DR	ARROYO SECO	HIGHLAND AVE	1,856	Sep, 2013		
	FAIR AVE	W CLIFF DR	MISSION ST	5,706	Sep, 2013		
	FAIRMONT AVE	BRANCIFORTE AVE	MORRIISSEY BLVD	4,908	Jan, 2014		
	FERNSIDE ST	PLYMOUTH ST	EMELINE AVE	2,348	Feb, 2015		
	FREDERICK ST	WINDHAM ST	BROADWAY	1,629	Feb, 2015		
	FREDERICK ST	BROADWAY	SOQUEL AVE	7,680	Feb, 2015		
	FRONT ST	PACIFIC ST	LAUREL ST	8,797	Oct, 2013		
	FRONT ST	LAUREL ST	RIVER ST	11,925	Oct, 2016	13,798	Jul, 2015
	FRONT ST	RIVER ST	N. PACIFIC AVE	7,976	Mar, 2015		
	GLEN COOLIDGE DR	.94 N OF HIGH ST	1.58 N OF HIGH ST	4,822	Feb, 2015	2,818	Jul, 2011
	GLEN COOLIDGE DR	HIGH ST	.94 N OF HIGH ST	12,514	Feb, 2015		
	GOSS AVE	BRANCIFORTE AVE	ELK ST	1,120	Jan, 2014		
	GRAHAM HILL RD	OCEAN ST	.18 N OF OCEAN ST	15,089	Feb, 2015	8,339	Jul, 2011
	GRANDVIEW ST	SWIFT ST	ARROYO SECO	2,734	Oct, 2013		
	GRANT ST	PLYMOUTH ST	MARKET ST	2,560	Feb, 2015		
	HARVEY WEST BLVD	CORAL ST	DU BOIS ST	2,864	Oct, 2013		
	HELLER DR	EMPIRE GRADE	STEINHART WY	5,501	Feb, 2015		
	HIGH ST	CL SE/HIGH VIEW	WESTERN DRIVE	9,545	Sep, 2013	8,024	Jul, 2011
	HIGH ST	WESTERN DR	HIGHLAND AVE	13,716	Oct, 2016	5,921	Jul, 2015
	HIGH ST	HIGHLAND AVE	.05M W/SHWY 1	372	Oct, 2013		
	HIGHLAND AVE	HIGH ST	SPRING ST	857	Sep, 2013		
	HIGHLAND AVE	SHWY 1	HIGH ST	7,358	Sep, 2013		
	HIGHWAY 1	Highland Ave	Chestnut St	45,466	Aug, 2015	50,832	Jun, 2015
	ISBEL DR	MARKET ST	CARBONERA DR	1,808	Jan, 2014		
	KING ST	STOREY ST	SHWY 1	7,966	Feb, 2015		
	KING ST	SHWY 1	LAURENT ST	3,429	Sep, 2013		
	KING ST	LAURENT ST	STOREY ST	4,432	Sep, 2013		
	LA FONDA AVE	SOQUEL AVE	PROSPECT HEIGHTS	3,696	Jan, 2014	2,676	May, 2011
	LAGUNA ST	SANTA CRUZ ST	BAY ST	3,622	Sep, 2013		
	LAUREL ST	KING ST	SHWY 1	3,310	Sep, 2013		
	LAUREL ST	SHWY 1	FRONT ST	14,480	Sep, 2013		
	Laurel St.	E/O	Front St.	19,984	Oct, 2016	21,888	Oct, 2014
	LAURENT ST	KING ST	HIGH ST	1,084	Sep, 2013		
	LEE ST	EMELINE AVE	PLYMOUTH ST	744	Feb, 2015		
	LINCOLN ST	WALNUT AVE	WASHINGTON ST	2,516	Feb, 2015		
	LINCOLN ST	WASHINGTON ST	PACIFIC AVE	2,418	Oct, 2013		
	Market St.	S/O	Goss Ave.	3,600	Mar, 2015	4,045	May, 2011

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	MCLAUGHLIN DR	STEINHART WY	.41 E/STEINHART WY	3,059	Feb, 2015		
	MEDER ST	WESTERN DR	BAY DR	2,153	Sep, 2013		
	MIRAMAR DR	SHWY 1	ALTA VISTA DR	3,331	Sep, 2013		
	MISSION ST	WESTERN DR	NATURAL BRIDGES DR	3,457	Oct, 2013		
	MISSION ST	CHESTNUT ST	N PACIFIC AVE	10,287	Jul, 2015	10,847	Feb, 2015
	Mission St.	at	Baldwin St.	34,178	Aug, 2015	34,366	Jun, 2015
	Mission St/Hwy 1	NW/O	Shaffer Rd	13,740	Aug, 2015	9,979	Jun, 2015
	MORRISSEY BLVD	WATER ST	PACHECO AVE	17,354	Jan, 2014		
	MORRISSEY BLVD	PACHECO AVE	PROSPECT HEIGHTS	3,300	Jan, 2014	4,431	May, 2011
	MURRAY AVE	E CLIFF DR	LAKE AVE	18,496	Oct, 2014	17,772	Oct, 2013
	MURRAY ST	Pilkington	Brook Ave	14,272	Jul, 2015		
	Murray St.	E/O	Seabright Ave.	19,510	Oct, 2016		
	N BRANCIFORTE AVE	WATER ST	DE LA VEAGA DR	5,828	Jan, 2014	5,557	May, 2011
	N. BRANCIFORTE	SOQUEL AVE	WATER ST	5,380	Jan, 2014		
	NATURAL BRIDGES DR	MISSION ST	DELAWARE AVE	2,304	Sep, 2013	2,281	Feb, 2012
	NOBEL DR	MEDER ST	BAY DR	1,968	Sep, 2013		
	NORTH PACIFIC AVE	WATER ST	RIVER ST	6,549	Oct, 2013		
	OCEAN ST	BROADWAY	EAST CLIFF DR	14,262	Feb, 2015	13,683	Jul, 2011
	OCEAN ST	WATER ST	SOQUEL AVE	18,862	Jan, 2014	27,687	Jul, 2011
	OCEAN ST	SOQUEL AVE	BROADWAY	14,998	Jan, 2014	23,957	Jul, 2011
	OCEAN ST	PLYMOUTH ST	GRAHAM HILL RD	12,160	Oct, 2013		
	PACHECO AVE	ROONEY DR	PROSPECT HEIGHTS	1,228	Jan, 2014	1,783	May, 2011
	PACIFIC AVE	LAUREL ST	WATER ST	3,394	Feb, 2015		
	PACIFIC AVE	BEACH ST	WASHINGTON	8,348	Oct, 2013		
	PACIFIC AVE	WASHINGTON ST	PACIFIC AVE	9,776	Oct, 2013		
	PINE ST	SEABRIGHT AVE	SOQUEL AVE	504	Mar, 2015		
	PLYMOUTH ST	LEE ST	.13 N OF LEE ST	781	Feb, 2015	684	May, 2011
	PLYMOUTH ST	OCEAN ST	FERNSIDE ST	2,486	Feb, 2015		
	PROSPECT HTS DR	MORRISSEY BLVD	LA FONDA AVE	3,022	Jan, 2014		
	RIVER ST	RIVER ST SOUTH	SHWY 1	10,535	Feb, 2015		
	RIVER ST	FRONT ST	RIVER ST SOUTH	7,152	Feb, 2015		
	RIVERSIDE AVE	BEACH ST	2ND ST	2,774	Mar, 2015	910	Oct, 2013
	RIVERSIDE AVE	2ND ST	SAN LORENZO BLVD	3,944	Oct, 2013		
	ROONEY ST	ELK ST	PACHECO AVE	4,974	Jan, 2014	3,341	May, 2011
	S. BRANCIFORTE	BROADWAY	SOQUEL AVE	4,008	Feb, 2015		
	SAN LORENZO BLVD	BROADWAY	OCEAN ST	9,184	Oct, 2013		
	SAN LORENZO BLVD	OCEAN ST	EAST CLIFF DR	10,484	Feb, 2015		
	SEABRIGHT AVE	MURRAY ST	SOQUEL AVE	7,162	Feb, 2015	10,062	Oct, 2014

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	SEABRIGHT AVE	N/O	Murray St	8,532	Oct, 2016	9,436	Jul, 2015
	SECOND ST	PACIFIC AVE T	RIVERSIDE AVE	2,380	Oct, 2013		
	SOQUEL AVE	PACIFIC AVE	WATER ST	15,328	Feb, 2015	18,159	Jul, 2011
	SOQUEL AVE	WATER ST	LA FONDA	25,044	Jan, 2014	30,338	Jul, 2011
	Soquel Ave.	at	San Lorenzo bridge	12,412	Oct, 2016		
	SPRING ST	HIGH ST	.2M N/PASTURE RD	1,220	Sep, 2013		
	SR 1	ALMAR STREET	SANTA CRUZ SWIFT ST	22,033	Jan, 2014		
	SR 1	SANTA CRUZ JCT. RTE. 17	JCT. RTE. 9 NORTH RIVE	63,417	Jan, 2014		
	SR 9	SANTA CRUZ JCT. RTE. 1	ENCINAL STREET	28,331	Jan, 2014		
	SR 9	ENCINAL STREET	SANTA CRUZ NORTH CI	5,200	Jan, 2014		
	STOREY ST	KING ST	HIGH ST	5,994	Sep, 2013		
	SWANTON BLVD	W CLIFF DR	DELAWARE AVE	1,839	Sep, 2013		
	SWIFT ST	DELAWARE AVE	SHWY 1	8,461	Sep, 2013		
	SWIFT ST	SHWY 1	GRANDVIEW ST	2,678	Sep, 2013		
	SWIFT ST	W CLIFF DR	DELAWARE AVE	1,718	Sep, 2013		
	THIRD ST	BEACH ST	RIVERSIDE AVE	3,676	Oct, 2013		
	WALNUT AVE	SHWY 1	CHESTNUT ST	4,860	Sep, 2013		
	WALNUT AVE	KING ST	SHWY 1	2,348	Sep, 2013		
	WALNUT AVE	CENTER ST	PACIFIC AVE	2,196	Feb, 2015		
	WATER ST	N PACIFIC AVE	N BRANCIFORTE AVE	20,448	Feb, 2015	21,170	Jul, 2011
	WATER ST	N BRANCIFORTE AVE	POPLAR AVE	16,476	Oct, 2016	14,923	Jan, 2014
	Water St.	at	San Lorenzo Bridge	24,666	Oct, 2016		
	WEST CLIFF DR	SWANTON BLVD	BEACH ST	5,356	Sep, 2013		
	WESTERN DR	SHWY 1	MISSION	2,904	Oct, 2013		
	WESTERN DR	SHWY 1	HIGH ST	4,318	Sep, 2013		
	WOODROW AVE	W CLIFF DR	DELAWARE AVE	2,600	Oct, 2013		
	WOODROW AVE	DELAWARE AVE	ERRETT CIRCLE	3,738	Sep, 2013		
	YOUNGLOVE AVE	ERRETT CIRCLE	SHWY 1	1,598	Oct, 2013		
SV							
	BEAN CREEK RD	SCOTTS VALLEY DR	CITY LIMIT	4,826	Feb, 2015		
	GLEN CANYON RD	GREEN HILLS RD	MT HERMON RD	4,603	Feb, 2015		
	GLENWOOD DR	SCOTT VALLEY DR	SHWY 17	8,724	Feb, 2015		
	GLENWOOD DR	SCOTT VALLEY DR	.13 N OF CANHAM RD	4,754	Feb, 2015	1,694	Feb, 2012
	Graham Hill Rd.	S/O	Tanner Heights Dr.	1,432	Feb, 2015		
	GREEN HILLS RD	GLEN CANYON RD	.90 N OF GLEN CYN R	2,471	Feb, 2015		
	HACIENDA DR	GLENWOOD DR	CASA WAY	1,032	Feb, 2015		
	LOCKEWOOD LN	ESTRELLA DR	MT HERMON RD	3,774	Feb, 2015		
	LOCKEWOOD LN	GRAHAM HILL RD	ESTRELLA DR	4,058	Jul, 2011		

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	MT HERMON RD	SCOTTS VALLEY RD	SHWY 17	27,648	Mar, 2015	33,242	Feb, 2012
	MT HERMON RD	LOCKEWOOD LN	SCOTTS VALLEY RD	31,061	Feb, 2015		
	MT HERMON RD	.17 N OF LOCKHART	LOCKEWOOD LN	22,606	Jul, 2015	19,891	Feb, 2012
	Mt. Hermon Rd.	N/O	Scotts Valley Dr.	33,742	Oct, 2016	38,028	Oct, 2014
	SCOTT VALLEY DR	MT HERMON RD	GLENWOOD DR	21,668	Oct, 2016	16,542	Feb, 2015
	SR 17	SCOTT VALLEY ROAD INT	GRANITE CREEK ROAD	57,985	Jan, 2014		
	WHISPERING PINES D	LOCKWOOD LN	MT HERMON RD	4,759	Feb, 2015		
W							
	2ND ST	WALKER ST	UNION ST	3,247	Feb, 2015		
	AIRPORT BLVD	ROACHE RD	FREEDOM BLVD	18,190	Feb, 2015	19,607	Jul, 2011
	AIRPORT BLVD	FREEDOM BLVD	CL .22 N/ FREEDOM BLV	16,460	Feb, 2015		
	AIRPORT BLVD	SHWY 1	ROSS AVE	16,608	Feb, 2015	18,071	Jul, 2011
	AIRPORT BLVD	ROSS AVE	ROACHE RD	18,438	Feb, 2015	19,542	Jul, 2011
	ALTA VISTA AVE	ARTHUR RD	FREEDOM BLVD	4,868	Feb, 2015		
	ARTHUR RD	ALTA VISTA AVE	FREEDOM BLVD	1,916	Feb, 2015		
	ARTHUR RD	MARIN ST	ALTA VISTA AVE	6,222	Feb, 2015		
	ATKINSON LN	FREEDOM BLVD	MATA RD	1,464	Feb, 2015		
	AUTO CENTER DRIVE	SHWY 152	MARIN ST	8,458	Feb, 2015		
	AUTO CENTER DRIVE	SHWY 152	MARIN ST	8,458	Feb, 2015		
	BEACH RD	BLACKBURN ST	HUSHBECK AVE	1,268	Feb, 2015		
	BECK ST	SHWY 152	BRIDGE ST	1,970	Feb, 2015		
	BLACKBURN ST	RIVERSIDE SH129	BEACH ST	4,455	Feb, 2015	4,537	Jul, 2011
	BLACKBURN ST	BEACH ST	LAKE AVE SHWY 152	4,106	Feb, 2015	4,498	Jul, 2011
	BRENNAN ST	LAKE AVE SHWY152	FREEDOM BLVD	7,274	Feb, 2015	6,496	Jul, 2011
	BRENNAN ST	LAKE AVE SHWY152	FREEDOM BLVD	7,274	Feb, 2015	6,496	Jul, 2011
	BREWINGTON AVE	MARTINELLI ST	CRESTVIEW DRT	1,898	Feb, 2015		
	BRIDGE ST	RIVERSIDE DR (129)	CEDAR DR	6,828	Feb, 2015		
	BRIDGE ST	CEDAR DR	SHWY 152	2,443	Feb, 2015		
	BRONSON ST	WAGNER ST	MARTINELLI RD	101	Feb, 2015		
	CARR ST	E BEACH ST	W LAKE AVE	1,987	Mar, 2015		
	CHAPPELL RD	SUNNYHILLS DR	ROSS AVE	1,014	Feb, 2015		
	CHAPPELL RD	SUNNYHILLS DR	ROSS AVE	7,372	Feb, 2015		
	CLIFFORD AVE	.03 S OF FREEDOM BL	FREEDOM BLVD	5,964	Feb, 2015		
	CLIFFORD AVE	.20 N OF PA DR	.03 S OF FREEDOM BL	2,618	Feb, 2015		
	CLIFFORD AVE	PENNSYLVANIA DR	.20 N OF PA DR	6,113	Feb, 2015		
	CLIFFORD AVE	MAIN ST152	PENNSYLVANIA DR	9,802	Feb, 2015		
	CRESTVIEW DR	FREEDOM BLVD	.25 E OF FREEDOM BL	4,414	Mar, 2015		
	EAST BEACH ST	LINCOLN ST	BLACKBURN ST	4,819	Feb, 2015		

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	FORD ST	RODRIGUEZ ST	MAIN ST	2,514	Feb, 2015		
	FREEDOM BLVD	COMPTON TERRACE	GREEN VALLEY RD	18,368	Jul, 2011		
	FREEDOM BLVD	COMPTON TERRACE	GREEN VALLEY RD	13,167	Feb, 2015	18,047	May, 2011
	FREEDOM BLVD	MILES LN	MAIN ST (HWY 152)	25,710	Feb, 2015	16,738	Jul, 2011
	FREEDOM BLVD	GREEN VALLEY RD	LINCOLN STREET	26,418	Oct, 2016	21,973	Feb, 2015
	GREEN VALLEY RD	MAIN ST	LAWRENCE RD	16,154	Feb, 2015	17,522	Jul, 2011
	GREEN VALLEY RD	FREEDOM BLVD	.15M S/HOLAHAN RD	18,572	Feb, 2015		
	GREEN VALLEY RD	LAWRENCE RD	FREEDOM	22,834	Oct, 2016	20,762	Feb, 2015
	GREEN VALLEY RD	LAWRENCE RD	FREEDOM BLVD	18,292	Jul, 2011		
	GREEN VALLEY RD	HARKINS SLOUGH RD	MAIN ST	13,502	Feb, 2015	15,198	Jul, 2011
	HAMMER DR	PENNSYLVANIA RD	ARTHUR RD	6,661	Feb, 2015		
	HARKINS SLOUGH RD	GREEN VALLEY RD	WALKER ST	9,910	Feb, 2015		
	HARVEST DR	RIVERSIDE DR	W BEACH ST	1,074	Feb, 2015		
	HILL AVE	PALM AVE	TUTTLE AVE	1,024	Feb, 2015		
	HOLM RD	JEANETTE WY	SUNNYHILLS DR	2,952	Feb, 2015		
	HOLM RD	MAIN ST152	JEANETTE WY	3,202	Feb, 2015		
	Holm Rd.	N/O	Westgate	4,118	May, 2011		
	HUSHBECK AVE	SHWY 152	BRIDGE ST	3,323	Feb, 2015		
	INDUSTRIAL RD	ROUTE 129	W BEACH ST	2,233	Feb, 2015	2,216	Jul, 2011
	Lake Ave.	N/O	Wagner Ave.	16,960	May, 2011		
	LEE RD	W BEACH ST	URL.6M N/W BEACH ST	2,668	Feb, 2015		
	LINCOLN	RIVERSIDE DR(SH 129)	LAKE AVE	2,876	Feb, 2015		
	LINCOLN	.13M SE/SHWY 129	SHWY 129	235	Feb, 2015		
	LINCOLN ST	LAKE AVE	FREEDOM BLVD	6,344	Feb, 2015		
	LOMA PRIETA RD	.11 N OF GRN VLY RD	AIRPORT BLVD	4,482	Feb, 2015		
	MAIN ST	MON CO LINE	BEACH ST	12,844	Feb, 2015	17,375	Jul, 2011
	Main St.	E/O	Green Valley Rd.	31,306	May, 2011		
	MAPLE AVE	UNION ST	BLACKBURN ST	1,385	Feb, 2015		
	MARCHANT ST	W FRONT ST	E BEACH ST	1,836	Feb, 2015		
	MARIN ST	AUTO CENTER DRIVE	FREEDOM BLVD	4,557	Feb, 2015		
	MARTINELLI ST	FREEDOM BLVD	SHWY 152	4,782	Feb, 2015		
	OHLONE PKWY	HARKINS SLOUGH	WEST BEACH ST.	4,676	Feb, 2015		
	OHLONE PKWY	MAIN ST	HARKINS SLOUGH RD	14,400	Feb, 2015	13,521	Feb, 2012
	PALM AVE	BRENNAN ST	SHWY 152	2,348	Feb, 2015		
	PENNSYLVANIA RD	MAIN ST 152	GREEN VALLEY RD	6,306	Feb, 2015		
	Riverside Dr.	E/O	Blackburn St.	14,561	May, 2011		
	RODRIGUEZ ST	W BEACH ST	RIVERSIDE DR-SHWY12	6,994	Feb, 2015		
	RODRIGUEZ ST	MAIN ST (SHWY152)	W LAKE AVE	6,583	Oct, 2016	18,210	Feb, 2015

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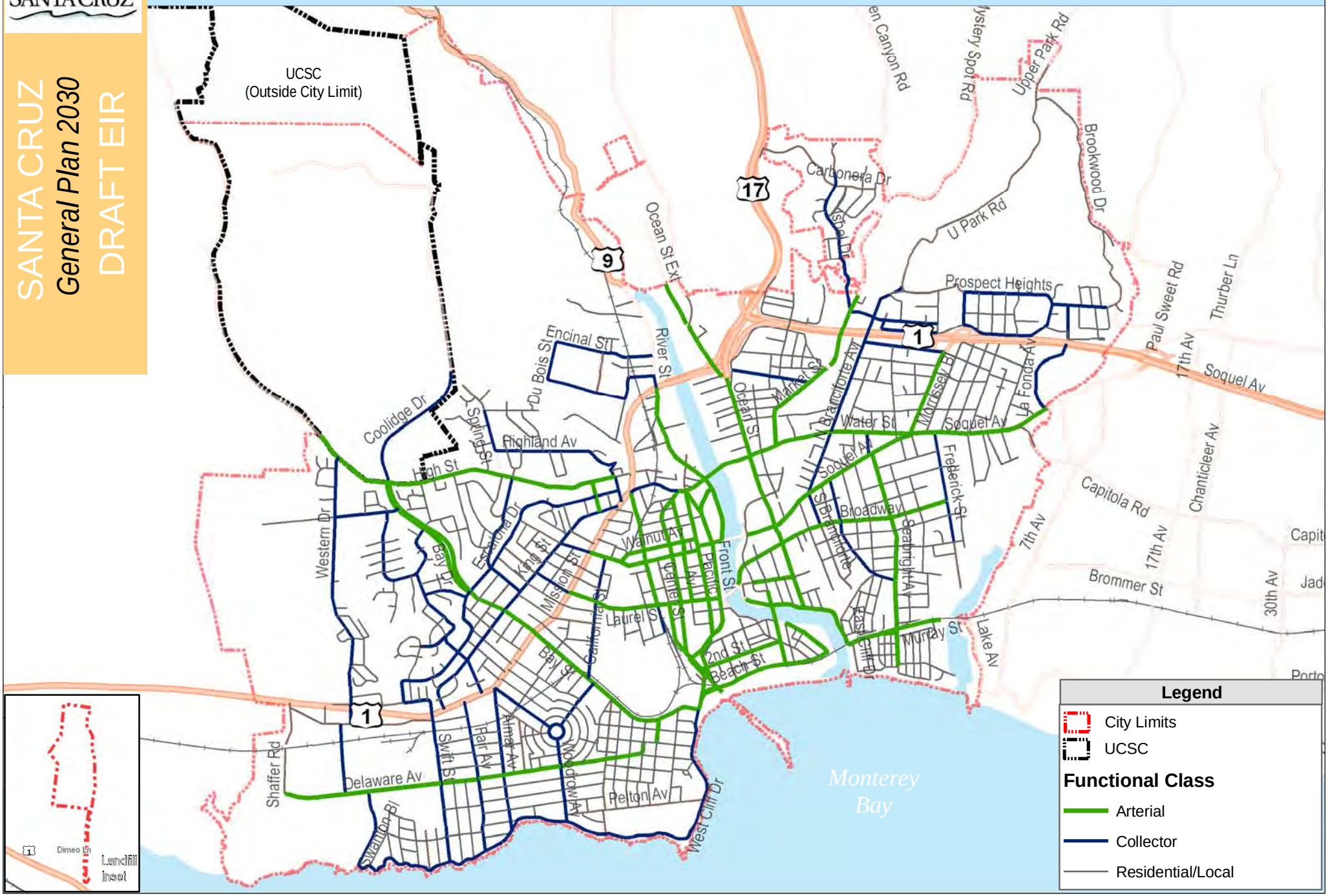
	RODRIGUEZ ST	W LAKE AVE	W BEACH ST	6,966	Feb, 2015		
	ROSS AVE	CHAPPELL RD	AIRPORT BLVD	230	Feb, 2015		
	SR 1	JCT. RTE. 152	WATSONVILLE AIRPORT	56,813	Jan, 2014		
	SR 152	WATSONVILLE JCT. RTE.	GREEN VALLEY RD	28,734	Jan, 2014		
	SR 152	WATSONVILLE FREEDOM	WATSONVILLE MAIN ST	21,264	Jan, 2014		
	STANFORD ST	LINCOLN ST	RODGERS AVE	5,158	Feb, 2015		
	SUDDEN ST	W LAKE AVE	PALM AVE	468	Feb, 2015		
	TUTTLE AVE	E LAKE AVE 152	BRIDGE ST	2,843	Feb, 2015		
	TUTTLE AVE	RODGERS AVE	E LAKE AVE 152	4,376	Feb, 2015		
	UNION ST	E BEACH ST	W LAKE AVE	6,923	Feb, 2015		
	UNION ST	RIVERSIDE DR 129	E BEACH ST	7,088	Oct, 2016	4,568	Feb, 2015
	W FRONT ST	UNION ST	MARCHANT ST	466	Feb, 2015		
	W FRONT ST	WALKER ST	UNION ST	422	Feb, 2015		
	WAGNER AVE	.13 W OF MOJAVE ST	LAKE AVE SHWY 152	383	Feb, 2015		
	WALKER ST	HARKINS SLOUGH RD	SHWY 129	9,790	Feb, 2015		
	WEST BEACH ST	WALKER ST	MAIN ST	5,190	Feb, 2015	5,251	Jul, 2011
	WEST BEACH ST	HARVEST DR	WALKER ST	6,874	Feb, 2015		
	WEST BEACH ST	URL .07 W/LEE RD	INDUSTRIAL RD	5,228	Jul, 2015	6,346	Feb, 2012
	WEST BEACH ST	HARVEST DR	WALKER ST	6,543	Feb, 2012		
	WEST BEACH ST	URL .07M W/LEE RD	INDUSTRIAL ROAD	5,439	Feb, 2015	6,385	May, 2011
	WEST BEACH ST	INDUSTRIAL ROAD	HARVEST DR	6,232	Feb, 2015	7,044	Jul, 2011
	WEST LAKE AVE	RODRIGUEZ ST	MAIN ST	4,616	Feb, 2015		
	WEST LAKE AVE	WALKER ST	RODRIGUEZ ST	3,296	Mar, 2015		

SANTA CRUZ
General Plan 2030
DRAFT EIR

Figure 4.4-2
Functional Classification of Streets



4.13 NOISE

4.13.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Noise Fundamentals
- Existing Noise Sources & Noise Levels
- Noise Compatibility Standards & Noise Attenuation

This section summarizes the noise background that was prepared or the City by Rosen, Goldberg, Der & Lewitz (November 2007) as part of the General Plan update process. The report provides background information on noise sources within the City, noise measurements that were made to document noise levels throughout the City, and development of noise contours for existing conditions. The firm also prepared a report identifying future noise conditions along key roadways (November 2010) based on the outcome of the traffic analysis, the results of which are also included in this chapter. The technical reports are included in Technical Appendix F-3, which is available for review at the City of Santa Cruz Planning Department[1] and is also included on the Draft EIR CD and on the online version of the Draft EIR on the City's website at www.cityofsantacruz.com, Planning Department.

REGULATORY SETTING

There are no federal noise requirements or regulations applicable to local actions of the City of Santa Cruz. However, there are federal regulations that influence the audible landscape, where federal funding is involved. The Federal Highway Administration (FHWA) requires abatement of highway traffic noise for highway projects through rules in the Code of Federal Regulations (23 CFR Part 772), and the Federal Transit Administration (FTA) and Federal Railroad Administration (FRA) each recommend thorough noise and vibration assessments through comprehensive guidelines for any mass transit or high-speed railroad projects that would pass by residential areas. For housing constructed with assistance from U.S. Department of Housing and Urban Development, minimum noise insulation standards must be achieved (24 CFR Part 51, Subpart B).

California Government Code Section 65302(f) requires that each city and county general plan include a "noise element" that: "shall identify and appraise noise problems in the community"; "shall recognize the guidelines established by the Office of Noise Control"; and "shall analyze

[1] Located at 809 Center Street, Room 107, Santa Cruz, California during business hours: Monday through Thursday, 8 AM to 12 PM and 1-4 PM.

and quantify, to the extent practicable, as determined by the [city or county] legislative body, current and projected noise levels for all of the following sources:

- Highways and freeways,
- Primary arterials and major local streets,
- Passenger and freight on-line railroad operations and ground rapid transit systems,
- Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation,
- Local industrial plants, including, but not limited to, railroad classification yards, [and]
- Other ground stationary noise sources, including, but not limited to, military installations, identified by local agencies as contributing to the community noise environment."

"Noise contours shall be shown for all of these sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (Ldn). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (1) to (6), inclusive." These "noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise."

Finally, "[t]he noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards."

The State of California Office of Planning and Research Noise Element Guidelines (Governor's Office of Planning and Research, October 2003) include recommended exterior noise level standards for different land uses to assure compatibility with ambient noise levels. The City of Santa Cruz' existing General Plan includes the state's standards that were recommended at the time the existing General Plan was prepared in 1990.

The State of California establishes minimum noise insulation performance standards for hotels, motels, dormitories, apartment houses and dwellings other than detached single-family dwellings. Interior noise levels attributable to exterior sources shall not exceed 45 db in any habitable room, measured in either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the General Plan, although Ldn is preferred as set forth in the California Building Code (Title 24, Chapter 12 Appendix Section 1207.11.2). The Day-Night Average Sound Level (DNL) is a descriptor established by the U.S. Environmental Protection Agency to represent a 24-hour average noise level with a penalty applied to noise occurring during the nighttime hours (10 p.m. - 7 a.m.) to account for the increased sensitivity of people during sleeping hours. Where exterior noise levels exceed 60 dBA Ldn, a report must be submitted with the building plans describing the noise control measures that have been incorporated into the design of the project to meet the noise limit.

Regulations within the City of Santa Cruz Municipal Code include performance standards regarding noise and vibration. Section 24.14 includes performance standards for the control of land uses to enable potential nuisance factors to be measured factually and objectively where possible and to protect the community as a whole from hazards and nuisances which can be prevented by methods of control and elimination. Sections 24.14.220 indicate that no land or

building in any district shall be used or occupied in any manner so as to create noise or vibration in such a manner or in an amount as to adversely affect the surrounding area or adjoining premises. Section 24.14.260 establishes the maximum sound level that shall not be exceeded as more than five dBA above the local ambient for residential uses and six dBA for commercial uses. Section 24.14.262 indicates that no vibration (other than from transportation facilities or temporary construction work) shall be permitted which is discernible without instruments at the points of measurement specified in the regulations. Chapter 9.36 regulates "offensive" and disturbing noise, which generally prohibits loud noise between the hours of 10 PM and 8 AM.

NOISE FUNDAMENTALS

Definitions of Noise and Effects of Noise

"Sound" is mechanical energy transmitted by pressure waves in a compressible medium such as air. "Noise" is generally defined as "unwanted or disturbing sound." Sound becomes unwanted when it either interferes with normal activities such as sleeping, conversation or disrupts or diminishes one's quality of life (U.S. EPA "Noise Pollution" website). For some people, the persistent and escalating sources of sound can often be considered an annoyance. Annoyance is the common issue regarding community noise. Studies have also shown that there are direct links between noise and health. Problems related to noise include stress-related illnesses, high blood pressure, speech interference, hearing loss, sleep disruption, and lost productivity (Ibid.).

Unlike many other environmental factors, noise is a subjective. Its effects often depend on the source, its loudness, and duration. Which sounds are considered noise varies from person to person and with the time of day and setting. Many factors influence people's response to noise, such as the character of the noise, sound level, and duration of the sound. When the noise level of an activity rises above 70 dBA, the chance of receiving a complaint is possible. The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure.

Loudness is measured in decibels (dB) and is typically expressed in dBA, which approximates human hearing. The human ear can generally perceive noise from 0 to 140 decibels. Sounds as faint as 0 decibels are barely audible, and then only when there are no other sounds. Ordinary conversation is about 60 dB. People can tolerate some noise, but brief exposure to intense sounds of 120 to 140 dB can threaten physical or psychological well-being.

Measuring Noise

Noise levels are commonly measured with an instrument called a sound level meter. The sound level meter captures the sound with a microphone and converts it into a number called a sound level. Sound levels are expressed in units of decibels. To correlate the microphone signal to a level that corresponds to the way humans perceive noise, the A-weighting filter is used. A-weighting de-emphasizes low-frequency and very high-frequency sound in a manner similar to human hearing. The use of A-weighting is required by most local General Plans as well as federal and state noise regulations (e.g. Caltrans, EPA, OSHA and HUD). The abbreviation dBA

is sometimes used when the A-weighted sound level is reported (Rosen Goldberg Der & Lewitz, Inc., November 2007).

Because of the time-varying nature of environmental sound, there are many descriptors that are used to quantify the sound level. Although one individual descriptor alone does not fully describe a particular noise environment, taken together, they can more accurately represent the noise environment. The maximum instantaneous noise level (Lmax) is often used to identify the loudness of a single event such as a car passby or airplane flyover. To express the average noise level the Leq (equivalent noise level) is used. The Leq can be measured over any length of time but is typically reported for periods of 15 minutes to 1 hour. The background noise level (or residual noise level) is the sound level during the quietest moments. It is usually generated by steady sources such as distant highway traffic. It can be quantified with a descriptor called the L90 which is the sound level exceeded 90 percent of the time (Rosen Goldberg Der & Lewitz, Inc., November 2007).

To quantify the noise level over a 24-hour period, the Day/Night Average Sound Level (DNL or Ldn) or Community Noise Equivalent Level (CNEL) is used. These descriptors are averages like the Leq except they include a 10 dB penalty during nighttime hours (and a 5 dB penalty during evening hours in the CNEL) to account for peoples increased sensitivity during these hours (Rosen Goldberg Der & Lewitz, Inc., November 2007).

In environmental noise, a change in noise level of 3 dB is considered just a noticeable difference. A 5 dB change is clearly noticeable, but not dramatic. A 10 dB change is perceived as a halving or doubling in loudness (Rosen Goldberg Der & Lewitz, Inc., November 2007).

EXISTING NOISE SOURCES & NOISE LEVELS

The most widespread and dominant noise source in Santa Cruz is traffic. Other noise sources such as railroads, industry and the Boardwalk tend to be localized and limited to certain locations and times of the day or year. The following is a discussion of the most common noise sources in Santa Cruz.

Existing Sources of Noise

ROADWAY-TRAFFIC NOISE

The noisiest roadways are those with the greatest traffic volumes and highest travel speeds. For example, the highways (State Route 1 and State Route 17) generate noise which affects large areas. The noise from arterials affects the development that is directly adjacent but the affects are significantly reduced beyond the first row of buildings. Examples are Mission Street (State Route 1), Water Street, Soquel Avenue, Ocean Street, Broadway, River Street, Bay Street and Laurel Street.

Soundwalls along freeways and highways reduce noise levels at the land uses behind them. Typical noise reductions are in the 5 to 15 dBA range depending on the location of the noise receptor. Soundwalls have been installed along much of the length of the Highway 1 in Santa Cruz as part of the State Route 1/17 Widening of Merge Lanes project.

RAILROAD NOISE

The railroad tracks that cross the southern portion of the City in an east/west direction are used for limited freight transport and generally during daytime hours. During the summer (and limited days during the winter holidays) recreational trains access the Boardwalk along the tracks that cross the City in a north/south direction along Chestnut Street. There are generally two round trip excursions per day. The trains travel at relatively low speeds through the City and the major noises are the rumble from the locomotive and the whistles that must be sounded before and during each at-grade roadway crossing.

Locomotives typically produce maximum noise levels (Lmax) of 88 dBA at a distance of 50 feet and whistles produce an Lmax of 105 dBA at 50 feet2. If there are two round trips a day, this corresponds to an Ldn of 49 dBA. The Ldn would increase to 65 dBA near grade crossings since the train would be required to sound its warning horn (whistle).

AIRCRAFT NOISE

There are no airfields or airports in Santa Cruz and, therefore, airplane noise is limited to overflights. There is an emergency helipad at Dominican Hospital just outside of the northeast corner of the City Limits.

INDUSTRIAL NOISE

Much of the industrial land use in the City is located north of Highway 1 and west of River Street (State Route 9). Concrete production and distribution is a common noise source in this area. Measurements along Coral Street indicate that the steady noise level from machinery at the Graniterock facility is 65 to 67 dBA at a distance of 185 feet (Rosen Goldberg Der & Lewitz, Inc., November 30, 2007).

OTHER SOURCES – THE BOARDWALK

The Santa Cruz Beach Boardwalk is the predominant noise source in the beach area during the summer months. Major noise sources include roller coasters, people screaming and outdoor concerts. Noise measurements conducted for the Beach Area/South of Laurel Master Plan EIR3 indicated that roller coasters generate maximum noise levels (Lmax) of 69 to 78 dBA at the residences and businesses across Beach Street. The DNL along Leibrandt Street was 68 dBA. Along East Cliff Drive, homes on the bluff overlooking the boardwalk, were exposed to an Lmax of 60 to 65 dBA from music at the bandstand and 65 to 70 dBA from the screams of people on the wooden roller coaster (Giant Dipper) (Rosen Goldberg Der & Lewitz, Inc., November 30, 2007).

Existing Noise Levels

As part of preparation of the General Plan, a noise measurement program was conducted to quantify noise levels throughout the City. The program included measurements along the busiest roads in the city in November 2006. One continuous "long term" 24-hour noise measurement and one "short-term" 15-minute measurement were conducted at each of ten locations. The short-term noise measurement was conducted at the typical setback of the nearby land uses (typically residences) while the long-term noise monitor was mounted to an existing utility pole

or tree. The short-term measurement results were correlated with simultaneous measurements at the long-term monitoring location to determine the DNL at the typical setback of land uses in the vicinity of the long-term noise monitor. Table 4.13-1 shows the results of the short-term noise measurements and the correlated DNL.

TABLE 4.13-1
Short-Term Noise Measurement Results

LOCATION		Short-Term Noise Measurement Results				
		L_{eq}	L_{10}	L_{50}	L_{90}	DNL*
1	Swift Street at Jeter St.	65	69	62	51	66
2	West Cliff Drive at Woodrow Avenue	56	48	47	46	56
3	Barson Street at Canfield Avenue	60	65	54	48	62
4	Ocean Street south of Hubbard Street	71	74	69	62	73
5	Mission Street at Van Ness Avenue	70	69	67	84	75
6	Seabright Avenue at Windsor Street	63	67	60	48	66
7	Water Street at Benito Avenue	67	69	64	58	69
8	Morrissey Blvd. at Hammond Avenue	66	69	65	56	67
9	Highway 1 at High Street	70	73	69	59	73
10	Center Street at New Street	63	64	56	48	63

* DNL calculated by correlating with simultaneous measurement at 24-hbour noise monitor.
SOURCE: Rosen, Goldberg, Der & Levitz, Inc., November 2007

An existing noise contour map was developed and the contours are shown on Figure 4.13-1.[2] The contours are shown for DNL values of 60 and 65 dBA. Although some segments experienced noise levels above 70 dBA as shown on Table 4.13-1, these areas are quite limited and were not mapped due to the limited visibility with the scale of mapping. The traffic noise contours are based on calculations using the Federal Highway Administration's Traffic Noise Model (TNM 2.5), which includes inputs such as traffic volume, truck percentage and travel speeds. Traffic volume data developed by the City of Santa Cruz for the General Plan Update was supplemented by observations made in the field. The traffic data for the highways is based on counts published by Caltrans. The traffic noise contours do not take into account the acoustical shielding provided by buildings or fences along the roadways. However, along

[2] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

portions of Highway 1, the effects of recently constructed soundwalls are included. The soundwall locations are based on the environmental document for the highway widening project. The soundwalls are assumed to reduce the noise levels by 5 dBA (Rosen Goldberg Der & Lewitz, Inc., November 30, 2007).

NOISE COMPATIBILITY STANDARDS & NOISE ATTENUATION

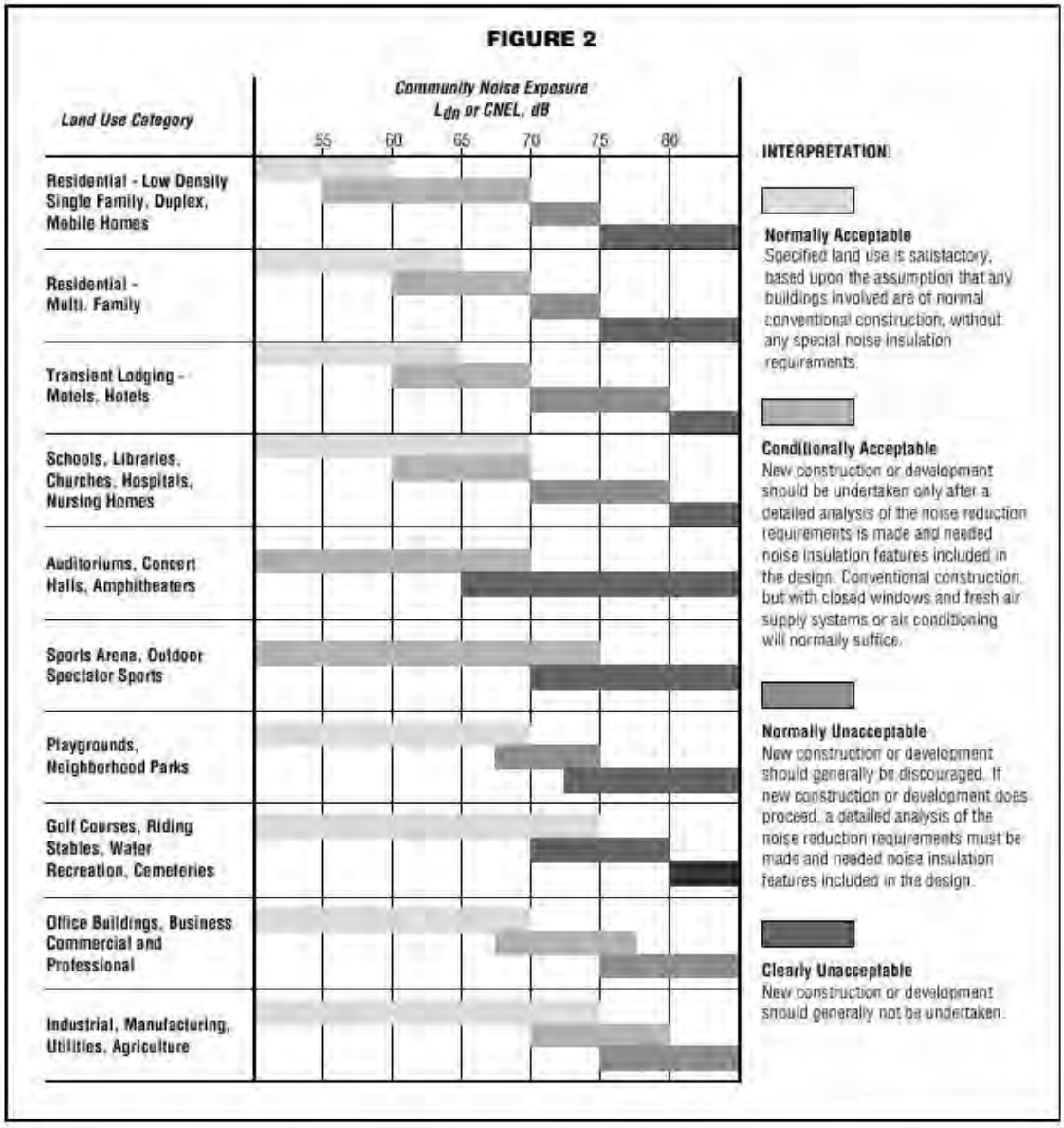
As previously indicated, the State of California Office of Planning and Research Noise Element Guidelines (Governor's Office of Planning and Research, October 2003) include recommended exterior noise level standards for different land uses to assure compatibility with ambient noise levels. These Guidelines describe the compatibility of various land uses with a range of environmental noise levels in terms of dBA CNEL. According to the State, a noise environment of 60 dBA or less CNEL is considered to be "normally acceptable" for residential uses. Additionally, more restrictive standards for quiet suburban and rural communities may be reduced by 5 to 10 dBA to reflect their lower existing outdoor noise levels in comparison with urban environments. Table 4.13-2 illustrates the State guidelines, which were originally established by the State Department of Health Services, for acceptable noise levels for each jurisdiction.

An interior CNEL of 45 dBA is mandated by the State of California Noise Insulation Standards (California Code of Regulations, Title 24, Part 6, Section T25 28) for multiple-family dwellings and hotel and motel rooms. Since normal noise attenuation within residential structures with closed windows is about 20 dBA, an exterior noise exposure of 65 dBA Ldn allows the interior standard to be met without any specialized structural attenuation (e.g., dual paned windows). A noise level of 65 dBA is also the level at which ambient noise begins to interfere with one's ability to carry on a normal conversation at reasonable separation without raising one's voice.

For typical residential construction (i.e., light frame construction with ordinary sash windows), the minimum amount of exterior to interior noise reduction is at least 20 dBA with exterior doors and windows closed and approximately 15 dBA with windows partially open for ventilation. Buildings constructed of stucco or masonry with dual-glazed windows and solid core exterior doors can be expected to achieve an exterior to interior noise reduction of approximately 25-30 dBA.

A solid barrier, such as a concrete masonry wall, located between a noise source and a receiver will typically provide about 5 dBA of noise reduction; additional reduction may be achieved by increasing the length and/or height of the barrier. A row of buildings located between a source and a receiver may provide 3 dBA of noise reduction with up to a 1.5-dBA reduction for each additional row up to a maximum reduction of approximately 10 dBA (California Department of Transportation, November 2009). The exact degree of noise attenuation depends on the nature and orientation of the structure and intervening barriers. Sound levels from a localized point source typically are reduced by 6 dBA for each doubling in distance, and sound levels from roadway traffic noise may be reduced by 3 dBA for each doubling in distance (Ibid). Ordinary landscaping along a highway accounts for less than 1 dBA of noise reduction, while dense landscaping (i.e., 100 feet wide) could attenuate traffic noise by 5 dBA (Ibid.).

TABLE 4.13-2
Land Use – Noise Compatibility Standards



SOURCE: California Governor's Office of Planning and Research

4.13.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The draft *General Plan 2030* includes a HAZARDS, SAFETY & NOISE chapter that sets forth one goal with two policies and 14 accompanying actions that address noise issues. The following goal HZ3 and its two policies seek to maintain or reduce existing noise levels and control excessive noise and ensure that noise standards are met in the siting of noise-sensitive uses.

GOAL HZ3 *Noise levels compatible with occupancy and use.*

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Land Use policies LU1.1.4 and LU1.1.5 address development for specific sites: the Swenson property and the Golf Club Drive property, respectively.

Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or development, including new mixed-use use districts and/or intensified redevelopment. The *General Plan 2030* continues to include an industrial land use designation in the same areas currently designated industrial (Westside and Harvey West). Light industrial and "creative" industrial uses are encouraged in the Harvey West area (LU3.2.3), and "incubator" uses are specified for the Westside industrial area (LU3.2.3). Policy ED6.1.1 supports the establishment of industries and "lifestyle businesses" that draw on Santa Cruz's natural assets and environment. In addition, the proposed *General Plan 2030* supports development of a desalination plant (Policy CC3.1.3), but a specific site is not identified.

4.13.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

13a Expose persons to noise levels in excess of "normally acceptable" standards established in the State of California *General Plan Guidelines*' (2003) "Noise Element Guidelines" for compatible community noise levels;

13b Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project if it will expose outdoor activity areas of noise-sensitive land uses to:

- A 5 dB increase in noise where existing noise levels are below 60 dBA L_{dn}, or
- a 3 dB increase in noise where existing noise levels are above 60 dBA L_{dn}.

13c Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or

13d Expose persons to or generate excessive groundborne vibration.

IMPACT ANALYSIS

The following impact analyses address potential impacts related to exposure to noise levels that exceed standards (13a), permanent increases in ambient noise levels (13b), and temporary increases in noise due to construction (13c). There are no planned land uses that would be expected to result in generation of groundborne vibration. The potential for vibration (13d) is mostly associated with construction-related impacts, and is addressed in that impact discussion below (13c). There are no airports or airfields within the City or in the immediate vicinity that would cause noise-related impacts related to aviation.

Potential Future Development & Buildout

The proposed General Plan would accommodate future development. As described in the PROJECT DESCRIPTION and LAND USE sections of this EIR (Chapters 3.0 and 4.1, respectively), buildout projections were estimated for the draft General Plan to provide an estimate of the amount of development that is expected to occur by the year 2030. The projected development includes 3,350 additional residential dwelling units with an associated population increase of 8,040 residents (based on 2.4 persons per household). The buildout projections estimate 3,140,000 additional square feet of commercial, office and industrial uses by the year 2030. According to the traffic analysis, this potential development would generate an estimated 78,260 new daily trips with approximately 7,180 trips occurring during the PM peak hour.

Impact 4.13-1: Exposure to Noise
Implementation of the proposed *General Plan 2030* would accommodate future development that could be exposed to noise levels that exceed state standards for compatible noise levels for residential uses. With implementation of the proposed General Plan policies and actions for noise, this is considered a *less-than-significant impact*.

Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development. However, the draft General Plan includes policies and a land use map that support additional development. This potential development, as summarized in subsection 4.13.2 above, could result in increased vehicular noise as discussed below, as well as project-level construction-related noise, which is discussed below under Impact 4.13-3.

The proposed *General Plan 2030* would accommodate future development pursuant to planned land use designations contained in the Plan. Development under the proposed General Plan would primarily occur on vacant infill sites, on underutilized properties that could redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan, approximately 55 percent of all new housing, 45 percent of new commercial development and 52 percent of new office development would located along these corridors.[3] Although the City of Santa Cruz is primarily developed, except for a few remaining vacant lots located within developed areas, the following three areas within the planning area are primarily undeveloped or underdeveloped that would be subject to potential future development: the Swenson site adjacent to Antonelli Pond; the Golf Club Drive area adjacent to Pogonip Creek, and the area along Seventh Avenue that is within the City's Sphere of Influence, but outside city limits.

Future noise levels adjacent to roadways were modeled by Rosen, Goldberg, Der & Lewitz, Inc. for this EIR, based on traffic data developed for the EIR, which was used as input to the Federal Highway Administration's TNM 2.5 model. This model calculates the traffic noise level based on input such as traffic volume, truck percentage and travel speeds. (See Appendix F-3 for further details). The resulting noise levels are shown on Table 4.13-3.

Based on the projected future noise levels, a future noise contour map was developed, which is shown on Figure 4.13-2. The noise contours are shown for DNL values of 60 and 65 dBA. Although some segments experienced noise levels above 70 dBA as shown on Table 4.13-3, these areas are quite limited and were not mapped due to the limited visibility with the scale of mapping. The traffic noise contours do not take into account the acoustical shielding provided by buildings or fences along the roadways. However, along the portions of Highway 1, the effects of recently constructed soundwalls are included; the soundwalls are assumed to reduce the noise levels by 5 dBA.

As shown on Table 4.13-3, land uses along a number of City streets would experience future noise levels in excess of 65 dBA at distances of 50 or more feet. As previously indicated, 65 dBA is the typical exterior noise level at which the state-mandated interior sound level of 45 dBA could be achieved without specialized structural noise attenuation. The streets include segments along:

- Bay Street
- Front Street
- King Street / Union
- Laurel Street / Broadway
- High Street
- Mission Street / Water Street
- Morrissey Blvd.
- Ocean Street
- River Street
- Riverside Avenue
- San Lorenzo/East Cliff/Murray
- Soquel Avenue
- Swift Street
- Seventh Avenue
- Highway1

[3] See Table 3-3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development per specific areas in the City.

Some future development accommodated by the proposed *General Plan 2030* would be located along some of these roadways, especially along the proposed intensified mixed-use corridors along, Mission Street, Soquel Avenue, Water Street, and Ocean Street. The two major vacant properties – the Swenson site adjacent to Antonelli Pond and the Golf Club Drive area – would not be located in areas where future noise levels may exceed standards for noise-land use compatibility standards. However, some of the area along Seventh Avenue that is within the City's existing Sphere of Influence, but outside city limits, may experience unacceptable noise levels.

Certain land uses are particularly sensitive to noise, such as schools, hospitals, and rest homes. Residential areas are also considered noise sensitive, especially during the nighttime hours. There are no major hospitals within city limits. The City is predominantly residential with 12 public and private schools distributed throughout the City. Residential uses within new mixed-use developments along the major transportation corridors would be potentially exposed to noise levels that exceed noise-land use compatibility standards as future noise levels along Mission Street, Ocean Street, Soquel Avenue and Water Street would be at or near 70 decibels. The unincorporated area along Seventh Avenue that is within the City's existing Sphere of Influence is projected to experience a noise level of 65 decibels L_{dn} as a result of General Plan-related traffic. New residential development along segments of Bay Street, High Street, and Morrissey Blvd., as well as adjacent to Highways 1 and 17, could also be exposed to exterior noise levels above 65 dBA L_{dn}.

The Draft *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize adverse impacts on noise. In particular, noise-land use compatibility standards will be applied to all new residential, commercial and mixed-use projects (HZ3.2.1), and the proposed General Plan seeks to ensure that noise standards are met in the siting of noise-sensitive uses (HZ3.2). The policies also establish an interior noise level of 45 dBA for all residential uses, consistent with state law, and a target outdoor level of 65 dBA for activity areas associated with new multi-family development. However, the draft plan does not contain a table or graphic depicting what noise compatibility standards are for different land uses as exists in the City's current General Plan. Table 4.13-2 presents such standards as recommended by the state of California and currently included in the City's existing General Plan. Denotation of a land use as "normally acceptable" implies that the highest noise level in that band is the maximum desirable for existing or conventional construction that does not incorporate any special acoustic treatment. In general, evaluation of land use that falls into the "normally acceptable" or "normally unacceptable" noise environments should include consideration of the type of noise source, the sensitivity of the noise receptor, the noise reduction likely to be provided by structures, and the degree to which the noise source may interfere with speech, sleep, or other activities characteristic of the land use. The objective of the noise compatibility guidelines is to provide the community with a means of judging the noise environment it deems to be generally acceptable (California Governor's Office of Planning and Research, October 2003). In instances where new development may be exposed to unacceptable noise levels, acoustical studies would necessary to ensure that the building construction can meet state-required noise levels, as well as acceptable outdoor noise levels.

TABLE 4.13-3
Existing and Future Noise Levels Adjacent to Roadways

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 50 ft from Center of Roadway (dBA)	L_{dn} at 50 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Noise Levels Adjacent to City Streets						
Bay Street (Bay Dr.)						
-High to Nobel-Iowa	67	67	0.1	240	85	--
-Nobel-Iowa to Escalona	67	67	0.4	260	95	--
-Escalona to King	67	67	0.4	260	90	--
-King to Mission	65	67	1.5	240	85	--
-Mission to California St	65	65	0.2	160	50	--
-California St to California Ave	66	67	0.9	240	85	--
-California Ave to West Cliff	65	66	0.9	200	70	--
Branciforte Avenue						
-Goss to Water	64	65	1.0	160	50	--
-Water to Soquel	64	65	0.8	160	50	--
-Soquel to Broadway	61	62	0.8	90	--	--
California Street						
-Laurel to Bay	63	63	0.4	110	--	--
Front Street						
-Mission/Water to Cooper of	63	65	1.5	160	50	--
-Soquel to Cathcart	66	67	1.3	260	90	--
-Cathcart to Metro Center	65	66	1.2	220	70	--
-Metro Center to Laurel	65	66	1.2	200	70	--
Center Street						
-Mission to Laurel	63	64	0.7	140	--	--
-Laurel to Pacific	60	60	0.7	55	--	--
Seabright Avenue						
-Water to Soquel	60	60	-0.4	50	--	--
-Soquel to Broadway	63	64	0.7	140	--	--
-Broadway to Murray	63	64	0.8	130	--	--
Ocean Street						
-Ocean/Plymouth to Kennan/Washburn	68	70	1.4	320	160	50
-Kennan/Washburn to Water	69	71	1.3	360	190	60
-Water to Soquel	68	69	1.3	320	150	--
-Soquel to Broadway	66	68	1.8	280	120	--
-Broadway to San Lorenzo/East Cliff	65	66	1.4	220	70	--
Riverside Avenue						
-San Lorenzo to Third	66	67	1.1	240	85	--
-Third to Second	62	63	0.7	100	--	--

TABLE 4.13-3
Existing and Future Noise Levels Adjacent to Roadways

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 50 ft from Center of Roadway (dBA)	L_{dn} at 50 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Chestnut Street						
-Laurel to Mission	62	63	0.9	110	--	--
River Street						
-Encinal to Fern	66	69	2.6	300	140	--
-Fern to Rte 1	67	70	2.6	340	170	50
-Rte 1 to Potrero	66	68	2.1	280	120	--
-Potrero to N Pacific River	65	68	2.6	260	110	--
-N Pacific River to Water	64	67	2.3	240	75	--
-Water to Soquel	64	65	1.1	180	55	--
Pacific Avenue						
Mission to Laurel	60	62	1.5	80	--	--
-Laurel to Center	59	60	0.8	50	--	--
-Center to Beach	64	65	1.0	160	50	--
Market Street						
-Isbel-Goss to Water	62	64	1.5	140	--	--
High Street						
-Western to Bay	65	66	0.2	190	60	--
-Bay to Moore	66	66	0.3	200	70	--
-Moore to Laurent	66	66	0.3	200	70	--
Mission Street / Water Street						
-Shaffer to Western	65	65	0.4	180	55	--
-Western to Swift	65	66	0.9	200	70	--
-Swift to Miramar	67	69	2.0	320	150	--
-Miramar to Younglove	67	70	2.4	340	170	50
-Younglove to Bay	68	70	2.2	340	180	60
-Bay to Laurel	69	71	2.8	400	240	75
-Laurel to Walnut	68	71	2.9	360	190	60
-Walnut to King-Union	68	71	2.3	360	190	60
-King-Union to Chestnut-Hwy 1	70	72	1.8	400	240	80
-Chestnut-Hwy 1 to Center	65	67	2.2	260	90	--
-Center to N. Pacific	67	69	1.9	300	130	--
-N.Pacific to River	66	68	2.1	280	120	--
-River to Ocean	68	70	2.1	340	170	50
-Ocean to Market	68	70	1.7	340	180	55
-Market to N.Branciforte	69	70	1.4	340	180	55
-N.Branciforte to Seabright	68	69	1.1	300	130	--
-Seabright to Morrissey	69	70	0.7	320	160	50

TABLE 4.13-3
Existing and Future Noise Levels Adjacent to Roadways

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 50 ft from Center of Roadway (dBA)	L_{dn} at 50 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Walnut / Soquel Avenue						
-Mission to Front	63	63	-0.1	120	--	--
-Front to River	65	66	1.3	220	70	--
-River to Riverside-Dakota	66	67	1.4	260	95	--
Walnut / Soquel Avenue (con't)						
-Riverside-Dakota to Ocean	66	67	1.3	260	95	--
-Ocean to Branciforte	66	68	1.6	260	100	--
-Branciforte to Seabright	67	68	1.0	260	100	--
-Seabright to Morrissey	69	69	0.7	320	150	--
-Morrissey to Frederick	69	70	1.0	340	180	55
Frederick to Trevthan-Hagemann	70	71	1.0	360	190	60
Trevthan-Hagemann to Park	70	70	0.8	340	180	60
-Park to Capitola	69	70	0.8	340	180	55
-Capitola to La Fonda	66	67	0.5	240	85	--
Laurel Street / Broadway						
-King to Mission	60	62	1.8	90	--	--
-Mission to California	67	67	0.0	240	75	--
-California to Chestnut	66	68	1.5	260	110	--
-Chestnut to Center	66	68	1.5	260	100	--
-Center to Cedar	66	68	1.6	260	110	--
-Cedar to Pacific	66	68	1.3	260	110	--
-Pacific to Front	67	68	1.3	260	110	--
-Front to San Lorenzo	67	69	1.3	300	130	--
-San Lorenzo to Ocean	65	67	1.6	240	75	--
-Ocean to S.Branciforte	65	66	1.3	220	70	--
-S.Branciforte to Seabright	65	66	1.0	200	70	--
San Lorenzo/East Cliff/Murray						
-Laurel-Broadway to Riverside	64	65	0.9	160	50	--
-Riverside to Ocean	66	68	1.1	260	100	--
-Ocean to Seabright	67	68	0.6	260	100	--
West Cliff Dr. / Beach Street						
Swanton to Bay	62	63	0.3	100	--	--
-Bay to Pacific	64	65	0.8	160	50	--
-Pacific to Cliff	60	61	1.2	70	--	--
-Cliff to Riverside	59	61	1.9	70	--	--
King Street / Union						
-Bay to Laurel	63	63	0.6	120	--	--
-Laurel to Storey	62	63	0.8	120	--	--
-Storey to Mission	64	65	1.1	180	55	--

TABLE 4.13-3
Existing and Future Noise Levels Adjacent to Roadways

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 50 ft from Center of Roadway (dBA)	L_{dn} at 50 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Western Drive						
-High to Hwy1	60	62	1.3	80	--	--
Swift Street						
-Mission to Delaware	62	65	3.0	180	55	--
Morrissey Blvd.						
-Fairmount to Soquel	66	67	0.5	240	85	--
Third Street						
Front to Riverside	64	64	0.3	140	--	--
Riverside to Beach	63	64	1.2	150	--	--
Seventh Avenue						
- Soquel to Capitola		64	NA	130	--	--
- Capitola to Brommer		65	NA	160	50	--
- Brommer to Eaton		65	NA	160	50	--
- Eaton to Cliff		65	NA	180	55	--

Noise Levels Adjacent to Highways

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 100 ft from Center of Roadway (dBA)	L_{dn} at 100 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Highway 1						
-Soquel to Morrissey	79	80	0.4	1050	650	400
-Morrissey to Emeline	74	75	0.4	650	400	240
-Emeline to Hwy 17	74	75	0.4	650	400	240
-Hwy 17 to Hwy 9	77	77	0.4	850	550	320
-Hwy 9 to Mission	76	76	0.4	750	480	300
Highway 17						
-Begin Freeway to Pasatiempo	78	78	0.4	900	550	340

SOURCE: Rosen, Goldberg, Der & Levitz, Inc., November 2007

As previously indicated, typical residential construction (i.e., light frame construction with sash windows) with closed windows and doors can result in an exterior-to-interior noise reduction of at least 20 dBA and approximately 15 dBA with windows partially open for ventilation. Buildings constructed of stucco or masonry with dual-glazed windows and solid core exterior doors can be expected to achieve an exterior to interior noise reduction of approximately 25-30 dBA. Further noise reduction could be achieved with mechanical air systems and/or other window designs for areas where the ambient noise level exceeds 65 dBA.

The draft General Plan also includes support of measures to attenuate noise exposure, such as soundwalls, berms and setbacks (HZ3.1.11) and includes policies to minimize and mitigate new sources of vehicular and stationary noise (HZ3.1, HZ3.1.1, HZ3.1.6, HZ3.1.8, HZ 3.1.9). In addition to these policies, numerous proposed policies address specific alternative transportation modes, and serve to encourage a reduction in vehicle traffic as discussed in the TRANSPORTATION & TRAFFIC (Chapter 4.4) section of this EIR. A summary of the proposed *General Plan 2030* policies that serve to reduce/mitigate impacts related to exposure to unacceptable noise levels are summarized in Table 4.13-4.

The *General Plan 2030* also encourages passenger rail transit or other alternative transportation options (M2.2) and continued transport of goods by rail (M2.2.2). At such time that passenger rail may be proposed, project-level environmental review would be required, including an assessment of noise as the existing rail right-of-way travels through residential neighborhoods.

TABLE 4.13-4
Proposed General Plan Policies & Actions that Avoid or Reduce Noise Impacts

Type of Measure / Action	Policies
AVOID OR MITIGATE EXPOSURE TO NOISE LEVELS THAT EXCEED STANDARDS	▪ Protect residents from excessive road noise: HZ3.1.7 ▪ Mitigate noise impacts from roadways through setbacks, landscaping and other measures: M3.3.4 ▪ Apply noise compatibility standards: HZ3.2, HZ3.2.1 ▪ Require residential interior noise levels of 45 dBA: HZ3.2.3 ▪ Establish outdoor noise targets of 65 dBA for activity areas in new mutli-family developments: HZ3.2.2 ▪ Require soundwalls, berms, setbacks or other noise reduction techniques when necessary: HZ3.1.11 ▪ Reduce auto dependence, vehicle trips and peak hour trip & increase vehicle occupancy: M1.1, M3.1, M3.1.1, M3.1.2 – See also Table 4.4-4in the TRANSPORTATION & TRAFFIC (Chapter 4.4) section of this EIR ▪ Minimize impacts of intermittent urban noise: HZ3.1.4 ▪ Limit truck traffic in residential and commercial areas to designated truck routes: HZ3.1.9
RESULT IN SUBSTANTIAL PERMANENT NOISE INCREASE	▪ Maintain or reduce existing noise levels and control excessive noise: HZ3.1 ▪ Require land uses at noise levels that do not significantly increase ambient noise and minimize noise from new uses: HZ3.1.1, HZ3.1.2 ▪ Require mitigation for substantial noise increases: HZ3.1.6 ▪ Require environmental review & mitigation for roadway projects with significant noise increases: HZ3.1.8 ▪ Install "quiet" pavement surfaces where beneficial: HZ3.1.10
RESULT IN SUBSTANTIAL TEMPORARY NOISE INCREASE	▪ Minimize & monitor construction noise: HZ3.1.3, HZ3.1.5

In addition, compliance with state regulations regarding maintaining interior noise levels of 45 dBA, in conjunction with implementation of the proposed General Plan policies and actions outlined above, will mitigate potential impacts of future development to a less-than-significant level. New development located within areas in which noise levels may exceed acceptable levels would be required to have a project-level acoustical/noise assessment conducted to

specify building and structural designs to attenuate noise levels and achieve the required interior noise level.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result increased traffic and exposure to vehicular noise. However, the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize exposure to noise levels that exceed land use compatibility standards for noise exposure. With implementation of these proposed policies and actions, as well as future project-level environmental review, exposure to noise would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required, but revisions to the following *General Plan 2030* actions are recommended to specifically reference land-use noise compatibility standards.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

HZ3.2.1 Apply noise and land use compatibility table and standards to all new residential, commercial, and mixed-use proposals, including condominium conversions in accordance with the standards set forth in the "Land Use – Noise Compatibility Standards" table.

Impact 4.13-2: Increase in Permanent Ambient Noise Levels
Implementation of the proposed *General Plan 2030* would accommodate future development that would generate traffic and contribute to increased noise levels along City streets and highways, but would not exceed criteria of significance or substantially increase ambient noise levels. Thus, permanent increases in ambient noise levels due to increased vehicular traffic are considered a *less-than-significant impact*.

As discussed under the Impact 4.13-1 discussion above, future noise levels and noise contours were developed along City streets and highways based on the traffic data developed for this EIR. Table 4.13-3 shows existing and future noise levels along roadways. Most of the noise increases are less than 2 dBA as a result of traffic associated with future development accommodated by the General Plan. In some cases, noise increases are between 2 and 3 dBA, such as along some segments of River Street, Mission Street, and Swift Street.

As previously indicated, a change in noise level of 3 dB is considered just a noticeable difference. A 5 dB change is clearly noticeable, but not dramatic, and a 10 dB change is perceived as a halving or doubling in loudness (Rosen Goldberg Der & Lewitz, Inc., November 30, 2007). In areas where the ambient noise level without a project is below 60 dBA, an increase in the ambient noise level of 5 dBA or more would be considered significant. In areas were ambient noise levels are above 60 dBA, an increase in the ambient noise level of greater than 3 dBA would be considered significant.

All City streets and highway segments included within the future noise contours would experience noise increases of less than 3 dBA due to future estimated traffic volumes, except for one segment along Swift Street, which would reach a 3 dBA increase. Therefore, the increase in traffic would not result in significant ambient noise level increases (i.e., above 3 dBA) for existing or future residents. Noise levels along the segments of the following roads would exceed 65 dBA in the future (as well as under both existing conditions in some cases): Bay Street, Front Street, Ocean Street, River Street, Mission Street, High Street, Soquel Avenue, Morrissey Blvd., San Lorenzo-East Cliff-Murray, and Highways 1 and 17. However, the increase due to development accommodated by the proposed General Plan would be less than 3 dBA (and often less than 2 dBA), and thus, the increase would not be considered substantial.

The segment of Swift Street between Mission and Delaware Avenue would increase by 3 dBA to reach a projected ambient noise level of 65 decibels L_{dn}. New development would be subject to noise attenuation requirements as discussed in Impact 4.13-1. The existing development along this segment of Swift Street is primarily commercial and light industrial for which normally acceptable noise levels would be 70 decibels. For the few homes located along this segment, exterior noise levels would not exceed 65 decibels. Since normal noise attenuation within residential structures with closed windows is about 20 dBA, an exterior noise exposure of 65 dB ACNEL allows the interior standard to be met without any specialized structural attenuation (e.g., dual paned windows).

The *General Plan 2030* continues to include an industrial land use designation in the same areas currently designated industrial (Westside and Harvey West). Light industrial and "creative" industrial uses are encouraged in the Harvey West area (LU3.2.3), and "incubator" uses are specified for the Westside industrial area (LU3.2.3). Depending on the specific use, some industrial uses can result in a stationary source of emissions. However, Policy ED6.1.1 supports the establishment of industries and "lifestyle businesses" that draw on Santa Cruz's natural assets and environment. Additionally, Policy ED6.2 encourages and supports "green" and environmentally-oriented businesses to locate in Santa Cruz. Furthermore, the draft plan supports "green" and sustainable commercial and industrial operating practices (ED6.2.2) and encourages businesses that "don't pollute" (ED6.2.3). Overall, the type of industry and business supported in the draft *General Plan 2030* typically would not be heavy industrial or the type of business that would be significant source of noise.

The draft plan does support development of a desalination plant (LU3.1.3) as part of the actions outlined to implement the City's adopted *Integrated Water Plan* (IWP) (see the WATER SUPPLY [Chapter 4.5] section of this EIR for further discussion of the planned desalination facility). A program EIR prepared for the IWP also reviewed potential impacts of a desalination facility, but did not identify permanent generation of noise as a potentially significant impact (EDAW,

June 2005). (See the WATER SUPPLY (Chapter 4.4) of this EIR for further discussion of potential impacts related to construction and operation of a desalination facility.)

The Draft *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize adverse impacts on noise that include applying noise compatibility standards to new residential, commercial and mixed-used development (HZ3.2.1) and establishing indoor and outdoor noise level targets of 45 dBA and 65 dBA, respectively, for new multifamily residential developments (HZ3.2.2) as discussed above for Impact 4.13-1. The draft general plan also includes support of measures to attenuate noise exposure, such as soundwalls, berms and setbacks (HZ3.1.11) and includes policies to minimize and mitigate new sources of vehicular and stationary noise (HZ3.1, HZ3.1.1, HZ3.1.6, HZ3.1.8, HZ 3.1.9). Additionally, the proposed *General Plan 2030* also includes numerous policies that seek to maintain or reduce existing noise levels (HZ3.1), and require mitigation for uses that would substantially increase noise levels (HZ3.1.6). A summary of the proposed *General Plan 2030* policies that serve to further reduce potential impacts related to increases in ambient noise levels are summarized in Table 4.13-4.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in increased traffic that would increase ambient noise levels. The increases would not exceed three decibels and mostly would be below two decibels. Thus, permanent increases in ambient noise levels would not be significant, and permanent increases in ambient noise levels is considered a less-than-significant impact. Implementation of proposed *General Plan 2030* includes goals, policies and actions that set forth measures to minimize increases in ambient noise levels, as well as future project-level environmental review, would further reduce potential permanent ambient noise increases.

Mitigation Measures

None mitigation measures are required as a significant impact has not been identified.

Impact 4.13-3: Increase in Temporary Noise Levels Due to Construction
Implementation of the proposed *General Plan 2030* would accommodate future development that would generate temporary increases in ambient noise levels due to construction activities, although substantial generation of vibration would not be expected. Due to the temporary and short-term duration of construction with intermittent noise levels, this is considered a *less-than-significant impact*.

Future development accommodated under the proposed General Plan would result in temporary increases in ambient noise levels due to construction activities. Construction-related noise levels would vary throughout the day, depending on the type of equipment in use at any one time and the distance to the receptors, and noise impacts from construction may vary greatly depending on the duration and complexity of the project. However, construction-related noise impacts are temporary and often of a short-term duration. Noise generated during construction

could be considered a nuisance to some residents and/or employees in the proximity to such construction, and may seem intolerable during constructions phases with the loudest equipment/activities in operations.

Anticipated equipment includes, but is not limited to, equipment that would be used for excavation, site grading, and construction of structures. Construction equipment can operate in two modes – stationary and mobile. Stationary equipment operates in one location for one or more days at a time, with either a fixed power operation (pumps, generators, compressors) or a variable noise operation (pile drivers, pavement breakers). Mobile equipment moves around the construction site with power applied in cyclic fashion (bulldozers, loaders), or to and from the site (trucks). As a result of the equipment mix for any given project, each phase has its own noise characteristics; some have higher continuous noise levels than others, some have high impact noise levels. Table 4.13-5 shows typical noise levels associated with different types of construction equipment. These noise levels would decrease with distance from the construction site at a rate of approximately 6 dBA per doubling of distance (California Department of Transportation, November 2009).

Groundborne noise and other types of construction-related noise impacts would typically occur during the initial site preparation, which can create the highest levels of noise. Generally, site preparation has the shortest duration of all construction phases. Activities that occur during this phase include earthmoving and soils compaction. High groundborne noise levels and other miscellaneous noise levels can occur during this phase by the operation of heavy-duty trucks, backhoes and other heavy-duty construction equipment. Sources of man-made vibration often result from the use of heavy-duty construction equipment. The effects of vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Ground-borne vibrations from construction activities rarely reach levels that damage structures.

The draft general plan addresses construction noise in that it seeks to minimize and monitor construction noise (HZ3.1.3, HZ3.1.5). In particular, the plan seeks to ensure that construction activities are managed to minimize overall noise impacts on surrounding land uses (HZ3.1.3). Development projects are reviewed on a case-by-case basis, and typical conditions of approval include limiting the day and times of day during which construction and/or heavy construction can be conducted, provision of notification to neighbors regarding construction schedules, and implementation of a process to receive and respond to noise complaints. These are some of the types of measures that would be implemented by the City to manage and minimize construction noise impacts per proposed General Plan Actions HZ3.1.3 and HZ3.1.5.

> **Conclusion**. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in construction of varying sound level and duration, which could be an annoyance to adjacent residents. With implementation of the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to minimize exposure construction noise levels, the increase in temporary noise levels from construction-related activities would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

TABLE 4.13-5
Noise Levels of Construction Equipment Noise (in dBA)

Equipment	Typical Noise Level (dBA) 50 ft from Source
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile-driver (Impact)	101
Pile-driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rock Drill	98
Roller	74
Saw	76
Scraper	89
Truck	88

SOURCE: Transit Noise And Vibration Impact Assessment, May 2006, Federal Transit Administration, FTA-VA-90-1003-06

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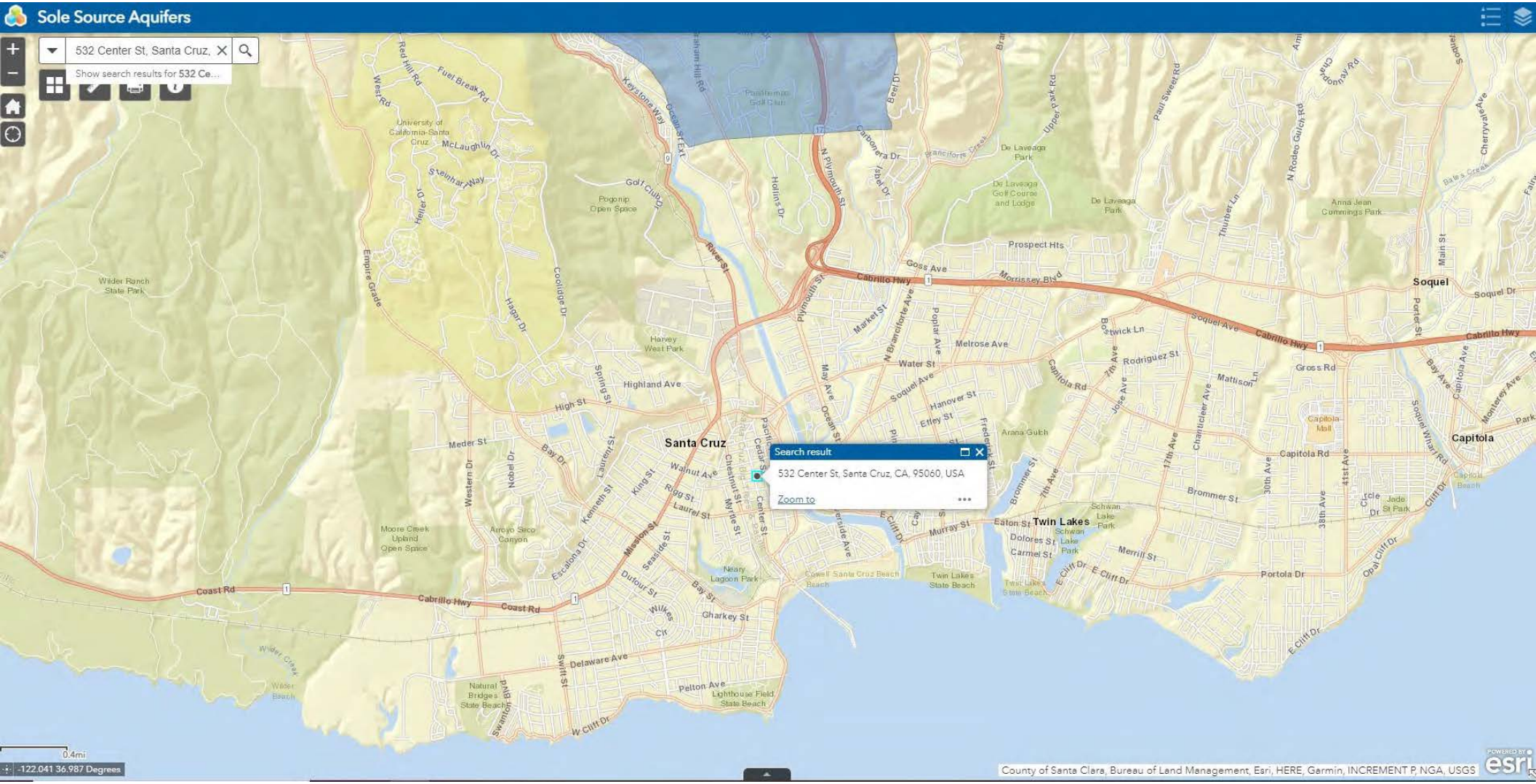
United States Department of Transportation, Federal Highway Administration. August 2006. "Construction Noise Handbook."

United States Environmental Protection Agency website, "Noise Pollution;" online at: http://www. Epa.gov/air/noise.html.


Sole Source Aquifers
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Search result
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Santa Cruz
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Capitola
Twin Lakes
Prospect Hts
Highland Ave
Water St
Soquel Ave
Cabrillo Hwy
Coast Rd
Mission St
River St
Bay St
Portola Dr
Capitola Rd
Gross Rd
Morrissey Blvd
Goss Ave
Melrose Ave
Brommer St
Murray St
Eaton St
Merrill St
Delaware Ave
Pelton Ave
W Cliff Dr
E Cliff Dr
Gharkey St
Dufour St
Laurel St
Walnut Ave
Chestnut St
Myrtle St
Center St
Pacific Ave
Cedar St
Lighthouse Field State Beach
Natural Bridges State Beach
Twin Lakes State Beach
Cowell Santa Cruz Beach
Neary Lagoon Park
Schwan Lake Park
De Laveaga Park
De Laveaga Golf Course and Lodge
Pasatiempo Golf Club
Pogonip Open Space
Harvey West Park
Moore Creek Upland Open Space
Arroyo Seco Canyon
Wilder Ranch State Park
University of California-Santa Cruz
Capitola Mall
Arana Gulch
0.4mi
-122.041 36.987 Degrees
County of Santa Clara, Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, NGA, USGS
esri

U.S. Fish and Wildlife Service
National Wetlands Inventory

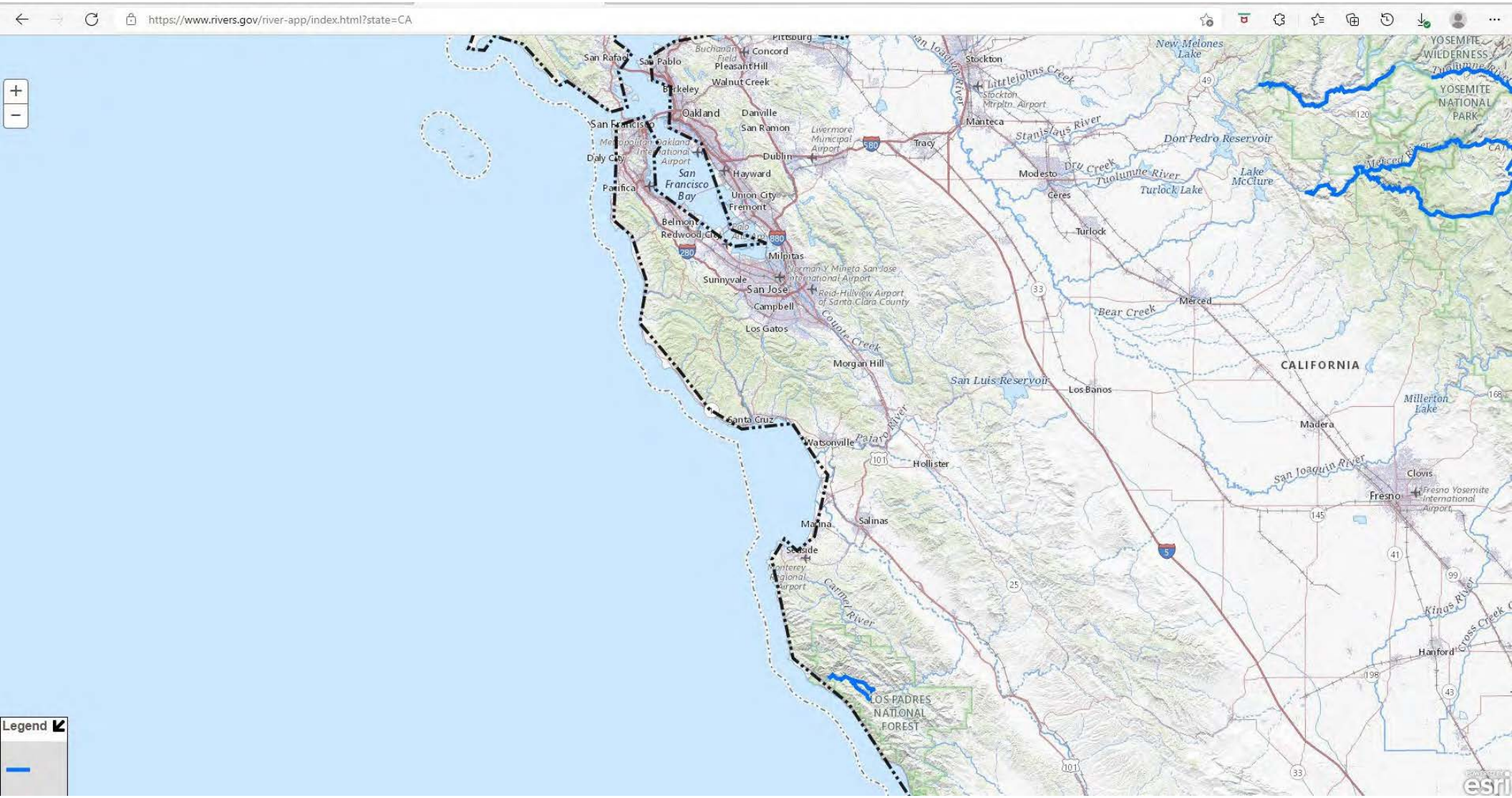
Wetlands_None

October 23, 2021

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.


https://www.rivers.gov/river-app/index.html?state=CA
San Rafael
San Pablo
Pittsburg
Concord
Pleasant Hill
Walnut Creek
Berkeley
Oakland
Danville
San Ramon
San Francisco
Daly City
Dublin
Hayward
Pacifica
San Francisco Bay
Union City
Fremont
Belmont
Redwood City
Milpitas
Sunnyvale
San Jose
Campbell
Los Gatos
Morgan Hill
Santa Cruz
Watsonville
Hollister
Salinas
Marina
Seaside
Carmel River
LOS PADRES NATIONAL FOREST
Stockton
Manteca
Tracy
Livermore Municipal Airport
Modesto
Ceres
Turlock
Merced
Bear Creek
Coyote Creek
San Luis Reservoir
Los Banos
CALIFORNIA
Madera
Fresno
Clovis
San Joaquin River
Millerton Lake
Hanford
Kings River
Cross Creek
Don Pedro Reservoir
Lake McClure
Turlock Lake
Tuolumne River
Stanislaus River
Dry Creek
Littlejohns Creek
New Melones Lake
YOSEMITE NATIONAL PARK
YOSEMITE WILDERNESS
Legend

	0.12 m	0.25 m	0.5 m	0.75 m	1.0 m		State	Region	U.S.
Particulate	6.79	6.8	6.8	6.81	6.81		10.6	9.99	8.55
Ozone	33.2	33.3	33.3	33.3	33.3		49.2	50.1	42.9
Diesel PM	0.202	0.202	0.204	0.203	0.203		0.467	0.479	0.478
Air Toxics	25	25	26	26	26		36	35	32
Resp Haz	0.41	0.41	0.42	0.44	0.42		0.55	0.53	0.44
Traffic Prox	1600	1900	1900	2000	1800		2000	1700	750
Lead Paint	0.5	0.4	0.38	0.44	0.46		0.29	0.24	0.28
Superfund	0.11	0.11	0.11	0.11	0.11		0.17	0.15	0.13
RMP	0.3	0.3	0.3	0.3	0.31		1.1	0.99	0.74
Haz Waste	4	4.1	4.3	4.5	4.5		6.2	5.3	5
Wastewater	4.8E-05	4.7E-05	5.3E-05	5E-05	5.3E-05		18	18	9.4
Dem Index	44%	47%	48%	46%	42%		47%	46%	36%
Min. Pop.	36%	38%	42%	42%	39%		62%	60%	39%
Low Income	53%	55%	54%	50%	45%		33%	33%	33%
Ling. Isolated	2%	2%	2%	3%	3%		9%	8%	4%
< H.S.	2%	3%	5%	8%	8%		17%	16%	13%
Under 5	2%	1%	2%	4%	4%		6%	6%	6%
Over 64	4%	8%	10%	10%	11%		14%	14%	15%

Higher than all three averages
Higher than two averages
Higher than one average

EJSCREEN Report (Version 2020)

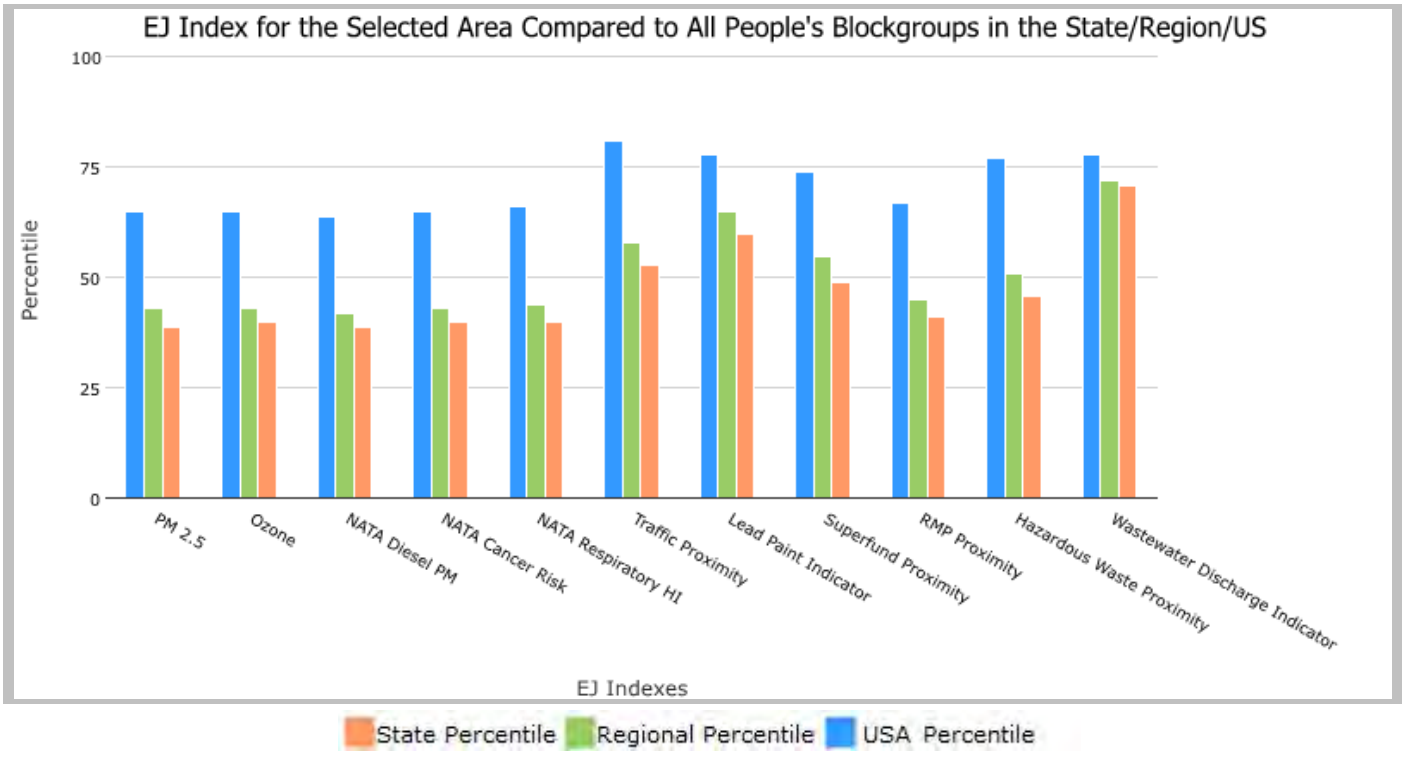
0.125 miles Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 640

Input Area (sq. miles): 0.05

EJScreen_0.125 Mile

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	39	43	65
EJ Index for Ozone	40	43	65
EJ Index for NATA* Diesel PM	39	42	64
EJ Index for NATA* Air Toxics Cancer Risk	40	43	65
EJ Index for NATA* Respiratory Hazard Index	40	44	66
EJ Index for Traffic Proximity and Volume	53	58	81
EJ Index for Lead Paint Indicator	60	65	78
EJ Index for Superfund Proximity	49	55	74
EJ Index for RMP Proximity	41	45	67
EJ Index for Hazardous Waste Proximity	46	51	77
EJ Index for Wastewater Discharge Indicator	71	72	78



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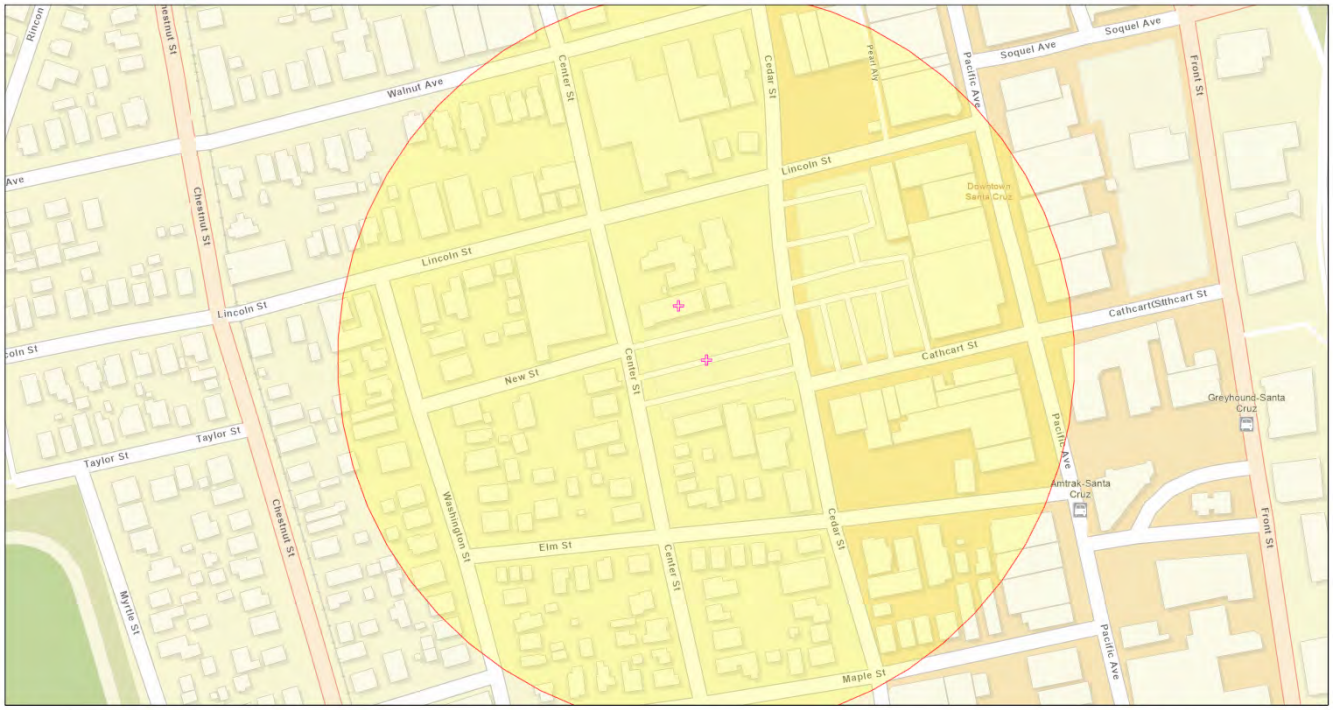
EJSCREEN Report (Version 2020)

0.125 miles Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 640

Input Area (sq. miles): 0.05

EJScreen_0.125 Mile



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2020)

0.125 miles Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 640

Input Area (sq. miles): 0.05

EJScreen_0.125 Mile

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	6.79	10.6	2	9.99	6	8.55	11
Ozone (ppb)	33.2	49.2	9	50.1	7	42.9	6
NATA* Diesel PM (µg/m^3)	0.202	0.467	14	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	25	36	7	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.41	0.55	13	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	1600	2000	63	1700	69	750	88
Lead Paint Indicator (% Pre-1960 Housing)	0.5	0.29	74	0.24	79	0.28	77
Superfund Proximity (site count/km distance)	0.11	0.17	61	0.15	67	0.13	70
RMP Proximity (facility count/km distance)	0.3	1.1	34	0.99	40	0.74	49
Hazardous Waste Proximity (facility count/km distance)	4	6.2	45	5.3	54	5	80
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	4.8E-05	18	61	18	61	9.4	50
Demographic Indicators							
Demographic Index	44%	47%	46	46%	48	36%	68
People of Color Population	36%	62%	20	60%	23	39%	55
Low Income Population	53%	33%	80	33%	80	33%	82
Linguistically Isolated Population	2%	9%	22	8%	27	4%	54
Population With Less Than High School Education	2%	17%	8	16%	8	13%	9
Population Under 5 years of age	2%	6%	13	6%	14	6%	14
Population over 64 years of age	4%	14%	6	14%	6	15%	5

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

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EJSCREEN Report (Version 2020)

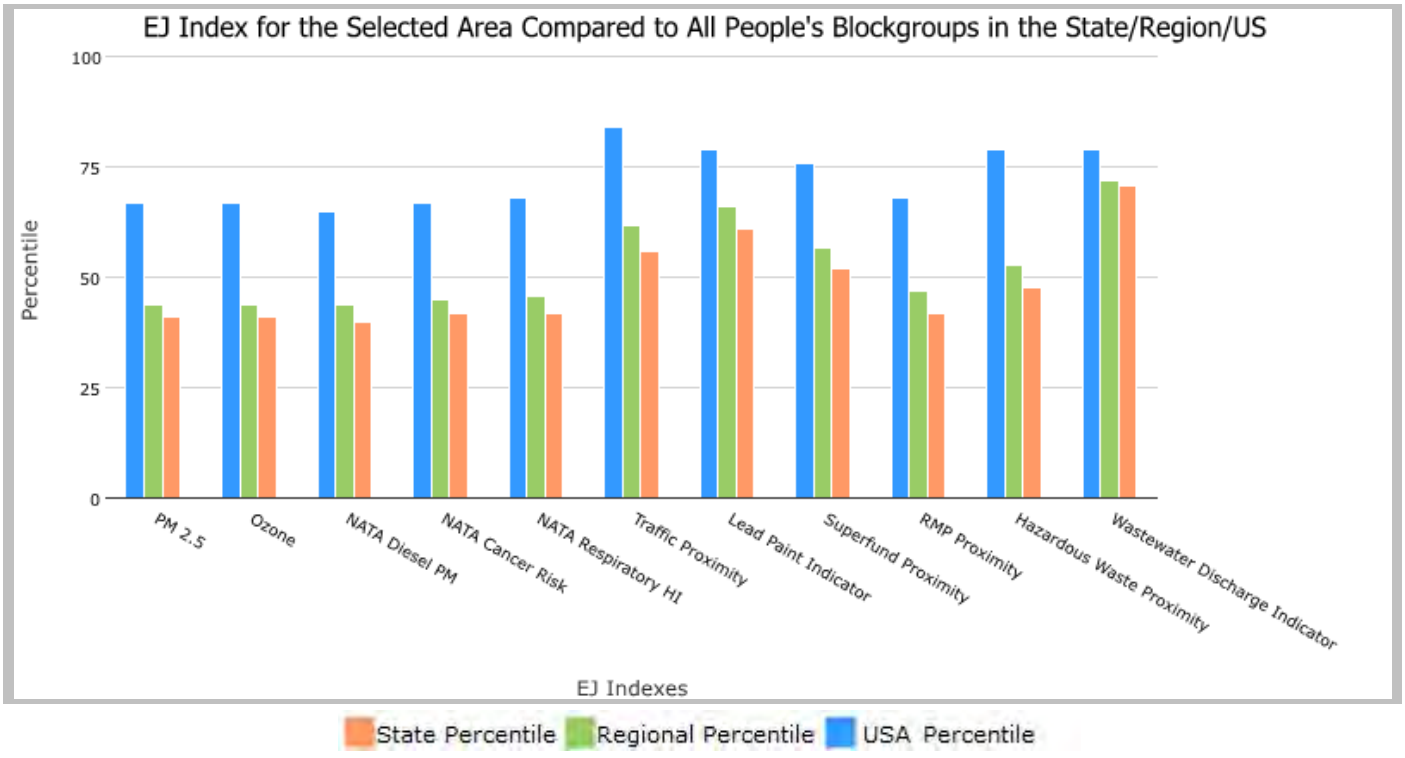
0.25 miles Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 2,068

Input Area (sq. miles): 0.20

EJScreen_0.25 Mile

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	41	44	67
EJ Index for Ozone	41	44	67
EJ Index for NATA* Diesel PM	40	44	65
EJ Index for NATA* Air Toxics Cancer Risk	42	45	67
EJ Index for NATA* Respiratory Hazard Index	42	46	68
EJ Index for Traffic Proximity and Volume	56	62	84
EJ Index for Lead Paint Indicator	61	66	79
EJ Index for Superfund Proximity	52	57	76
EJ Index for RMP Proximity	42	47	68
EJ Index for Hazardous Waste Proximity	48	53	79
EJ Index for Wastewater Discharge Indicator	71	72	79



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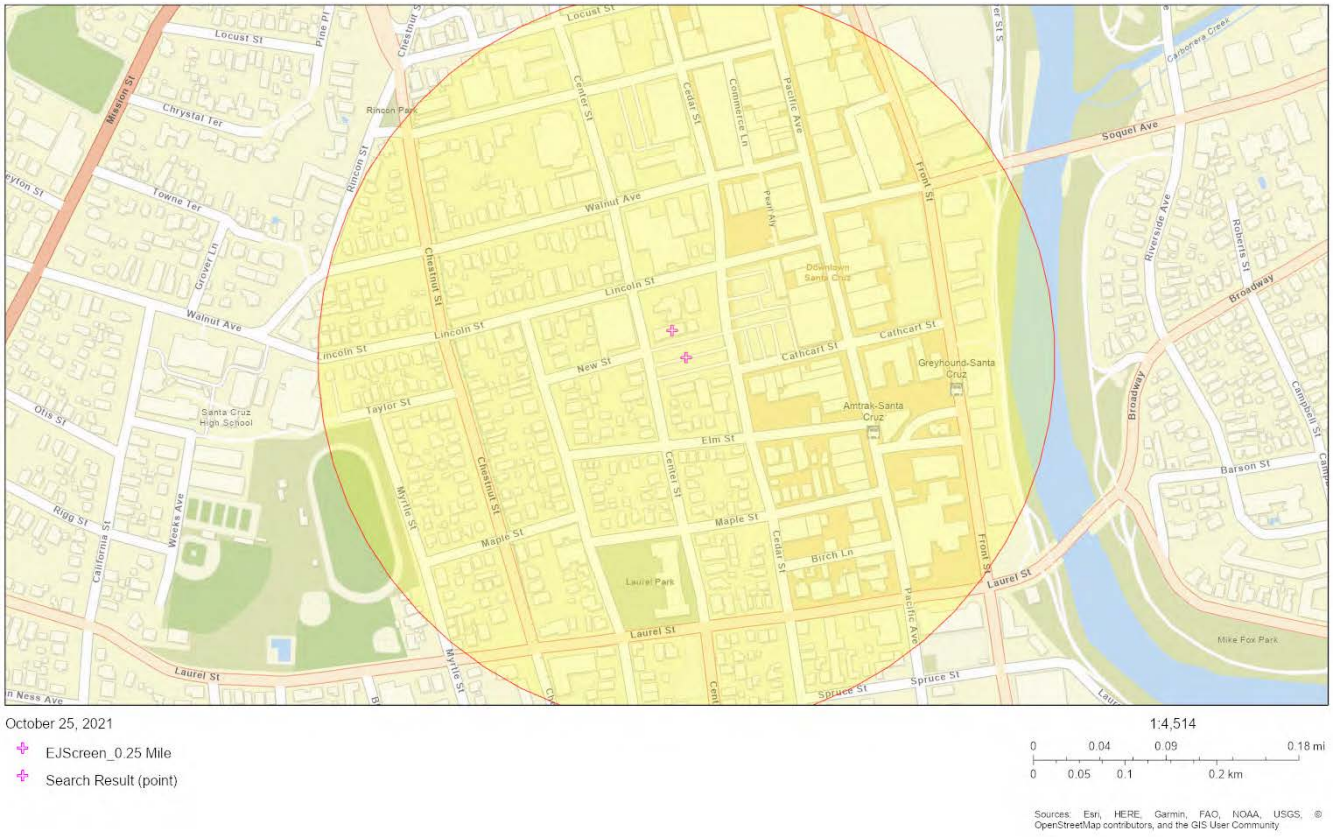
EJSCREEN Report (Version 2020)

0.25 miles Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 2,068

Input Area (sq. miles): 0.20

EJScreen_0.25 Mile



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2020)

0.25 miles Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 2,068

Input Area (sq. miles): 0.20

EJScreen_0.25 Mile

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	6.8	10.6	2	9.99	6	8.55	11
Ozone (ppb)	33.3	49.2	9	50.1	7	42.9	6
NATA* Diesel PM (µg/m^3)	0.202	0.467	14	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	25	36	6	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.41	0.55	13	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	1900	2000	69	1700	74	750	90
Lead Paint Indicator (% Pre-1960 Housing)	0.4	0.29	67	0.24	73	0.28	70
Superfund Proximity (site count/km distance)	0.11	0.17	61	0.15	67	0.13	70
RMP Proximity (facility count/km distance)	0.3	1.1	34	0.99	40	0.74	49
Hazardous Waste Proximity (facility count/km distance)	4.1	6.2	46	5.3	55	5	81
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	4.7E-05	18	61	18	61	9.4	50
Demographic Indicators							
Demographic Index	47%	47%	50	46%	52	36%	71
People of Color Population	38%	62%	22	60%	26	39%	57
Low Income Population	55%	33%	82	33%	82	33%	84
Linguistically Isolated Population	2%	9%	27	8%	32	4%	59
Population With Less Than High School Education	3%	17%	14	16%	14	13%	16
Population Under 5 years of age	1%	6%	7	6%	8	6%	8
Population over 64 years of age	8%	14%	29	14%	29	15%	22

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

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EJSCREEN Report (Version 2020)

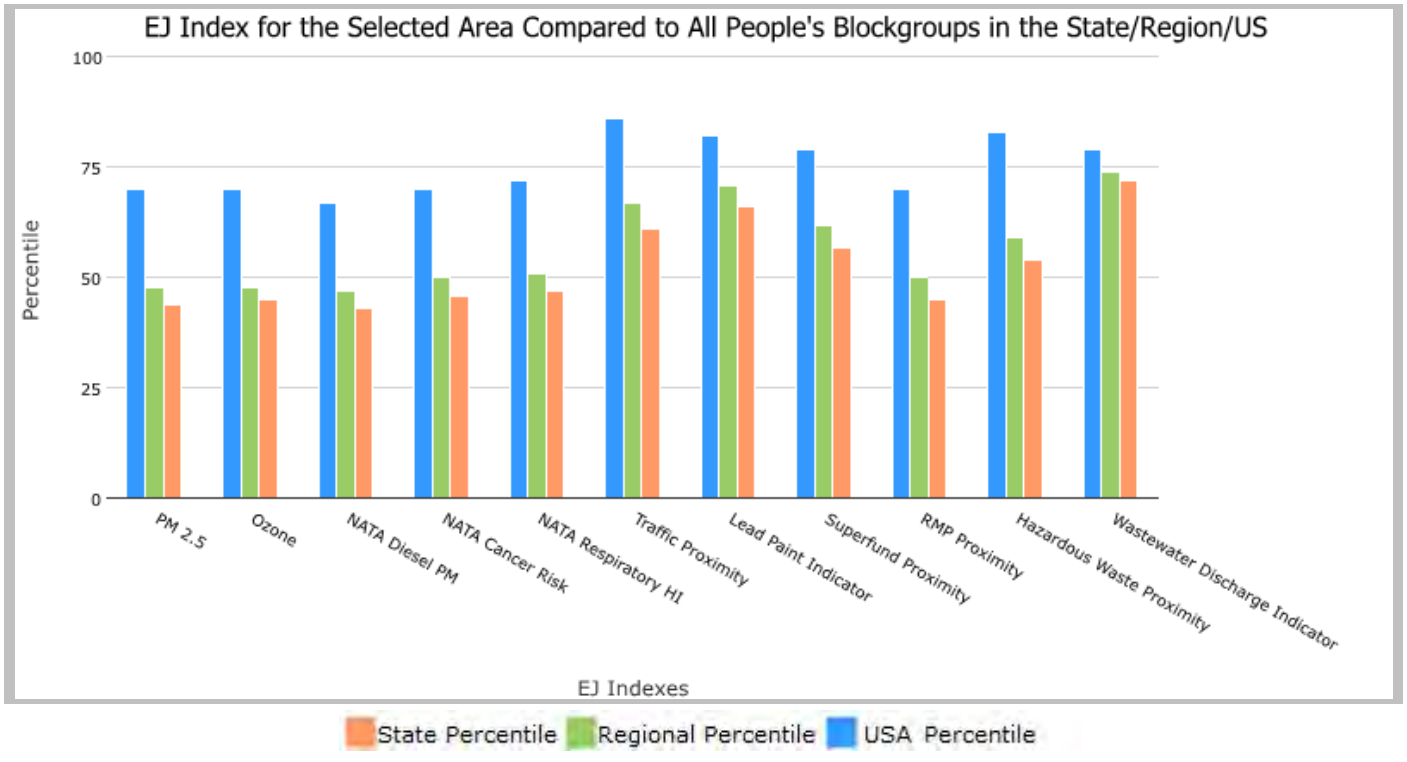
0.5 miles Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 7,910

Input Area (sq. miles): 0.79

EJScreen_0.5 Mile

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	44	48	70
EJ Index for Ozone	45	48	70
EJ Index for NATA* Diesel PM	43	47	67
EJ Index for NATA* Air Toxics Cancer Risk	46	50	70
EJ Index for NATA* Respiratory Hazard Index	47	51	72
EJ Index for Traffic Proximity and Volume	61	67	86
EJ Index for Lead Paint Indicator	66	71	82
EJ Index for Superfund Proximity	57	62	79
EJ Index for RMP Proximity	45	50	70
EJ Index for Hazardous Waste Proximity	54	59	83
EJ Index for Wastewater Discharge Indicator	72	74	79



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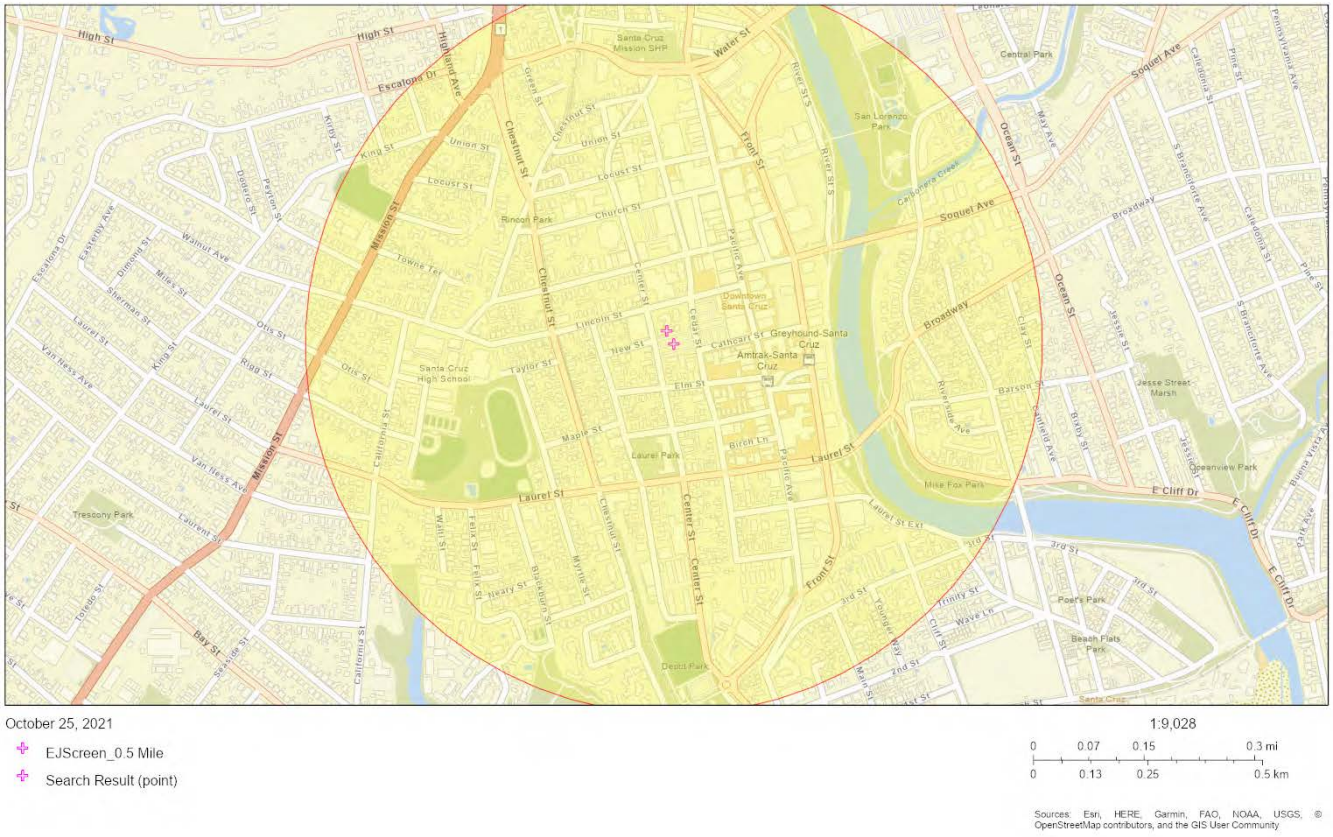
EJSCREEN Report (Version 2020)

0.5 miles Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 7,910

Input Area (sq. miles): 0.79

EJScreen_0.5 Mile



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2020)

0.5 miles Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 7,910

Input Area (sq. miles): 0.79

EJScreen_0.5 Mile

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	6.8	10.6	2	9.99	7	8.55	11
Ozone (ppb)	33.3	49.2	9	50.1	7	42.9	6
NATA* Diesel PM (µg/m^3)	0.204	0.467	15	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	26	36	8	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.42	0.55	16	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	1900	2000	68	1700	74	750	90
Lead Paint Indicator (% Pre-1960 Housing)	0.38	0.29	65	0.24	71	0.28	69
Superfund Proximity (site count/km distance)	0.11	0.17	61	0.15	67	0.13	70
RMP Proximity (facility count/km distance)	0.3	1.1	34	0.99	40	0.74	48
Hazardous Waste Proximity (facility count/km distance)	4.3	6.2	47	5.3	56	5	81
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	5.3E-05	18	61	18	62	9.4	51
Demographic Indicators							
Demographic Index	48%	47%	51	46%	54	36%	72
People of Color Population	42%	62%	27	60%	31	39%	60
Low Income Population	54%	33%	81	33%	81	33%	83
Linguistically Isolated Population	2%	9%	26	8%	32	4%	58
Population With Less Than High School Education	5%	17%	25	16%	26	13%	30
Population Under 5 years of age	2%	6%	12	6%	13	6%	14
Population over 64 years of age	10%	14%	37	14%	37	15%	28

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

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EJSCREEN Report (Version 2020)

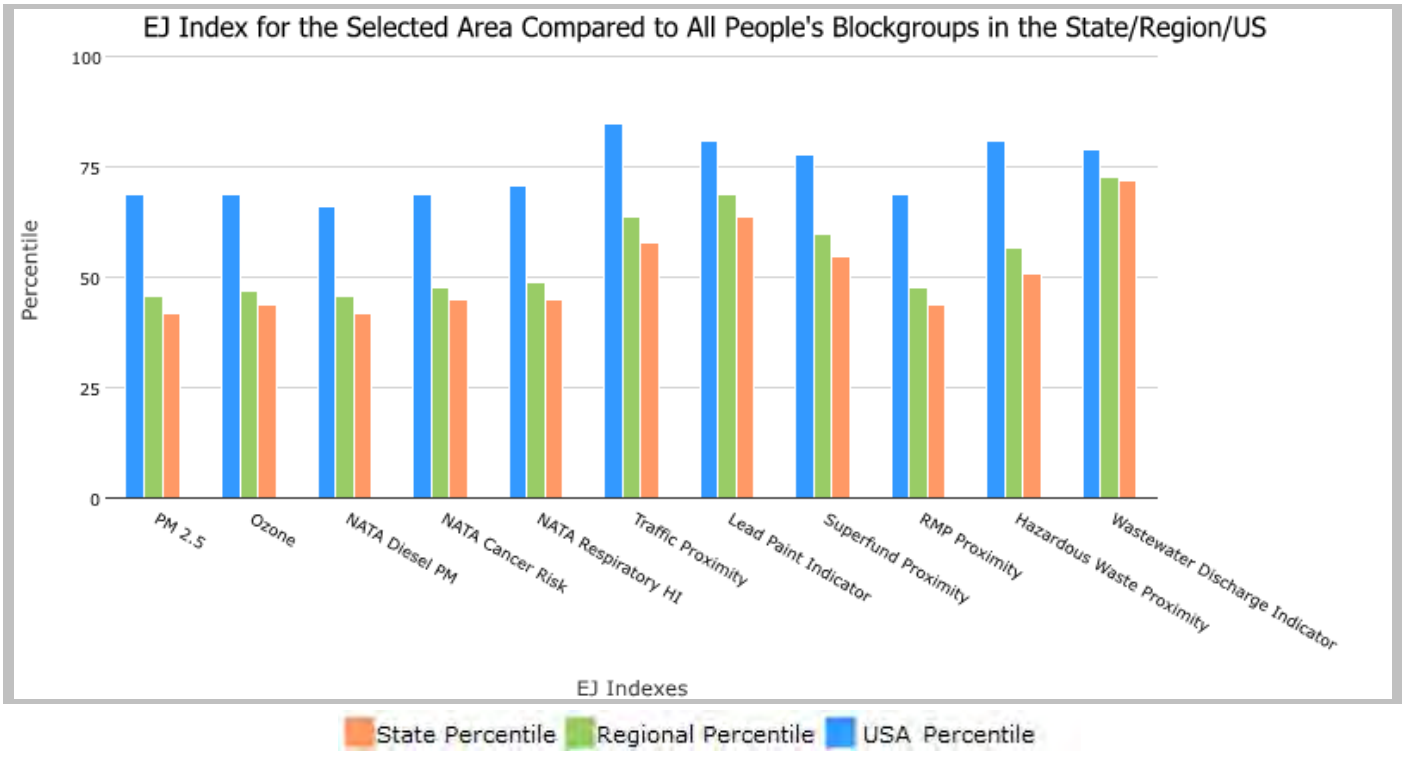
0.75 miles Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 15,767

Input Area (sq. miles): 1.77

EJScreen_0.75 Mile

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	42	46	69
EJ Index for Ozone	44	47	69
EJ Index for NATA* Diesel PM	42	46	66
EJ Index for NATA* Air Toxics Cancer Risk	45	48	69
EJ Index for NATA* Respiratory Hazard Index	45	49	71
EJ Index for Traffic Proximity and Volume	58	64	85
EJ Index for Lead Paint Indicator	64	69	81
EJ Index for Superfund Proximity	55	60	78
EJ Index for RMP Proximity	44	48	69
EJ Index for Hazardous Waste Proximity	51	57	81
EJ Index for Wastewater Discharge Indicator	72	73	79



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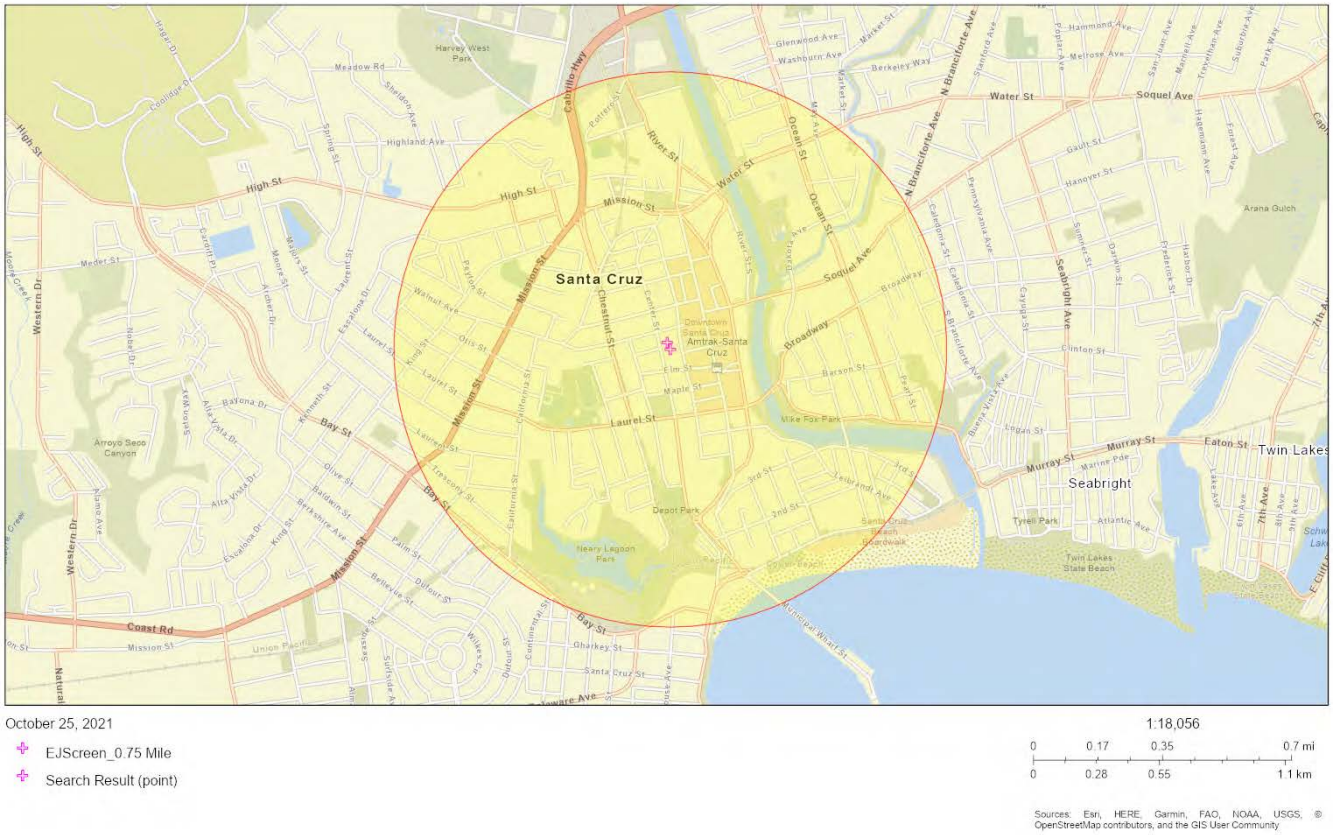
EJSCREEN Report (Version 2020)

0.75 miles Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 15,767

Input Area (sq. miles): 1.77

EJScreen_0.75 Mile



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

EJSCREEN Report (Version 2020)

0.75 miles Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 15,767

Input Area (sq. miles): 1.77

EJScreen_0.75 Mile

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	6.81	10.6	2	9.99	7	8.55	11
Ozone (ppb)	33.3	49.2	9	50.1	7	42.9	6
NATA* Diesel PM (µg/m^3)	0.203	0.467	15	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	26	36	8	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.42	0.55	17	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	2000	2000	70	1700	75	750	91
Lead Paint Indicator (% Pre-1960 Housing)	0.44	0.29	69	0.24	75	0.28	73
Superfund Proximity (site count/km distance)	0.11	0.17	61	0.15	67	0.13	70
RMP Proximity (facility count/km distance)	0.3	1.1	34	0.99	40	0.74	49
Hazardous Waste Proximity (facility count/km distance)	4.5	6.2	49	5.3	57	5	82
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	5E-05	18	61	18	61	9.4	50
Demographic Indicators							
Demographic Index	46%	47%	48	46%	51	36%	70
People of Color Population	42%	62%	26	60%	30	39%	60
Low Income Population	50%	33%	77	33%	76	33%	79
Linguistically Isolated Population	3%	9%	30	8%	35	4%	62
Population With Less Than High School Education	8%	17%	34	16%	36	13%	43
Population Under 5 years of age	4%	6%	24	6%	25	6%	27
Population over 64 years of age	10%	14%	39	14%	38	15%	29

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

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EJSCREEN Report (Version 2020)

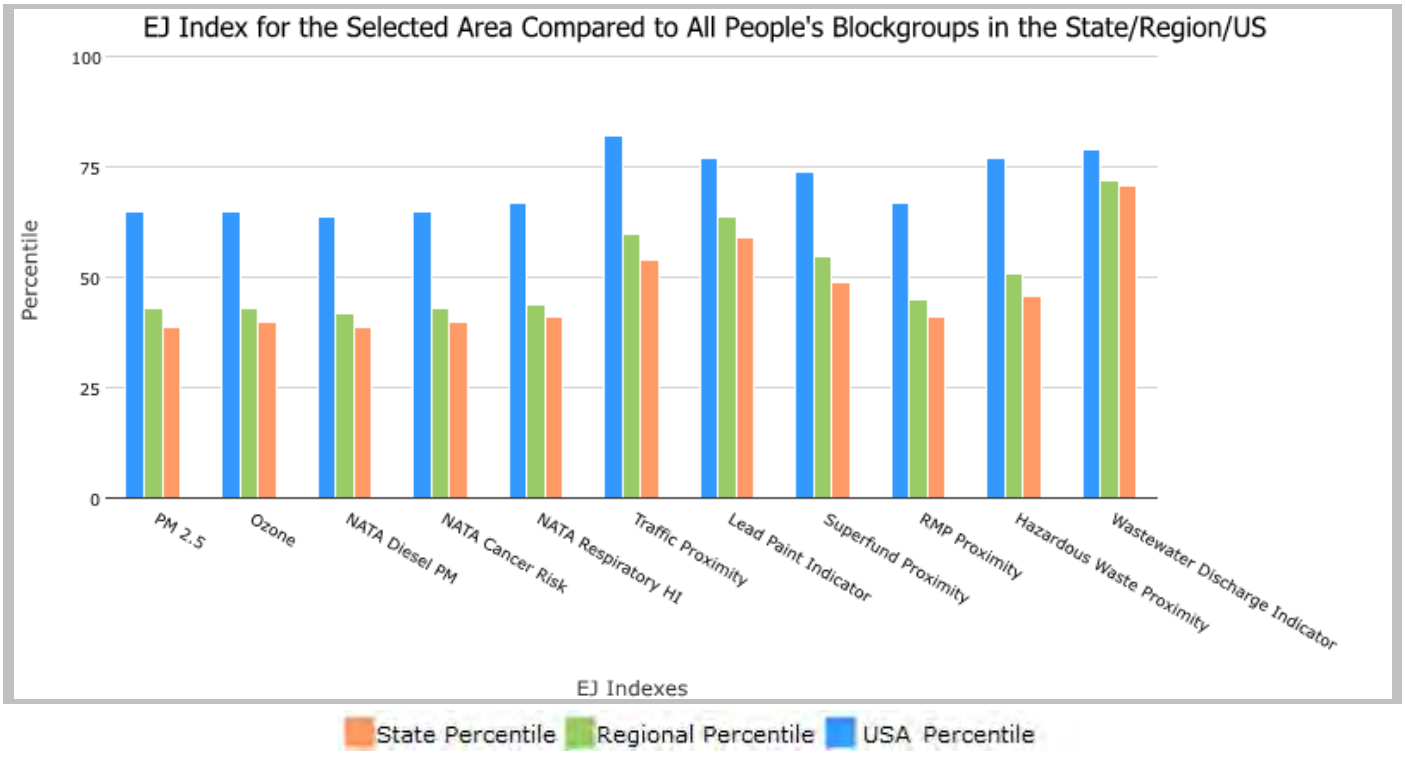
1 mile Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 24,286

Input Area (sq. miles): 3.14

EJScreen_1.0 Mile

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	39	43	65
EJ Index for Ozone	40	43	65
EJ Index for NATA* Diesel PM	39	42	64
EJ Index for NATA* Air Toxics Cancer Risk	40	43	65
EJ Index for NATA* Respiratory Hazard Index	41	44	67
EJ Index for Traffic Proximity and Volume	54	60	82
EJ Index for Lead Paint Indicator	59	64	77
EJ Index for Superfund Proximity	49	55	74
EJ Index for RMP Proximity	41	45	67
EJ Index for Hazardous Waste Proximity	46	51	77
EJ Index for Wastewater Discharge Indicator	71	72	79



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2020)

1 mile Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 24,286

Input Area (sq. miles): 3.14

EJScreen_1.0 Mile

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	3

EJSCREEN Report (Version 2020)

1 mile Ring Centered at 36.971565,-122.027482, CALIFORNIA, EPA Region 9

Approximate Population: 24,286

Input Area (sq. miles): 3.14

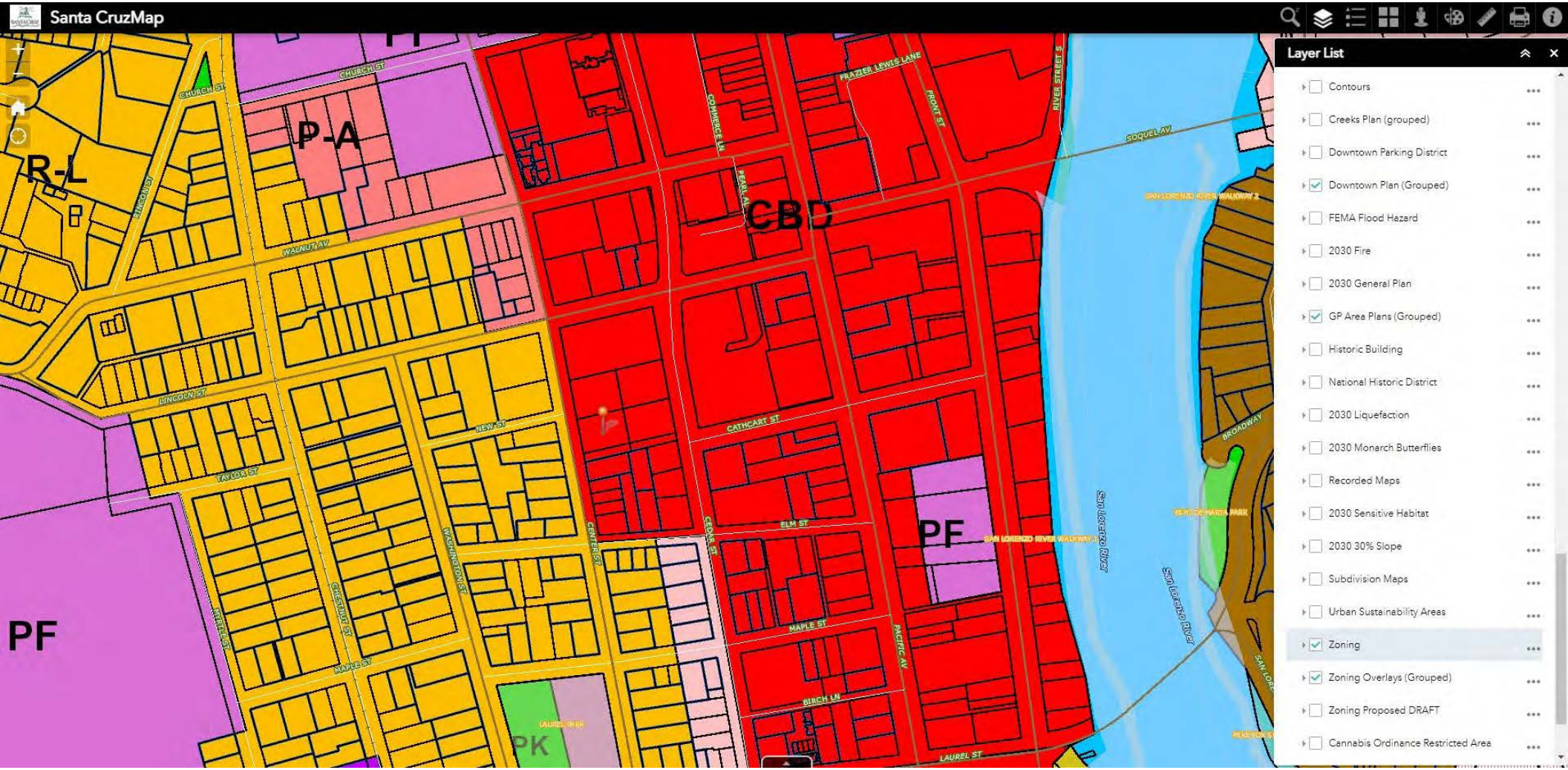
EJScreen_1.0 Mile

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	6.81	10.6	2	9.99	7	8.55	11
Ozone (ppb)	33.3	49.2	9	50.1	7	42.9	6
NATA* Diesel PM (µg/m^3)	0.203	0.467	15	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	26	36	9	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.42	0.55	17	0.53	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	1800	2000	68	1700	73	750	90
Lead Paint Indicator (% Pre-1960 Housing)	0.46	0.29	71	0.24	76	0.28	74
Superfund Proximity (site count/km distance)	0.11	0.17	61	0.15	67	0.13	70
RMP Proximity (facility count/km distance)	0.31	1.1	34	0.99	40	0.74	49
Hazardous Waste Proximity (facility count/km distance)	4.5	6.2	49	5.3	57	5	82
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	5.3E-05	18	61	18	62	9.4	51
Demographic Indicators							
Demographic Index	42%	47%	42	46%	44	36%	66
People of Color Population	39%	62%	23	60%	27	39%	58
Low Income Population	45%	33%	71	33%	71	33%	73
Linguistically Isolated Population	3%	9%	31	8%	36	4%	62
Population With Less Than High School Education	8%	17%	37	16%	39	13%	47
Population Under 5 years of age	4%	6%	26	6%	27	6%	29
Population over 64 years of age	11%	14%	46	14%	46	15%	36

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.


Santa CruzMap
Layer List
Contours
Creeks Plan (grouped)
Downtown Parking District
Downtown Plan (Grouped)
FEMA Flood Hazard
2030 Fire
2030 General Plan
GP Area Plans (Grouped)
Historic Building
National Historic District
2030 Liquefaction
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Recorded Maps
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Zoning
Zoning Overlays (Grouped)
Zoning Proposed DRAFT
Cannabis Ordinance Restricted Area
R-L
P-A
CBD
PF
PK
CHURCH ST
WALNUT AV
LINCOLN ST
TAYLOR ST
NEW ST
CATHCART ST
ELM ST
MAPLE ST
BIRCH LN
LAUREL ST
SOQUEL AV
FRONT ST
RIVER STREET S
COMMERCE LN
PEARL ALLEY
FRAZIER LEWIS LANE
CENTER ST
CEDAR ST
WASHINGTON ST
CHESTNUT ST
PACIFIC AV
BROADWAY
San Lorenzo River
SAN LORENZO RIVER WALKWAY
MEM. DE HARTA PARK
LAUREL PARK

State of California

Tax Credit Allocation Committee

ATTACHMENT 14
Verification of Zoning and Land Use Entitlement Approvals

Agency Name	City of Santa Cruz	Contact Name	Ryan Bane
Address	809 Center St.	Title	Senior Planner
City	Santa Cruz, CA	Email	rbane@cityofsantacruz.com

Project Name	Cedar Street Apartment Homes	Proposed Number of Units:	65
Project Address / Site	538 Centerr St.	Assessor Parcel Number(s):	005-148-17, -18, -21, -22
Project City	Santa Cruz	Census Tract Number(s):	1010
Project County	Santa Cruz		

The entire parcel upon which the above-described low-income project will be located is zoned CBD which allows for multi-family residential development of no greater than N/A units per acre. This project is eligible to apply for a density bonus that would allow a maximum density of N/A units per acre. The project, as proposed, is zoned for the intended use or is existing legal non-conforming.

Please complete the following table and confirm all necessary public or tribal approvals **subject to the discretion of local or tribal elected officials** necessary to begin construction are either finally approved or not applicable by **July 1, 2021** with appeal periods, if any, expired by **July 31, 2021**.

Please note, the following approvals, even if they are discretionary, are not required (by CDLAC and TCAC) to be obtained at the time of the CDLAC and TCAC applications: design review, initial environmental study assessments, variances, and development agreements.

Action	Requirement		Type of Approval Required	Approval Date	Appeal Expiration Date
	Yes/No	Comments			
Streamlined Ministerial Approval (SB35)	No		Select		
Streamlined Approval (AB 2162)	Yes	On 1/26/21 Council approved increase in units by right.	By Right		
Site/Plot Plan Review	No		Select		
Parcel Map	No		Select		
Conditional Use Permit	No		Select		
Variance Approval	No		Select		
Change of Zone	No		Select		
General Plan Amendment	No		Select		
Development Agreement or similar	No		Select		
Phase I Environmental Site Assessment	No		Select		
CEQA Review	No		Select		
Soil and Toxic Reports	No		Select		
Article 34 of State Constitution	No		Select		
Design/Architectural Review	Yes	An Adminstrative Design Permit will be required for approval.	Ministerial		
Coastal Commission	No		Select		
Other:	No		Select		
Other:	No		Select		

As indicated in the table above, the proposed development complies with the general plan and conditional use requirements (if any), and has obtained all applicable local land use approvals.

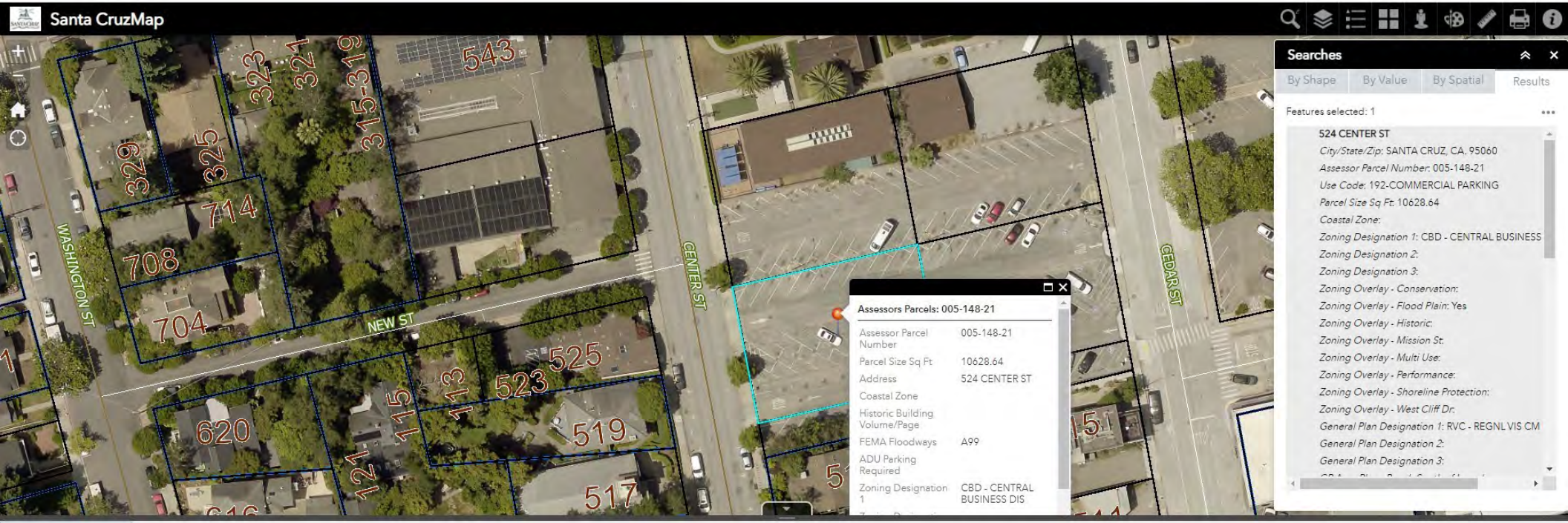
Are you aware of any state/local approvals still required from the Planning Commission, City Council, Board of Supervisors, or other agency for this project?

Yes ■ No □

If yes, please list: An Administrative Design Permit is required for approval at the planning staff level.

Completed By: Ryan Bane
(Signature)

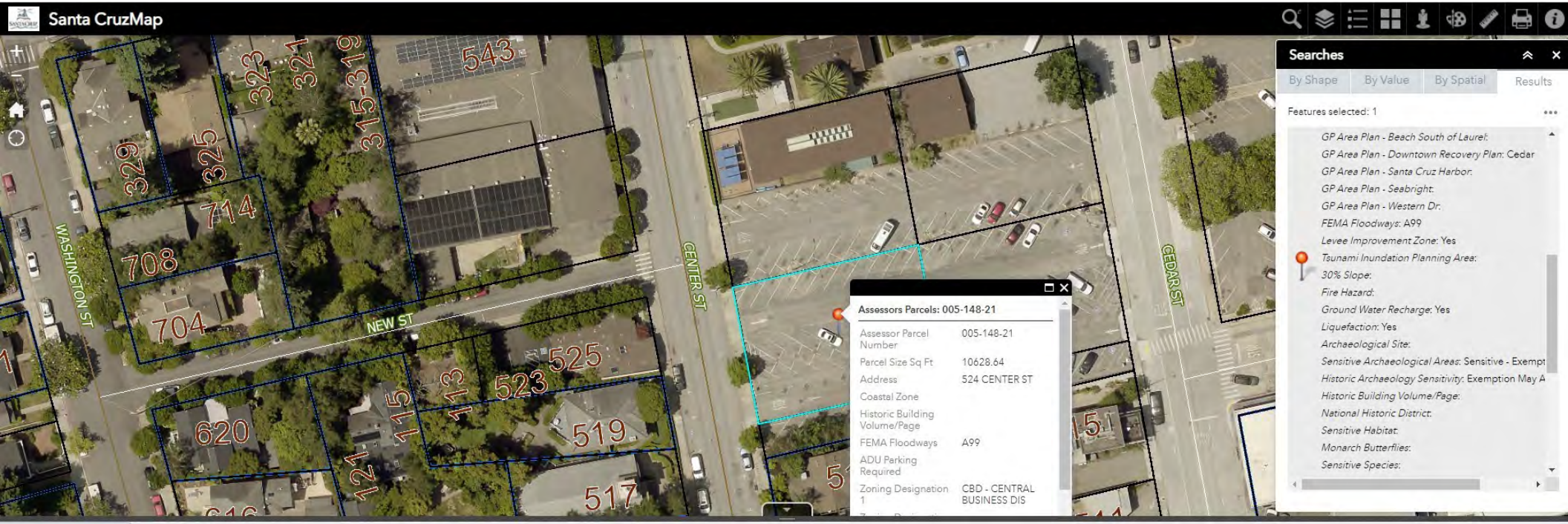
Date: 6-28-21



Search Results: Address

Options | Filter by map extent | Zoom to | Clear selection | Refresh

Assessor Parcel Number	Address	City/State/Zip	Use Code	Parcel Size Sq Ft	Coastal Zone	Zoning Designation 1	Zoning Designation 2	Zoning Designation 3	Zoning Overlay - Conservation	Zoning Overlay - Flood Plain	Zoning Overlay - Historic	Zoning Overlay - Mission St	Zoning Overlay - Multi Use	Zoning Overlay - Performance	Zoning Overlay - Shoreline Protection	Zoning Overlay - West Cliff Dr	General Plan Designation 1	General Plan Designation 2
005-148-21	524 CENTER ST	SANTA CRUZ, CA. 95060	192-COMMERCIAL PARKING	10628.64		CBD - CENTRAL BUSINESS DIS				Yes							RVC - REGNL VIS CM	



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Options | Filter by map extent | Zoom to | Clear selection | Refresh

Assessor Parcel Number	Address	City/State/Zip	Use Code	Parcel Size Sq Ft	Coastal Zone	Zoning Designation 1	Zoning Designation 2	Zoning Designation 3	Zoning Overlay - Conservation	Zoning Overlay - Flood Plain	Zoning Overlay - Historic	Zoning Overlay - Mission St	Zoning Overlay - Multi Use	Zoning Overlay - Performance	Zoning Overlay - Shoreline Protection	Zoning Overlay - West Cliff Dr	General Plan Designation 1	General Plan Designation 2
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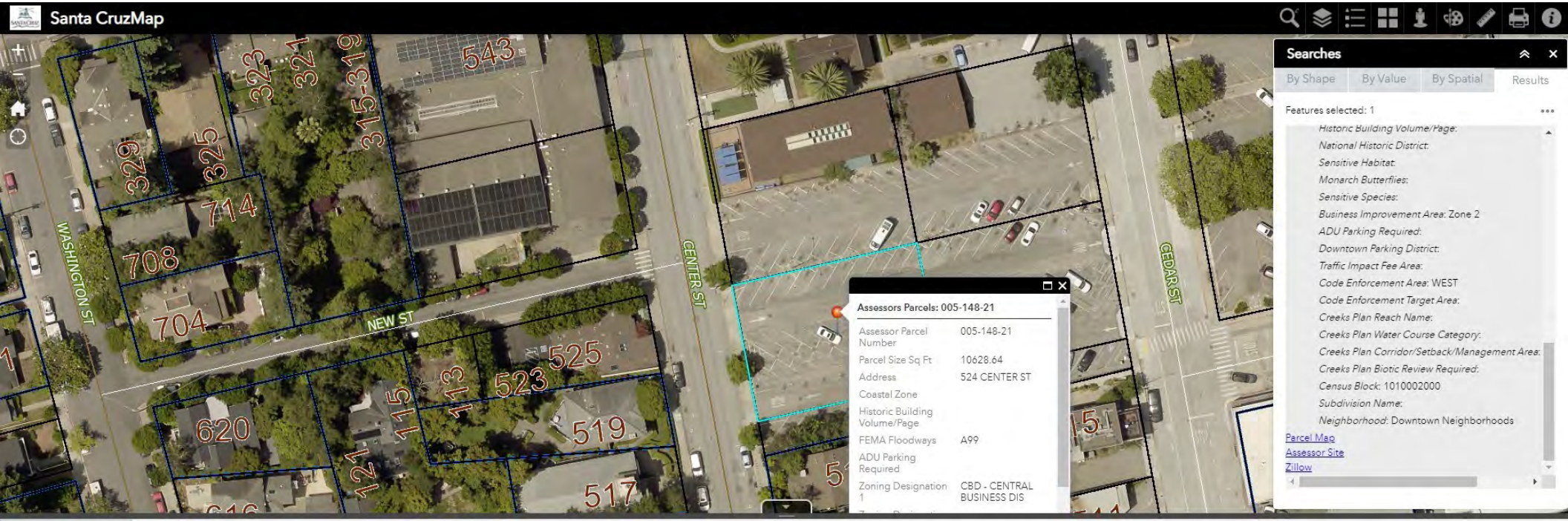

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Options | Filter by map extent | Zoom to | Clear selection | Refresh

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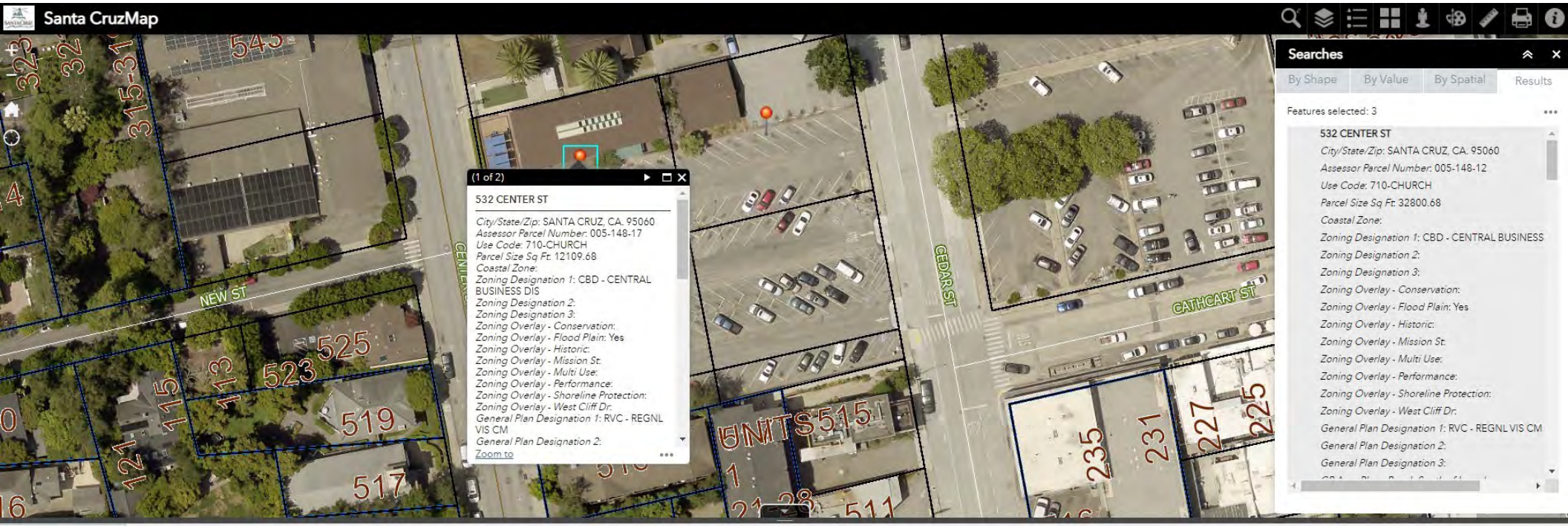
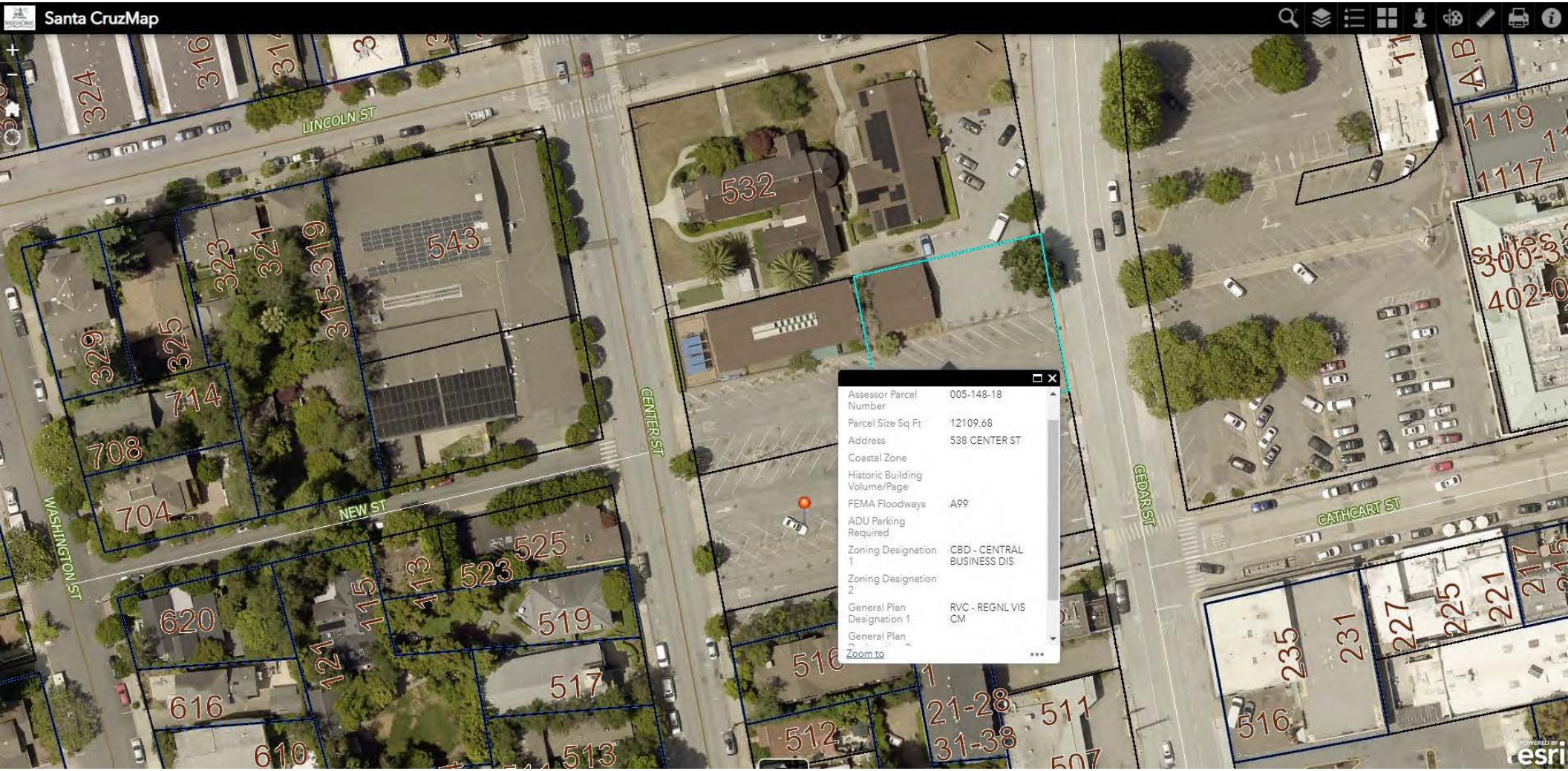
005-148-21	524 CENTER ST	SANTA CRUZ, CA, 95060	192-COMMERCIAL PARKING	10628.64		CBD - CENTRAL BUSINESS DIS				Yes							RVC - REGNL VIS CM	



Search Results: Address

Options | Filter by map extent | Zoom to | Clear selection | Refresh

Assessor Parcel Number	Address	City/State/Zip	Use Code	Parcel Size Sq Ft	Coastal Zone	Zoning Designation 1	Zoning Designation 2	Zoning Designation 3	Zoning Overlay - Conservation	Zoning Overlay - Flood Plain	Zoning Overlay - Historic	Zoning Overlay - Mission St	Zoning Overlay - Multi Use	Zoning Overlay - Performance	Zoning Overlay - Shoreline Protection	Zoning Overlay - West Cliff Dr	General Plan Designation 1	General Plan Designation 2
005-148-17	532 CENTER ST	SANTA CRUZ, CA. 95060	710-CHURCH	12109.68		CBD - CENTRAL BUSINESS DIS				Yes							RVC - REGNL VIS CM	
005-148-18	532 CENTER ST CMN-18	SANTA CRUZ, CA. 95060	711-OTHER CHURCH PROPERTY	12109.68		CBD - CENTRAL BUSINESS DIS				Yes							RVC - REGNL VIS CM	


Santa CruzMap
LINCOLN ST
NEW ST
CENTER ST
CEDAR ST
CATHCART ST
WASHINGTON ST
532
543
315-319
321
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325
329
714
708
704
525
523
519
517
513
512
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616
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121
115
113
1119
1117
A,B
235
231
227
225
221
217
Assessor Parcel Number 005-148-18
Parcel Size Sq Ft 12109.68
Address 538 CENTER ST
Coastal Zone
Historic Building Volume/Page
FEMA Floodways A99
ADU Parking Required
Zoning Designation 1 CBD - CENTRAL BUSINESS DIS
Zoning Designation 2
General Plan Designation 1 RVC - REGNL VIS CM
General Plan
Zoom to
esri

Santa CruzMap
Assessors Parcels: 005-148-22
Assessor Parcel Number 005-148-22
Parcel Size Sq Ft 10672.2
Address
Coastal Zone
Historic Building Volume/Page
FEMA Floodways A99
ADU Parking Required
Zoning Designation 1 CBD - CENTRAL BUSINESS DIS
Zoning Designation 2
General Plan Designation 1 RVC - REGNL VIS CM
Zoom to
WASHINGTON ST
NEW ST
CENTER ST
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UNITS 1
21-28
511
235
231
227
225
221
217
402
esri

General Plan Land Use Designations

SANTA CRUZ 2030

0 0.75 1.5 Miles

City of Santa Cruz
Planning Department
809 Center St. Room 206
Santa Cruz, CA 95060
Ph: 420-5100

The Land Use Diagram is intended to be used in conjunction with the General Plan 2030 Goals, Policies and Programs Document. The document describes the guidelines, standards, and description of the land use designations on the map.

Projection: California State Plane Nad 83 Zone 3 (Feet)

Disclaimer:
City of Santa Cruz has provided this map to allow easy access and a visual display of City in formation. We have made considerable effort to assure the accuracy of the maps and data provided; nevertheless, some information may be inaccurate. The data available includ ing all maps, tables, numbers, graphics, and text (hereinafter collectively referred to as the "information,") is provided on an "AS IS," basis.

City of Santa Cruz shall assume no liability for any errors, omissions or inaccuracies in the in formation provided regardless of how accessed or provided.

Landfill Inset

Monterey Bay

Legend

City Limit
UCSC Campus
Specific or Area Plan Required
Coastal Zone
Sphere of Influence

General Plan Land Use Designations

- Community Commercial
- Regional Visitor Commercial
- Industrial
- Community Facilities
- U.C.S.C. Lands
- Coastal Dependent
- Coastal Recreation
- Agriculture / Grazing
- Parks
- Natural Areas
- Very Low Density Residential (.1-1 DU/Acre)
- Low Density Residential (1.1-10 DU/acre)
- Low Medium Density Residential (10.1-20 DU/acre)
- Medium Density Residential (20.1-30 DU/acre)
- High Density Residential (30.1-55 DU/acre)
- Mixed-Use High Density (MXHD), 1.0 to 2.75 FAR, 10 to 55 DU/AC
- Mixed-Use Medium Density (MXMD), 0.75 to 1.75 FAR, 10 to 30 DU/AC
- Mixed-Use Visitor Commercial (MXVC), 1.0 to 2.75 FAR, 0 to 55 DU/AC
- Neighborhood Commercial
- Office

Santa CruzMap
Layer List
Downtown Plan (Grouped)
FEMA Flood Hazard
2030 Fire
2030 General Plan
Very Low Density Residential (.1-1 DU/Acre)
Mixed-Use Visitor Commercial (MXVC), 1.0 to 2.75 FAR, 0 to 55 DU/AC
Mixed-Use High Density (MXHD), 1.0 to 2.75 FAR, 10 to 55 DU/AC
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Parks/Community Facilities
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GP Area Plans (Grouped)
Historic Building
National Historic District
2030 Liquefaction
CHURCH ST
LINCOLN ST
WALNUT AV
COMMERCE LN
PEARL AL
FRAZIER LEWIS LANE
FRONT ST
RIVER STREET S
SOQUEL AV
PACIFIC AV
CATHCART ST
ELM ST
CEDAR ST
CENTER ST
WASHINGTON ST
CHESTNUT ST
MAPLE ST
BIRCH LN
LAUREL ST
NEW ST
TAYLOR ST
CRYSTAL TE
RVC
NA
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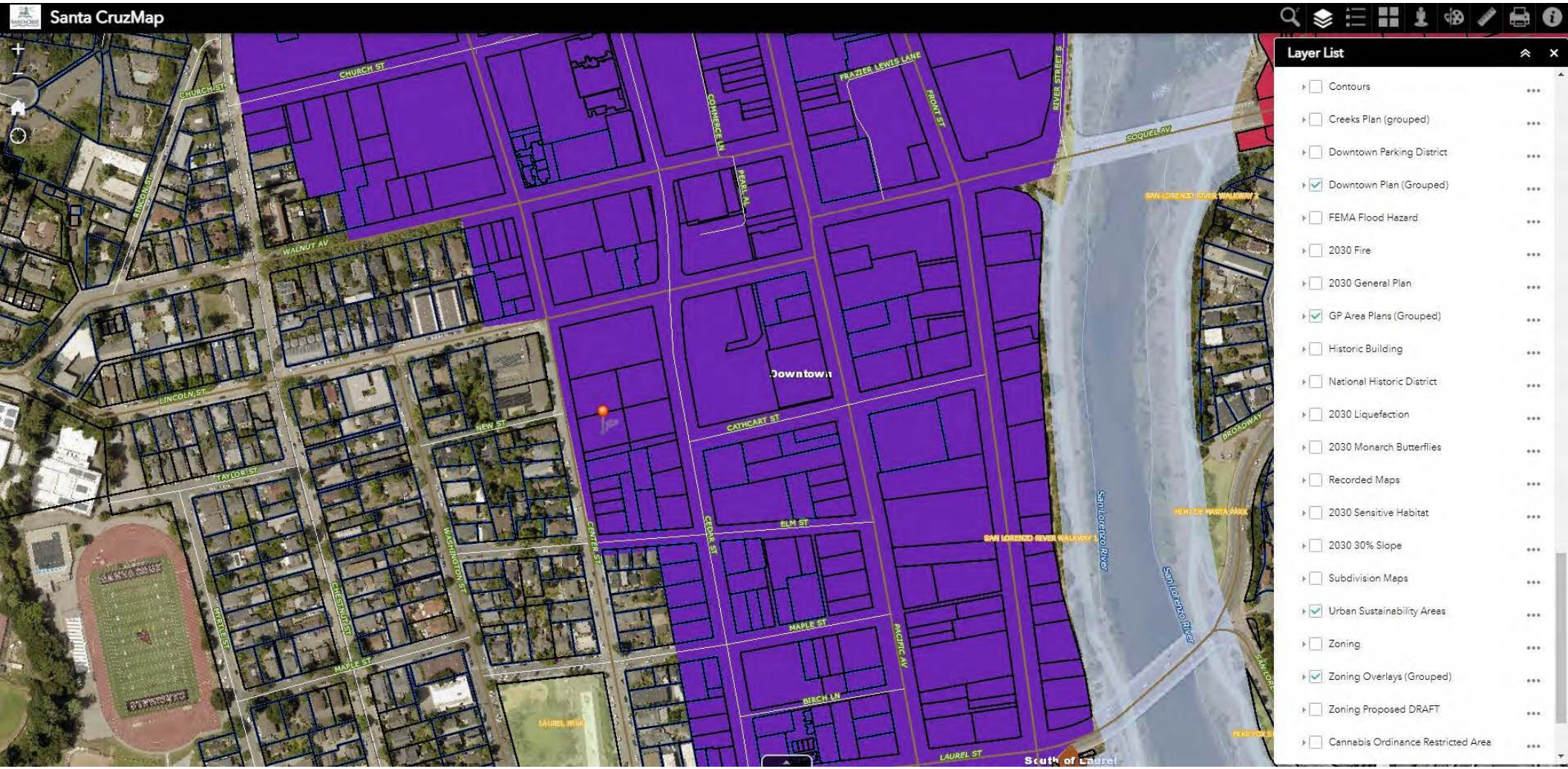
PK
San lorenzo River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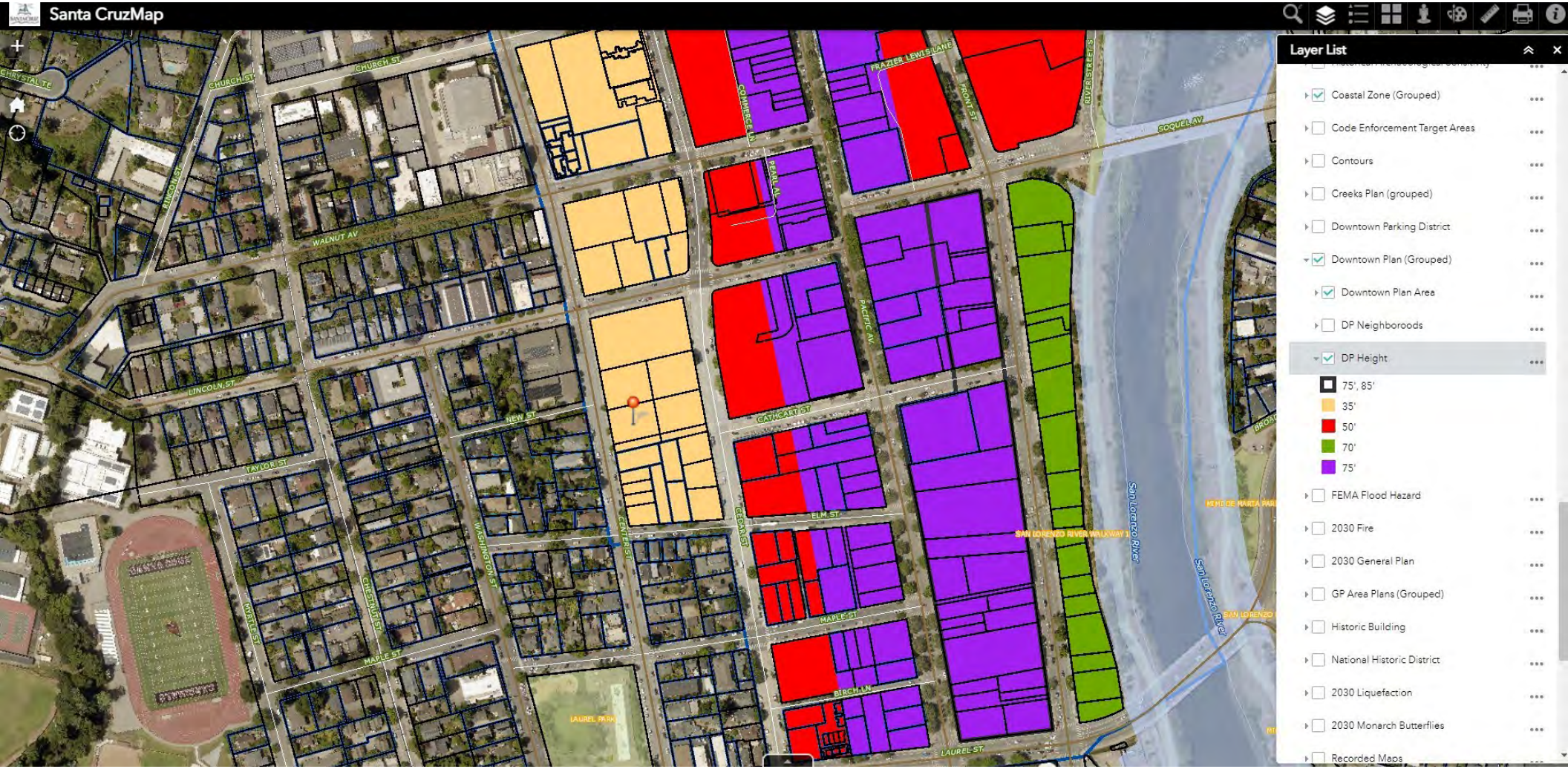
SOQUEL AV
BROADWAY
CEDAR ST
CENTER ST
WASHINGTON ST
CHESTNUT ST
WATER ST
PACIFIC AV
San Lorenzo River
SAN LORENZO RIVER WALKWAY
HENRY DE MARTA PARK
South of Laurel


Santa CruzMap
Layer List
Coastal Zone (Grouped)
Code Enforcement Target Areas
Contours
Creeks Plan (grouped)
Downtown Parking District
Downtown Plan (Grouped)
Downtown Plan Area
DP Neighboroods
DP Height
75', 85'
35'
50'
70'
75'
FEMA Flood Hazard
2030 Fire
2030 General Plan
GP Area Plans (Grouped)
Historic Building
National Historic District
2030 Liquefaction
2030 Monarch Butterflies
Recorded Maps
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WALNUT AV
LINCOLN ST
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MAPLE ST
CHESTNUT ST
WASHINGTON ST
CENTER ST
CEDAR ST
ELM ST
BIRCH LN
LAUREL ST
CATHCART ST
PACIFIC AV
COMMERCE LN
PEARL ALY
FRAZIER LEWIS LANE
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RIVER STREET PS
SOQUEL AV
San Lorenzo River
SAN LORENZO RIVER WALKWAY
LAUREL PARK

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Bird Development Standards
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SOQUEL AV
PACIFIC AV
RIVER STREET S
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CATHCART ST
NEW ST
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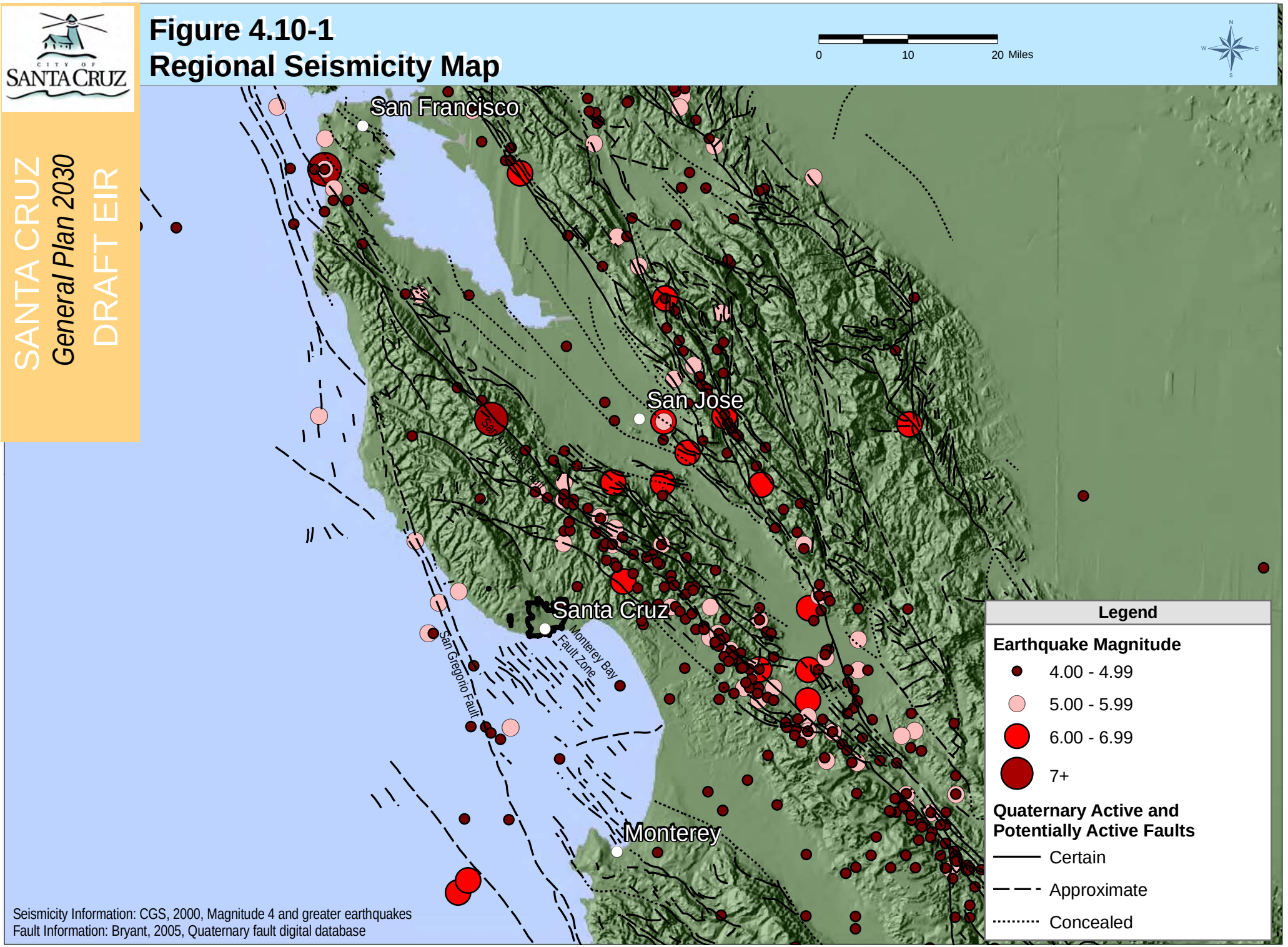
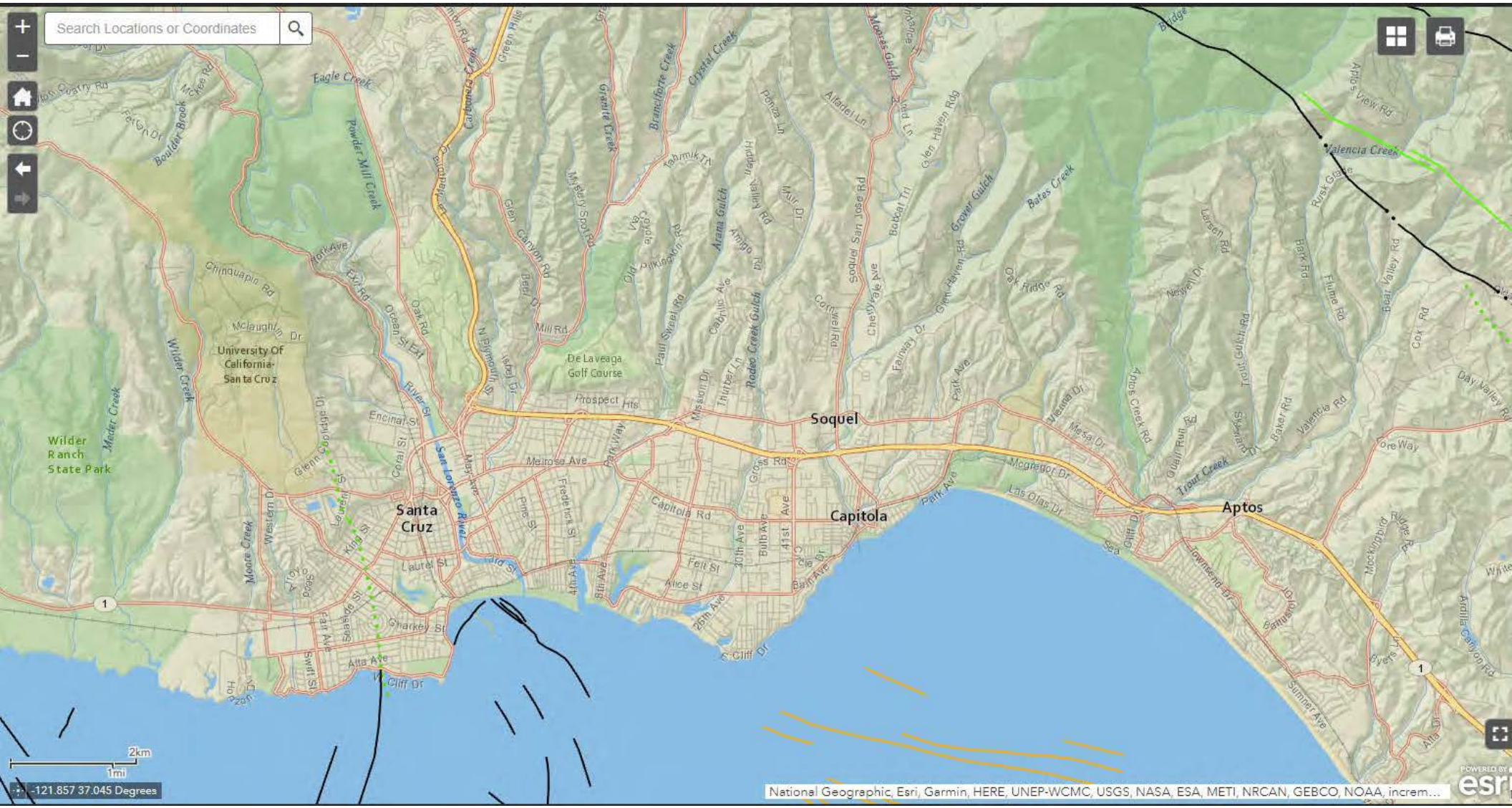
LAUREL PARK
CENTER ST
WASHINGTON ST
CEDAR ST
CHESTNUT ST
MYRTLE ST
San Lorenzo River
SAN LORENZO RIVER WALKWAY

SANTA CRUZ
General Plan 2030
DRAFT EIR

Figure 4.10-1
Regional Seismicity Map



Seismicity Information: CGS, 2000, Magnitude 4 and greater earthquakes
Fault Information: Bryant, 2005, Quaternary fault digital database


Search Locations or Coordinates
Soquel
Capitola
Santa Cruz
Aptos
University Of California-Santa Cruz
De Laveaga Golf Course
Wilder Ranch State Park
Prospect Hts
Eagle Creek
Powder Mill Creek
Granite Creek
Branciforte Creek
Crystal Creek
Arana Gulch
Rodeo Creek Gulch
Bates Creek
Grover Gulch
Valencia Creek
Soquel Creek
Wilder Creek
Moore Creek
Meder Creek
San Lorenzo River
Capitola Rd
Soquel Dr
Mar Vista Dr
Park Ave
Bay Ave
Cliff Dr
Mission St
Freedom Blvd
Chinquapin Rd
Mill Rd
Ocean St Ext
Bates Creek Rd
Valencia Rd
Aptos Creek Rd
Trout Gulch Rd
Day Valley Rd
Las Olas Dr
Townsend Dr
Summer Ave
Ardilla Canyon Rd
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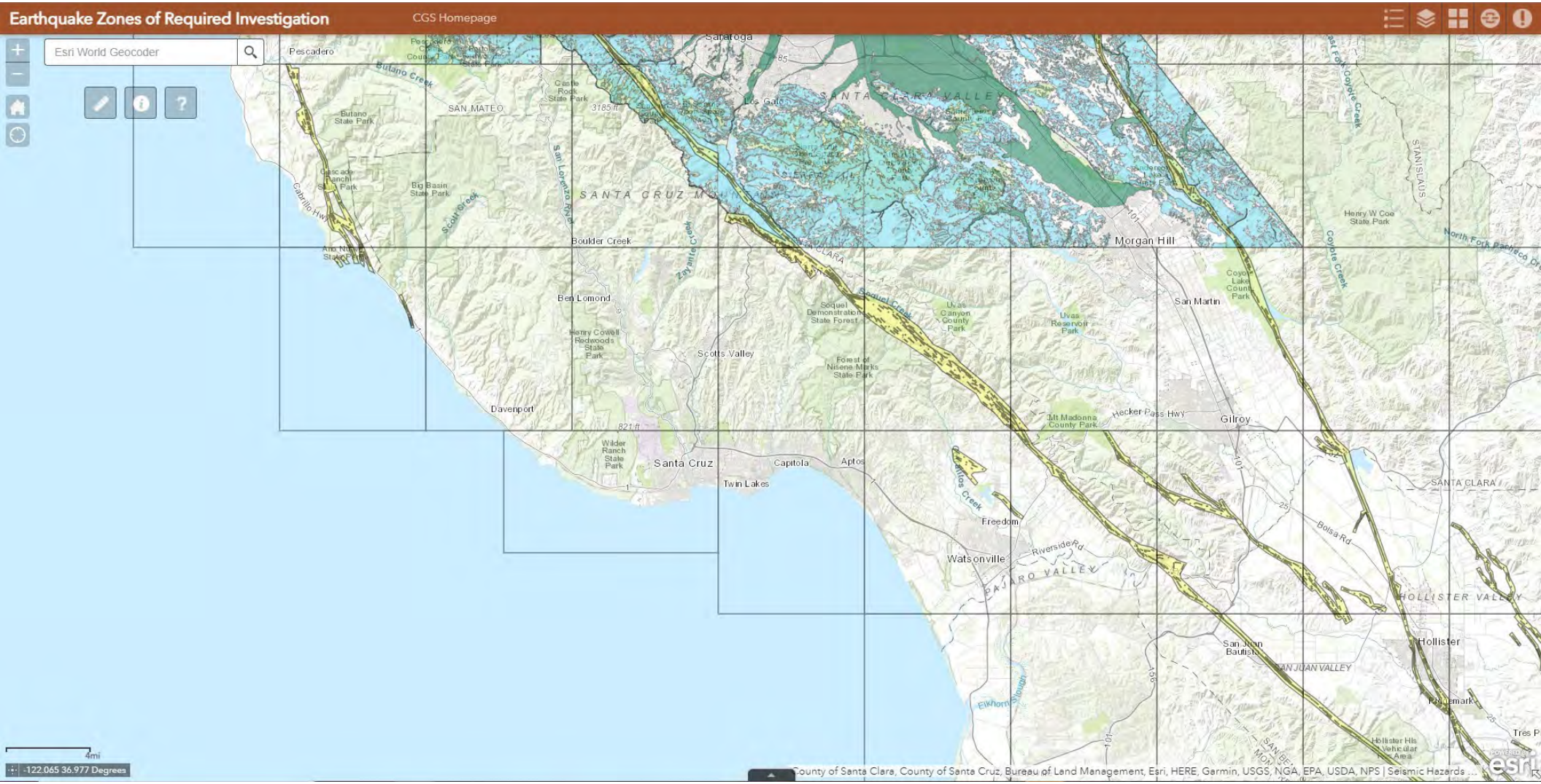
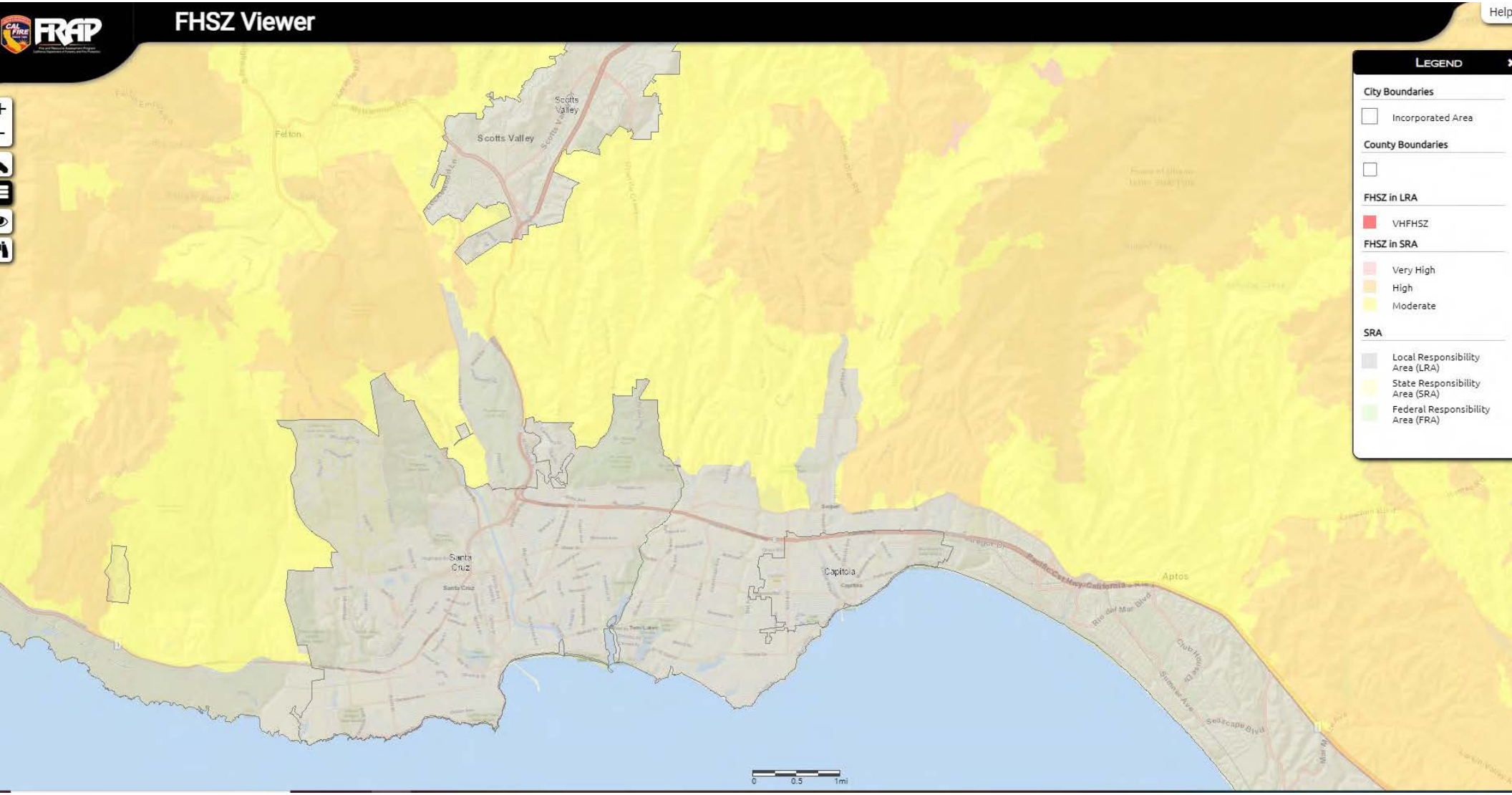
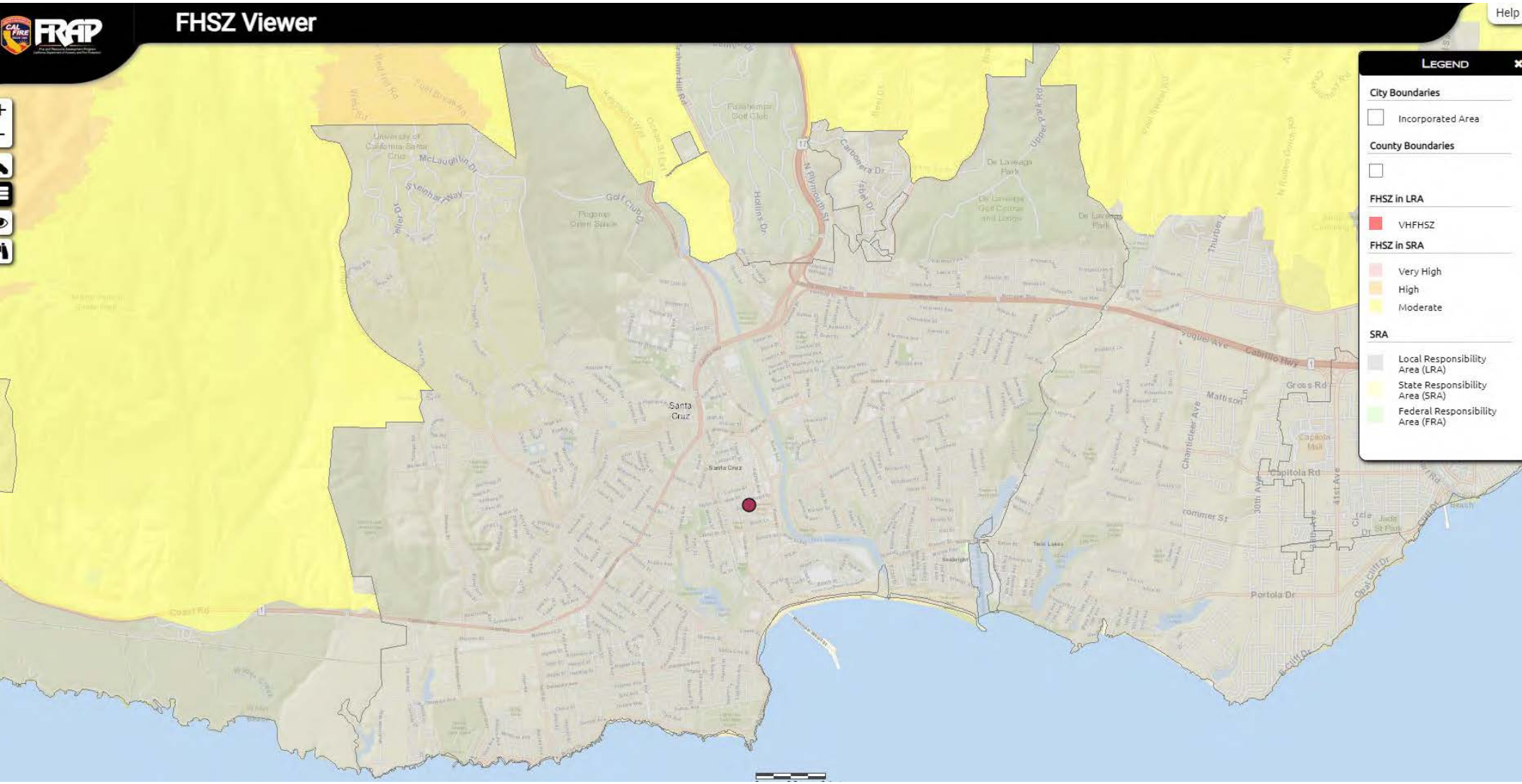
National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increm...
esri


Earthquake Zones of Required Investigation
CGS Homepage
Esri World Geocoder
Pescadero
Butano Creek
SAN MATEO
Butano State Park
Castle Rock State Park
3185 ft
Saratoga
Los Gatos
SANTA CLARA VALLEY
Big Basin State Park
Scott Creek
San Lorenzo River
SANTA CRUZ MOUNTAINS
Boulder Creek
Zayante Creek
Ben Lomond
Henry Cowell Redwoods State Park
Scotts Valley
Soquel Demonstration State Forest
Soquel Creek
Uvas Canyon County Park
Uvas Reservoir Park
Forest of Nisene Marks State Park
Davenport
821 ft
Wilder Ranch State Park
Santa Cruz
Capitola
Aptos
Twin Lakes
Morgan Hill
San Martin
Coyote Creek
Coyote Lake County Park
Henry W Coe State Park
Mt Madonna County Park
Hecker Pass Hwy
Gilroy
Pajaro River
Freedom
Watsonville
Riverside Dr
PAJARO VALLEY
SANTA CLARA
Bolsa Rd
HOLLISTER VALLEY
Hollister
San Juan Bautista
SAN JUAN VALLEY
Elkhorn Slough
4mi
-122.065 36.977 Degrees
County of Santa Clara, County of Santa Cruz, Bureau of Land Management, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS | Seismic Hazards ...
esri

Santa CruzMap
Layer List
Downtown Plan (Grouped)
FEMA Flood Hazard
2030 Fire
2030 General Plan
GP Area Plans (Grouped)
Historic Building
National Historic District
2030 Liquefaction
2030 Monarch Butterflies
Recorded Maps
2030 Sensitive Habitat
2030 30% Slope
Subdivision Maps
Urban Sustainability Areas
Zoning
Zoning Overlays (Grouped)
Zoning Proposed DRAFT
Cannabis Ordinance Restricted Area
Revised Density Bonus 100% Affordable
Bird Development Standards
ADU Parking Required
CHURCH ST
WALNUT AV
LINCOLN ST
LINCOLN ST
TAYLOR ST
NEW ST
CATHCART ST
ELM ST
MAPLE ST
MAPLE ST
LAUREL ST
BIRCH LN
COMMERCIAL
PEARL ALY
PACIFIC AV
FRONT ST
RIVER STREET S
FRAZIER LEWIS LANE
SOQUEL AV
WASHINGTON ST
CENTER ST
GEDDA ST
CHESTNUT ST
MYRTLE ST
LAUREL PARK
SAN LORENZO RIVER WALKWAY
San Lorenzo River
San Lorenzo River


FHSZ Viewer
Help
Legend
City Boundaries
Incorporated Area
County Boundaries
FHSZ in LRA
VHFHSZ
FHSZ in SRA
Very High
High
Moderate
SRA
Local Responsibility Area (LRA)
State Responsibility Area (SRA)
Federal Responsibility Area (FRA)
Scotts Valley
Felton
Santa Cruz
Capitola
Aptos
0
0.5
1mi


FHSZ Viewer
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City Boundaries
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County Boundaries
FHSZ in LRA
VHFHSZ
FHSZ in SRA
Very High
High
Moderate
SRA
Local Responsibility Area (LRA)
State Responsibility Area (SRA)
Federal Responsibility Area (FRA)
Santa Cruz
Portola Dr
Capitola Rd
Soquel Ave
Cabrillo Hwy
Gross Rd
Mattison
Chanticleer Ave
30th Ave
41st Ave
Coast Rd
Golf Club Dr
McLaughlin Dr
Harbor
Beach

Santa CruzMap
Layer List
2030 Archaeological Areas
Historical Archaeological Sensitivity
Coastal Zone (Grouped)
Code Enforcement Target Areas
Contours
Creeks Plan (grouped)
Downtown Parking District
Downtown Plan (Grouped)
FEMA Flood Hazard
2030 Fire
2030 General Plan
GP Area Plans (Grouped)
Historic Building
National Historic District
2030 Liquefaction
2030 Monarch Butterflies
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CHURCH ST
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MAPLE ST
NEW ST
ELM ST
CATHCART ST
LAUREL ST
BIRCH LN
FRAZIER LEWIS LANE
FRONT ST
RIVER STREET S
COMMERCE LN
PEARL AL
WASHINGTON ST
CENTER ST
CEDAR ST
CHESTNUT ST
WINKLE ST
PACIFIC AV
LAUREL PARK
SANTA CRUZ HIGH
CHRYSTAL TE
TOWNE TE
CALIFORNIA ST
WEEKS AV
RIGGS ST

Map Scale: 1:523 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 5
- 5 - 15
- 15 - 45
- 45 - 60
- 60 - 100
- Not rated or not available

Soil Rating Lines

- 0 - 5
- 5 - 15
- 15 - 45
- 45 - 60
- 60 - 100
- Not rated or not available

Soil Rating Points

- 0 - 5
- 5 - 15
- 15 - 45
- 45 - 60
- 60 - 100
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Santa Cruz County, California
Survey Area Data: Version 15, Sep 9, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 13, 2020—Apr 24, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Representative Slope

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
104	Baywood loamy sand, 0 to 2 percent slopes	1.0	0.8	100.0%
Totals for Area of Interest			**0.8**	**100.0%**

Description

Slope gradient is the difference in elevation between two points, expressed as a percentage of the distance between those points.

The slope gradient is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: percent

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

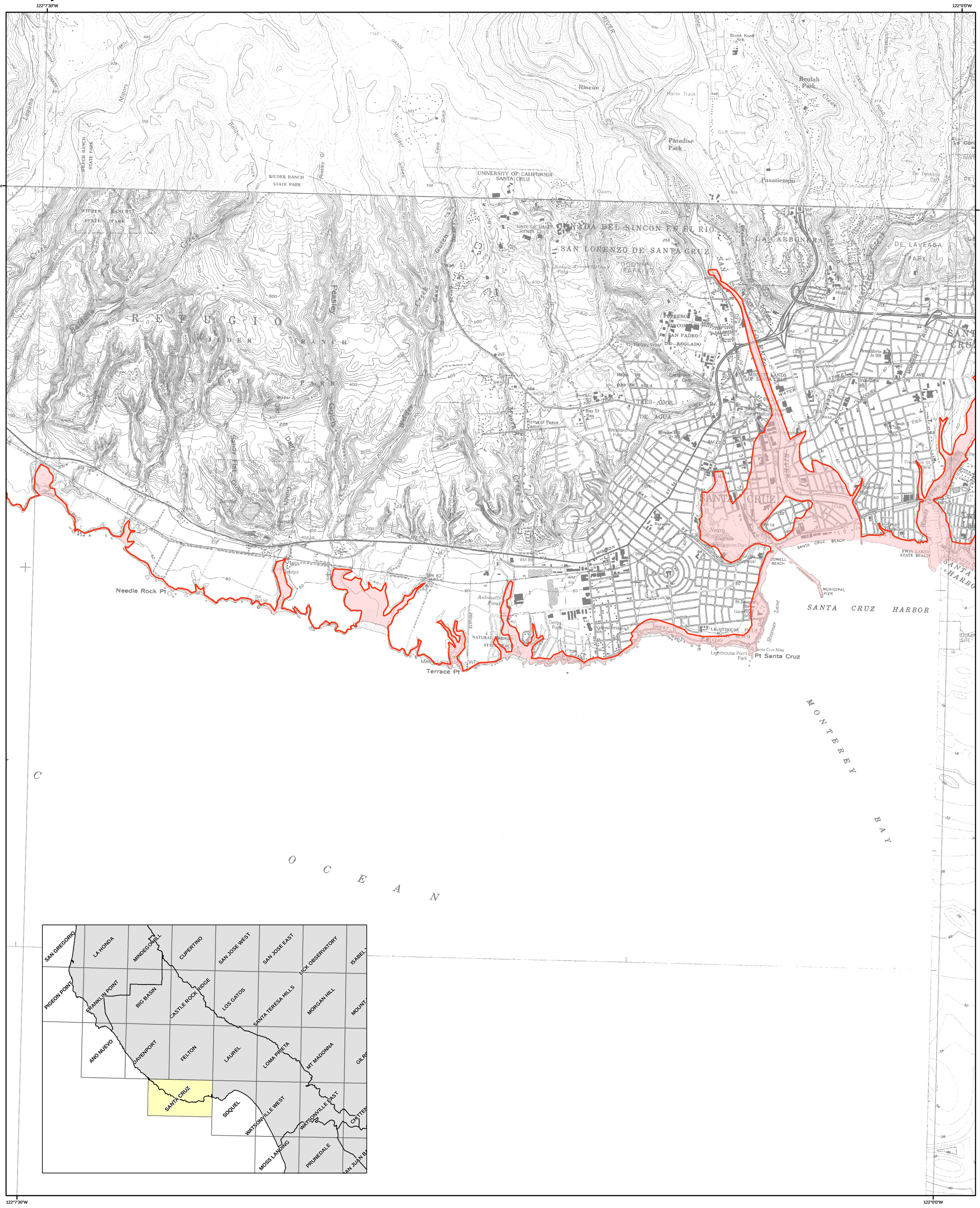
Tie-break Rule: Higher

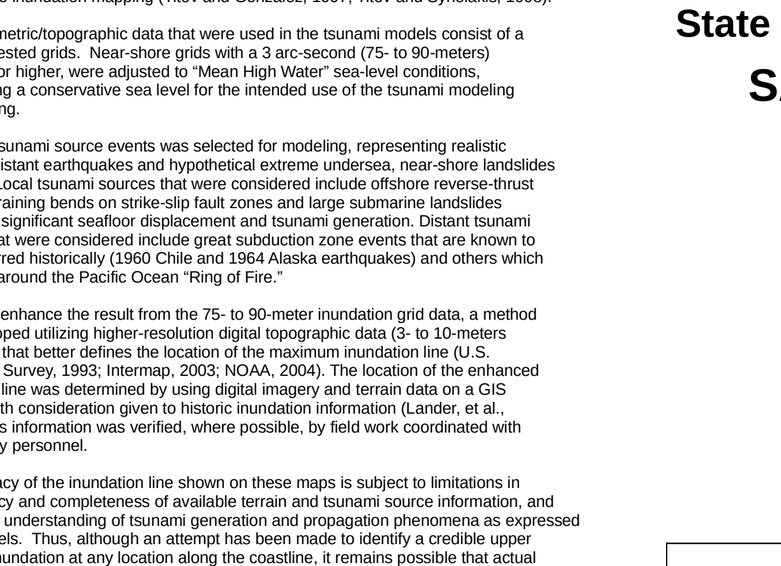
Interpret Nulls as Zero: No

California Emergency Management Agency
California Geological Survey
University of Southern California

Tsunami Inundation Map for Emergency Planning
Santa Cruz Quadrangle

State of California
County of Santa Cruz





METHOD OF PREPARATION

Initial tsunami modeling was performed by the University of Southern California (USC) Tsunami Research Center funded through the California Emergency Management Agency (CalEMA) by the National Tsunami Hazard Mitigation Program. The tsunami modeling process utilized the MOST (Method of Splitting Tsunamis) computational program (Version 0), which allows for wave evolution over a variable bathymetry and topography used for the inundation mapping (Titov and Gonzalez, 1997; Titov and Synolakis, 1998).

The bathymetric/topographic data that were used in the tsunami models consist of a series of nested grids. Near-shore grids with a 3 arc-second (75- to 90-meters) resolution or higher, were adjusted to "Mean High Water" sea-level conditions, representing a conservative sea level for the intended use of the tsunami modeling and mapping.

A suite of tsunami source events was selected for modeling, representing realistic local and distant earthquakes and hypothetical extreme undersea, near-shore landslides (Table 1). Local tsunami sources that were considered include offshore reverse-thrust faults, restraining bends on strike-slip fault zones and large submarine landslides capable of significant seafloor displacement and tsunami generation. Distant tsunami sources that were considered include great subduction zone events that are known to have occurred historically (1960 Chile and 1964 Alaska earthquakes) and others which can occur around the Pacific Ocean "Ring of Fire."

In order to enhance the result from the 75- to 90-meter inundation grid data, a method was developed utilizing higher-resolution digital topographic data (3- to 10-meters resolution) that better defines the location of the maximum inundation line (U.S. Geological Survey, 1993; Intermap, 2003; NOAA, 2004). The location of the enhanced inundation line was determined by using digital imagery and terrain data on a GIS platform with consideration given to historic inundation information (Lander, et al., 1993). This information was verified, where possible, by field work coordinated with local county personnel.

The accuracy of the inundation line shown on these maps is subject to limitations in the accuracy and completeness of available terrain and tsunami source information, and the current understanding of tsunami generation and propagation phenomena as expressed in the models. Thus, although an attempt has been made to identify a credible upper bound to inundation at any location along the coastline, it remains possible that actual inundation could be greater in a major tsunami event.

This map does not represent inundation from a single scenario event. It was created by combining inundation results for an ensemble of source events affecting a given region (Table 1). For this reason, all of the inundation region in a particular area will not likely be inundated during a single tsunami event.

References:

Intermap Technologies, Inc., 2003, Intermap product handbook and quick start guide: Intermap NEXTmap document on 5-meter resolution data, 112 p.

Lander, J.F., Lockridge, P.A., and Kozuch, M.J., 1993, Tsunamis Affecting the West Coast of the United States 1806-1992: National Geophysical Data Center Key to Geophysical Record Documentation No. 29, NOAA, NESDIS, NGDC, 242 p.

National Atmospheric and Oceanic Administration (NOAA), 2004, Interferometric Synthetic Aperture Radar (IfSAR) Digital Elevation Models from GeoSAR platform (EarthData): 3-meter resolution data.

Titov, V.V., and Gonzalez, F.I., 1997, Implementation and Testing of the Method of Tsunami Splitting (MOST): NOAA Technical Memorandum ERL PMEL – 112, 11 p.

Titov, V.V., and Synolakis, C.E., 1998, Numerical modeling of tidal wave runup: Journal of Waterways, Port, Coastal and Ocean Engineering, ASCE, 124 (4), pp 157-171.

U.S. Geological Survey, 1993, Digital Elevation Models: National Mapping Program, Technical Instructions, Data Users Guide 5, 48 p.

TSUNAMI INUNDATION MAP FOR EMERGENCY PLANNING

State of California ~ County of Santa Cruz

SANTA CRUZ QUADRANGLE

July 1, 2009

SCALE 1:24,000

0.5 0.25 0 0.5 1 Miles

1,000 500 0 1,000 2,000 3,000 4,000 5,000 Feet

0.5 0.25 0 0.5 1 Kilometers

Table 1: Tsunami sources modeled for the Santa Cruz County coastline.

Sources (M = moment magnitude used in modeled event)		Areas of Inundation Map Coverage and Sources Used		
		Pescadero	Santa Cruz	Monterey Bay Big
Local Source	Monterey Canyon Landslide			X
Distant Sources	Cascadia Subduction Zone-full rupture (M9.0)		X	
	Central Aleutians Subduction Zone #1 (M8.9)	X	X	X
	Central Aleutians Subduction Zone #2 (M8.9)		X	
	Central Aleutians Subduction Zone #3 (M9.2)	X		X
	Chile North Subduction Zone (M9.4)		X	
	1960 Chile Earthquake (M9.3)		X	
	1964 Alaska Earthquake (M9.2)	X	X	X
	Japan Subduction Zone #2 (M8.8)		X	
	Kuril Islands Subduction Zone #2 (M8.8)		X	
	Kuril Islands Subduction Zone #3 (M8.8)		X	
	Kuril Islands Subduction Zone #4 (M8.8)		X	
	Marianas Subduction Zone (M8.6)	X		X

Cal EMA CALIFORNIA EMERGENCY MANAGEMENT AGENCY

CGS CALIFORNIA GEOLOGICAL SURVEY

USC UNIVERSITY OF SOUTHERN CALIFORNIA

MAP EXPLANATION

Tsunami Inundation Line

Tsunami Inundation Area

PURPOSE OF THIS MAP

This tsunami inundation map was prepared to assist cities and counties in identifying their tsunami hazard. It is intended for local jurisdictional, coastal evacuation planning uses only. This map, and the information presented herein, is not a legal document and does not meet disclosure requirements for real estate transactions nor for any other regulatory purpose.

The inundation map has been compiled with best currently available scientific information. The inundation line represents the maximum considered tsunami runup from a number of extreme, yet realistic, tsunami sources. Tsunamis are rare events; due to a lack of known occurrences in the historical record, this map includes no information about the probability of any tsunami affecting any area within a specific period of time.

Please refer to the following websites for additional information on the construction and/or intended use of the tsunami inundation map:

State of California Emergency Management Agency, Earthquake and Tsunami Program:
http://www.oes.ca.gov/WebPage/oeswebsite.nsf/Content/B1EC51BA215931768825741F005E8D80?OpenDocument

University of Southern California – Tsunami Research Center:
http://www.usc.edu/dept/tsunamis/2005/index.php

State of California Geological Survey Tsunami Information:
http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/index.htm

National Oceanic and Atmospheric Agency Center for Tsunami Research (MOST model):
http://nctr.pmel.noaa.gov/time/background/models.html

MAP BASE

Topographic base maps prepared by U.S. Geological Survey as part of the 7.5-minute Quadrangle Map Series (originally 1:24,000 scale). Tsunami inundation line boundaries may reflect updated digital orthophotographic and topographic data that can differ significantly from contours shown on the base map.

DISCLAIMER

The California Emergency Management Agency (CalEMA), the University of Southern California (USC), and the California Geological Survey (CGS) make no representation or warranties regarding the accuracy of this inundation map nor the data from which the map was derived. Neither the State of California nor USC shall be liable under any circumstances for any direct, indirect, special, incidental or consequential damages with respect to any claim by any user or any third party on account of or arising from the use of this map.

Google

Santa Cruz Medical Facilities

Sign in

Rating ▾ Hours ▾

Santa Cruz Health Center
3.6 ★★★½☆ (7) · Community h...
1080 Emeline Ave
Closed · Opens 9AM Wed · (831) ...
"Their integrated system keeps my medical team of my...
WEBSITE DIRECTIONS

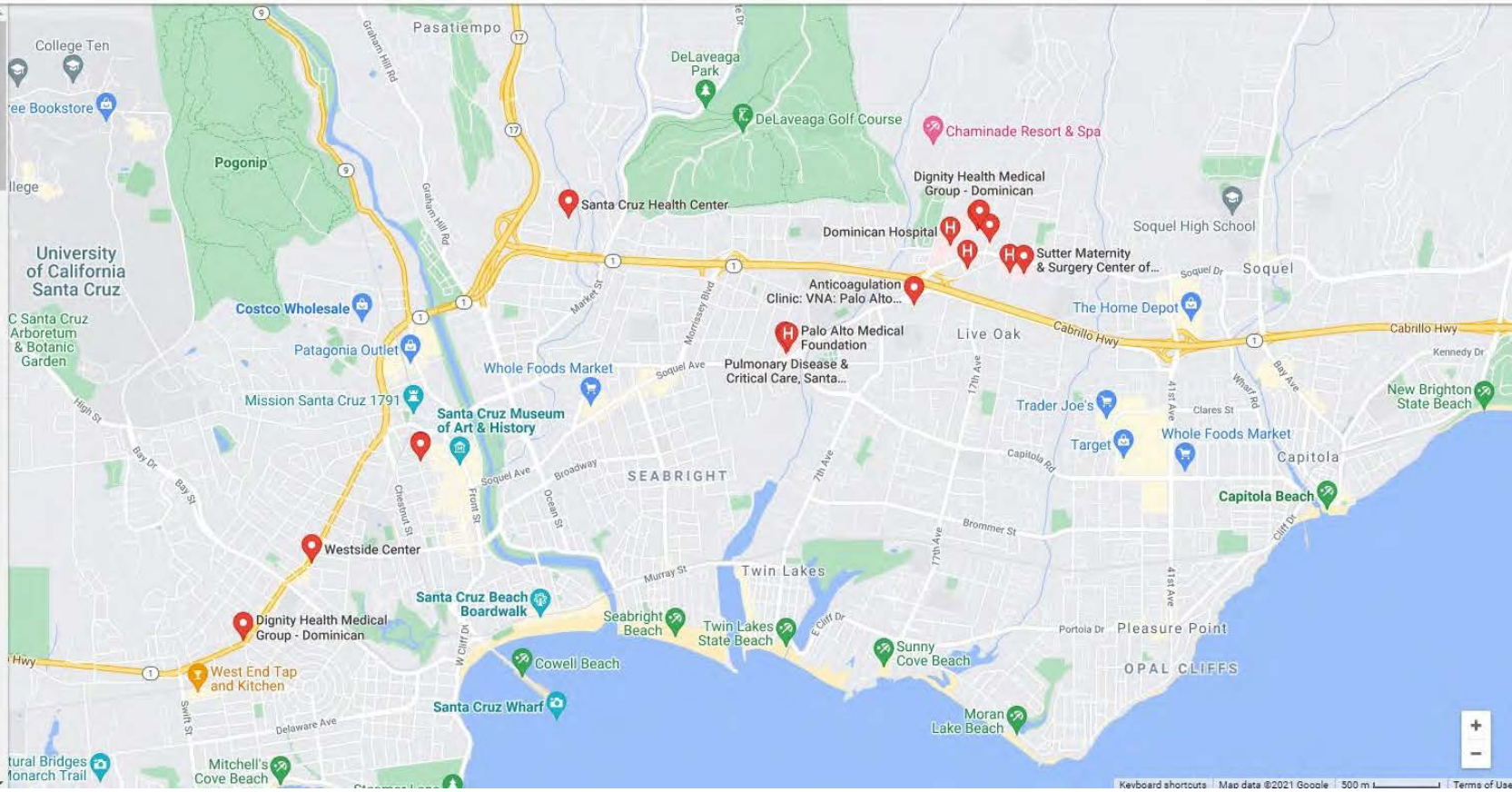
Westside Center
3.7 ★★★½☆ (31) · Medical clinic
1301 Mission St
Closed · Opens 8AM Wed · (831) ...
Online care
WEBSITE DIRECTIONS

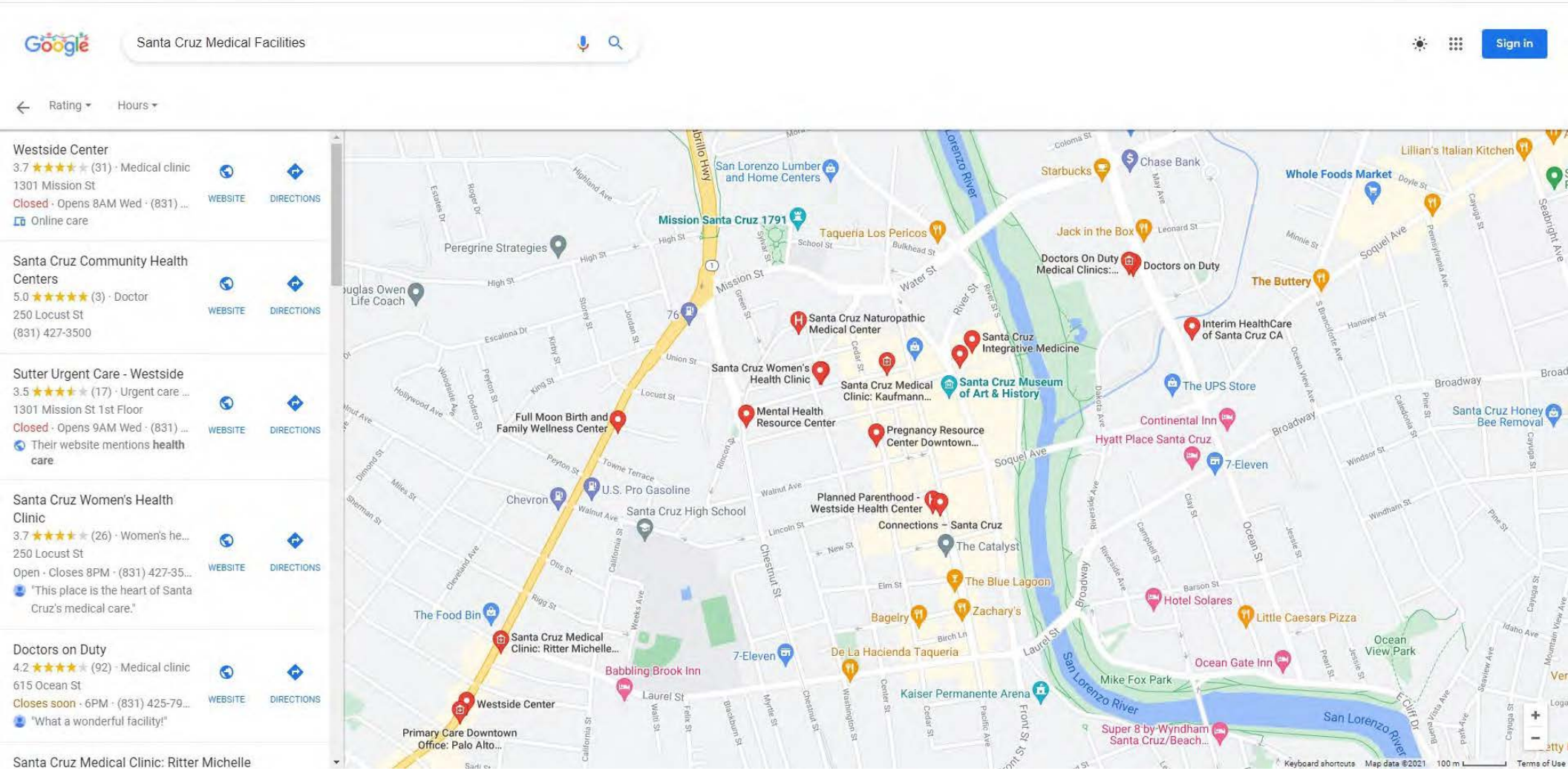
Santa Cruz Center
5.0 ★★★★★ (2) · Medical clinic
2025 Soquel Ave 2nd Floor · In Pa...
Closed · Opens 8AM Wed · (831) ...
Online care
WEBSITE DIRECTIONS

Cypress Medical Center
5.0 ★★★★★ (1) · Medical Center
1667 Dominican Way
(831) 464-3801
DIRECTIONS

Pediatrics: Santa Cruz Main Clinic: Palo Alto Medical Foundation
3.8 ★★★★☆ (6) · Medical clinic
2025 Soquel Ave 2nd Floor
Open · Closes 9PM · (831) 458-55...
WEBSITE DIRECTIONS

Santa Cruz Community Health Centers
5.0 ★★★★★ (3) · Doctor




Google
Santa Cruz Medical Facilities
Sign in
Rating
Hours
Westside Center
3.7 (31) · Medical clinic
1301 Mission St
Closed · Opens 8AM Wed · (831) ...
Online care
WEBSITE
DIRECTIONS
Santa Cruz Community Health Centers
5.0 (3) · Doctor
250 Locust St
(831) 427-3500
WEBSITE
DIRECTIONS
Sutter Urgent Care - Westside
3.5 (17) · Urgent care ...
1301 Mission St 1st Floor
Closed · Opens 9AM Wed · (831) ...
Their website mentions health care
WEBSITE
DIRECTIONS
Santa Cruz Women's Health Clinic
3.7 (26) · Women's he...
250 Locust St
Open · Closes 8PM · (831) 427-35...
"This place is the heart of Santa Cruz's medical care."
WEBSITE
DIRECTIONS
Doctors on Duty
4.2 (92) · Medical clinic
615 Ocean St
Closes soon · 6PM · (831) 425-79...
"What a wonderful facility!"
WEBSITE
DIRECTIONS
Santa Cruz Medical Clinic: Ritter Michelle
San Lorenzo Lumber and Home Centers
Mission Santa Cruz 1791
Peregrine Strategies
Taqueria Los Pericos
Starbucks
Chase Bank
Lillian's Italian Kitchen
Whole Foods Market
Jack in the Box
Doctors On Duty Medical Clinics:...
Doctors on Duty
The Buttery
Santa Cruz Naturopathic Medical Center
Santa Cruz Integrative Medicine
Interim HealthCare of Santa Cruz CA
Santa Cruz Women's Health Clinic
Santa Cruz Medical Clinic: Kaufmann...
Santa Cruz Museum of Art & History
The UPS Store
Full Moon Birth and Family Wellness Center
Mental Health Resource Center
Pregnancy Resource Center Downtown...
Continental Inn
Hyatt Place Santa Cruz
7-Eleven
Santa Cruz Honey Bee Removal
Chevron
U.S. Pro Gasoline
Santa Cruz High School
Planned Parenthood - Westside Health Center
Connections – Santa Cruz
The Catalyst
The Blue Lagoon
Hotel Solares
Little Caesars Pizza
The Food Bin
Bagelry
Zachary's
Santa Cruz Medical Clinic: Ritter Michelle...
7-Eleven
De La Hacienda Taqueria
Ocean Gate Inn
Ocean View Park
Babbling Brook Inn
Kaiser Permanente Arena
Mike Fox Park
Westside Center
Primary Care Downtown Office: Palo Alto...
Super 8 by Wyndham Santa Cruz/Beach...
Highway 1
Soquel Ave
Broadway
Mission St
Water St
Laurel St
Chestnut St
Ocean St
San Lorenzo River
Keyboard shortcuts
Map data ©2021
100 m
Terms of Use

Google Santa Cruz Medical Facilities Sign in

Rating Hours

Westside Center
3.7 ★★★½☆ (31) · Medical clinic
1301 Mission St
Closed · Opens 8AM Wed · (831) …
Online care
WEBSITE DIRECTIONS

Santa Cruz Center
5.0 ★★★★★ (2) · Medical clinic
2025 Soquel Ave 2nd Floor · In Pa…
Closed · Opens 8AM Wed · (831) …
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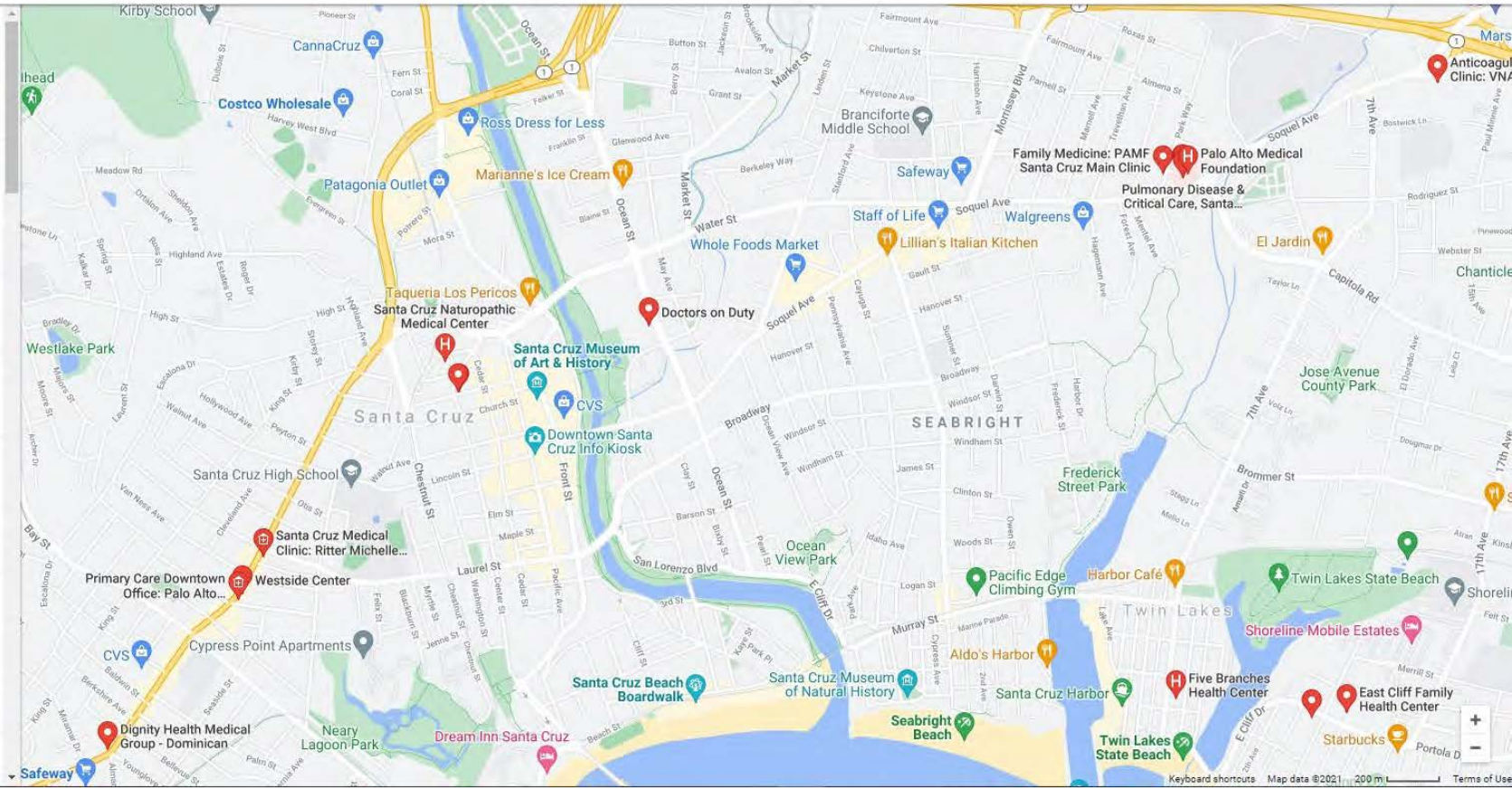
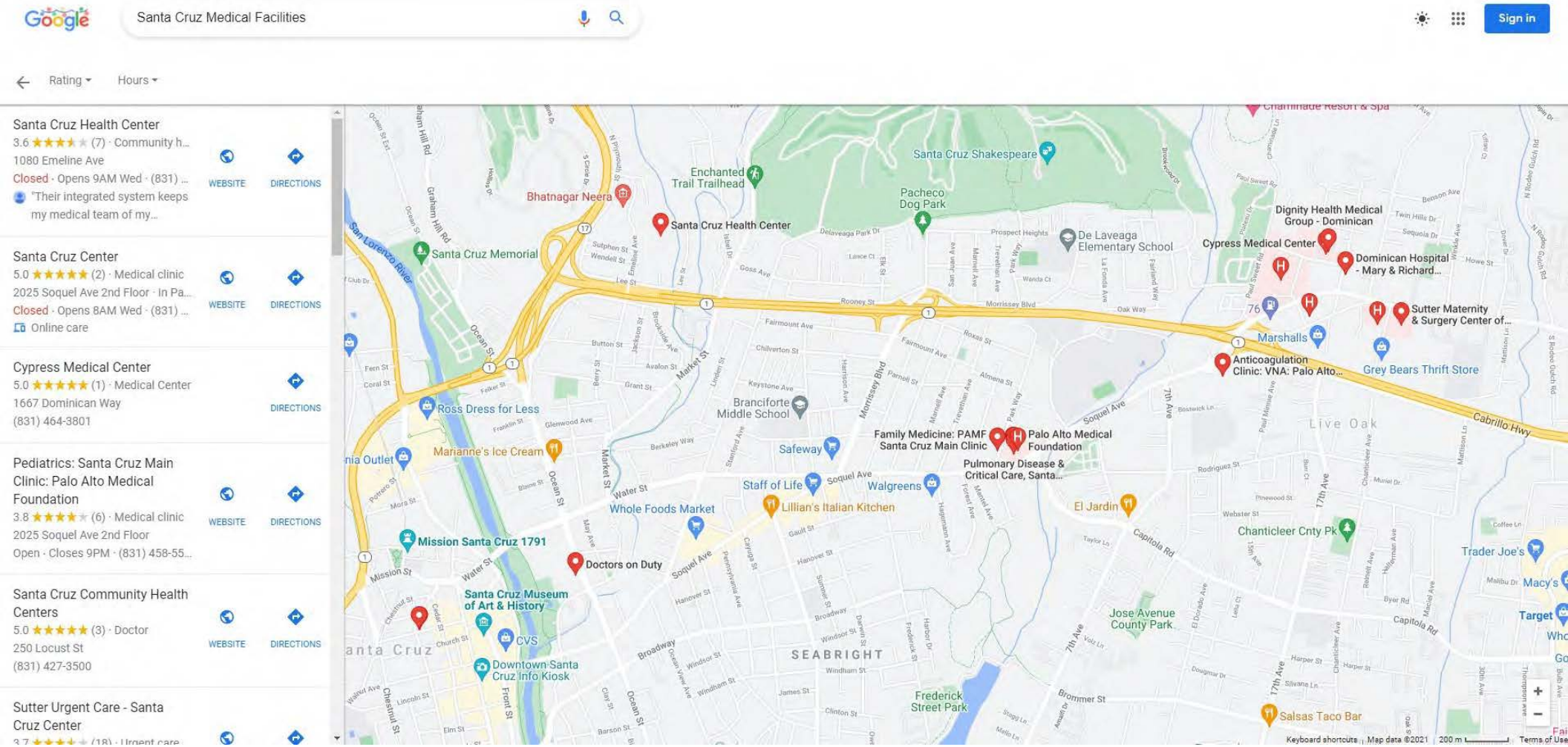
Pediatrics: Santa Cruz Main Clinic: Palo Alto Medical Foundation
3.8 ★★★★☆ (6) · Medical clinic
2025 Soquel Ave 2nd Floor
Open · Closes 9PM · (831) 458-55…
WEBSITE DIRECTIONS

Santa Cruz Community Health Centers
5.0 ★★★★★ (3) · Doctor
250 Locust St
(831) 427-3500
WEBSITE DIRECTIONS

Sutter Urgent Care - Santa Cruz Center
3.7 ★★★½☆ (18) · Urgent care …
2025 Soquel Ave 2nd Floor · In Pa…
Open · Closes 8PM · (831) 458-55…
Online care
WEBSITE DIRECTIONS

Dignity Health Medical Group - Dominican

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Online care
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5.0 ★★★★★ (3) · Doctor
250 Locust St
(831) 427-3500
WEBSITE
DIRECTIONS
Sutter Urgent Care - Santa Cruz Center
3.7 ★★★½☆ (18) · Urgent care
Santa Cruz Shakespeare
Enchanted Trail Trailhead
Bhatnagar Neera
Pacheco Dog Park
Santa Cruz Health Center
Santa Cruz Memorial
De Laveaga Elementary School
Dignity Health Medical Group - Dominican
Cypress Medical Center
Dominican Hospital - Mary & Richard...
Sutter Maternity & Surgery Center of...
Marshalls
Grey Bears Thrift Store
Anticoagulation Clinic: VNA: Palo Alto...
Cabrillo Hwy
Live Oak
Ross Dress for Less
Branciforte Middle School
Marianne's Ice Cream
Safeway
Family Medicine: PAMF Santa Cruz Main Clinic
Palo Alto Medical Foundation
Pulmonary Disease & Critical Care, Santa...
Staff of Life
Walgreens
Lillian's Italian Kitchen
El Jardin
Whole Foods Market
Chanticleer Cnty Pk
Trader Joe's
Macy's
Target
Mission Santa Cruz 1791
Doctors on Duty
Santa Cruz Museum of Art & History
CVS
Downtown Santa Cruz Info Kiosk
Jose Avenue County Park
SEABRIGHT
Frederick Street Park
Salsas Taco Bar
Soquel Ave
Capitola Rd
Broadway
Water St
Mission St
Market St
Morrissey Blvd
Keyboard shortcuts
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200 m
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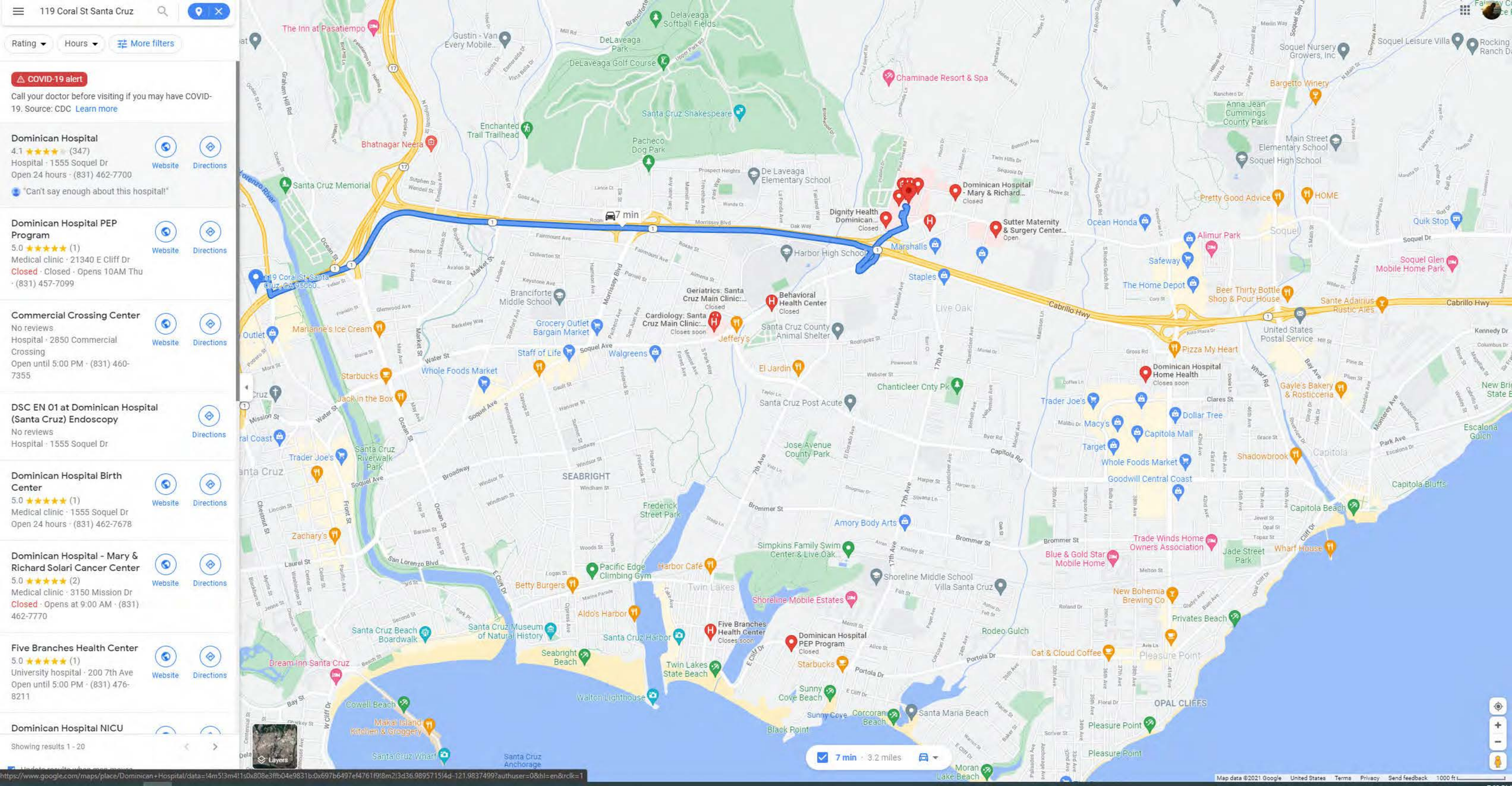
119 Coral St Santa Cruz
Rating
Hours
More filters
COVID-19 alert
Call your doctor before visiting if you may have COVID-19. Source: CDC Learn more
Dominican Hospital
4.1 ★★★★☆ (347)
Hospital · 1555 Soquel Dr
Open 24 hours · (831) 462-7700
"Can't say enough about this hospital!"
Website
Directions
Dominican Hospital PEP Program
5.0 ★★★★★ (1)
Medical clinic · 21340 E Cliff Dr
Closed · Closed · Opens 10AM Thu · (831) 457-7099
Commercial Crossing Center
No reviews
Hospital · 2850 Commercial Crossing
Open until 5:00 PM · (831) 460-7355
DSC EN 01 at Dominican Hospital (Santa Cruz) Endoscopy
No reviews
Hospital · 1555 Soquel Dr
Dominican Hospital Birth Center
5.0 ★★★★★ (1)
Medical clinic · 1555 Soquel Dr
Open 24 hours · (831) 462-7678
Dominican Hospital - Mary & Richard Solari Cancer Center
5.0 ★★★★★ (2)
Medical clinic · 3150 Mission Dr
Closed · Opens at 9:00 AM · (831) 462-7770
Five Branches Health Center
5.0 ★★★★★ (1)
University hospital · 200 7th Ave
Open until 5:00 PM · (831) 476-8211
Dominican Hospital NICU
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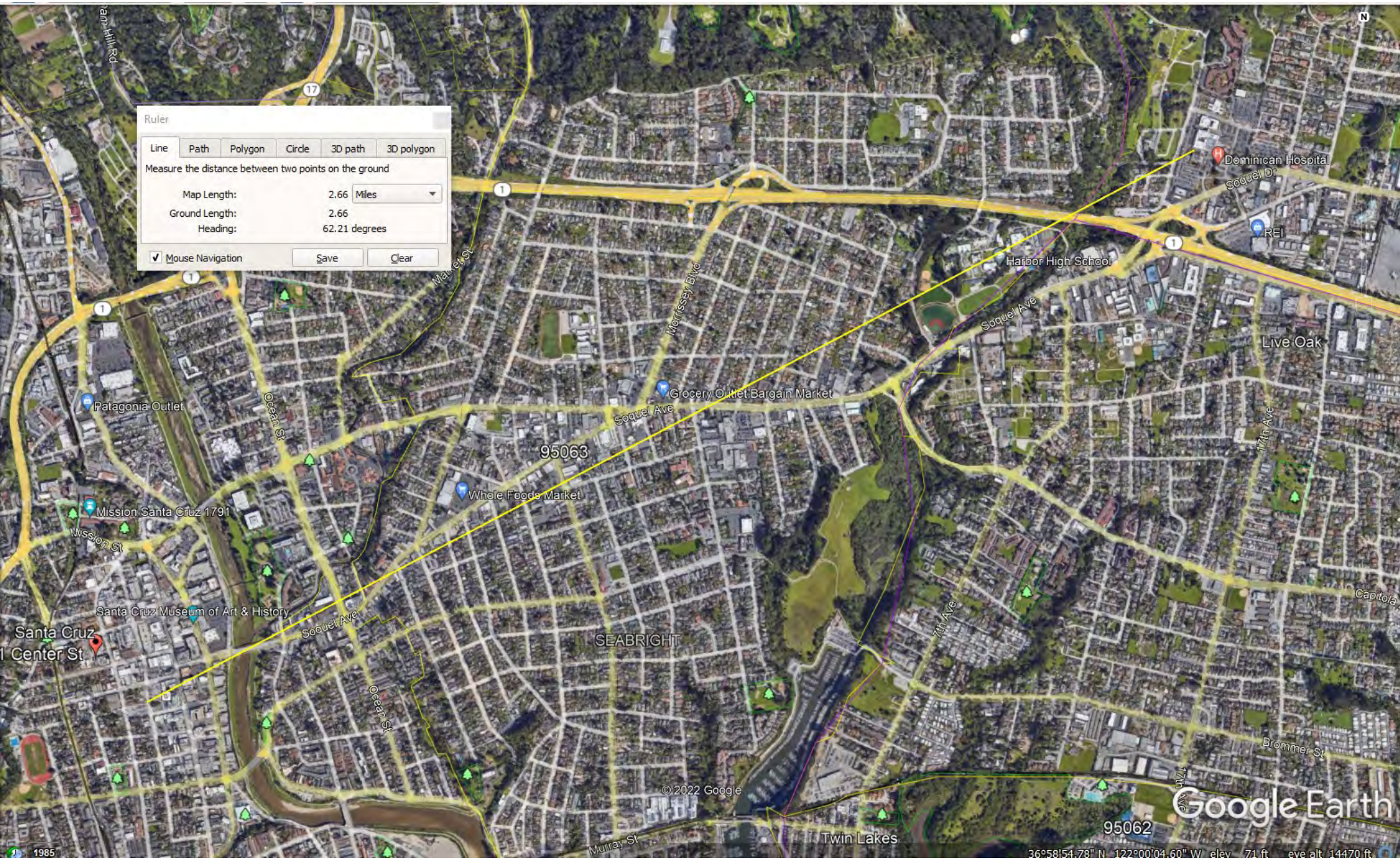
7 min
3.2 miles
Map data ©2021 Google
United States
Terms
Privacy
Send feedback
1000 ft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Path
Polygon
Circle
3D path
3D polygon
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Ground Length: 2.66
Heading: 62.21 degrees
Mouse Navigation
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Clear
Dominican Hospital
Soquel Dr
REI
Harbor High School
Soquel Ave
Live Oak
Morrissey Blvd
Market St
Grocery Outlet Bargain Market
Patagonia Outlet
Ocean St
95063
Whole Foods Market
Mission Santa Cruz 1791
Mission St
Santa Cruz Museum of Art & History
Santa Cruz
1 Center St
SEABRIGHT
17th Ave
Capitola
Brommer St
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Twin Lakes
Murray St
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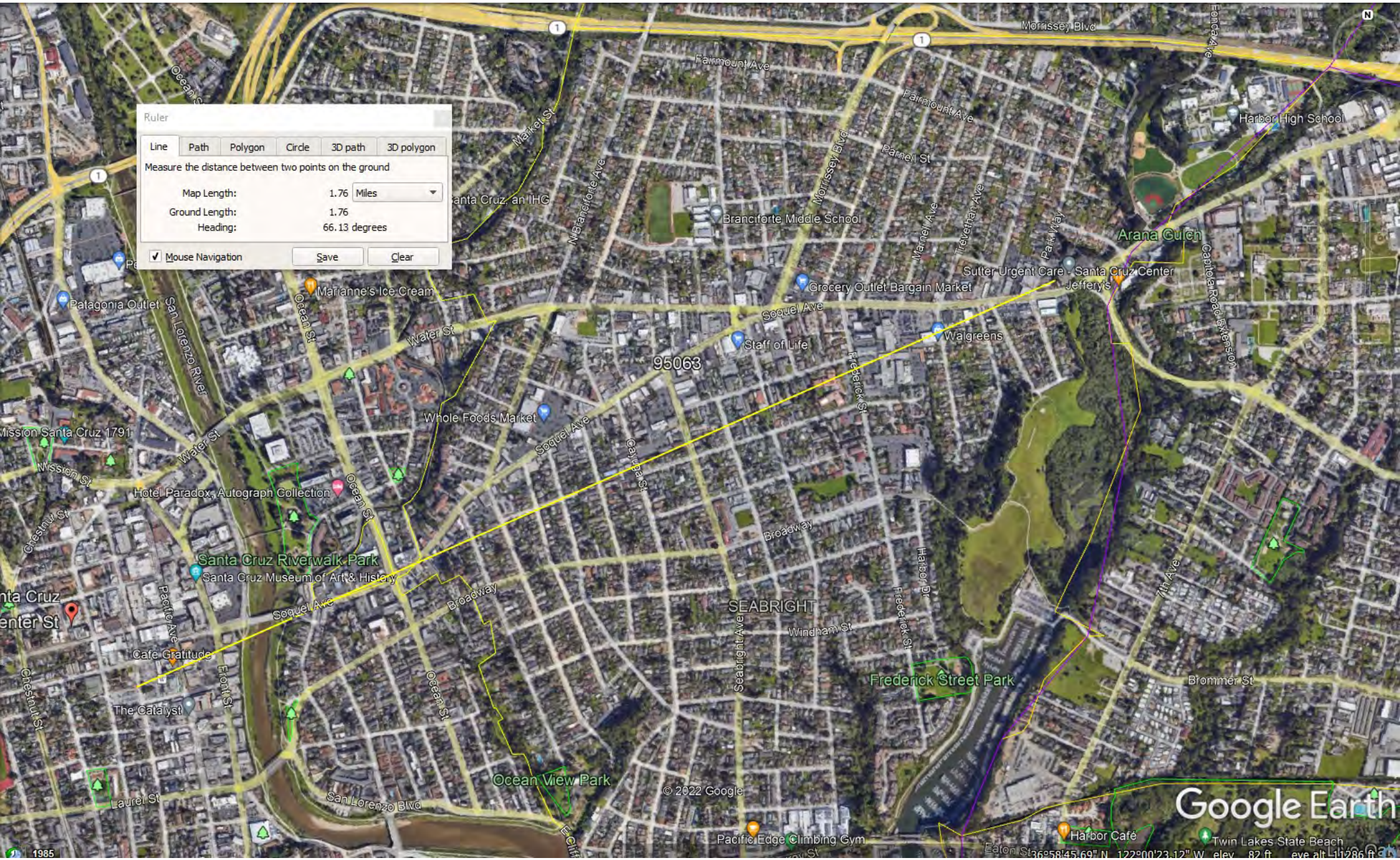
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Morrissey Blvd
Fairmount Ave
Market St
Branciforte Middle School
Harbor High School
Arana Gulch
Sutter Urgent Care - Santa Cruz Center
Jeffery's
Grocery Outlet Bargain Market
Walgreens
Staff of Life
Soquel Ave
Water St
Ocean St
Mariannes Ice Cream
Patagonia Outlet
San Lorenzo River
95063
Whole Foods Market
Mission Santa Cruz 1791
Mission St
Hotel Paradox, Autograph Collection
Santa Cruz Riverwalk Park
Santa Cruz Museum of Art & History
Broadway
Pacific Ave
Cafe Gratitude
Front St
The Catalyst
Chestnut St
Laurel St
Ocean View Park
San Lorenzo Blvd
SEABRIGHT
Windham St
Seabright Ave
Frederick St
Frederick Street Park
Harbor Dr
Brommer St
7th Ave
Capitola Road Extension
Park Way
Carbonera Dr
Pacific Edge Climbing Gym
Harbor Café
Twin Lakes State Beach
© 2022 Google
Google Earth
1985

Community Life Services
5.0 ★★★★★ (2)
Social services organization · 740 Front St Suite 135
(831) 600-7778
Website Directions

Laurel Street Center
5.0 ★★★★★ (3)
Social services organization · 214 Laurel St
(831) 420-0290
Directions

Santa Cruz Equal Employment
No reviews
Social services organization · 701 Ocean St #310
(831) 454-2600
Directions

Inspire Supported Living
No reviews
Social services organization · 309 Isbel Dr
(831) 429-5002
Directions

Special Parents Information
No reviews
Social services organization · 740 Front St #175
(831) 423-7713
Website Directions

Santa Cruz Barrios Unidos Inc
4.9 ★★★★★ (22)
Social services organization · 1817 Soquel Ave
Closing soon: 5:00 PM · (831) 457-8208
Website Directions

Transportation Services
No reviews
Social services organization · 1010 Emeline Ave
(831) 427-3435
Directions

Women, Infants & Children (WIC)
4.3 ★★★★½ (3)
Social services organization · 1105 Water St
Open until 6:00 PM · (831) 426-3911
Website Directions

National Higher Education

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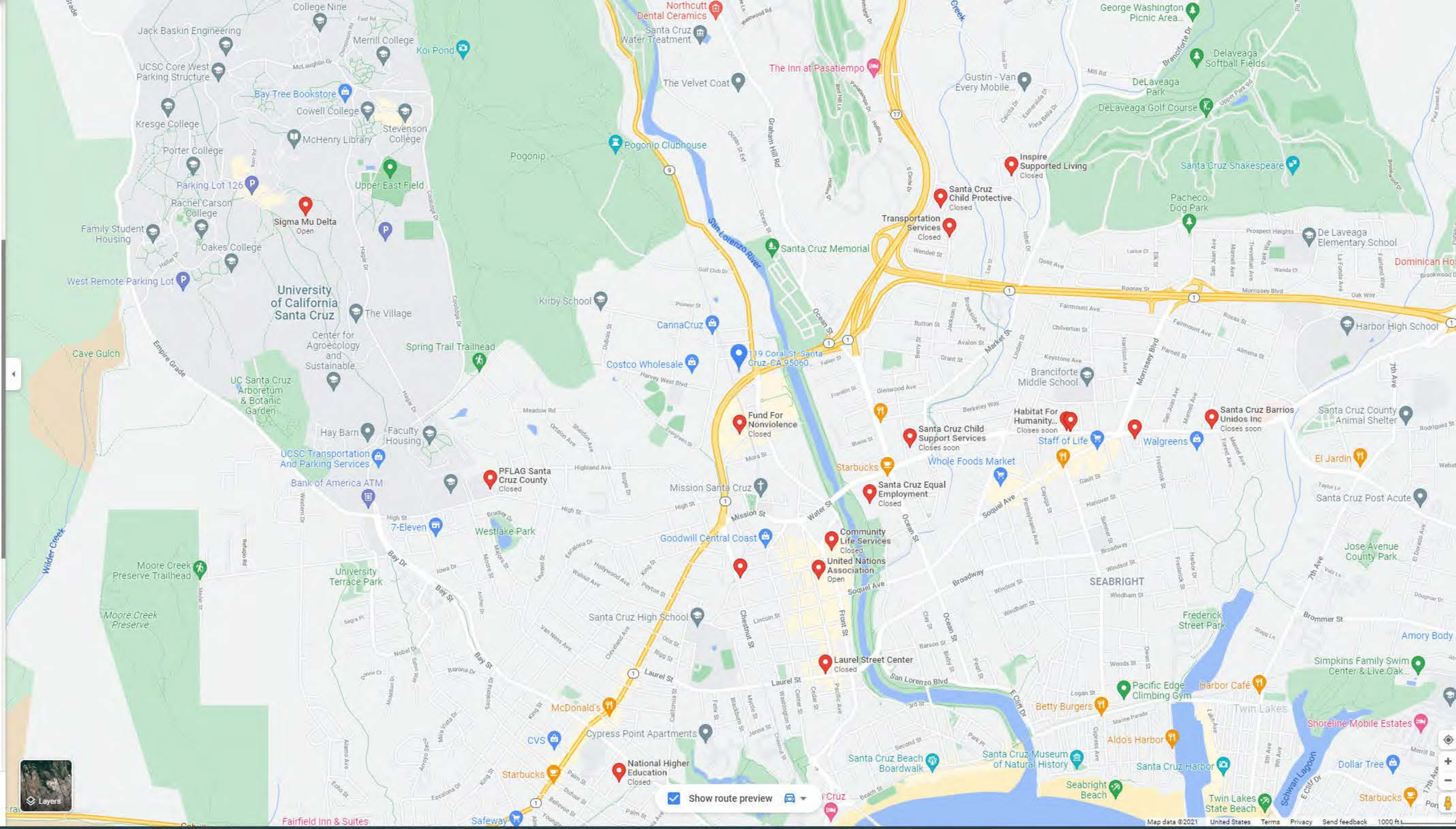
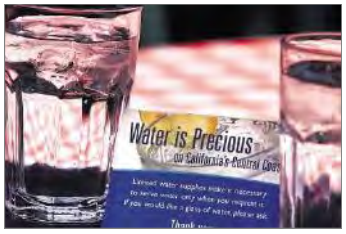


City of Santa Cruz

2015 Urban Water Management Plan



Prepared by: City of Santa Cruz Water Department

August 2016

City of Santa Cruz Water Department

2015 Urban Water Management Plan

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August 2016

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Chapter 1

INTRODUCTION AND OVERVIEW

1.1 Urban Water Management Planning Act

This report has been prepared by the City of Santa Cruz Water Department in response to the Urban Water Management Planning Act. The Act, which became part of the California Water Code with the passage of Assembly Bill 797 in 1983, requires that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare and adopt an Urban Water Management Plan, and to update it every five years.

The Act requires water agencies to evaluate and describe their water resource supplies and projected needs over a twenty-year planning horizon and to address a number of related subjects including water conservation, water service reliability, water recycling, opportunities for water transfers, and contingency plans for drought events.

The Act recognizes that water is a limited and renewable resource subject to ever-increasing demands and that conservation and efficient use of urban water supplies is a statewide concern. The Act also states that a long-term reliable supply of water is essential to protect the productivity of California's businesses and economic climate and, as part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years.

The purpose, required contents, and process for preparing and adopting Urban Water Management Plans are specified in Water Code sections 10608 and 10610 – 10656 (Appendix A). The overall goal is to provide water suppliers throughout the state a framework for carrying out their long-term planning responsibilities and for reporting their strategies to meet future water challenges to both state government and the communities they serve.

1.2 Recent Changes to the Water Code

The Act has been amended numerous times by the Legislature over the years in response to the State's water shortages, droughts, and other factors. A significant

amendment was made in 2009, after the drought of 2007-2009 and as a result of the governor's call for a statewide 20 percent reduction in per capita water use by the year 2020. The Water Conservation Act of 2009, also known as SB X7-7, required urban water suppliers to establish water use targets for 2015 and 2020 that would result in statewide savings of 20 percent by 2020 (Appendix B). Under the law, each urban water supplier is required to determine its baseline daily per capita water use and to calculate future water use targets in accordance with technical methodologies developed by the California Department of Water Resources, and to include this information beginning in its 2010 Urban Water Management Plan. Progress towards decreasing daily per capita water use and achieving future water use targets is then to be documented in subsequent plans starting with this 2015 update.

Recent legislative amendments to the Water Code since 2010 include the following:

- Water suppliers are required to provide a narrative description of their water demand management measures over the past 5 years, as well as the measures a supplier plans to implement to achieve its water use targets.

- Water suppliers are required to submit their 2015 plan electronically to the Department of Water Resources by July 1, 2016,

- Water suppliers are required to use standardized forms, tables, or displays specified by the Department of Water Resources, to facilitate statewide planning.

- Plans must quantify and report on distribution system water losses for the most recent 12-month period using a standardized water balance methodology developed by the American Water Works Association.

- Agencies are authorized, but not required, to include certain energy–related information for collection, treatment, and distribution of water supplies, as well as the water savings estimated to result from adopted codes, standards, or ordinances.

A summary of the changes to the Water Code since 2010 is included in Appendix C.

1.3 Urban Water Management Plans in Relation to Other Planning Efforts

Urban Water Management Plans serve a variety of purposes and are intended to be consistent with and support other local, regional, and statewide plans and processes.

Information about water use and supplies reported by water agencies is collected and used by the state in updating the California Water Plan every five years. They provide a common basis for cooperative water resource management through preparation of Integrated Regional Water Management Programs, such as one now being implemented in Santa Cruz County, of which the City of Santa Cruz is an active project participant. Land use agencies rely on a water agency's Urban Water Management Plan as a long-range planning document to aid in updating city and county General Plans and for the preparation of environmental documents under the California Environmental Quality Act (CEQA). They also serve as a detailed source of information to coordinate local water supply availability and certain land use decisions made by cities and counties under Senate Bills 610 and 221 of 2001.

1.4 City of Santa Cruz' 2015 Urban Water Management Plan

This document constitutes the sixth update of the City's Urban Water Management Plan. The first version was adopted by City Council in 1986. The plan was most recently updated in 2010/11 and adopted in late 2011. Since then, circumstances and events have evolved in a way that was difficult to foresee only a few short years ago. Some of the interrelated factors that have changed in the last five years include the following:

- **New Vision for the City's Water Supply.** The City of Santa Cruz has long faced challenges with the reliability of its water supply and had been actively pursuing ocean desalination as a supplemental water source for more than a decade. In spring 2014, the Santa Cruz City Council changed course and appointed a committee of 14 residents representing diverse viewpoints to take an exhaustive look at the City's water issues and ways to address them. The Water Supply Advisory Committee (WSAC) worked for 18 months in an open, public, and transparent process to develop recommendations to ensure a more stable and reliable water supply. In addition to more conservation, the WSAC recommended the City embark on a program to enhance regional groundwater storage using in-lieu water exchanges and/or aquifer storage and recovery with neighboring water districts. Advanced treated recycled water or desalination were recommended as backup plans.

- **Historic Drought Conditions.** The City of Santa Cruz, along with the rest of the State of California, has recently faced one of the most severe droughts in its history. At the local level, the Santa Cruz City Council declared a water shortage in each of the last four years and instituted mandatory water rationing in both 2014 and 2015. At the state level, Governor Brown in January 2014 proclaimed a State of

Emergency to exist throughout California due to the ongoing drought, leading to emergency conservation regulations being imposed on all urban water suppliers to achieve a statewide 25 percent reduction in urban water use in 2015. While water conditions improved in 2016 for parts of California, including Santa Cruz, all urban water suppliers remain subject to updated emergency water restrictions through at least January 2017, as well as other statewide orders aimed at permanently using water more wisely, eliminating water waste, and strengthening drought resilience.

- **Endangered Species Act Issues and Ecosystem Restoration.** The City has not yet finalized a flow agreement with state and federal fishery agencies but has been voluntarily releasing higher flows at various points of diversion to protect endangered Coho salmon and threatened steelhead trout. Improving habitat conditions to restore declining fish populations, while consistent with community values, will further limit the availability of water for municipal purposes in the future. The ultimate resolution of fish flow requirements for the City's sources of supply will be a result of forthcoming negotiations with state and federal fishery agencies.

- **Sustainable Groundwater Management.** In 2014, California enacted landmark legislation to bring the state's groundwater basins into a more sustainable regime of pumping and recharge. Facing declining groundwater supplies, the City recently joined together with two overlying water districts and the County of Santa Cruz to form a Joint Powers Agreement for the creation of a local Groundwater Sustainability Agency (GSA) required by the act. The GSA will oversee the preparation of a cooperative groundwater management plan for the Santa Cruz Mid-County Groundwater Basin, the status of which was recently designated by the State to be in a condition of critical overdraft.

- **Aging Infrastructure.** Key components of the City water system, including the North Coast System, the Newell Creek Dam Inlet/Outlet pipe, and water treatment facilities have reached the end of their useful life and are overdue for renewal and replacement. The Water Department's long-range Capital Improvement Program envisions a total of almost $120 million in needed infrastructure reinvestment projects over the next 10 years, adding pressure on limited financial resources.

As with elsewhere in California, the challenges for managing water supply and demand in the central coast region are dynamic. This plan acknowledges that the future is both variable and uncertain and that change will continue to occur.

1.5 Report Format

For this 2015 submittal cycle, the City has elected to modify the basic structure and organization used in previous plans to better align the document and accompanying tables with the organization recommended in DWR's Guidebook for Urban Water Suppliers (CA DWR, 2016). Required content is grouped by topic as follows:

Chapter 1 – Introduction and Overview: This section covers the background, purpose, and scope of an Urban Water Management Plan.

Chapter 2 – Plan Preparation: This section covers the process used to develop the 2015 plan, including efforts in coordination and outreach.

Chapter 3 – System Description: This section describes the City's water service area including population, climate, and other factors affecting the City's water management planning, including governance and the Water Department's organizational structure.

Chapter 4 – System Water Use: This section covers the past, current, and projected water uses within the City's water service area. It also provides information on distribution system water losses.

Chapter 5 – Baselines and Targets: This section provides information about the City's baseline per capita water use and urban water use targets, describes the methods for calculating baseline and target consumption, and success in achieving its 2015 target.

Chapter 6 – System Supplies: This section describes and quantifies the current and projected sources of water available to the City, including surface water, groundwater, and potential new sources, transfers, or exchanges of water.

Chapter 7 – Water Supply Reliability: This section characterizes the reliability of the City water supply system, provides an updated assessment of the system reliability under differing hydrologic conditions and describes the overall strategy and work plan the City is pursuing to improve its water supply reliability.

Chapter 8 – Water Shortage Contingency Planning: This section summarizes the City's 5-stage plan for addressing water shortages and describes actions that would be undertaken in response to a catastrophic interruption of water supplies, including a regional power outage, earthquake, or other emergency situation.

Chapter 9 – Demand Management Measures: This section describes the measures currently being implemented by the City to promote conservation and discusses the planning process underway to guide water conservation activities in future years.

Chapter 10 – Plan Adoption, Submittal, and Implementation: This section describes the steps taken to adopt and submit the Urban Water Management Plan update, and to make the plan available for public use and reference.

1.6 UWMPs and Funding Eligibility

In order for an urban water supplier to be eligible for any state water grants or loans administered by DWR, the agency must have a current Urban Water Management Plan on file that has been determined by DWR to address the requirements of the Water Code.

Beginning in 2016, urban water suppliers must also comply with the requirements of the Water Conservation Act of 2009 in order to be eligible for state water grants and loans, meaning an agency must both meet its interim water use target and report compliance in its 2015 UWMP.

Chapter 2

PLAN PREPARATIOIN

2.1 Basis for Preparing a Plan

In accordance with the California Water Code, every urban water supplier with 3,000 or more service connections or supplying more than 3,000 acre-feet of water per year are required to prepare an Urban Water Management Plan every five years. With 24,534 active service connections, the City of Santa Cruz clearly meets the definition of "Urban Water Supplier" and therefore must prepare a plan.

The Santa Cruz water system also qualifies under the California Health and Safety Code, Section 116275, as a "Public Water System" that provides drinking water for human consumption and is regulated by the State Water Resources Control Board, Division of Drinking Water. The City operates a single, retail drinking water system. It receives no water from any wholesale supplier nor does it supply either raw or treated water to another agency at the present time.

Table 2-1. Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA4410010	Santa Cruz Water Department	24,534	2,452
	TOTAL	24,534	2,452
NOTES: Volume of water supplied in million gallons			

2.2 Regional Planning and Compliance

CWC 10620

(d)(1) *An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.*

The City of Santa Cruz actively participates in several regional, interagency, groundwater and watershed basin management efforts. As indicated in Table 2-2, however, the City is choosing to prepare an individual Urban Water Management Plan.

Table 2-2. Plan Identification (Select One)		
☑	Individual UWMP	
☐	Regional UWMP (RUWMP)	
	Select One:	
	☐	RUWMP includes a Regional Alliance
	☐	RUWMP does not include a Regional Alliance
NOTES:		

CWC 10608.20

(a)(1) *…Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis as provided in subdivision (a) of Section 10608.28…*

Similarly, for the purpose of determining, reporting, and assessing compliance with its urban water use baselines and targets described in Chapter 5, the City of Santa Cruz is choosing to report as an individual supplier.

2.3 Reporting Year and Units of Measure

All information in this plan, except where otherwise noted, is reported on a calendar year basis, and volumes are expressed in units of million gallons.

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
Units of Measure Used in UWMP (select from Drop down)	
Unit	MG
NOTES:	

2.4 Coordination and Outreach

The process of developing the City's 2015 Urban Water Management Plan really began with the Water Supply Advisory Committee process starting in 2014. This intensive process included an enormous amount of data collection, analysis, modeling, and evaluation of myriad topics and issues associated with water supply planning over an 18-month period. The Committee itself consisted of 14 individuals appointed by the City Council representing diverse viewpoints and interests; including residents, business organizations, environmental organizations, Water Commission members, and an outside City water customer representative. The process was supported by a facilitation team, a technical team, an independent review panel, and by Water Department staff.

All Committee meetings were open to the public with numerous opportunities for public input. The Committee had its own website to share materials, agendas, and to communicate with the public. The committee hosted several public workshops, enrichment sessions, a strategies and ideas convention, open houses, and other outreach activities. Many of the work products developed for the Committee, including a new econometric water demand model, were intended to also serve in updating the City's Urban Water Management Plan.

In late 2015, City staff participated in a webinar and attended a workshop sponsored by DWR to become familiar with changes to the law, the 2015 guidebook, new UWMP tables and tools, and changes in the reporting of wastewater and recycled water.

Written notice regarding the plan review and update was sent to both the City of Capitola and the County of Santa Cruz in December 2015, more than 60 days prior to the public hearing, as required by Section 10621(b) of the Act (Appendix D). Notices were provided both to the City Manager/County Administrative Officer and the Director of Planning/Community Development of these two jurisdictions.

In February 2016, the City hosted and led a meeting to coordinate preparation among all major public water agencies, wastewater utilities, and land use agencies in Santa Cruz County. This meeting was also attended by representatives of the following organizations:

- California Department of Water Resources
- Association of Monterey Bay Area Governments
- Santa Cruz County Local Agency Formation Commission.
- Regional Water Management Foundation (local IRWM entity)

- Resource Conservation District of Santa Cruz County
- Santa Cruz County Environmental Health

Water Department staff prepared the draft urban water management plan in winter and spring of 2016 with the help of the state's *Guidebook for Urban Water Suppliers* (DWR, 2016). Throughout development of this plan, City staff was communicating and coordinating with neighboring water agencies, city and county land use agencies within the service area, as well as the staff from the City's wastewater treatment facilities, City of Scotts Valley, and the Santa Cruz County Sanitation District in accordance with section 10620(d)(2) of the Act.

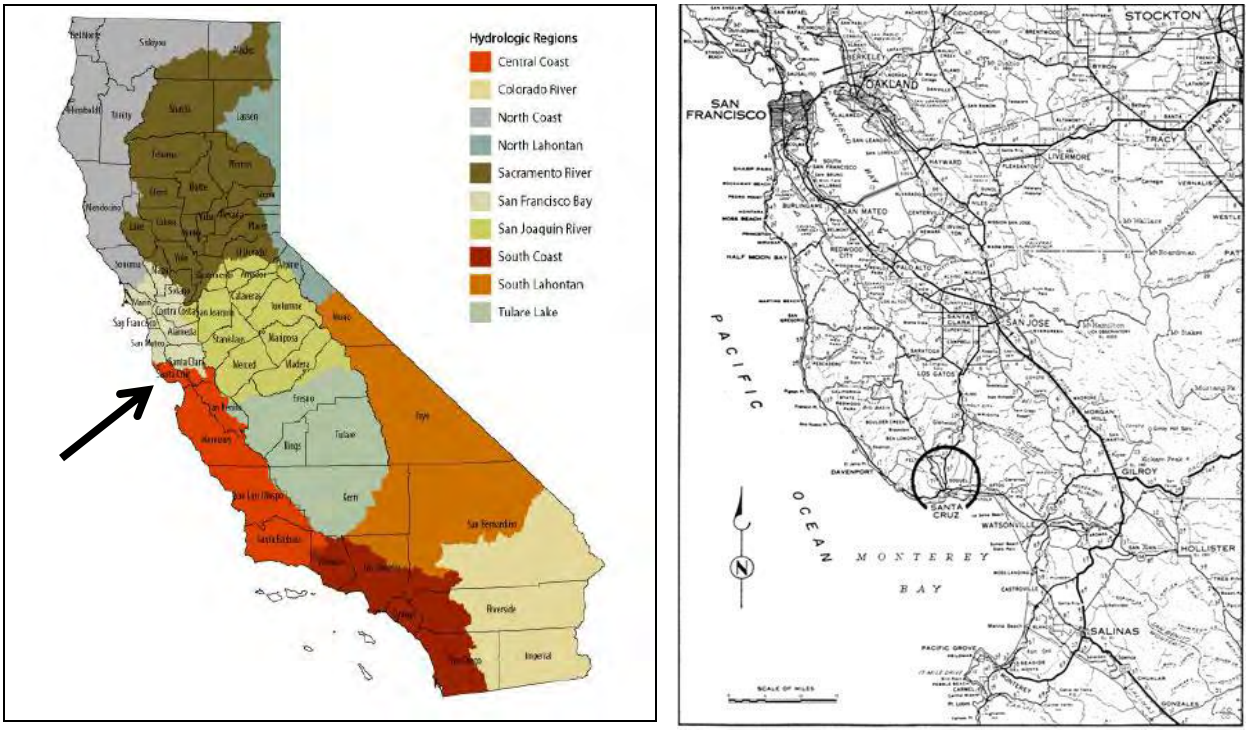
Chapter 3

SYSTEM DESCRIPTION

3.1 General Description of Service Area

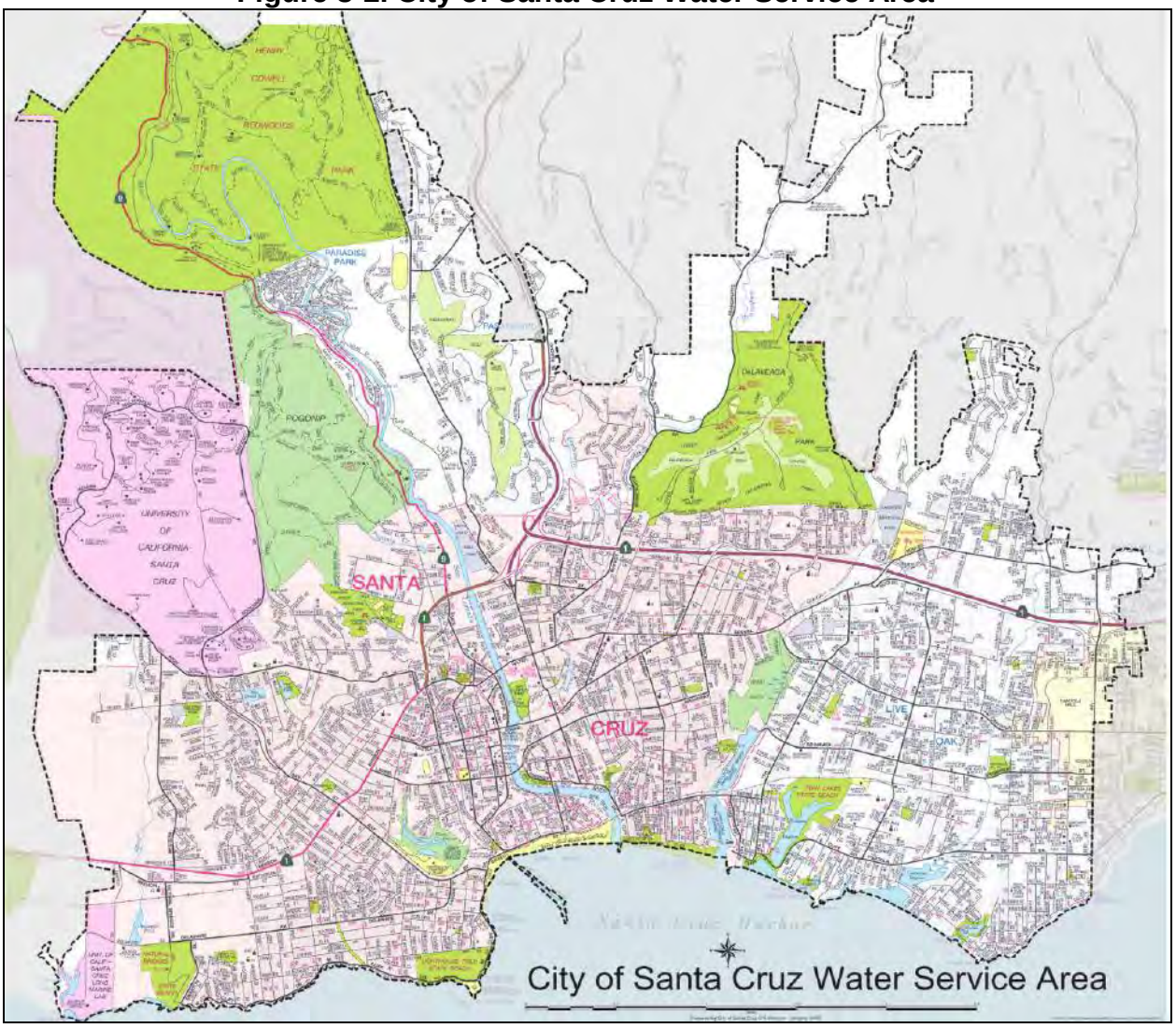
The City of Santa Cruz is located on the central coast of California along the northern shore of Monterey Bay. The City's position on the northern end of the state's Central Coast Hydrologic Region (Region 3) and vicinity relative to the San Francisco Bay Area are shown below in Figure 3-1.

Figure 3-1. California Hydrologic Region and Vicinity Maps



Water service is provided to an area approximately 20 square miles in size, including the entire City of Santa Cruz, adjoining unincorporated areas of Santa Cruz County, a small part of the City of Capitola, and coastal agricultural lands north of the city. A generalized map of the water service area, excluding the north coast, is provided in Figure 3-2. No significant changes to the City's service area boundary have occurred in many years.

Figure 3-2. City of Santa Cruz Water Service Area



People are drawn to the Santa Cruz area for its recreational attractions, its small town ambiance and sense of community, its pleasant weather, its natural beauty and scenic coastline, and its higher education facilities. The sandy beaches and nearby mountains attract millions of visitors to the region every year. The City is bounded by several state parks and open-space lands that provide facilities for bicycling, hiking and other outdoor activities. The seashore and ocean waters of the Monterey Bay National Marine Sanctuary serve as a prime destination in the summer months for sunbathers, surfers, and tourists. Other visitor attractions include the Santa Cruz Beach Boardwalk, Municipal Pier, and Pacific Avenue Mall.

The University of California, Santa Cruz is situated atop the upper west side of the City overlooking the downtown area and Monterey Bay. The campus is nationally recognized

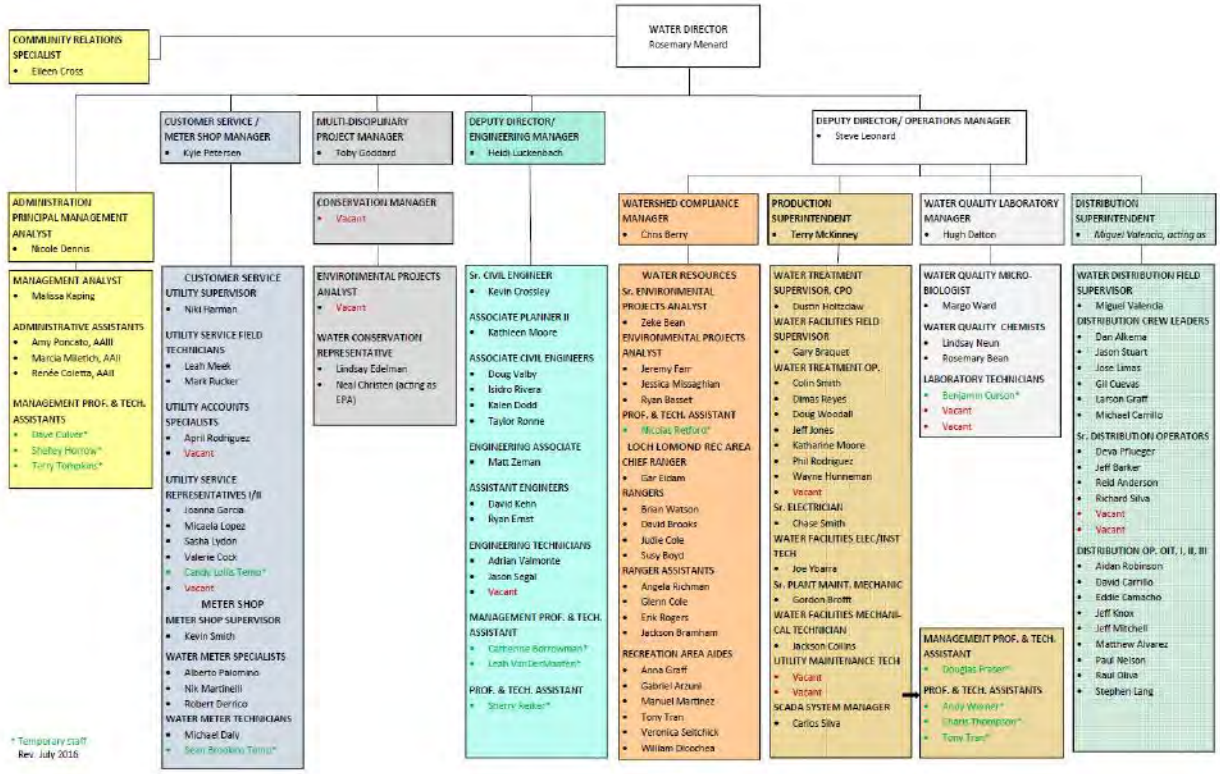
for its quality of instruction, its academic stature, and its research impact. It currently accommodates an enrollment of slightly more than 17,000 students during the academic year.

3.2 Water Department

The Santa Cruz Water Department is a municipal utility that is owned and operated by the City of Santa Cruz. It is led by a Director who is appointed by the City Manager. The governing body for the Water Department is the City Council. A seven-member Water Commission advises Council on policy matters involving the operations and management of the water system. The Commission is composed of six members who reside within the City limits and one member who resides in the unincorporated portion of the water service area.

The Department is organized into eight sections. These include Administration, Customer Service, Water Conservation, Engineering, Water Resources/Recreation, Water Production, Water Quality, and Water Distribution. There is currently the equivalent of 102 full-time staff positions in the Water Department. An organization chart of the Water Department is shown in Figure 3-3.

Figure 3-3. Water Department Organization



The Water Department's adopted mission statement is as follows:

> ***"To provide a safe, clean, and continuous supply of water for municipal and fire protection purposes that meets or exceeds local, State, and Federal standards for public health and environmental quality, and to provide courteous, responsive, and efficient service in the most cost-effective manner to our customers".***

The Department operates financially as an enterprise in which all the costs of running the system are paid by water rates, service charges, and related revenues. The Water Fund receives no tax or general fund revenues. In addition to providing water service, the Department has responsibility for billing and customer service functions related to sewer, refuse, and recycling services inside the City limits.

Long-range goals and policies for guiding growth and development in the City, including civic and community facilities like the water system, are contained in the City's 2030 General Plan. The General Plan includes a series of policy statements regarding water service that support and promote the General Plan's overarching goal of achieving a safe, reliable, and adequate water supply. (Appendix E). Some of these policies will need updating with the change in direction for the City's future water supply resulting from the recent WSAC process.

3.3 Service Area Climate

Santa Cruz enjoys a pleasant Mediterranean climate that is characterized by warm, mostly dry summers and mild, wet winters. Due to its proximity to Monterey Bay, fog and low overcast are common during the night and morning hours, especially in the summer. Monthly and annual climate data for Santa Cruz are shown in Table 3-1 below.

Mean monthly temperatures range between 51 to 65 degrees, with the warmest weather usually occurring during August and September. Extreme temperatures are rare and short-lived, with weather conditions being moderated by the oceanic influence and presence of summer fog.

Rainfall in Santa Cruz averages 31.35 inches annually, but varies considerably from year to year. The bulk of seasonal rainfall occurs between November and March. In the

watershed above the City's reservoir in the Santa Cruz Mountains, rainfall averages nearly 50 inches per year.

Table 3-1. Climate Data for Santa Cruz

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean High Temp (F)	62.2	64.4	66.4	69.5	71.9	74.7	75.3	76.2	76.4	73.2	66.8	61.9	69.9
Mean Low Temp (F)	41.3	43.3	44.4	46.0	48.9	51.8	54.0	54.3	53.0	49.5	44.9	41.2	47.7
Mean Temp (F)	51.9	53.8	55.4	57.8	60.4	63.2	64.7	65.2	64.7	61.4	55.8	51.5	58.8
Precipitation (in)	6.28	6.24	4.63	1.97	0.84	0.19	0.01	0.04	0.27	1.45	3.75	5.68	31.35
Evapotran-spiration (in)	1.5	1.8	2.6	3.5	4.3	4.4	4.8	4.4	3.8	2.8	1.7	1.2	36.6

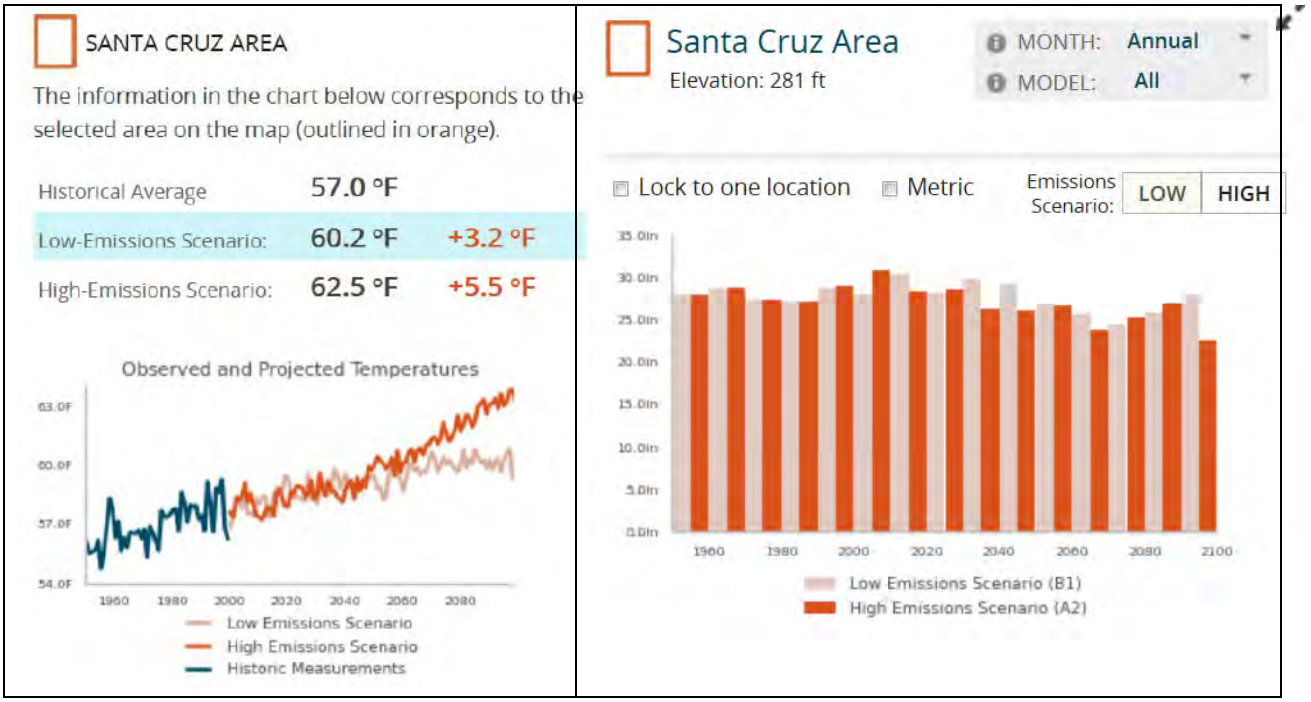
NOTES: National Climate Data Center 1981-2010 Monthly Normals; CA Department of Water Resources

Reference evapotranspiration - a standard measurement of environmental parameters used for determining irrigation needs - averages 36.6 inches per year in Santa Cruz. Average monthly evapotranspiration varies seasonally from a low of 1.2 inches in December to a high of 4.8 inches in July.

Like other coastal communities, the marine influence on local air temperature, humidity, and cloud cover helps keep demand for water relativity low in the City's service area. The presence of summer fog moderates outdoor water use during peak summer season compared to inland locations within Santa Cruz County and elsewhere in California.

Future average temperatures in Santa Cruz are expected to increase. Figure 3-4 below shows two projections of mean temperature to 2100 under different climate change scenarios (Cal-Adapt.org, 2016). A temperature increase of between 3.2 and 5.5 degrees F compared to the historic average is predicted by the end of the century. Conversely, models of future mean annual precipitation show a slight decline over time. The City's Climate Adaptation Study indicates changing temperatures and precipitation will impact ecosystems, fire risk, water quality and quantity, human and environmental health (City of Santa Cruz, 2009). As a coastal community, the City of Santa Cruz recognizes the significance of climate change to the City's economic well-being, public health, and environment, and has begun taking steps as a local agency to respond. Impacts of ongoing climate change on water demand, water supply, and water system reliability are discussed further in Chapters 4, 6, and 7.

Figure 3-4. Projected Mean Temperature and Annual Precipitation for Santa Cruz Area



3.4 Service Area Population and Demographics

The current population residing in the Santa Cruz water service area is estimated to be 95,251 people. Approximately two thirds of the total population, almost 64,000, lives inside the City limits. Within the City, about 9,100 people including students, faculty, staff, and their families reside on the UC Santa Cruz campus. It is estimated that another 31,462 people, or 34 percent of the service area population, live outside the City limits. Since the 2010 US Census, the water service area population has grown by approximately 4,000 persons, mostly inside the City limits.

Table 3-2 shows the current and projected population for the water service area out to 2035, in five year increments.

These figures are derived from a regional growth forecast prepared by the Association of Monterey Bay Area Governments (AMBAG, 2014). According to the forecast, the total number of people receiving water service is expected to grow by about 17,000 people and reach more than 112,000 in 2035. This equates to a population growth rate of less than one percent per year.

Table 3-2. Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040*(opt)*
City of Santa Cruz	63,789	66,860	70,058	73,375	76,692	n/a
County of Santa Cruz, City of Capitola	31,462	32,543	33,562	34,614	35,698	n/a
Total	95,251	99,403	103,620	107,989	112,390	n/a
NOTES: AMBAG 2014 Regional Growth Forecast (adopted June 11, 2014), and City of Santa Cruz GIS section.						

Population is a key factor in determining water use. However, reductions in per capita water use over the last decade have more than offset gradual population increases; that is, even though the service area population has been slowly but steadily rising, total water use has declined. More information on per capita water use is covered in Chapter 5 of this report.

3.5 Housing

According to utility billing records, there are some 37,003 housing units within the City's water service area. The number of housing units, broken down by account type and jurisdiction is shown in Table 3-3 below. Approximately 19,029, or a little over half of all households in the service area are classified as single family accounts[1]. The other 17,974 homes are multiple family dwelling units consisting of various housing types including duplexes, condominium and townhouse complexes, apartments, mobile homes and alternative housing types such as live/work units, mixed use development, single room occupancy, and accessory dwelling units. The figures below do not include dormitory rooms, apartments, and other housing units located on the UC Santa Cruz main campus, nor does it include residential units associated with mixed use/commercial accounts. A large proportion of the local housing stock (over 50 percent) is rented.

Each of the three jurisdictions served by the City has a recently adopted Housing Element that addresses its required regional fair share of the statewide housing needs established by AMBAG. These documents set forth goals and objectives for housing construction, rehabilitation, and conservation for the period 2015-2023.

[1] Water account categories are not the same as housing type. A single family account has one dwelling unit per meter, but may be any type of residence. A multifamily account has two or more dwelling units per meter.

Table 3-3. Housing Units, by Account Type and Jurisdiction			
Jurisdiction	Single Family	Multi-family	Total
City of Santa Cruz	12,273	10,034	22,307
County of Santa Cruz	6,622	7,821	14,443
City of Capitola	134	119	253
Service Area Total	19,029	17,974	37,003
NOTES: 2015 Annual Sales Report, EDEN Multi-residential units counts report Feb 3, 2016			

The regional housing goals for the three jurisdictions served by the City are shown below in Table 3-4. For this housing element cycle, the City is planning for an additional 747 units. The County is planning for a total of 1,837 units to be built Countywide through 2023, of which perhaps 372 units would be located within the City water service area. Capitola has a goal to construct 143 units by 2023 in its housing element, but only a small number of these are expected to fall into the City's water service area. Together, these housing plans represent a total residential development potential in the near term of about 1149 new homes within the City's water service area, of which an estimated 414, about one-third, are planned for lower income categories.

Table 3-4. Regional Housing Goals				
Period: 2015-2023	Total Housing Units		Units in Lower Income Categories	
	Entire Jurisdiction	City Water Service Area	Entire Jurisdiction	City Water Service Area
City of Santa Cruz	747	747	298	298
County of Santa Cruz	1,837	372	636	110
City of Capitola	143	30	57	6
Service Area Total	--	1,149	--	414
NOTES: County housing estimates within City water service area based on personal communication with Sarah Neuse, Santa Cruz County Planning Department. Capitola housing estimates within the City water service area based on personal communication with Richard Grunow, Community Development Director.				

It is important to note that while each jurisdiction must demonstrate it has land zoned that can accommodate its fair share of the regional housing needs, it does not necessarily mean such housing actually will be constructed. Some of the units listed above are already permitted and under construction. The City is planning to incentivize smaller, more vertical, mixed-use or multifamily-type housing units along its major transportation corridors. What type of housing is ultimately built, though, will depend largely on market forces. And despite the collective vision for increased housing in the community, actual progress remains slow. In the last five years, only 204 new single family units, and 6 multifamily projects have been built.

3.6 Community Growth and Development

All three jurisdictions served by the Santa Cruz water system have general plans, local coastal programs, zoning regulations, and development standards that determine the location, type, and density of growth allowed in the region. The General Plan serves as the principal policy and planning document guiding long-range land use and conservation decisions in cities and counties.

The cities of Santa Cruz and Capitola have both completed comprehensive updates to their General Plans in the last few years. The Santa Cruz City General Plan timeline extends to 2030, and Capitola's has a 20 to 30 year planning horizon. The County's current General Plan was adopted in 1994. It has recently prepared and adopted a Sustainable Santa Cruz County plan addressing sustainable land use, housing, economic development, and transportation objectives in the urban area of the County, part of which is served by the City's water system (Santa Cruz County, 2015). The time horizon of that plan is through 2035.

In addition to city and county General Plans, the University of California has Long Range Development Plans (LRDPs) for both its main campus (UCSC, 2005) and its marine science campus (UCSC, 2008, revised 2013) located on the western edge of the City. These plans provide a comprehensive framework to guide physical development, land use, and resource protection to meet the University's academic and institutional objectives through the year 2020.

The size of the City water service area has remained relatively fixed over time due to a long-standing prohibition against new water connections along the north coast, the acquisition of open space lands which created a greenbelt around the City, and the County's urban services boundary, all of which have served to inhibit urban sprawl. Accordingly, most growth and redevelopment that does happen going forward is

expected to be concentrated within the confines of the existing service area boundary. Any proposed changes to the City's service area boundary that do come forward are subject to approval by both City Council and the Santa Cruz Local Agency Formation Commission (LAFCO).

Within the City of Santa Cruz, only a small amount of land remains undeveloped. The same is true in the parts of the County and City of Capitola served by the City. Because of the relative scarcity of raw land, the majority of future growth in the area is likely to be achieved through redevelopment, remodeling, increased density on underutilized land, and infill development in the urban core and along major transportation corridors, along with new construction on the little amount of vacant land remaining

Many of the major decisions made by local governing bodies about public improvements and private development are also subject to the review and oversight of, or may be appealed to, the California Coastal Commission. Accordingly, change in the City water service area tends to occur slowly, if at all, and only after exhaustive public process.

3.7 Employment and the Economy

The State Employment Development Department estimates employment within the City's water service area in 2014 (the most recent year for which complete data exists) to average about 42,800, which represents roughly 50 percent of all non-farm jobs in Santa Cruz County (CA EDD, 2016). The three largest employment sectors are health care and social assistance, retail trade, and educational services (Table 3-5).

The University is a key component of the region's economic fabric in terms of employment, spending, research, and business creation. It is the area's largest single employer. Other top employers include the County of Santa Cruz, City of Santa Cruz, Plantronics, and the Santa Cruz Beach Boardwalk. Tourism and lodging are additional major economic drivers in the community. Commercial development is centered in downtown Santa Cruz including River Street, around 41st Avenue in Capitola, and along the major transportation corridors including Mission, Ocean, and Water Streets and Soquel Avenue. The Harvey West area and west side of Santa Cruz support a diverse mix of light industry, retail, high tech, research, and consumer goods and service enterprises. Regional hospitals, medical, and health care facilities and services are concentrated along Soquel Drive in unincorporated Santa Cruz County.

The local economy has rebounded from the great recession, continuing on trend to pace behind the San Jose market by about six months as reflected by reduced unemployment, an improved housing market, increased development activity, a vibrant tourism base, and sustainable increases in sales and hotel revenues. Like other coastal communities, the housing supply is very tight and housing affordability has become a major political, economic, and social issue for families, residents, and employers alike.

Table 3-5. Employment in Santa Cruz Water Service Area, 2014

Major Industry NAICS Sector	NAICS Classification	Employment
Agriculture, Forestry, Fishing & Hunting	11	144
Utilities	22	*****
Construction	23	1,157
Manufacturing	31-33	2,015
Wholesale Trade	42	1,021
Retail Trade	44-45	6,160
Transportation & Warehousing	48-49	431
Information	51	408
Finance & Insurance	52	680
Real Estate & Rental & Leasing	53	568
Professional, Scientific, & Technical Skills	54	1,986
Management Of Companies And Enterprises	55	177
Admin & Support & Waste Mgmt & Remediation	56	1,714
Educational Services	61	5,282
Health Care & Social Assistance	62	7,722
Arts, Entertainment, & Recreation	71	1,460
Accommodation & Food Services	72	5,622
Other Services	81	1,737
Non-Classified	99	*****
Government	92	599
Sub-Total		38,989
Multiple Sites (Government Only)		3,829
Federal		210
Local		3,620
Service Area Total		**42,818**

NOTES: Source: Andy Wong, CA Employment Development Department, Labor Market Information Division, 2016

Chapter 4

SYSTEM WATER USE

This chapter describes the City's customer classification system, summarizes trends in water consumption, and presents projections of water use out to the year 2035. It also covers information on distribution system losses, water for low income housing units, and future water savings expected water savings from plumbing codes and standards.

4.1 Customer Classification System

The City divides its water customers into eight major classes and one miscellaneous category, as follows:

Single Family Residential: Individually metered residential units (regardless of housing type).

Multiple Family Residential*:* Any residential account with more than one dwelling unit served by one water meter.

Business: Commercial establishments including restaurants, hotel/motel, retail, medical, schools, offices, churches and mixed-use buildings. This category also includes county and state government accounts.

Industry/UCSC: This category is comprised of one primary customer - the University of California, Santa Cruz - and a small number of manufacturing businesses.

Municipal: These are City-owned and operated facilities such as city offices, parks, police and fire stations, a wastewater treatment plant, street medians, and parking lots.

Irrigation: Dedicated water services for landscape irrigation associated with large multiple residential complexes and homeowners associations, or with commercial, industrial, and institutional sites, including schools, churches, parks, etc.

Golf Irrigation: Accounts serving the two golf courses in the service area.

Coast Irrigation: Agricultural accounts receiving untreated or "raw" water on the north coast.

Other: Miscellaneous uses such as temporary construction accounts, hydrant meters, and bulk water sales.

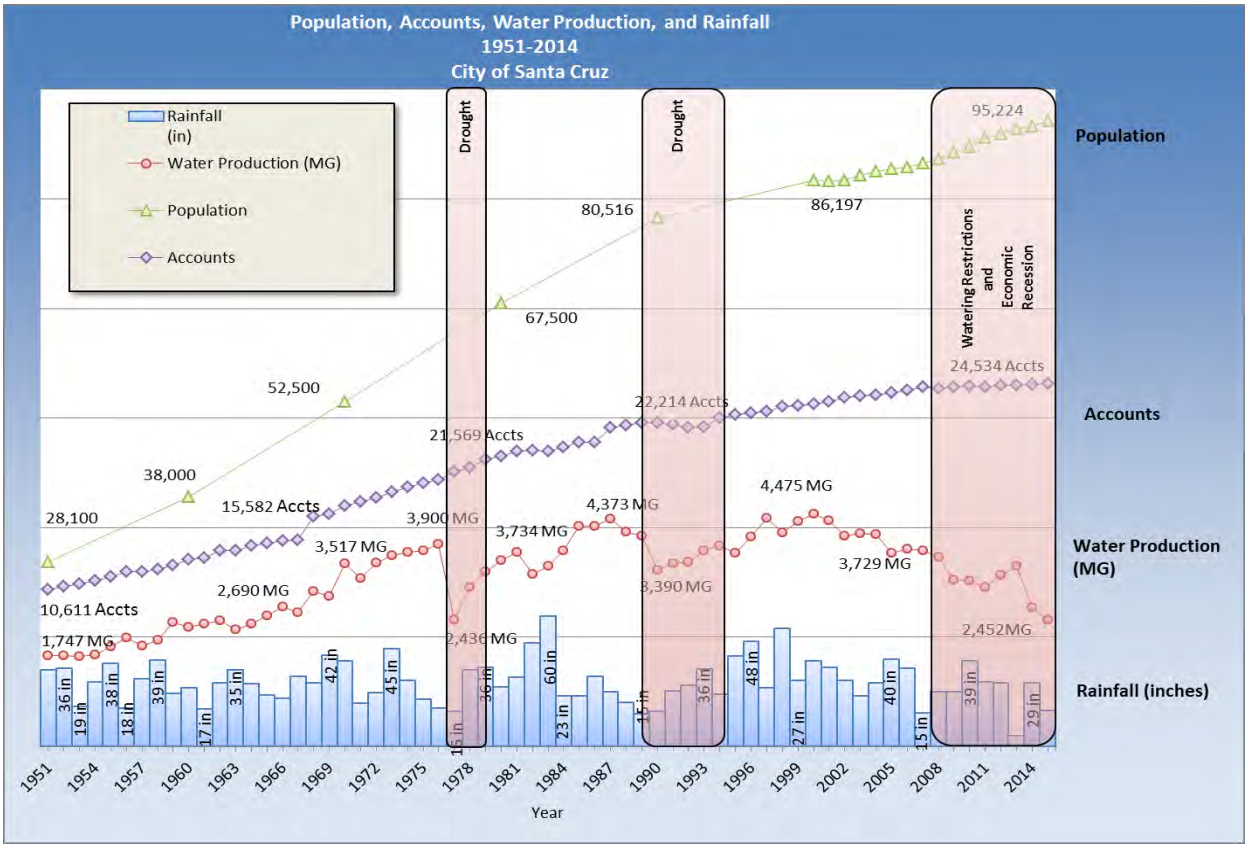
In addition to designating accounts into various customer classes, the City also groups its customers into either “inside-City” or “outside-City” categories for billing purposes.

Except for coast irrigation which receives raw water, all water supplied is potable water. The City does not currently provide recycled water within its service territory. Moreover, no water is presently sold to other agencies, or used for groundwater recharge, saline water intrusion barriers, conjunctive use, or any combination thereof. The potential future use of treated water for transfer, exchange, or groundwater recharge is discussed in Chapter 7.

4.2 Historical Water Use

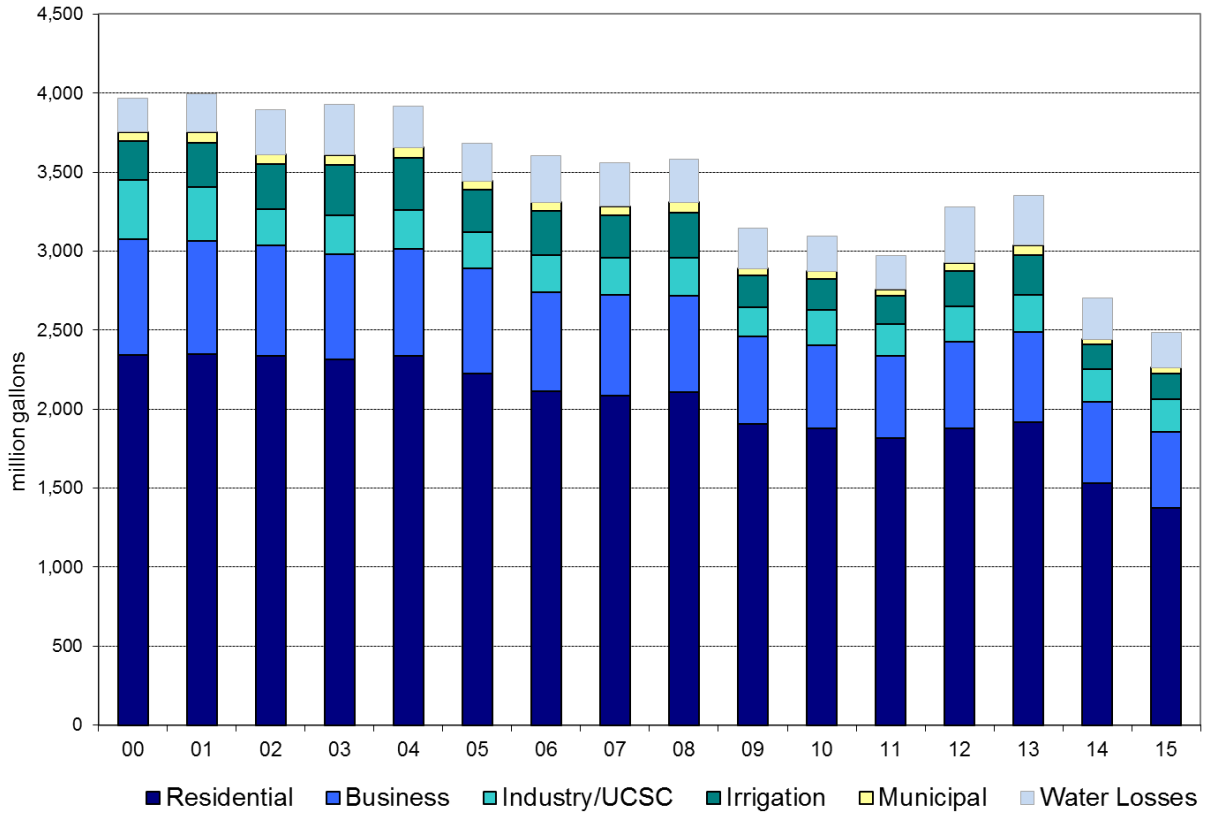
The overall trend in population, number of accounts and total annual water use going back to the 1950s is presented below in Figure 4-1.

Figure 4-1. Historic Trends for City of Santa Cruz



Until recently, the general trend in system demand was one in which water use rose roughly in parallel with account and population growth over time, except during two major drought periods in the late 1970s and the early 1990s. Around 2000, this pattern changed and system demand began a long period of decline, accelerated by pricing changes, drought, economic downturn, and other factors. In 2015, after 2 years of water rationing, annual water use fell to a level of about 2.45 billion gallons, similar to the level experienced during the 1970s drought. A breakdown of annual water consumption by City's major customer classes since 2000, along with system water losses, is illustrated in Figure 4-2.

Figure 4-2. Annual Water Consumption by Customer Category (million gallons)



4.3 Water Use by Sector

Actual demands for potable water in calendar year 2015 are reported by customer class in Table 4.1 below. As illustrated above, both the level and the composition of demand have been strongly affected by the recent drought. Compared to two years before, total system water demand was down nearly 900 million gallons or 27 percent due to local drought response and implementation of water rationing during 2015. In addition to the potable water demand listed below, the City also supplied 34 million gallons of raw water to coast irrigation accounts in 2015.

Table 4-1. Demands for Potable Water – Actual			
Use Type	2015 Actual		
	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume (mg)
Single Family	Individually meter dwellings	Drinking Water	835
Multi-Family	2 or more dwelling units	Drinking Water	538
Commercial		Drinking Water	485
Industrial		Drinking Water	43
Industrial	UC Santa Cruz	Drinking Water	160
Institutional/Governmental	Municipal (city) accounts	Drinking Water	35
Landscape	Dedicated Irrigation Accounts	Drinking Water	46
Landscape	Golf Irrigation	Drinking Water	87
Losses		Drinking Water	223
		TOTAL	2,452
NOTES: System water losses are considered provisional until 2015 annual water audit is completed. Figures above do not include raw water sales of 34 mg in 2015 for coast irrigation, or 2 mg received from Soquel Creek Water District during a major valve replacement project. No drinking water was otherwise used for groundwater recharge, saline water intrusion barrier, wetlands or wildlife habitat, or for sales, transfers, or exchanges to other agencies.			

4.4 Distribution System Water Losses

Total system water demand includes not only metered water sales but also authorized, unmetered uses from fire hydrants such as main flushing, fire fighting, street sweeping, and sewer flushing, as well as losses due to underground leaks. The difference between the amount of water produced at the City's water treatment plants entering the distribution system and the amount of water consumed, including both metered and unmetered uses, is referred to as system water losses. System losses have two components: physical losses from leaking service lines and water mains, and apparent losses in which actual consumption is underreported due to sales meter inaccuracies and other factors.

The City has conducted audits of the distribution system annually since the late 1990's to account for unmetered water uses and to track how much water is lost to leakage over time. The City uses AWWA water balance software to help quantify and track water losses associated with the water distribution system and identify areas for improved efficiency and cost recovery. Total water losses vary from year to year, averaging 265 million gallons per year or about 7.5 percent of treated water production.

The volume of water loss for calendar year 2014, which is the most recent 12-month period available, is presented in Table 4-2. The City is currently conducting a Water Loss Control project to examine the City's water system and operations practices to better validate where losses are occurring, evaluate options, and set forth a formal strategy to improve water accountability and reduce lost water. More information on distribution system water losses is covered in Chapter 9.

Table 4-2. 12 Month Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss (million gallons)
01/2014	261
NOTES: AWWA Water Audit Software, V5.0 for Calendar Year 2014	

4.5 Water Demand Projections

One of the first requests made by the WSAC was for the Water Department to update the demand forecast to reflect current information on water usage and to account for effects of conservation, water rates, and other factors expected to impact the future demand for water. Accordingly, the Water Department contracted with M.Cubed to develop two products: 1) an interim forecast to assist the WSAC process, and 2) a separate econometric demand forecast for the service area extending to year 2035.

The forecast of future water demand is a foundational component of any Urban Water Management Plan. In recent years the historical patterns of water demand have been upended by a variety of factors, including the cumulative effects of tighter efficiency standards for appliances and plumbing fixtures, greater investment in conservation, a significant uptick in water rates, an equally significant downturn in economic activity during the Great Recession, and on-going drought. These events have resulted in even more uncertainty than usual regarding future water demand and have placed even greater importance on sorting out the effect each has had on demand in recent years as well as how they are likely to affect demand going forward.

Econometric demand forecasting develops statistically-based models of average water use per service by customer class. A demand forecast was developed based on these models covering the period 2020-2035 and incorporating empirical relationships between water use and key explanatory variables, including season, weather, water rates, household income, employment, conservation, and drought restrictions. The approach builds on similar models of water demand developed for the California Urban Water Conservation Council (Western Policy Research, 2011), Bay Area Water Supply and Conservation Agency (Western Policy Research, 2014), California Water Service

Company (A&N Technical Services, 2014, M.Cubed 2015), and Contra Costa Water District (M.Cubed 2014).

The statistical models of demand were estimated using historical data on customer class water use, weather, water price, household income, conservation, and other economic variables driving water demand. The monthly models of water demand were combined with service and housing growth forecasts to predict future water demands. The demand models explain 90 to 99% of the observed variation in historical average use over the 14-year estimation period.

A description of the model and forecasts of average demand by customer class are detailed in Appendix F. The forecasts include adjustments for future effects of water rates, plumbing codes and the City's baseline conservation program and are predicated on average weather and normal (predicted) income and growth.

Additional modeling was conducted to factor in updated information on passive and active conservation savings through the 2035 planning period (Maddaus Water Management, 2016). The resulting water demand projection, by customer class, is presented in Table 4-3. As summarized below, system water demands are expected to decline and then stabilize at a level of about 3.2 billion gallons per year.

Table 4-3. Demands for Potable Water - Projected

Use Type	Additional Description	Projected Water Use (mgy)				
		2020	2025	2030	2035	2040-opt
Single Family	Individually metered dwellings	1,277	1,223	1,191	1,170	n/a
Multi-Family	2 or more dwelling units	772	714	690	678	n/a
Commercial		574	541	525	519	n/a
Industrial		56	59	60	61	n/a
Institutional/ Governmental	Municipal (city) accounts	46	42	40	40	n/a
Landscape	Dedicated Irrigation	112	119	134	144	n/a
Landscape	Golf Irrigation	58	52	47	47	n/a
Other	UC Santa Cruz	196	234	271	308	n/a
Water Losses		236	241	247	253	n/a
TOTAL		3,327	3,225	3,205	3,220	n/a

NOTES: David Mitchell, M Cubed, October 2015, and by Maddaus Water Management, February 2016

Total water demands are presented in Table 4-4.

Table 4-4. Total Water Demands (mgy)

	2015	2020	2025	2030	2035	2040 *(opt)*
Potable and Raw Water	2,452	3,327	3,225	3,205	3,220	n/a
Recycled Water Demand	0	0	0	0	0	0
TOTAL WATER DEMAND	2,452	3,327	3,225	3,205	3,220	n/a

NOTES: Excludes 34 mg of raw water for coast ag in 2015, projection of coast ag use not available; See Chapter 6 for information on recycled water as a potential source of supply.

4.6 Estimating Future Water Savings

CWC 10631

(e)(4)(A) *If available and applicable to an urban water supplier, water use projections may display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.*

(B) *To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following: (i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.*

The City is in the final stages of completing a Water Conservation Master Plan, described later in Chapter 9. A major part of this planning effort was to model the impact of natural replacement of existing fixtures and appliances on future water use inside homes and businesses, as well as the impact of fixture codes on water use in new development. The model takes into account the existing proportion and characteristics of fixtures from a recent Baseline Water Use Survey, estimated annual replacement rate, fixture life, and assumed market share at various points in the planning horizon (Envirosmart Solutions Group, 2013).

Different federal and state laws regulate the sale or manufacturing of various water using fixtures and appliances. The following laws and regulations were taken into account to estimate the decrease in water use expected to occur over the next 20 years:

- California Energy Commission Appliance Efficiency Regulations, Sept 2015 (toilets, urinals, faucets, and showerheads)
- U.S. Department of Energy standards (residential clothes washers, dishwashers)
- Federal Energy Policy Act of 1992 (toilets, urinals, showerheads, faucets, pre-rinse spray valves)
- 2013 California Green Building Code (new development)
- AB 715 (toilets, urinals)

The estimated cumulative impact of plumbing codes on water use over the next 20 years is a reduction of some 329 million gallons or 8.6 percent of baseline water demand (Table 4-5).

Table 4-5. Future Cumulative Water Savings From Plumbing and Appliance Codes

	2020	2025	2030	2035	2040 *(opt)*
Water Savings (mgy)	94	179	269	329	n/a

NOTES: Maddaus Water Management, Inc., 2016

4.7 Water Use for Lower Income Households

In its demand forecast, the City expects nearly 1,000 new housing units to be built in its service area by 2025. Table 3-4 on page 3-8 (Chapter 3) provides details about these housing units, including the 414 units that are planned for lower income categories. The water demand for these low income units, while not separately calculated, is well within the range of housing units factored into the City's demand forecast.

4.8 Climate Change

Information in Section 3.3 on the service area climate suggests a gradually hotter and somewhat drier climate can be expected to occur in Santa Cruz in future years. Indeed, in 2014 and 2015, at the height of the current drought, the mean annual temperature was between 2 and 3 degrees higher than the historic, long-term average temperature. It is not unreasonable, given normal seasonality of water use, to expect that a warmer and drier future could result in an overall increase in water demand.

Using parameters from the econometric demand models, weather effects on City water demand were investigated using historical data on sales and weather and expressed as the expected change in demand per a 1(one) degree F increase in average maximum daily air temperature over the entire year (M.Cubed, 2016). The analysis shows, based on current water use patterns, demand would increase from between 0.19 to 1.38

percent for one degree increase in average daily high temperature for every customer group except industrial. Results are summarized in Table 4-6. Golf consumption shows the largest increase in demand due to change in maximum daily temperature and multifamily consumption is the least responsive. Total system demand would be expected to increase by about 0.45 percent per one degree F increase in average daily high temperature (Appendix G). Therefore, in the higher scenario for projected temperature in year 2100 shown in Figure 3-4, if average temperature in Santa Cruz were to rise by 5.5 degrees, water demand could be expected according to this analysis to increase by 2.5 percent.

Table 4-6. Expected % Change in Demand per 1 Degree F Change in Monthly Average Maximum Daily Air Temperature

SFR	0.62
MFR	0.19
BUS	0.29
MUN	1.09
IRR	0.80
GOLF	1.38
IND	0.00
Weighted Average	0.45

NOTES: M.Cubed, 2016. UCSC not listed since it was not modeled in econometric demand forecast.

Chapter 5

SB X7-7 BASELINES AND TARGETS

This chapter provides a description and calculations for the City's baseline daily per capita water use and future water use targets, in accordance with technical methods developed by the California Department of Water Resources, as required by Water Code section 10608.

> ***CWC 10608.20***
>
> ***(e)*** *An urban retail water supplier shall include in its urban water management plan . . . the baseline daily per capita water use, urban water use target, interim water use target, along with the bases for determining those estimates, including references to supporting data.*

5.1 Background Information

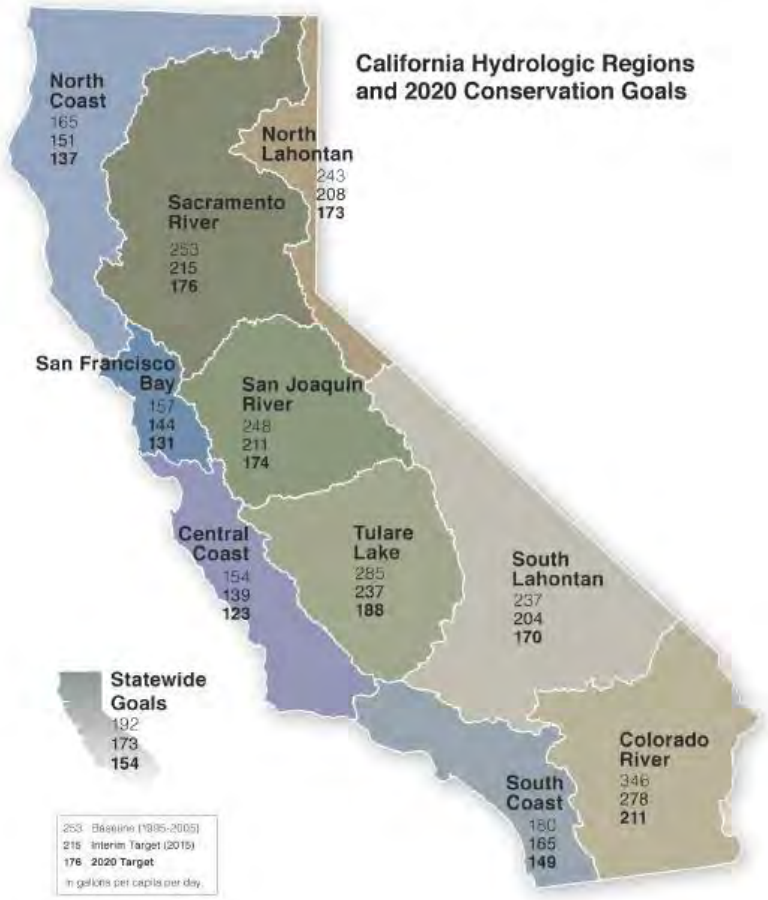
In February 2008, the Governor introduced a seven-part comprehensive plan for improving the Sacramento-San Joaquin Delta. As part of this effort, the Governor directed state agencies to develop a plan to reduce statewide per capita water use by 20 percent by the year 2020.

The 20x2020 Water Conservation Plan was designed to address several key questions, including the following:

- What is per capita use?
- How does it vary across the state?
- What is the conservation potential from current measures and new actions?
- Is it feasible to expect a 20 percent reduction in per capita water use?

The final 20x2020 Water Conservation Plan was issued February 2010 (DWR, 2010). It reported urban water use currently varies between **152 gpcd** in the Central Coast region (Region 3) to **346 gpcd** in the Colorado River region (Region 10) and averages **192 gpcd** statewide**.** The report concluded that California could achieve a 20 percent reduction in urban per capita water use to an average of **154 gpcd** using current and new conservation actions. It also established for water resources planning purposes baseline values and future water use targets for each of the state's ten hydrologic regions, summarized in Figure 5-1.

Figure 5-1. Regional Urban Water Use Targets



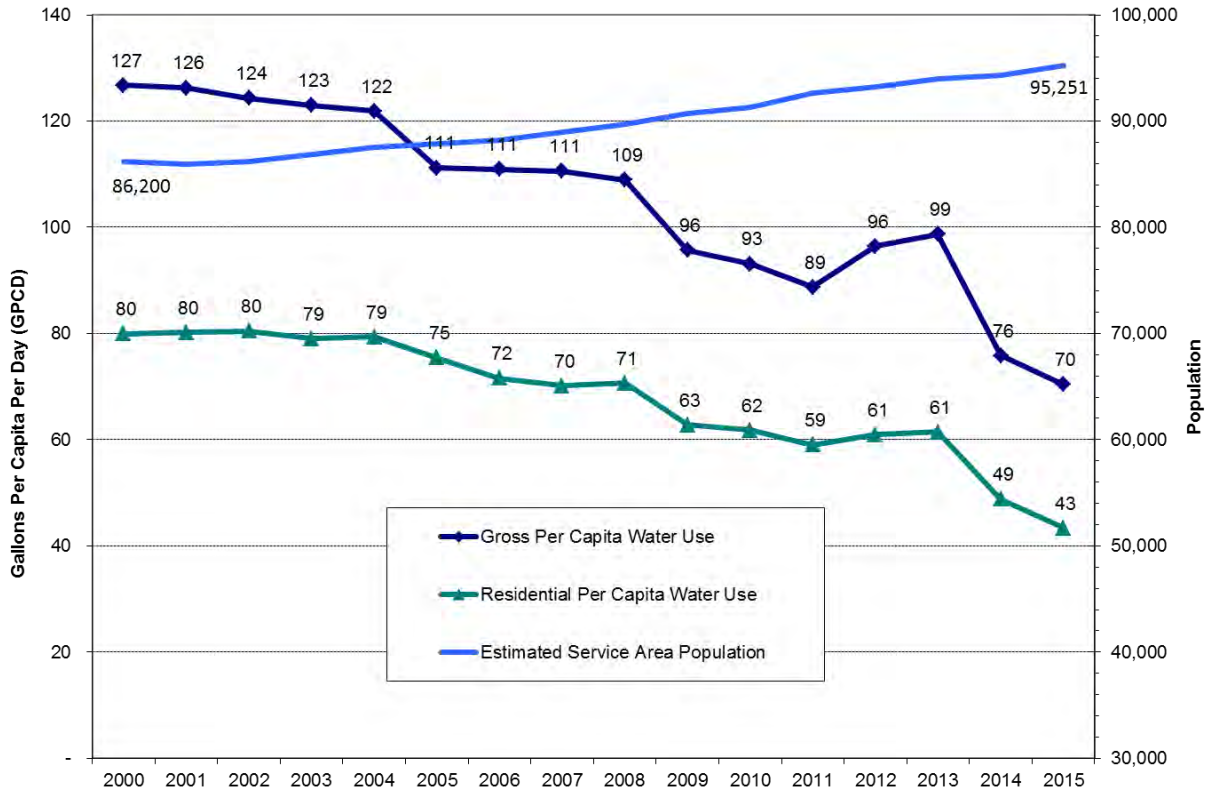
With the enactment of the Water Conservation Act of 2009, also known as SB X7-7, the state is required to set a goal to reduce urban per capita water use by 20 percent by the year 2020. Each retail urban water supplier must determine its baseline water use during their baseline period and also target water use for the years 2015 and 2020 in order to help the State achieve the 20 percent reduction. A copy of the law is included as Appendix B.

To provide for consistent implementation of the law, suppliers are required to conform to Technical Methodologies prepared by the CA Department of Water Resources, which details the process that urban water suppliers are to follow and the options available for complying with the legislation (DWR, February 2016). Water suppliers have some flexibility in setting and revising water use targets. For instance, a water supplier may set its water use target and comply individually, or as part of a regional alliance. The City of Santa Cruz is electing to report as an individual retail supplier.

In this 2015 Plan, water agencies must demonstrate compliance with their established water use target for the year 2015. This will also demonstrate whether or not the agency is currently on track to achieve its 2020 target. Retail water agencies are also required to separately complete and submit the standard tables in the SB X7-7 verification form.

Figure 5-2 below shows the City's per capita water use and estimated population since 2000. The top line labeled **Gross Per Capita Water Use** is the metric that water agencies are required to calculate and to reduce under SB X7-7. It represents all the treated water entering the distribution system over one year's time, divided by the total population, and expressed in gallons per person per day. As explained further below, gross per capita water use includes residential and nonresidential uses of water in the community, as well as unmetered uses such as firefighting and losses that occur due to leakage on the distribution system.

Figure 5-2. Per Capita Water Use and Service Area Population



The bottom line labeled Residential Per Capita Water Use is included for reference only. It represents the total annual metered water consumption at single and multiple

residential accounts, divided by the residential population[1]. It is intended to show the estimated average amount of water used by a person both indoors and outdoors at their home on a daily basis. This metric better approximates how most people relate to their own personal water use at their property. It is also the same metric used by the State Water Board to set urban water reduction targets in 2014 and 2015, explained in Section 5.9 below.

Over the last 15 years, the City's gross per capita water use has declined from about **127 gpcd** in 2000 to **70 gpcd** in 2015. Similar to the pattern in total water use discussed in Chapter 4, the trend in per capita water has been mostly declining over this period, for various reasons. These include the cumulative effects of more conservation, higher water rates, economic downturn, drought, and industrial closures. The steep drop in 2014 and 2015 reflects the effect of water rationing that was instituted both years as a result of a declared emergency water shortage.

As is described below, the City's gross per capita water use is presently far below both its **2015 interim target of 111 gpcd** and its **2020 target of 110 gpcd,** as determined in accordance with DWR's technical methodologies. Accordingly, the City is presently in compliance with all requirements of SB X7-7.

The remainder of this Chapter strictly follows the DWR Guidebook for demonstrating and documenting compliance with the City' water use target for the year 2015.

5.2 Updating Calculations from 2010 Urban Water Management Plan

In accordance with Water Code section 10608.20, an urban retail water supplier may update its 2020 urban water use target in its 2015 Urban Water Management Plan. In the 2010 plan, the City elected to use **Target Method 3** (for an explanation of the four target methods, see section 5.7). No change to the target method is being made in this 2015 plan.

The 2010 plan also used both 2000 and 2010 U.S. Census data at the block level in its baseline population calculations. As a result, no recalculation of the baseline population calculations is needed for this 2015 plan. It should be noted, however, that the annual population estimates from the CA Department of Finance (CA DOF) for the Santa Cruz City in non-census years were slightly revised since the 2010 plan, and those revisions

[1] Residential population differs from total population. There are several thousand students, families, and staff living on the University main campus, which is classified as an industrial account. Only the people living in residences off-campus are counted for the purpose of calculating R-GPCD.

have been incorporated in this update. The change in population inside the City estimated by CA DOF ranged from a decline of 0.1 percent in 2001 to an increase of 0.6 percent in 2009 (-62 to +341 persons). These small revisions made no difference in the City's base daily per capita water use.

The baseline and targets water use development process consists of four basic steps, which are summarized below and detailed in a flow chart in Appendix H.

Step 1: Determine Baseline Daily Per Capita Water Use
Step 2: Determine Urban Water Use Target
Step 3: Confirm Urban Water Use Target
Step 4: Determine Interim Urban Water Use Target

Step 1 - determining baseline daily per capita water use – involves several steps on its own, as listed below:

1A. Establishing the baseline period,
1B. Estimating the service area population for each year in the baseline period,
1C. Measuring gross water use, typically expressed in million gallons per year, and
1D. Determining the daily per capita water use in each of the baseline years.

The calculations for Step 1, A-D are detailed further below in Sections 5.3 through 5.6. Steps 2 through 4 are then described in Section 5.7.

5.3 Baseline Period (Step 1A)

Under SB X7-7, water suppliers must define two baseline periods. The first is a continuous 10-year baseline period (or 15-year period if more than 10 percent of system water demand is met through recycled water) ending no earlier than December 2004 and no later than December 2010. The City does not provide recycled water service so the 15-year baseline period does not apply. The 10-year baseline period selected by the City of Santa Cruz is **2001-2010**.

The second is a continuous five-year baseline period ending no earlier than December 2007 and no later than December 2010. This second baseline period is used to confirm that the selected target meets the minimum water use reduction requirement (see section 5.7 on target confirmation). The 5-baseline period selected by the City of Santa Cruz is **2003-2007**. Both the 10-year and the 5-year baseline periods presented in this plan are the same as were reported in the 2010 plan.

5.4 Service Area Population (Step 1B)

Estimates of the City's water service area population are based on the sum of separate population estimates for inside and outside the Santa Cruz city limits.

Inside the City limits, population data is readily available on an annual and decennial basis for the City as a whole. The City uses data published by both the U.S. Census Bureau for census years and the California Department of Finance in non-census years.

Outside the City limits, however, including parts of unincorporated Santa Cruz County and the City of Capitola that are served by the City water system, population data are available only every ten years through the census. Moreover, because the City's service area boundary in those jurisdictions does not coincide neatly with census tract or block boundaries, estimates must be derived using a Geographic Information System at the census block level. In split census blocks, population is apportioned based the percentage of each individual block that is located within the water service area.

For non-census years, it is standard practice among water utilities to estimate population growth by using a people-per-residential connection method. Between 2000 and 2010, approximately 425 residential accounts were added to the system outside the City limits. But because census data indicated that the overall population outside the City actually declined during this period, this approach was not considered to be applicable or appropriate for that time period. Therefore, annual estimates of the outside city population were derived simply by interpolating between the 2000 and 2010 census years. Between 2010 and 2015, the outside City population was determined using a people-per-connection method.

5.5 Gross Water Use (Step 1C)

Gross water use[2] is a measure of water that enters the distribution system of a supplier over a specified period of time. Gross water use includes not just residential consumption but all the other uses of water in a community, including schools, parks, and commercial buildings such as restaurants, hotels, and office buildings. It also captures water used for public purposes, such as firefighting and water main flushing, and losses that arise from leaks on the water system.

[2] The terms "gross water use" as used in this chapter and "net water production" used in Chapter 3 mean effectively the same thing; i.e., they both refer to treated water production volumes supplied to the distribution system.

Gross water use was determined in a manner that is consistent with the definition in Water Code section 10608.12(g) and the method outlined in the AWWA Manual M36 as part of the City's annual distribution system water audit process (AWWA, 2016). These annual water use figures represent the total amount of treated water entering the distribution system from the City's Graham Hill and Live Oak water treatment plants, after corrections have been applied to adjust for both production meter accuracy and net change in distribution system storage at the beginning and end of the year.

Gross water use does not include raw water sales to coast agriculture, since it is fed to these customers before it reaches the water treatment plant.

5.6 Baseline Daily Per Capita Water Use (Step 1D)

The calculation of baseline daily per capita water use combines information described above and is provided in Tables 5-1 below. The City's baseline daily per capita use is **113 gpcd**.

Table 5-1: Gallons Per Capita Per Day (GPCD)

Baseline Year		Service Area Population	Gross Water Use (million gallons)	Daily Per Capita Water Use (GPCD)
10 Year Baseline GPCD				
Year 1	2001	85,972	3,962	126
Year 2	2002	86,158	3,909	124
Year 3	2003	86,865	3,898	123
Year 4	2004	87,556	3,895	122
Year 5	2005	87,864	3,567	111
Year 6	2006	88,170	3,570	111
Year 7	2007	88,929	3,590	111
Year 8	2008	89,666	3,565	109
Year 9	2009	90,728	3,169	96
Year 10	2010	91,291	3,103	93
10 Year Average Baseline GPCD				**113**

5 Year Baseline GPCD				
Baseline Year		Service Area Population	Gross Water Use	Daily Per Capita Water Use
Year 1	2003	86,865	3,898	123
Year 2	2004	87,556	3,895	122
Year 3	2005	87,864	3,567	111
Year 4	2006	88,170	3,570	111
Year 5	2007	88,929	3,590	111
5 Year Average Baseline GPCD				**116**
NOTES:				

5.7 2015 and 2020 Targets

CWC 10608.20

(e) *An urban retail water supplier shall include in its urban water management plan due in 2010. . . urban water use target, interim urban water use target,…along with the bases for determining those estimates, including references to supporting data (10608.20(e)).*

CWC 10608.20

(g) *An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan…*

5.7.1 Select and Apply a Target Method (Step 2)

Under SB X7-7, urban water suppliers must next set a 2020 water use target using one of the following four methods:

Method 1: Eighty percent of the water supplier's baseline per capita water use.

Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscaped area water use; and commercial, industrial and institutional water uses.

Method 3: Ninety-five percent of the applicable state hydrologic region target as stated in the State's April 30, 2009, draft 20x2020 Water Conservation Plan.

Method 4: A method developed by CA DWR that identifies water savings obtained through identified practices and subtracts them from the agency's baseline GPCD.

As mentioned above, the City of Santa Cruz elected in 2010 to use **Method 3**. For the Central Coast Region, 95 percent of the region's 2020 target is **117 gpcd** (0.95 x 123 gpcd = 117 gpcd). 100 percent of the City's water service area is located within the Central Coast region.

5.7.2 5-Year Baseline – 2020 Target Confirmation (Step 3)

> ***CWC 10608.22***
>
> *Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.*

Water Code section 10608.22 requires water suppliers to achieve at least a 5 percent minimum reduction in per capita water use, as compared to a different, 5-year baseline period, as mentioned earlier in section 5.3. The 5-year baseline period may end no earlier than December 2007 and no later than December 2010. The 5-year baseline period selected by the City of Santa Cruz is **2003-2007**.

As indicated in Table 5-1 above, the City's 5-year baseline water use calculates out to be **116 gpcd.** Accordingly, the City's maximum allowable gpcd target in 2020 (per section 10608.22) is **110 gpcd** (0.95 x 116 gpcd = 110 gpcd).

5.7.3 Calculate the 2015 Interim Urban Water Use Target (Step 4)

The last step in complying with SB X7-7 requires calculating an interim urban water use target, meaning the midpoint between the base daily per capita water use and the 2020 target water use for measuring progress in the year 2015. The City's interim urban water use target is:

Interim Urban Water Use Target = (113 gpcd + 110 gpcd)/2 = **111.5 gpcd**

5.7.4 Baselines and Targets Summary

All the discussion above regarding baseline periods, baseline GPCD, 2015 interim target and 2020 target is summarized in Table 5-2 below:

Table 5-2. Baselines and Targets Summary

Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	2001	2010	113	111	110
5 Year	2003	2007	116		

*All values are in Gallons per Capita per Day (GPCD)

NOTES:

5.8 2015 Compliance Daily per Capita Water Use

All water suppliers are required to calculate their actual 2015 water use to determine whether or not they have met their per capita 2015 target and to assess their progress toward meeting their 2020 target. Beginning in 2016, eligibility for state grants and loans is conditioned on an agency meeting its 2015 target.

Table 5-2 below documents the City of Santa Cruz has not only met but far surpassed its 2015 target and is therefore in compliance with the requirements in SB X7-7.

Table 5-2. 2015 Compliance

Actual 2015 GPCD	2015 Interim Target GPCD	**Optional Adjustments to 2015 GPCD** Enter "0" for adjustments not used *From Methodology 8*					2015 GPCD *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		Extraordinary Events	Economic Adjustment	Weather Normalization	TOTAL Adjustments	Adjusted 2015 GPCD		
70	111	0	0	0	0	70	70	Yes

**All values are in Gallons per Capita per Day (GPCD)*

NOTES:

5.9 Drought Emergency Water Conservation and R-GPCD

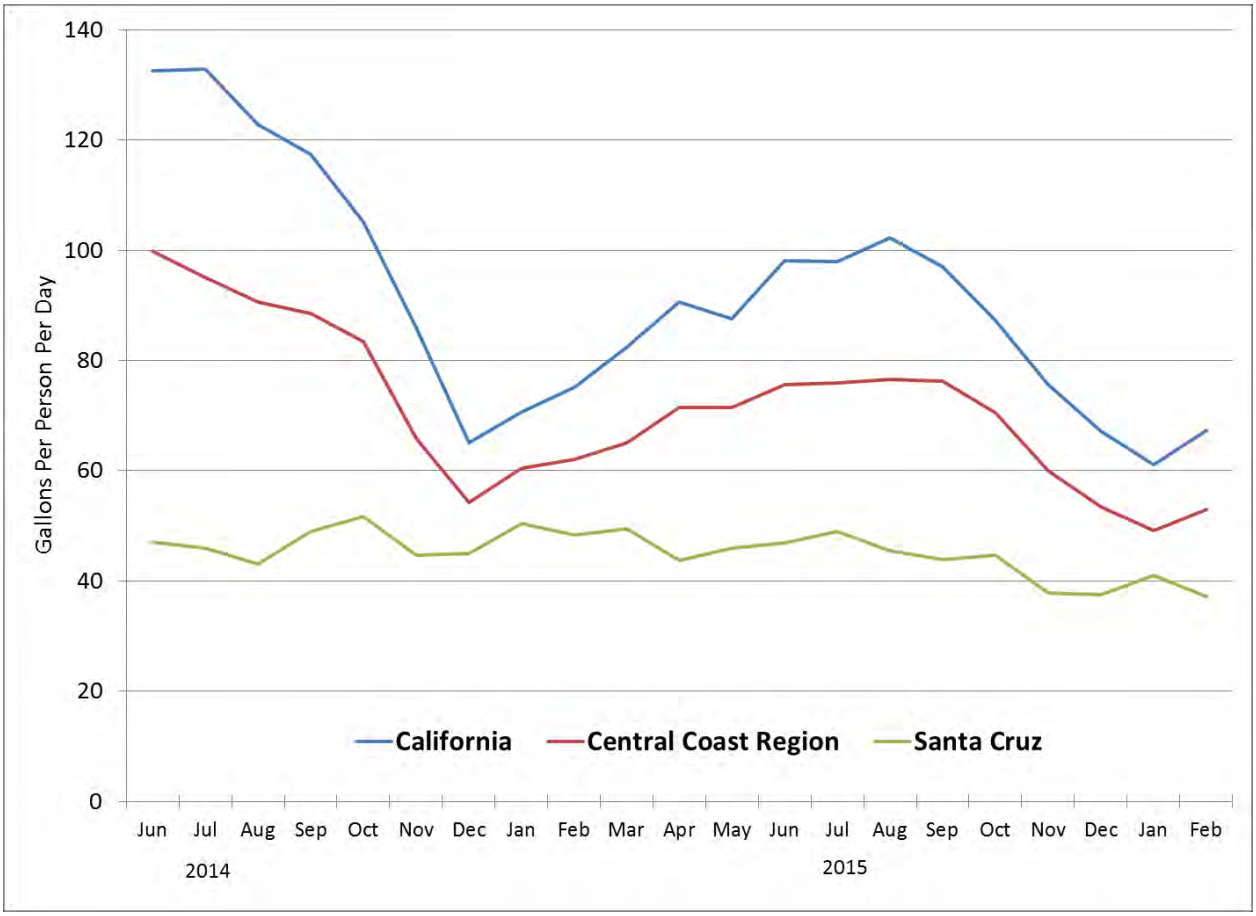
Beginning June 2014, urban water suppliers were required under separate drought emergency regulations to submit monthly reports to the State Water Resources Control Board on their urban water conservation efforts. These reports initially focused on the total monthly water production compared to the amount produced in the same month during 2013.

Shortly thereafter, beginning October 15, 2014, urban water suppliers were required to report R-GPCD (residential per capita water use) on a monthly basis to the State Water Board as an informational metric. An agency's monthly R-GPCD differs from the annual GPCD calculation discussed above. It takes into account the percentage of total monthly potable water production being used for residential purposes and the residential population served. Unlike gross daily per capita water use, R-GPCD does not include commercial, industrial or institutional water or non-revenue water (water losses).

On April 1 2015, the Governor issued an Executive Order that directed the State Board to impose restrictions on water suppliers to achieve a 25 percent reduction in potable urban usage. The regulations that were adopted shortly thereafter gave agency-specific reduction targets based on their R-GPCD. Agencies with a higher R-GPCD were required to cutback more than agencies with a lower R-GPCD. Targets ranged from 8 percent for agencies, including the City of Santa Cruz, whose average R-GPCD was less than 65 gallons per person per day, up to 36 percent for agencies whose R-GPCD was 215 gallons per person per day, or more.

Figure 5-3 below shows the R-GPCD for the City of Santa Cruz compared to the statewide and the Central Coast Hydrologic Region averages for the period June 2014 through February 2016, as reported by the State Water Resources Control Board on its Conservation Reporting website in April 2016. Over this period, as a result of strict water rationing in effect through October 2015, the City consistently had one of the lowest levels for R-GPCD in all of California. The City will continue to report and track R-GPCD through at least January 2017, as required under statewide emergency water conservation regulations.

Figure 5-3. Reported Residential Water Use Per Capita (R-GPCD)



5.10 New Water Use Targets

On May 9, 2016, the Governor issued Executive Order B-37-16. One of the provisions in this order was that the CA Department of Water Resources work with the State Water Resources Control Board to develop new targets as part of a permanent framework for urban water agencies. These new targets would build upon the state law requirements that the state achieve a 20 percent reduction in urban per capita water use by 2020. The targets would be customized to the unique conditions of each water agency, would generate more statewide conservation than existing requirements, and would be based on strengthened standards for:

- Indoor residential per capita water use;
- Outdoor irrigation, in a manner that incorporates landscape area, local climate, and new satellite imagery data;
- Commercial, industrial, and institutional water use; and
- Water lost through leaks

A draft framework for these new water use targets is planned for early 2017. It is unknown how this new target will change the current 2020 requirement for the City.

Chapter 6

SYSTEM SUPPLIES

This chapter describes the City's water supply system, presents supply source production volumes, and discusses possible future sources and opportunities to enhance the City's existing supply portfolio, including potential transfers, exchanges, and recycled water. Potential new sources are discussed further, in terms of planning for supply reliability, in Chapter 7.

The Santa Cruz water system relies predominantly on local surface water supplies, which include the North Coast sources, the San Lorenzo River, and Loch Lomond Reservoir. Together, these surface water sources represent approximately 95 percent of the City's total annual water production. The balance of the City's supply comes from groundwater, all of which is extracted from wells in the Purisima Formation in the mid-County area. These main production elements of the City's water supply system are illustrated below in Figure 6-1.

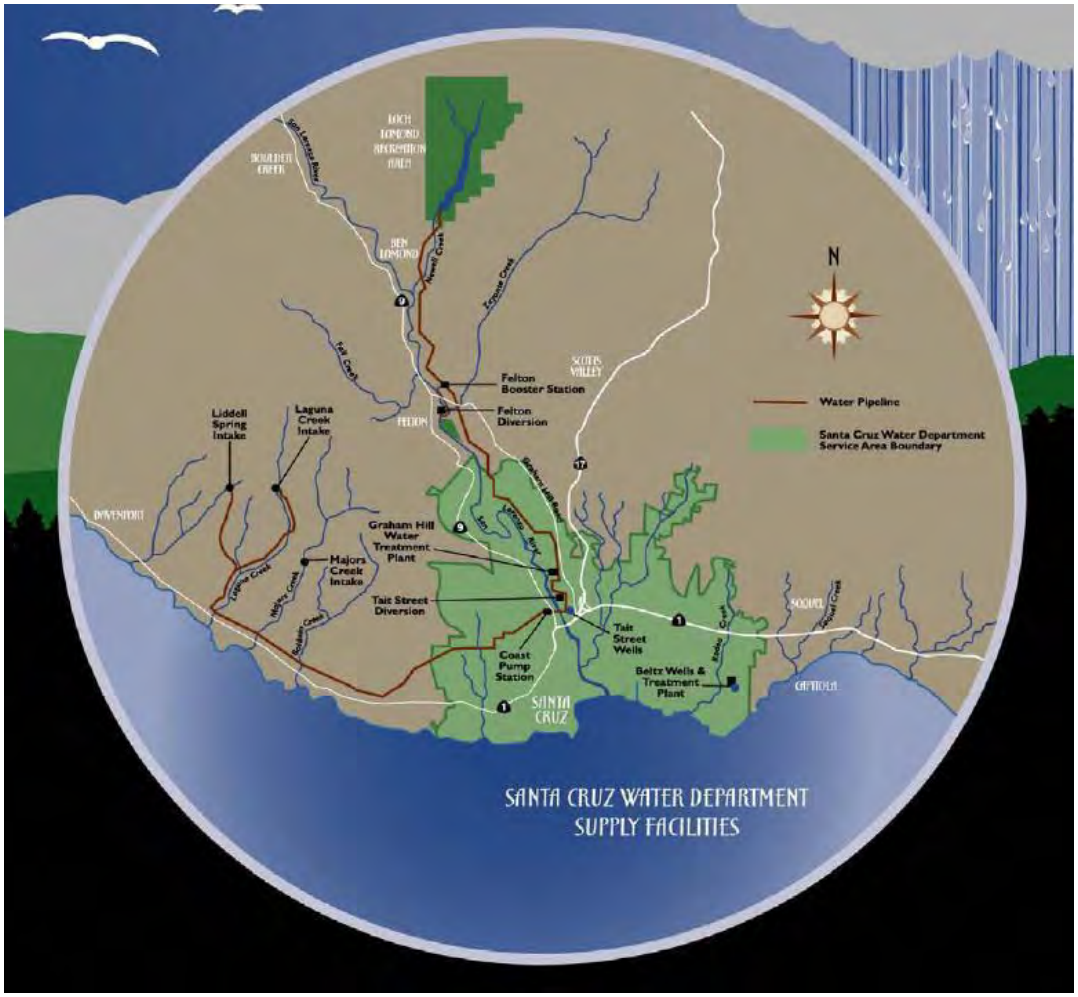
6.1 Purchased or Imported Water

The City of Santa Cruz does not now, nor does it plan to, import water, either from outside the Central Coast Hydrologic Region, or outside the Santa Cruz County boundaries. All of its water resources are obtained from local sources. The system relies entirely on rainfall, surface runoff, and groundwater infiltration occurring within watersheds located in Santa Cruz County. No water is purchased from state or federal sources or imported to the region from outside the Santa Cruz area.

6.2 Groundwater

Even though groundwater constitutes only up to about 5 percent of the entire City water supply on an annual basis, it has been a crucial component of the water system for meeting peak season demands, maintaining pressure in the eastern portion of the distribution system, and for weathering periods of drought since the facilities were acquired from the Beltz Water Company in 1964.

Figure 6-1. City of Santa Cruz Water Supply System



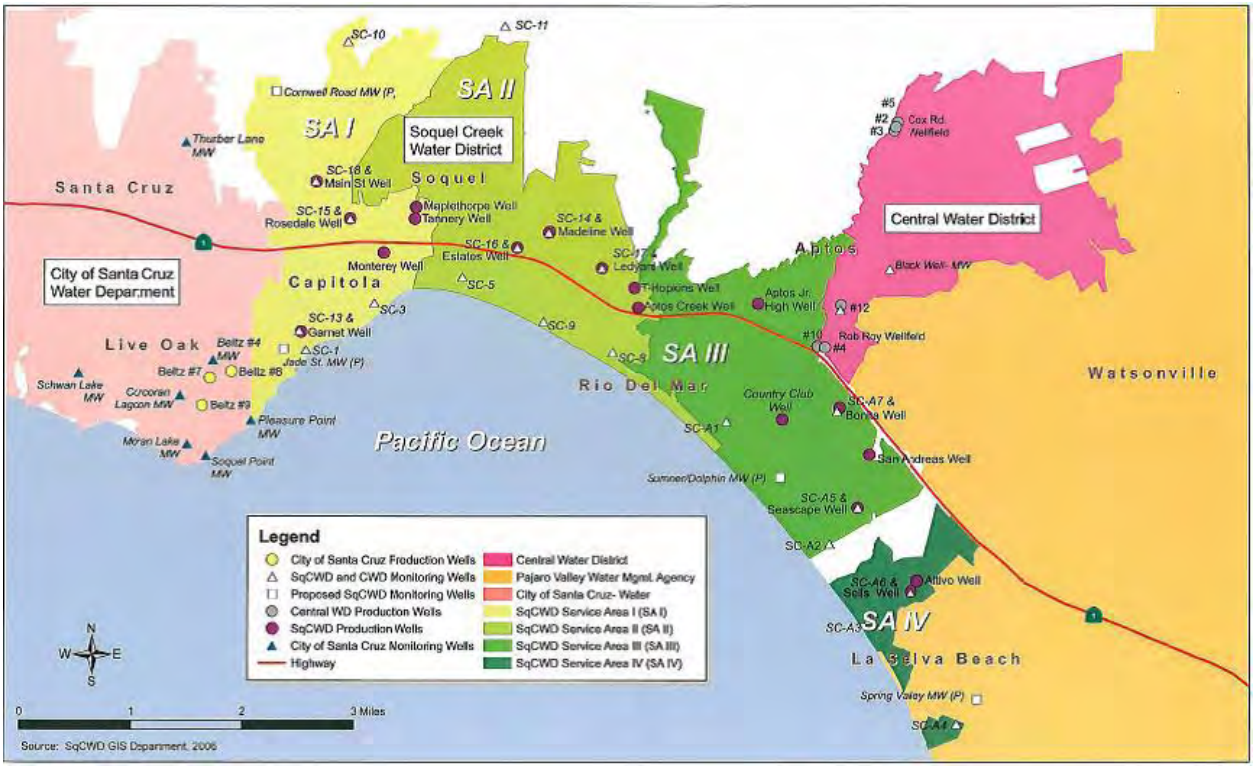
The Live Oak Well system consists of four production wells and two water treatment plants located in the eastern portion of the City water service area. The facilities were originally acquired by the City from the Beltz Water Company in 1964, and are still referred to as the "Beltz" wells. Wells 8 and 9 were installed in 1998 as replacement wells for Wells 1 and 2, which were damaged in the 1989 Loma Prieta earthquake. Well 7, which began operating in 1974, has been replaced by Well 10. The newest well, Beltz 12 and associated water treatment facilities, were completed in 2015.

The geographical area from which the City pumps groundwater is identified as the *West Santa Cruz Terrace Groundwater Basin* (Basin Number 3-26), whose western and eastern boundaries coincide roughly with the City's water service area (CA DWR, Bulletin 118). The entire production of the City's Live Oak well field is derived from the Purisima Formation, which is the primary groundwater aquifer underlying the entire

Mid-county region and makes up most of what is commonly referred to elsewhere as the “Soquel-Aptos” basin. As will be discussed in Section 6.2.2, a request to redefine the basin includes the reassignment of the eastern portion of the West Santa Cruz Terrace Groundwater Basin into the new Santa Cruz Mid-County Groundwater Basin.

Groundwater from the Purisima Formation is used by the City, the Soquel Creek and Central Water Districts, several small water systems, and numerous private rural water wells. A map of the public water supplier’s monitoring and production well networks within the region is shown in Figure 6-2. The City’s groundwater production and monitoring wells are concentrated on the western side, shown in the light pink area.

Figure 6-2. Public Water System Production and Monitoring Wells



6.2.1 Basin Description

The Purisima Formation is a collection of distinct geologic units composed of sandstone interbedded with layers of siltstone and claystone. These units, designated as AA through FF, vary in thickness and hydrogeological characteristics, with AA being the deepest and oldest unit. The formation is relatively shallow under the City’s water service area, but dips southeast, becoming deeper and thicker towards Capitola and Aptos and outcrops at the cliffs along the Monterey Bay shoreline. The A zone is the

primary supply for both the City's Live Oak (Beltz) wells and the Soquel Creek Water District's Service Area 1 wells and is continuous and connected between these areas of groundwater extraction (Hopkins Groundwater Consultants, 2009). Recharge is thought to occur from deep percolation of rainfall in the upper watersheds and along streambeds of Branciforte Creek, Arana Gulch, Rodeo Creek and Soquel Creek.

To better understand how the Purisima Formation responds to pumping stresses and to detect seawater intrusion, the City has installed and maintains a network of 34 monitoring wells at 14 sites. Groundwater levels and water quality, including chlorides, pH, total dissolved solids, general minerals, and other constituents are measured at regular intervals. Several new inland monitoring wells were added in 2012 and 2013. Data collected from these monitoring wells are shared with adjoining public water agencies interested in management and planning of groundwater supply.

6.2.2 Groundwater Management

The City of Santa Cruz Water Department has not itself prepared a groundwater management plan; however, a groundwater management plan has been prepared by the Soquel Creek and Central Water Districts for the Soquel-Aptos Area consistent with Assembly Bill 3030. This plan was originally prepared in 1996 then updated in 2007 and currently serves as a living document with the most recent update having occurred in 2013.

A new framework for sustainable management of groundwater supplies was provided in 2014 when Governor Brown signed the landmark Sustainable Groundwater Management Act or SGMA. Key milestones of SGMA are shown in the sidebar to the right.

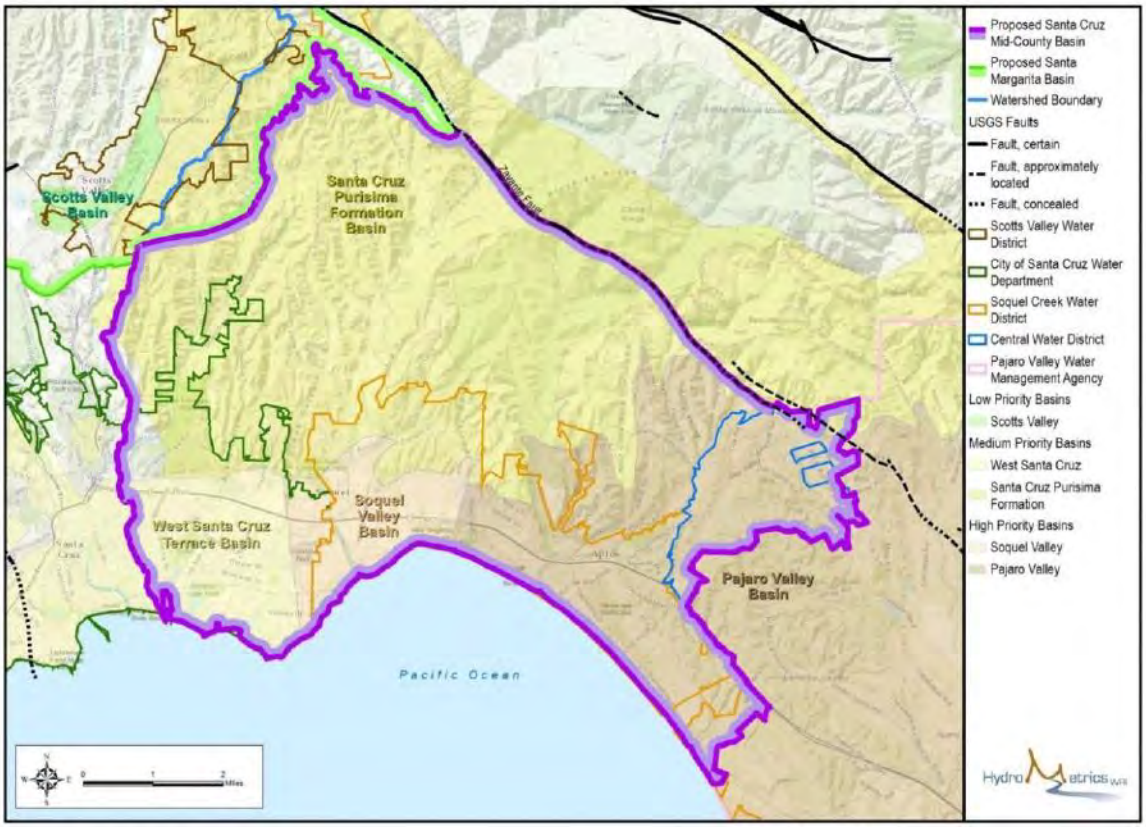
In July 2015, the Soquel-Valley Groundwater Basin (Basin Number 3-01) was identified by the Department of Water Resources as one of 21 groundwater basins to be reclassified as **critically overdrafted**. This was done on the basis of seawater intrusion detected at the coastline, and the local declaration of a Groundwater Emergency by Soquel Creek Water District in 2014.

In September 2015, the Soquel-Aptos Groundwater Management Committee (SAGMC) was formed which

includes representatives from the County of Santa Cruz, Central Water District, Soquel Creek Water District, the City of Santa Cruz, and private well owners. This group is a joint exercise of powers entity with interest in management of the Soquel-Aptos groundwater basin. Its efforts include collecting, maintaining and sharing data; undertaking cooperative research and resource management initiatives; jointly pursing groundwater management grants and studies; and facilitating requirements of the Sustainable Groundwater Management Act. The SAGMC also provides public outreach and education on groundwater topics and issues.

The SAGMC established a Groundwater Sustainability Agency Formation Subcommittee and appointed six members. Following the framework provided by the state, the subcommittee was charged with creating an approved Groundwater Sustainability Agency prior to the June 2017 deadline. Additional activities recently initiated by the SAGMC include requesting a basin boundary revision, developing quarterly monitoring reports, conducting an evaluation of shallow wells, and making progress on a comprehensive groundwater model by integrating information available for the entire management area.

Figure 6-3. Proposed Santa Cruz Mid-County Basin Boundary Area



Part of the recently completed work to redefine the boundary includes changing the name from Soquel-Aptos to Santa Cruz Mid-County Groundwater Basin, as illustrated in Figure 6-3. In early 2016 the SAGMC drafted a joint powers agreement (JPA) to create a fully empowered and independent Santa Cruz Mid-County Groundwater Agency (MGA) as authorized by the Sustainable Groundwater Sustainability Act (Appendix I). With the establishment of the Agency, the focus will shift from agency creation to the development of the Groundwater Sustainability Plan (GSP) that is required to be completed and submitted to the state in 2020. The City is a partner agency in the JPA and will have an allocated share of the total annual budget for the MGA that is consistent with the contributions provided under the previous planning and management efforts for the Soquel-Aptos Basin.

6.2.3 Overdraft Conditions

At this time, no court or board has adjudicated the right to pump groundwater from the Purisima aquifer, nor has the California Department of Water Resources identified the West Santa Cruz Terrace basin as critically overdrafted. Even so, the aquifer from which the City pumps long has been recognized locally as being threatened by the problem of over-pumping, as evidenced by a decline in static water levels and a broad, persistent trough consistently below sea level surrounding the Soquel Creek Water District's production wells, signaling that cumulative groundwater production exceeds the long-term sustainable yield of the aquifer.

Moreover, there is an ongoing risk of seawater intrusion into productive units of the Purisima Formation that could jeopardize the future production of groundwater by the City. This condition is due to coastal groundwater levels being below protective elevations. Although all units of the Purisima Formation extend offshore, the westernmost area of the A unit outcrops in the vicinity of Pleasure Point in close proximity to the Live Oak (Beltz) well field. This outcrop provides a pathway for seawater to enter the Unit A aquifer. Even though pumping by the City constitutes a small portion of the total extraction from the Purisima Formation, because the City's wells are located closest to the shoreline, they would be among the first impacted by seawater intrusion. This potential for seawater intrusion could reduce the City's dry year supply and exacerbate supply shortfalls during extended dry periods.

6.2.4 Groundwater Pumping

In 2010, the City was advised by its hydrogeologist that the yield of the Live Oak (Beltz) well field was substantially less than half the 420 mgy annual production that the City had long assumed for water supply planning purposes, and that the dry season

pumping rate that can be sustained without causing seawater intrusion in average years was closer to 170 mgy (Hopkins Groundwater Consultants, 2010). As a direct result of these findings, the City relocated pumping further inland to a new well site, shown as "Beltz 12" on the Figure 6-4 aerial image. This unexpected loss of drought year groundwater yield is emblematic of the continuing change and uncertainty facing the City in its effort to provide a safe, reliable, and adequate municipal water supply.

Figure 6-4. Location of Beltz Well Sites

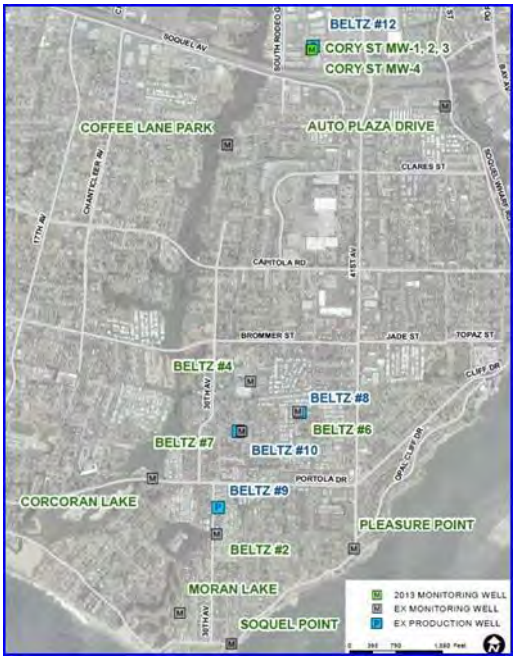


Table 6-1 below shows the actual volume pumped from the City's well fields during the peak season over the last five years. Average volume over this time is 164 mgy. As a result of the hydrogeology work, the City has limited groundwater pumping to a volume far below 420 mgy level. The current agreed upon sustainable yield volume is 170 mgy and has been utilized by the City when planning for the operation of the well fields. Due to the severe drought conditions in 2014, the City did rely on groundwater for a somewhat higher volume in order to meet peak demand in the dry summer months.

Table 6-1. Groundwater Volume Pumped (mgy)

Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	West Santa Cruz Terrace Groundwater Basin (3-26)	163	163	160	188	145
	TOTAL	163	163	160	188	145

6.3 Surface Water

As presented in Chapter 3, the surface water system supplies are located both within and outside of the City of Santa Cruz with a mix of flowing sources and a storage reservoir. The map provided as Figure 6-1 in the introductory section illustrates the various surface water sources and the conveyance systems that comprise the supply facilities of the City. Each of the surface water sources are briefly described in the following sections.

6.3.1 North Coast Creeks and Springs

The North Coast sources consist of surface diversions from three coastal streams and a natural spring located approximately six to eight miles northwest of downtown Santa Cruz. These sources are: Liddell Spring, Laguna Creek, Reggiardo Creek, and Majors Creek. The use of these sources by the City dates back as far as 1890.

Figure 6-5. Laguna Creek Diversion Dam

6.3.2 San Lorenzo River

The San Lorenzo River is the City's largest source of water supply. The main surface water diversion is located at Tait Street near the City limits just north of Highway 1. Use of this source dates back to the 1870s and was consolidated under public ownership in

1917. The Tait Street Diversion is supplemented by shallow, auxiliary wells located directly across the river. These wells are potentially hydraulically connected to the river and tied to the City's appropriative rights for surface diversion. The drainage area above the Tait Street Diversion is 115 square miles.

Figure 6-6. San Lorenzo River Diversions at Tait Street and at Felton

The other diversion on the San Lorenzo River is Felton Diversion, which is an inflatable dam and intake structure built in 1974, located about six miles upstream from the Tait Street Diversion. Water is pumped from this diversion through the Felton Booster Station to Loch Lomond Reservoir. The facility is used to augment storage in the reservoir during dry years when natural inflow from Newell Creek is low.

While the City is the largest user of water from the San Lorenzo River basin, two other water districts, several private water companies and numerous individual property owners share the San Lorenzo River watershed as their primary source for drinking water supply (Figure 6-7).

6.3.3 Newell Creek and Loch Lomond Reservoir

Loch Lomond Reservoir is located near the town of Ben Lomond in the Santa Cruz Mountains. The reservoir was constructed in 1960 and has a maximum capacity of 2,810 million gallons (mg). In addition to providing surface water storage, the reservoir and surrounding watershed are used for public recreation purposes, including fishing, boating, hiking, and picnicking (swimming and wading are prohibited). The Newell Creek watershed above the reservoir is about nine square miles. In addition to the City, the San Lorenzo Valley Water District is entitled by contract to receive a portion of the water stored in Loch Lomond.

Water System Operations

The Water Department follows a variety of policies, procedures, and legal restrictions in operating the water supply system. In general, the system is managed to use available flowing sources to meet daily demands as much as possible. Groundwater and stored water from Loch Lomond are used mainly in the summer and fall months when flows in the coast and river sources decline and additional supply is needed to meet higher daily water demands. On a typical summer day, the North coast sources yield 1-2 mgd, the San Lorenzo River produces 7.5 mgd, groundwater makes up 0.8 mgd, and the reservoir contributes an average of 1-2 mgd.

The amount of water produced from each of the City surface water sources is controlled by different water rights. A summary of these water rights is presented below.

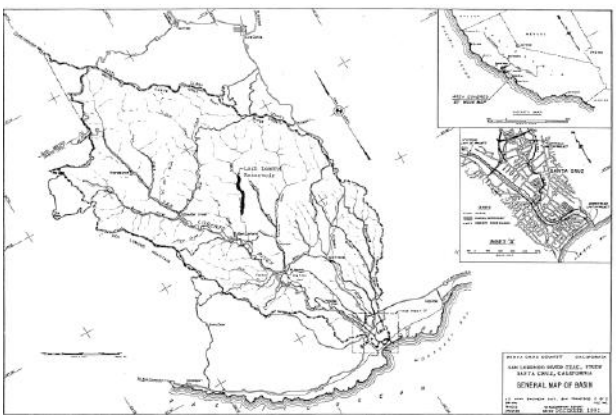
Summary of Water Rights Held by the City of Santa Cruz

Source	License/ Permit Number	Period	Maximum Diversion Rate (cfs)	Fish Flow Requirement (cfs)	Annual Diversion Limit (mg)
North Coast	Pre-1914	Year round	No limit	None	None
San Lorenzo River:					
Tait Street Diversion and Wells	1553, 7200	Year-round	12.2	None	None
Felton Diversion to Loch Lomond Reservoir	16601, 16123	Sept	7.8	10	977
		Oct	20	25	
		Nov-May	20	20	
		Jun-Aug	0	--	
Newell Creek:	9847				
Collection to storage (max amount/year)		Sept-Jun	No limit	--	1,825
Withdrawal		--	--	1	1,042

In accordance with the requirements of its water rights, the City releases a minimum flow of 1.0 cfs (equal to 0.65 mgd or approximately 20 million gallons per month) from storage in Loch Lomond Reservoir, to support fishery resources beneath the dam.

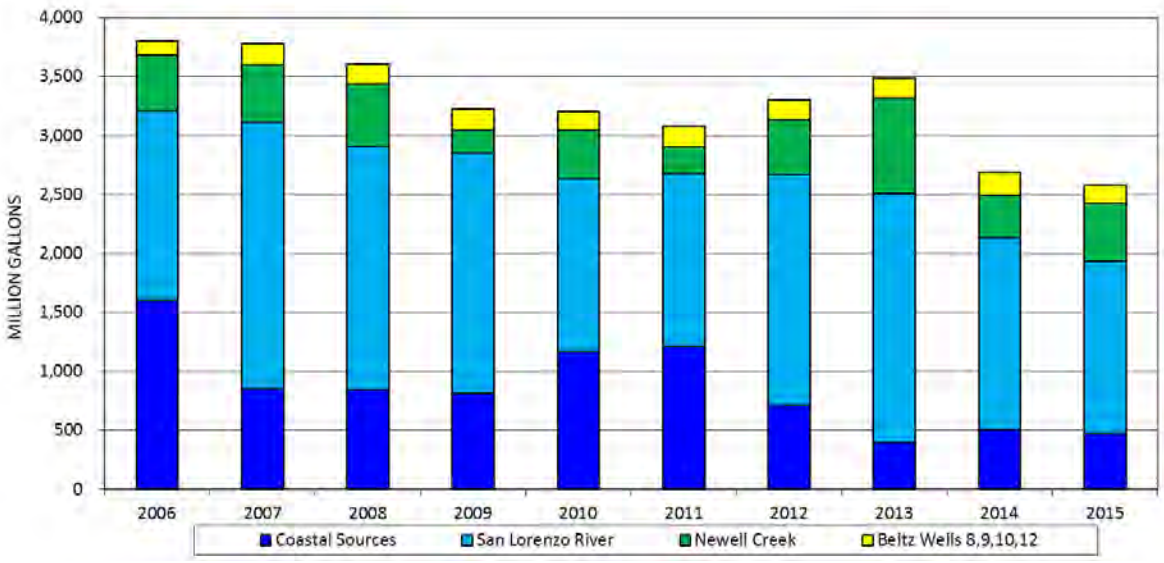
The City in 2007 voluntarily began releasing in-stream flows from the North Coast system on an interim basis in connection with an ongoing pursuit of an Incidental Take Permit under the Federal Endangered Species Act. Over the last 3 years, the City has dramatically reduced its diversion of water from Laguna Creek and increased instream flow releases on the San Lorenzo River to benefit fisheries habitat. Water system operations are likely to continue shifting toward using less flowing water and more water from reservoir storage to meet demand in the future (See Chapter 7).

Figure 6-7. San Lorenzo River Watershed and Loch Lomond Reservoir



Gross annual production volumes from the City's surface and groundwater sources over the past 10 years are shown in Figure 6-8, broken down by source of supply. During the past decade, the North Coast sources represented 26 percent of the total water supply, the San Lorenzo River represented 55 percent, Newell Creek (Loch Lomond Reservoir) represented 14 percent, and Live Oak (Beltz) wells contributed the remaining 5 percent.

Figure 6-8. Annual Production Volumes by Source of Supply (million gallons)



6.4 Storm Water

At this time, local urban storm runoff is not used by the City to meet its urban water demands. The City is regulated, however, by the California Regional Water Quality Control Board and has responsibility to reduce the amount of pollutants discharged in urban runoff, and to improve and protect water quality. The City is currently covered

under the State's General Permit for Storm Water Discharges from Small Municipal Storm Sewer Systems (MS4s). The General Permit requires the City to develop and implement a comprehensive Storm Water Management Program (SWMP). A complete description of this program is provided in the Storm Water Annual Report.

The City of Santa Cruz, through its Public Works Department, maintains seven miles of underground storm water pipelines, eight miles of surface storm ditches, one pump station, approximately 1,500 catch basins, and 125 outfalls. The City also maintains the U.S. Army Corps of Engineers flood control channel and levee system on the San Lorenzo River, which is approximately three miles long with five pump stations. The City's operations and maintenance program for the flood control facilities on the San Lorenzo River includes removal of sand and silt from the channels of the river and Branciforte Creek; maintenance of pumps, gates and levees; and removal of weeds and growth in drainage ditches and catch basins. As a best management practice the City has routine street sweeping and regularly cleans the storm drain pipeline system, among other activities.

Storm water system management maintenance in the unincorporated area and Capitola is provided by the Santa Cruz County Flood Control and Water Conservation District, Zone 5, operated through the County Public Works Department. The County Board of Supervisors serves as the Board of Directors for the District. Facilities include underground storm drain systems and above ground ditches and watercourses.

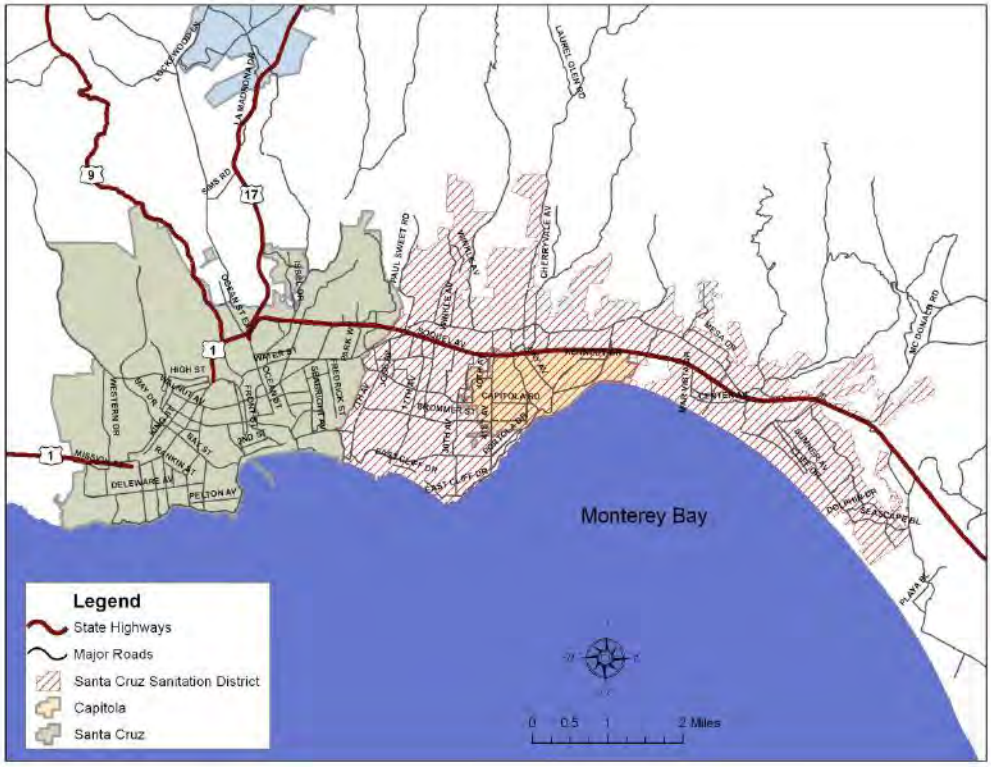
6.5 Wastewater and Recycled Water

The City of Santa Cruz owns and operates a city-wide wastewater collection and regional wastewater treatment and disposal facility providing service to a total urban population of approximately 130,000 people in an area extending from Santa Cruz out to the communities of Seascape and Aptos in unincorporated Santa Cruz County (Figure 6-9).

The City's Wastewater Treatment Facility (WWTF) is not currently permitted for and does not now produce recycled water for offsite reuse. Treated wastewater is reused internally within the wastewater plant to meet its major process water needs, including chemical mixing, contact and non-contact cooling water, equipment washing, heating, and cleaning. The 1998 upgrade of the plant to provide reuse water for on-site activities reduced potable water demand at the WWTF by about 90 percent. It now operates using only 3 to 4 million gallons per year for sanitary, irrigation, and other miscellaneous onsite uses. The only use of recycled water outside the WWTF has been that used by

the City's Public Works crews in trucks for flushing the sanitary sewer system as a way to conserve potable water during the recent drought.

Figure 6-9. Geographic Area Served by Santa Cruz Wastewater Facility



Over the years, the City has commissioned several engineering studies regarding the potential uses of recycled water for agricultural irrigation, landscape irrigation, groundwater recharge, direct potable reuse, and use of recycled water from neighboring water districts. These studies include the following:

- Alternative Water Supply Study (Carollo Engineers, 2000)
- Evaluation of Regional Water Supply Alternatives (Carollo Engineers, 2002)
- Integrated Water Plan Environmental Impact Report (City of Santa Cruz, 2005)
- Opportunities and Limitations for Recycled Water Use (Kennedy/Jenks, 2010)
- Current and Potential Future Opportunities for Indirect and Direct Potable Reuse of Recycled Water Use (Kennedy/Jenks, 2010)

The City of Santa Cruz is once again actively investigating the feasibility of recycled water though a regional Recycled Water Facilities Planning Study, funded in part by a grant from the State Water Board Division of Financial Assistance, Water Recycling

Funding Program. In addition, the City has been working to establish a small recycled water facility and is coordinating with the Pasatiempo Golf Club on a project to use treated wastewater from the Scotts Valley wastewater plant instead of potable water supplied by the City for the majority of its irrigation needs. A groundbreaking ceremony for the golf club's recycled water project was recently held. These two projects are described further in Section 6.5.4 in the discussion on beneficial uses of recycled water within the service area.

6.5.1 Recycled Water Coordination

As presented in Section 2.4, preparation of this 2015 UWMP was coordinated with all local water, wastewater, groundwater, and planning agencies throughout the water service area and Santa Cruz County. For this recycled water section, in particular, coordination involved working with the following entities:

- Santa Cruz Public Works Department (regional WWTF operator)
- Santa Cruz County Sanitation District (local wastewater collection agency)
- City of Scotts Valley Public Works (local WWTF operator)
- Scotts Valley Water District
- Soquel Creek Water District
- Pasatiempo Golf Course

6.5.2 Wastewater Collection, Treatment, and Disposal

6.5.2.1 Wastewater Collection

Municipal wastewater generated within the City limits is delivered to the treatment plant through a collection system consisting of 160 miles of gravity mains, 3.5 miles of force main, and 21 pumping stations. The City's collection system, treatment plant and ocean disposal system are managed and operated by the City's Public Works Department.

The Santa Cruz County Sanitation District, a special district operated through the Santa Cruz County Public Works Department, collects wastewater from the Live Oak, Capitola, Soquel, Aptos, and Seacliff areas through a system consisting of 188 miles of gravity main, 14 miles of force main, and 35 pump stations. It transports wastewater from a central pumping facility in Live Oak to the Santa Cruz WWTF for treatment and disposal. This wastewater is generated from outside the service area of the City of Santa Cruz and is treated within the service area. Table 6-2 summarizes wastewater collected from these two agencies in 2015.

Table 6-2. Wastewater Collected Within Service Area in 2015						
Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015 (mgy)	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
City of Santa Cruz	Metered	1,480	City of Santa Cruz	Wastewater Treatment Facility	Yes	No
Santa Cruz County Sanitation District	Metered	1,149	City of Santa Cruz	Wastewater Treatment Facility	Yes	No
Total Wastewater Collected from Service Area in 2015:		2,629				

With the exception of some outlying areas and individual parcels that have onsite wastewater systems, the vast majority of the estimated 95,251 persons residing in the City of Santa Cruz water service area are served by these two wastewater collection systems. A third-party organization is not operating a facility under contract in the Santa Cruz service area.

In addition to the City and County Sanitation District, two small County Service Areas serving the communities of Rollingwoods and Woods Cove are connected to the City's wastewater system. Dry weather flows from Neary Lagoon are also diverted through the WWTF to help protect water quality at local beaches for public health and recreation.

6.5.2.2 Wastewater Treatment

The City's treatment plant was modernized in the late 1990's from the advanced primary level to provide full secondary treatment in order to meet State and Federal waste discharge requirements (Figure 6-10).

The treatment process consists of screening, grit removal, primary sedimentation, biological treatment (trickling filters), secondary clarification, and disinfection (UV).

Bio-solids removed from the wastewater stream are treated by gravity thickening, anaerobic digestion, and dewatering by centrifuges.

Figure 6-10. City of Santa Cruz Wastewater Treatment Facility

The City's WWTF is designed to treat an average dry weather flow of 17 million gallons per day (mgd) and can accommodate peak wet weather flows of up to 81 mgd. Typical dry weather flows in past years have ranged between 9-10 mgd. Due to strict conservation measures in recent years, the amount of wastewater generated in the City and the Sanitation District's service areas has dropped substantially, averaging 6.5 mgd during the dry season and totaling 2,629 million gallons in 2015.

In 2013 the WWTF was awarded Plant of the Year by the California Water Environment Association (for facilities in the range of 5-20 million gallons per day). The award is based on the review of infrastructure, management practices and compliance records.

6.5.2.3 Wastewater Disposal

Wastewater effluent from the WWTF is disinfected with UV prior to being discharged to the Pacific Ocean through a deep water outfall extending 12,250 feet on the ocean bottom and terminating one mile offshore at a depth of approximately 110 feet below sea level. A 2,100 foot diffuser at the end of the pipe provides a minimum initial dilution of 139 parts seawater to one part wastewater.

The City's wastewater facility is regulated under a waste discharge permit issued by the California Regional Water Quality Control Board, Central Coast Region (Order No. R3 - 2010 - 0043). Monterey Bay and surrounding ocean waters was designated in 1992 as a National Marine Sanctuary and is widely recognized for its unique and diverse biological characteristics and physical features. To protect receiving water quality and sanctuary resources, the wastewater influent and effluent characteristics are carefully monitored for compliance with state water quality requirements. The City also performs receiving water monitoring and participates in a regional monitoring program with other dischargers in the Monterey Bay area, known as Central Coast Long-Term Environmental Assessment Network (CCLEAN).

The City of Scotts Valley treats its wastewater separately and transmits secondary treated effluent to Santa Cruz for combined disposal through the City's ocean outfall. Since 2002, the City of Scotts Valley, in conjunction with Scotts Valley Water District, has operated a 1.0 mgd tertiary treatment plant and delivered recycled water within its service area mainly for landscape irrigation purposes.

Table 6-3 below provides the total amount of wastewater treated and disposed by the City's wastewater treatment facility in 2015.

Table 6-3: Wastewater Treatment and Discharge Within Service Area in 2015

☐	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 volumes (mgy)	
							Wastewater Treated	Discharged Treated Wastewater
Wastewater Treatment Facility	Monterey Bay/Pacific Ocean Bay Outfall	Deep water outfall	3-440102001	Ocean outfall	Yes	Secondary, Undisinfected	2,629	2,629
						Total	2,629	2,629

NOTES: Treatment and discharge volumes are presented as equal to satisfy the objective of this table. The recycled water that is reused within the Facility is not considered eligible for designation as recycled water under current Title 22 requirements. Figures presented do not include Scotts Valley waste discharge volumes.

6.5.3 Recycled Water System

As mentioned above, the City does not operate a recycled water system in its service area at this time. The only use of recycled water outside the WWTF has been that used

by the City's Public Works crews in trucks for flushing the sanitary sewer system as a way to conserve potable water during the recent drought.

6.5.4 Recycled Water Beneficial Uses

6.5.4.1 Current and Planned Uses of Recycled Water

Title 22 California Code of Regulations, Division 4, Chapter 3, Sections 60301-60355 is the regulation overseeing the reuse or recycling of municipal wastewater to protect public health. Level of treatment and bacteriological water quality standards define what uses are legally allowed. The quality of wastewater produced at the City's treatment plant currently would be best classified under the Title 22 criteria as "Secondary, Undisinfected", even though the wastewater plant provides ultraviolet disinfection, and the City consistently meets its receiving water limitations contained in its NPDES permit for bacteriological objectives. The City's treated wastewater is therefore potentially suitable for only very limited agricultural applications and for flushing sanitary sewers according to the standards in Title 22.

The present level of wastewater treatment is not sufficient for the water to be used for unrestricted use on playgrounds, parks, schoolyards, construction, cooling and other non-contact industrial processes, or general landscape irrigation. Additional treatment above that currently provided would be needed to meet the state public health and safety requirements. In addition to the treatment upgrades, a separate distribution system, including pumps, storage facilities, and piping would be required to convey non-potable recycled water to potential customers.

As mentioned earlier, the City is undertaking a regional Recycled Water Facilities Planning Study (RWFPS) under a contract with Kennedy/Jenks Consultants. The goals of the RWFPS are:

- to assess beneficial reuse of wastewater from a resource recovery perspective
- to evaluate local and regional recycled water projects
- to identify near-term, mid-term and long-term projects
- to meet the schedule for the WSAC Implementation Plan, and
- to initiate a strategy for continued outreach related to recycled water.

Table 6-4 below lists the number and type of recycled water projects that are being considered in the planning study. This planning study is scheduled to be completed in 2017. The scope of work for this project is included as Appendix J.

Table 6-4. List of Potential Recycled Water Projects Under Investigation				
Project No:	**Recycled Water Use**	**Source Water**	**Treatment**	**Project Area(s)**
1a	Industrial Use/ Landscape Irrigation	Santa Cruz WWTF	Tertiary	City, District and County
1b		Local Raw Wastewater	MBR Tertiary	UC Santa Cruz
2a	Irrigation	Santa Cruz WWTF	Tertiary	North Coast Agricultural Irrigation
2b		Santa Cruz WWTF -or- SVWD WWTP	Secondary or Tertiary	Pasatiempo + Other Landscape
2c		Santa Cruz WWTF	Tertiary	Landscape
3	Seawater Barrier	Santa Cruz WWTF	Advanced Treatment	Lower Groundwater Basins
4a	Groundwater Replenishment	Santa Cruz WWTF	Advanced Treatment	Upper/Lower Purisma Formation and Soquel Valley Groundwater Basin
4b		Local Raw Wastewater	MBR + Advanced Treatment	
4c		Santa Cruz WWTF -and- Scotts Valley WWTP	Advanced Treatment	Santa Margarita GW Basin
5	Reservoir Augmentation	Santa Cruz WWTF	Advanced Treatment	Loch Lomond Reservoir
6	Streamflow Augmentation	Santa Cruz WWTF	Tertiary or Advanced Treatment	San Lorenzo River
7	Direct Potable Reuse	Santa Cruz WWTF	Advanced Treatment	City, District and County

In the meantime, the City is actively pursuing two recycled water projects: 1) a bulk recycled water fill station and pilot City park irrigation project adjacent to the WWTF, and 2) supporting delivery of recycled water from Scotts Valley to the Pasatiempo golf course.

The City Department of Public Works is planning to expand the internal reuse water system at the WWTF to produce Title 22 tertiary treated water and to build a small distribution system for offsite use. The maximum amount of recycled water production from this system would be about 0.25 mgd; about half of which would be used within the plant and the other half potentially available for offsite demand. Current bulk water use in the service area is approximately 4 mgy, which could be reduced partially or wholly

by switching to recycled water. In addition, there is the potential demand at La Barranca Park of about 1 mgy for landscape irrigation.

The Pasatiempo Golf Course is also in the process of finalizing arrangements to receive secondary effluent from the City Scotts Valley. The Scotts Valley Water District has been working on an agreement with the management of the Pasatiempo Golf Club and the City of Scotts Valley to allow the golf course to have a right to receive up to 170,000 gallons per day (up to 35 MGY – equivalent of 206 days per year) of secondary treated water from the City of Scotts Valley. The Golf Club would then treat the water to meet the standard in Title 22 for unrestricted access golf courses. The City of Santa Cruz would continue to supply a portion of the water demand as needed for potable water uses and supplemental water for recycled water irrigation.

The current and projected uses of recycled water for these near-term projects within the City's service area are presented in Table 6-5 below.

Table 6-5. Current and Projected Recycled Water Direct Beneficial Uses Within Service Area (mgy)

☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.

Name of Agency Producing (Treating) the Recycled Water:			City of Santa Cruz/SVWD/SqCWD						
Name of Agency Operating the Recycled Water Distribution System:			City of Santa Cruz/City of Scotts Valley/SVWD/SqCWD						
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040 (opt)	
Agricultural irrigation									
Landscape irrigation (excludes golf courses)	N/A	Tertiary	N/A	up to 1	up to 2	up to 3	up to 4		
Golf course irrigation	N/A	Tertiary	N/A	35 (est)	35 (est)	35 (est)	35 (est)		
Wildlife Habitat Enhancement/Wetland									
Commercial, Industrial	N/A	Tertiary	N/A	up to 4	up to 4	up to 4	up to 4		
Groundwater recharge (IPR)				TBD	TBD	TBD	TBD		
Reservoir Augementation				TBD	TBD	TBD	TBD		
Direct potable reuse				TBD	TBD	TBD	TBD		
Other	Type of Use								
		Total:	0	0	0	0	0	0	

IPR - Indirect Potable Reuse

NOTES: Due to the preliminary nature of the proposed recycled water projects, please refer to the narrative for details as these numbers represent potential volumes for planning purposes and are not known quantities suitable for operational purposes. Agencies involved include the City of Santa Cruz, City of Scotts Valley, Scotts Valley Water Distrct (SVWD), and Soquel Creek Water District (SqCWD). For golf course irrigation, the source of water is the City of Scotts Valley wastewater plant treated to secondary level and then treated to a teriary level at the golf course.

6.5.4.2 Planned Versus Actual Use of Recycled Water

Recycled water, as defined by the California Department of Water Resources, was not used by the City in 2010 nor projected for use in 2015.

Table 6-6. 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual	
☑	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.

6.5.5 Description of Actions to Encourage and Optimize Future Recycled Water Use

Currently the City does not produce recycled water for use outside its wastewater treatment plant, therefore actions to encourage the use, including financial incentives, and development of a plan to optimize the use of recycled water in the City's service area do not apply at this time. The steps and actions to encourage and optimize recycled water will be defined in the future if and when recycling is selected and pursued to diversify the City's water supply portfolio.

Currently, the City is pursuing groundwater storage strategies including projects for in-lieu/passive recharge, and aquifer storage and recovery/active recharge (ASR). In the event these strategies prove insufficient to meet the accepted goals of cost-effectiveness, timeliness, or yield, either advanced treated recycled water or desalinated water would be developed as a supplemental replacement supply. These strategies and the underlying assumptions and goals are discussed further in Chapter 7.

To prevent significant delay in developing an effective supply of reliable water, recycled water is being considered simultaneously with groundwater storage feasibility (in-lieu and ASR). After the initial five-year study phase, strategy options will be selected for buildout beginning in year 2020 to augment the existing supply by 2025.

Table 6-7. Methods to Expand Future Recycled Water Use			
☐	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Recycled Water Facilities Planning Study	Contract with Kennedy/Jenks to research potential uses of recycled water	TBD	TBD
		Total	TBD
NOTES:			

6.6 Desalinated Water Opportunities

For a decade or more, the City had been pursuing a 2.5 mgd desalination facility as a regional project with Soquel Creek Water District to diversify both agencies' water

supply portfolio. It remains a possible project for the City. In the recently completed Final Report on Agreements and Recommendations (Appendix K), the Water Supply Advisory Committee presented a supply strategy that includes desalinated water, but only as a last resort, and after exhausting several other preferred options (City of Santa Cruz, 2015). Soquel Creek Water District is continuing to consider desalinated water through a Memorandum of Interest with a different regional "Deepwater Desal" project proposed at Moss Landing Harbor.

6.7 Exchanges or Transfers

Following years of discussion and coordination on groundwater management, the City and Soquel Creek Water District recently signed a "Cooperative Water Transfer Pilot Project for Groundwater Recharge and Water Resource Management" agreement to transfer a small amount of water to Soquel Creek Water District in the winter months when surface water from the North Coast is available (Appendix Y). This transfer would allow the District to assess the effects of reduced pumping of the basin. The agreement is a first step in the implementation of the Water Supply Augmentation Strategy and serves to further study and determine the potential benefits of local exchanges and transfers as a groundwater management tool and supply reliability strategy.

6.8 Future Water Projects

The Final Report on Agreements and Recommendations presented by the Water Supply Advisory Committee includes an implementation strategy and work plan for determining which project to pursue. At this time it is unknown which project(s) will be carried out over the 20-year planning horizon of this Urban Water Management Plan. The Final Report, summarized in Chapter 7, provides the framework for the decision-making for initiating future water projects and describes the need either for substantial additional storage or some other strategy to increase supply reliability. Therefore the City is unable to complete Table 6-8 as some or all of the future water supply projects or programs are not compatible with the table and are described in a narrative format within the Plan.

Table 6-8. Expected Future Water Supply Projects or Programs	
☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.
6-21 & 7-12 to 7-21	Provide page location of narrative in the UWMP

6.9 Summary of Existing and Planned Sources of Water

6.9.1 Existing Sources of Water

The City's existing sources and actual production volumes for 2015 are presented in Table 6-9. The figures represent production volumes experienced under severe drought conditions and with emergency water shortage regulations and restrictions in effect locally between the months of May and October.

Table 6-9.Water Supplies — Actual

Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Surface water	North Coast	382	Raw Water	
Surface water	San Lorenzo River	1,458	Raw Water	
Surface water	Loch Lomond	495	Raw Water	
Groundwater	Live Oak Wells	145	Raw Water	
	Total	2,480		0

NOTES: Net production figures in million gallons

6.9.2 Planned Sources of Water

Table 6-10 provides an estimate of the volume of water, by source, that is reasonably available from 2020 to 2035. These volumes are based on deliveries for average years, projected water demands, and available surface water flows consistent with ecosystem protection goals, according to the City's water supply operations model, Confluence.

The City is currently developing a supply augmentation plan that will include increased production between 2020 and 2035. However these volumes and the prospective sources are not fully understood at this time. A shift in the balance of the supply sources may occur as a component of the supply augmentation strategies shown as potential planned water sources. For instance, the City expects to produce less water from the North Coast sources in the future compared to historic production levels. In total, the expectation is that existing and planned sources of water available to the City over the next twenty years, on average, are estimated to meet the predicted total annual water demand of about 3.2 to 3.3 billion gallons annually.

As part of the augmentation strategy the City recognizes the importance of additional supply storage as a safeguard against future water shortages. Chapter 7 discusses the

challenges to the City's supply system and provides additional narrative that proves useful in understanding the information presented in Table 6-10 below.

Table 6-10. Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply (mgy) *Report To the Extent Practicable*				
		2020	**2025**	**2030**	**2035**	**2040** *(opt)*
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Surface water	North Coast Sources	637	642	671	671	n/a
Surface water	San Lorenzo River	1,882	1,842	1,829	1,834	n/a
Surface water	Loch Lomond Reservoir	595	551	540	547	n/a
Groundwater	Live Oak/Beltz Wells	138	129	127	128	n/a
Transfers		Near term transfer to SqCWD of up to 100 mgy to assess the effect of reduced pumping on the groundwater basin and explore the opportunity of developing a longer-term agreement for aquifer storage and recovery				
Exchanges						
Recycled Water		Recycled water feasibility study investigating options including regional partnership opportunities for a recycled water project to provide drought resistant supply and options for groundwater management strategies due to overdraft conditions of local basins				
Desalinated Water				Potential project to expand recycled water supply or investigate desalination		
Other						
Total		3,252	3,164	3,167	3,180	0

NOTES: Projected supply volumes shown represent the output values from the City's Confluence (water supply) model. These projections consider the operations of the City's current supply system in response to a projected demand.

6.10 Climate Change Impacts to Supply

As the City of Santa Cruz water supply consists of only local sources maintained and recharged by natural processes, the potential weather conditions related to climate change could greatly impact the sources of supply. A widely accepted profile is that climate change may make the future hydrology drier than the historical record maintained in the region (1937 to today). General forecasts describe deviation in the seasonal patterns of rainfall with longer and more severe droughts. Additionally, the annual average temperature in the region may increase leading to variability in the rate of evaporative processes that can greatly impact local sources and watersheds (Stratus Consulting, 2015).

With these potential impacts to the available local supply in mind, the City is exploring projects that not only diversify supply options, but also enhance the reliability of the system. In Chapter 7, the long-term reliability of the system supplies is presented along with an analysis of known constraints on existing sources. Climate change impacts are likely to be a contributor to a less reliable supply and also a driver for strengthening demand management planning as discussed in Chapter 9.

Chapter 7

WATER SUPPLY RELIABILITY ASSESSMENT

This chapter of the plan describes the long-term reliability of the City's water supplies including assessment of supply relative to demand and the management strategies being implemented to create a more dependable supply. While this chapter is focused on assessment, Chapter 9 discusses the City's water conservation planning process and demand management measures currently being implemented. Short-term reliability planning that requires immediate action, such as drought or a catastrophic supply interruption, is addressed in Chapter 8, Water Shortage Contingency Planning.

7.1 Constraints on Water Sources

The City of Santa Cruz is facing several obstacles in meeting its present and future water supply needs. While each complication presents a unique set of water management challenges, the common theme is the limitation in where, when, and how much water is available to meet the area's water service needs, particularly during years when rainfall is below average. The following sections outline the known constraints on supply and include the management strategies implemented for each.

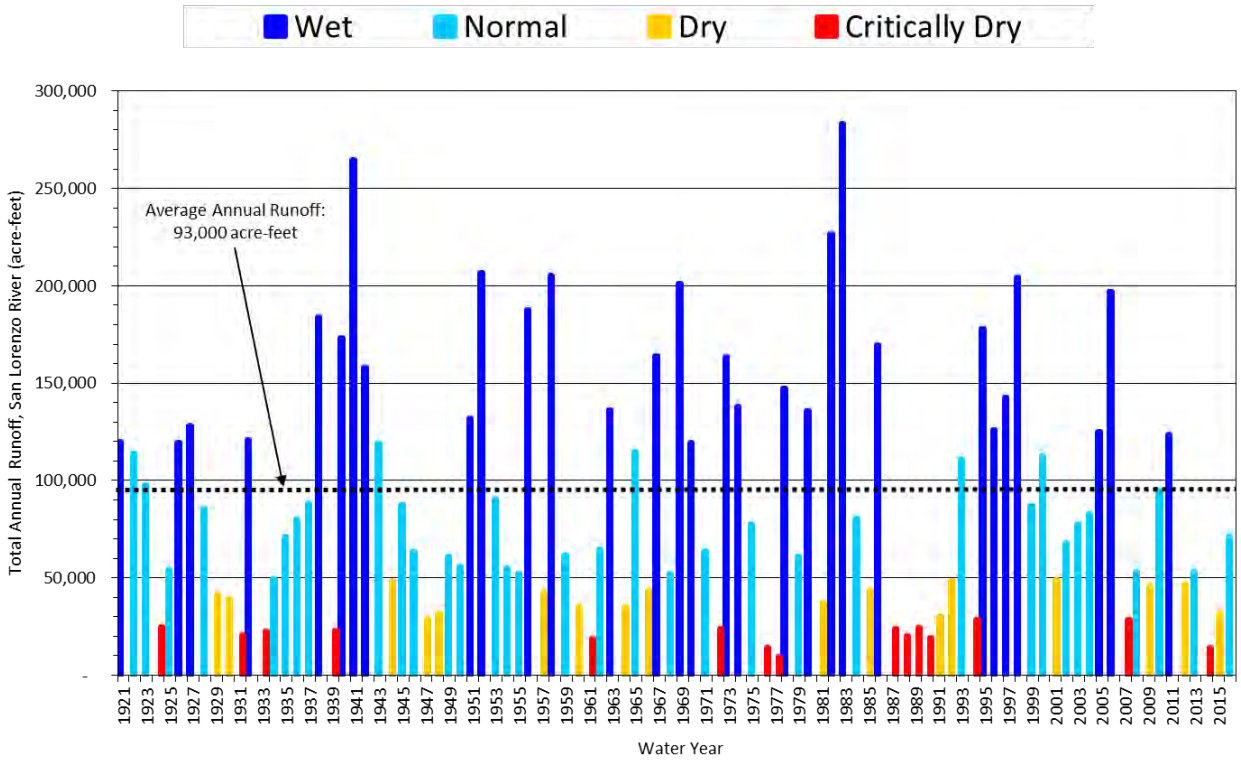
7.1.1 Local Supply Variability

As explained in Chapter 3, the City water system draws almost exclusively on local surface water sources, whose yield varies from year to year depending on the amount of rainfall received during the winter season and generated runoff that provides beneficial inflows. This local variation has been a significant constraint in recent years as the Central Coast, and the State of California more generally, were held in the grip of a multi-year drought. Declaration of a local water shortage emergency for the past two years underscores the effect of the drought on the City of Santa Cruz system.

Figure 7-1 below shows the total annual runoff for the San Lorenzo River over the 95-year period from 1921 to 2016 and the classification for each water year. The graph illustrates the dramatic variation in discharge from year to year. This natural variation in the level of runoff available in local streams and rivers, from which the City draws the majority of its supply, is the major factor that results in an inconsistent level of water supply from year to year. Ultimately, the only water available to the City is that which originates from rain that falls on the ocean side of the Santa Cruz Mountains. In normal

and wet years, when rainfall and runoff are abundant, the water system is capable of meeting the community's current total and anticipated annual water requirements.

Figure7-1. Total Annual Stream Discharge from the San Lorenzo River (Acre feet)



The system is highly vulnerable to shortage, however, in extended dry periods or critically dry years, when the flow in local streams and river sources runs low. Moreover, like other communities on California's central coast, the Santa Cruz water system is physically and geographically isolated. Limited emergency interconnection capability may be possible due to existing interties with a neighboring water district. The primary function of the interties is to allow for the movement of water to the Soquel Creek Water District that currently relies solely on groundwater from a critically over drafted basin.

Water is currently stored in Loch Lomond Reservoir (impounded by the Newell Creek Dam) to serve peak season demands and is an integral part of the supply system. Some amount of storage is used each year, mainly in the summer and fall months when the flows in the coast and river sources decline and additional supply is needed to meet higher daily water demands than during winter and spring.

During dry years, the system relies more heavily on water stored in Loch Lomond to satisfy demand, which draws down the reservoir level lower than usual and depletes

available storage. In multi-year or critical drought conditions, the combination of very low surface flows in the coast and river sources and depleted storage in Loch Lomond reservoir reduces available supply to a level which cannot support average dry season demands. Compounding the situation is the need to retain a certain amount of water in the reservoir if drought conditions continue into the following year. The existing system is not able to provide a reliable supply during multi-year droughts or prolonged periods of drier than normal hydrologic conditions within the source watersheds.

7.1.2 Ecosystem Restoration and Protected Species

Since 2002, the City of Santa Cruz has been working toward the development of a Habitat Conservation Plan (HCP) that covers operation and maintenance activities at the North Coast streams and San Lorenzo River diversions as well as other activities which may result in "take" of threatened and/or endangered species. An HCP is an operational avoidance and minimization and mitigation plan prepared under Section 10 of the Federal Endangered Species Act (FESA) and Section 2081 of the California Endangered Species Act (CESA) by nonfederal parties seeking to obtain a permit for incidental take of federally or state-listed threatened and endangered species.

The City initiated the HCP process because the streams from which the City diverts water currently support steelhead trout and the San Lorenzo River and Laguna Creek support coho salmon. Within the Central California Coast Region, steelhead (*Oncorhynchus mykiss*) is currently listed as "threatened" and Coho salmon *(Oncorhynchus kisutch*) is listed as "endangered" on the ESA federal list and Coho salmon are also listed as "threatened" under CESA.

Numerous studies undertaken in support of the HCP have evaluated what limiting factors may be affecting fish in these streams. Among other things, this includes evaluation of instream flow needs during all freshwater life phases (migration, spawning, incubation and rearing) over a range of hydrologic year types. Because these studies indicated that habitat conditions in these streams could be improved with increased instream flows, the City began voluntarily diverting less flow in 2007 on an interim basis in connection with the pursuit of the HCP.

Although the HCP negotiations are ongoing, the City is forecasting that ultimate compliance with the state and federal Endangered Species Acts will result in less water being available from the City's flowing sources for supply in future years compared to the past. This, in turn, will place greater reliance on water stored in Loch Lomond Reservoir to meet the community's annual water needs and exacerbate the aforementioned vulnerability to shortage.

7.1.3 Source Water Quality and Treatment Capacity

The City's Graham Hill Water Treatment Plant (GHWTP) currently complies with all drinking water standards set by the US Environmental Protection Agency (EPA) and the State Water Resources Control Board Division of Drinking Water (DDW). These regulations require monitoring of water sources, watershed protection, treatment techniques, and extensive monitoring of treated water quality throughout the distribution system.

The primary issues with respect to water quality are the treatment challenges posed by future changes in our source water mix driven in part by ecosystem protection requirements. The GHWTP is a conventional surface water treatment plant that was commissioned in 1960 as a 12 mgd plant and has undergone an expansion and a number of improvements over the last 50 years. Except for groundwater from the Live Oak wells, all water delivered through the City system is treated at this plant. In other words, it must operate properly 100 percent of the time to maintain water service throughout the entire system.

Following the last major expansion the plant can process up to 16 mgd and year-round average production is 10 mgd. The City has been evaluating improvements to accommodate a variety of changing conditions such as potential higher daily plant output in the winter, evolving water quality regulations, and future changes in the source water mix. As information has become available from the various studies such as the Initial Distribution System Evaluation—conducted as part of preparing to comply with the State 2 Disinfectant and Disinfection Byproducts Rule, and work toward the HCP, the focus has narrowed to strategies to reduce the formation of disinfection byproducts and the treatment of more turbid source water with greater natural organic matter.

The City plans to continue investment in the plant by taking on projects that upgrade the existing facility to enhance water quality and respond to detection of contaminants of emerging concern (CECs) including pharmaceuticals and personal care products (PPCPs). As water quality and treatment regulations change these investments are

designed to prevent noncompliance with drinking water standards and/or mission-critical values of supplying adequate, safe, and reliable water for the City's customers.

7.1.4 The Water Rights Conformance Project for Water Rights and Entitlements

In 2008, the City developed and submitted filings to the SWRCB to address a historical oversight in the language of the City's water rights documents for Newell Creek and the San Lorenzo River at Felton (Felton Diversion) and to request a time extension for the full development of the 3,000 ac-ft permit to divert water from the San Lorenzo River at Felton.

The Newell Creek and San Lorenzo River permits to divert at Felton were originally granted as "diversion to storage," rather than as "direct diversion" rights. A diversion to storage is used when the water diverted is put into storage and is retained in storage for some time prior to being used. Current State Water Resources Control Board practice, however, requires rights of "direct diversion" as well as diversion to storage for the same operations as the City originally proposed and has historically undertaken.

The City's interest in initiating the Water Rights Conformance Project is to eliminate technical constraints for the operations of its water supply resources. While the water rights granted pursuant to the original filings were thought to be adequate at the time, it is now necessary to add the right of direct diversion to the rights to divert to storage. If this is not rectified, the Newell Creek inflow could be considered unavailable as a source for City use during times when, for example, the reservoir is receiving more inflow from Newell Creek than is being released downstream (Gary Fiske & Associates, 2003).

The City's permits to divert water at Felton for storage in Loch Lomond Reservoir (as amended by earlier requests for time extensions in the mid-1980s and again in the mid-1990s) required the City to put all of its approximately 980 mgy entitlement to full beneficial use by December 2006. While the City has been diligently using water from the Felton Diversion for beneficial use over the years, to date the City has used just over half the permitted amount on an annual basis. In the future, the City expects to need the full 980 mgy and, therefore, filed timely petitions (in 2008) with the SWRCB to extend the time allowed for putting the full 980 mgy to beneficial use. The need for such time extensions is typical for municipal water rights, the use of which increases over time.

Recently completed water supply planning work done by the Water Supply Advisory Committee identified water from the Felton Permits as being critical to meeting the City's projected future demand. In particular, the winter water harvest strategy is highly likely to result in greater use of water from Felton during the coming decade. In addition, water from the Felton diversion is an important asset during operational outages, changes in

operations in response to environmental concerns, and as a significant component of the City's response to dry year conditions. The City mid-1990s extension required reaching an agreement with California Department of Fish and Wildlife (DFW) and execution of a Memorandum of Agreement that modified the manner in which the City operated the Felton Diversion facility to enhance fish passage.

Like the petitions to add direct diversion to the Newell Creek and Felton Diversion permits, the time extension petition are currently pending while the City works with the DFW and the National Marine Fisheries Service to complete a Habitat Conservation Plan and a federal Endangered Species Act Section 10 permit and a 2081 state permit that will address the impacts of the water system on threatened steelhead trout and endangered Coho salmon.

The Water Supply Advisory Committee's priority water supply augmentation strategy recommended developing and implementing conjunctive use of surface and groundwater resources in mid and northern Santa Cruz County. A significant barrier to proceeding to implement more conjunctive use of the City's San Lorenzo sources of supply is constraints on the Place of Use language included in the water rights documents for these sources. In particular, the Soquel Creek and Central Water Districts are not included in the Place of Use for any of the San Lorenzo water rights, which include rights related to Newell Creek, Felton Diversion and Tait Street Diversion. In addition, while Scotts Valley and the San Lorenzo Valley Water Districts are covered in the Place of Use descriptions for the Newell Creek and Felton Diversion water rights, they are not included in the Place of Use language of the Tait Street water right.

To address these Place of Use issues the City will be folding into the Water Rights Conformance Project a request to modify the Place of Use for the City's San Lorenzo River water rights and permits.

7.2 Reliability by Type of Year

For the purposes of assessing reliability, DWR uses the following definitions for determining year type:

Average/Normal Year: a year, or averaged range of years, that most closely represents the average water supply available to the agency.

Single-dry Year: a year that represents the lowest water supply available to the agency.

Multiple-dry Year: a period that represents the lowest average water supply available to the agency for a consecutive multiple year period of three years or more.

Table 7-1. Basis of Water Year Data			
Year Type	Base Year	Available Supplies if Year Type Repeats (mgy)	
		Agency may provide volume only, percent only, or both	
		Volume Available	% of Average Supply
Average Year		3,251	100%
Single-Dry Year	2014	2,692	83%
Multiple-Dry Years 1st Year	1976	2,430	75%
Multiple-Dry Years 2nd Year	1977	1,969	61%
Multiple-Dry Years 3rd Year	1977	1,597	49%
NOTES: Quantity volume of available water represents the maximum over time by year type. Projected volumes of available water produced by the Confluence model take into account demand assumptions.			

For this assessment the normal or average water supply available to the City was developed using the long-term average over the 78-year period of record (1936-2014). This record does include all water year types from critically dry to extremely wet and therefore represents a historical hydrologic average base year type.

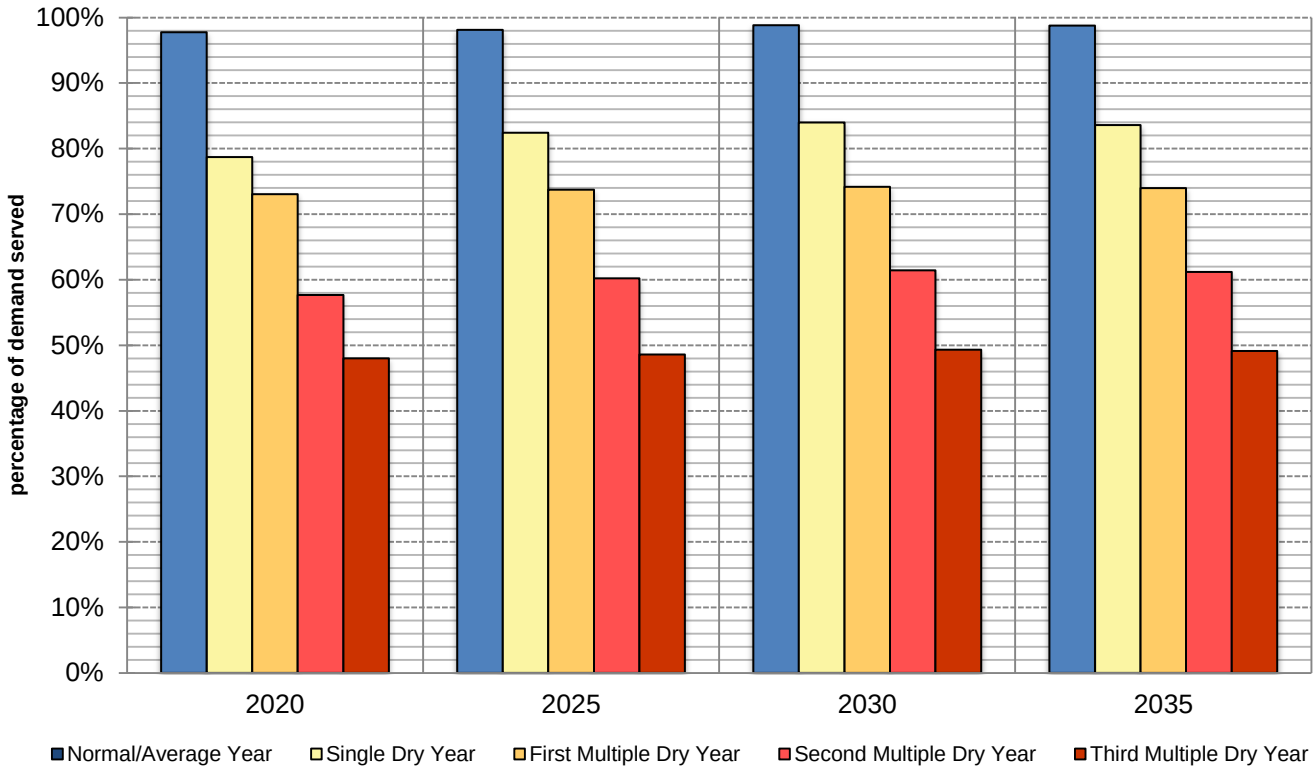
The City chose water year 2014 to represent the lowest water supply available to the agency for a single-dry year. Although 2014 was part of a larger drought sequence, the City was able to isolate the conditions for that single year. In terms of local source assessment, water year 2014 was representative of critically dry conditions for the City.

Consistent with previous plans and assessments, the City chose water years 1976-1977 as representing the most critical drought on record for a consecutive multiple-year period. A second 1977 year type was appended to the sequence to create the required third year for the assessment exercise. This sequence was used in the recent supply planning work completed in 2015 (see Section 7.4) and is consistent with the stated goal to create a reasonable worst-case scenario in a multi-year drought.

Each of the volumes included in the chart are the maximum available volumes by base year type as projected at the five-year intervals from 2020 to 2035. As such the percentage of average supply shown is the highest relative to average supply for all the base year types modelled.

To demonstrate the slight variability over time for each base year type modelled, Figure 7-2 shows the projected supply available relative to demand. Although the City chose the maximum value for comparison in Table 7-1, use of an average supply volume or a minimum supply volume would not substantially alter the presentation of the projections.

Figure 7-2. Projected Supply Availability as Demand Served



As will be expanded on in the following section, operationally the City has sufficient water supply available in normal years to meet demand even though a slight deficit seems to exist in the modelled projections. In single dry years, supplies are slightly inadequate to meet expected demands by 2020 and beyond. In multiple dry years, available supplies fall substantially short of system demands. The one variable that represents the biggest unknown at this time is the amount of water that will be required for ecosystem protection purposes. Should the City agree to release more water than is assumed in the operations model utilized for this analysis, these conclusions could change and shortages could be even greater than the estimated available supply presented.

7.3 Supply and Demand Assessment

The City of Santa Cruz utilizes the Confluence model to analyze the variability of water supplies to determine potential water supply shortages. The City has been utilizing the

Confluence model to support water supply planning activities since 2003 and this model was used to generate the results for the 2010 UWMP (City of Santa Cruz, 2011). The model takes into account the variation in demand both within and between years, the availability of water from various sources, and the capacity of infrastructure to pump and treat the water. The results presented in this section provide perspective on the City's water supply reliability based on accepted assumptions and projected conditions in the water system.

Water suppliers are required to characterize water supply reliability in a manner prescribed by law. In the analysis that follows, estimates of supply are given by both individual source and for the total available supply. The analysis assumes that future diversions, beginning sometime within the next five years will be limited due to the constraints of the specific factors described above. Although the constraints may ultimately be modified, the City is presenting the proposed forecasts as a composite of what total supply is likely to be, based on what is known at this time.

7.3.1 Normal/Average Water Year

After developing the normal year from the 78-year period of record, average conditions were projected for the future 5-year intervals. The summary results of this assessment are presented in Table 7-2 below. Notice the maximum availability of water for this base year type occurs in 2020; however reliability improves over time due to projected demand reduction in the future (M.Cubed, 2015).

Table 7-2. Normal Year Supply and Demand Comparison (mgy)

	2020	2025	2030	2035
North Coast Sources	637	642	671	671
San Lorenzo River	1882	1842	1829	1834
Loch Lomond Reservoir	595	551	540	547
Groundwater	138	129	127	128
Supply totals	3,252	3,164	3,167	3,180
Demand totals	3,327	3,225	3,205	3,220
Difference (mg)	(75)	(61)	(38)	(40)
Demand served %	97%	97%	98%	98%

In order to understand the source balance behind the numbers in Table 7-2, the City chose to provide the projected supply volumes by source to illustrate how the system provides water during these years. Of note, production from the North Coast sources is shown at a much lower diversion rate (637-671) than was projected in the 2010 UWMP (860 mgy). However, the modeling to support these new projections includes approval of an HCP with significant bypass flow requirements prior to the first five-year forecast year. This reduction is partly compensated for in normal water years by increased diversion from the San Lorenzo River and greater withdrawals from Loch Lomond Reservoir. Additionally, the expected future demand has reduced considerably since the 2010 Plan due to significant conservation and water efficiency programs.

Although the City has not previously seen shortages in normal water years, by adding the ecosystem protection conditions (HCP) likely to begin prior to 2020 a small shortage (1-3%) can be reasonably expected. Historically in normal water years, the City experienced a slight surplus of supply and this trend can be expected to continue until the HCP agreement is approved and higher instream flows are maintained. As the City chose to create a representative average year by using the historic record, the inclusion of the dry years and critically dry years within the average may explain the predicted small deficit. It is important to note that the City predicts the supply and demand volumes to be in balance for 90% of all normal water years for 2020-2035.

7.3.2 Single Dry Water Year

This assessment presents water supply available to the City as reflecting conditions comparable to water year 2014, which was a recent critically dry year. As shown in Table 7-3, water supply during a single dry year is not sufficient to meet the demand in the near term although the shortage experienced is projected to decrease over time. During a single dry year annual shortages of 16-21% are projected given the modelled supply and demand figures developed for planning and reliability purposes.

Due to the local conditions of the water supply sources and the tourist economy of the City, water shortages are typically concentrated into a “peak season” with much greater gaps between demand and supply of available water. The greatest demand for water occurs in the summer months when less water is available from surface water sources. Therefore the model predicts greater dependence on groundwater supply in dry years by increasing the volume by 25-35% more than during normal years. Evidence of this shift is shown in the groundwater supply volumes for Table 7-2 and 7-3.

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison (mgy)				
	2020	2025	2030	2035
North Coast	429	432	452	452
San Lorenzo River	1300	1275	1268	1271
Newell Creek	716	780	802	798
Groundwater	174	171	170	171
Supply totals	2619	2658	2692	2692
Demand totals	3,327	3,225	3,205	3,220
Difference (mg)	(708)	(567)	(513)	(528)
Demand served %	79%	82%	84%	84%
NOTES:				

Of interest when discussing a single dry year, the model makes assumptions about management of the reserve supply to be maintained in storage at Loch Lomond. The City may choose to draw more water from storage to meet customer demand in a dry year during the peak season than the model predicts (shown in Table 7-3) as operations are not always consistent with modeling assumptions. This decision is commonly applied when the storage level of the reservoir is reasonably expected to return to capacity during the following winter.

7.3.3 Multiple Dry Water Year Period

The City chose to present the estimated water supply available during the multiple dry water year period of a three-year drought sequence using hydrology from 1976, 1977, and a second 1977 year. The results of the multiple dry year supply and demand comparison are provided as totals and overall differences in Table 7-4. A breakdown of supply by source is not provided for this sequence in an effort to simplify the table for easy navigation and comparison between years and over time.

In an extreme multi-year drought similar to the 1976-77 event, the estimated water supply available to the City in the first year of that event, according to model, ranges between 2,430 and 2,377 or an average of 25% less water on an annual basis than is available in a normal water year. During the second year the average shortage over time increases to 39% and in the third year modeled, the average reduction compared

to a normal year is over 50%. Fortunately, growth in water demand is not anticipated to be a contributing factor to shortage as the City is projecting a small decrease in overall demand between 2020 and 2035.

Table 7-4. Multiple Dry Years Supply and Demand Comparison (mgy)

		2020	2025	2030	2035
First year	Supply totals	2,430	2,377	2,377	2,381
	Demand totals	3,327	3,225	3,205	3,220
	Difference	(897)	(848)	(828)	(839)
Second year	Supply totals	1,918	1,942	1,968	1,969
	Demand totals	3,327	3,225	3,205	3,220
	Difference	(1,409)	(1,283)	(1,237)	(1,251)
Third year	Supply totals	1,597	1,567	1,580	1,581
	Demand totals	3,327	3,225	3,205	3,220
	Difference	(1,730)	(1,658)	(1,625)	(1,639)

The deficit calculated for Table 7-4 is expressed as annual average deficits. However, as discussed in the single dry year analysis, supplies available to meet demand are reduced mainly during the peak season period between April and October, the actual shortage is likely to be experienced at a much greater percentage over a reduced number of months.

The annual shortages associated with the multiple dry year sequence range from 25%-52% and the peak season could experience a shortage greater than 60% at least once during a multiple year drought. The magnitude of a shortage volume of 60% is roughly equivalent to the total water usage for all residential customers in the service area during the year of 2014. As the likelihood of a recurring multiple dry year sequence is strong, the City is seeking a solution to this dilemma through an increase in storage of 3.0 billion gallons and/or a project to increase the reliability of peak season supply.

7.4 Water Supply Reliability Management Strategies

The City follows a variety of policies, procedures, and legal restrictions in operating the water supply system. As indicated in the foregoing sections, there are many complex

challenges and uncertainties that the City faces in its effort to maintain a safe, adequate, and reliable water supply. These include hydrologic, environmental, water quality, and legal factors. The City is pursuing a balanced approach to meet these challenges that includes both demand reduction and a phased, flexible augmentation strategy to diversify the City's and the region's existing water supply sources.

Over the past several decades the City has been studying ways to improve the reliability of its water supply; the problem has been defined in a variety of reports, plans, and projects that speak to the relative importance of the issues faced at the time. Participation by the community has been a significant element in the planning process for previous Integrated Water, Water Shortage Contingency, and Water Conservation Master Plans in addition to the review process for potential supply projects.

The most recent shift toward a new water supply vision occurred in late 2013 following expressed interest from the community to enhance public engagement on the subject of water supply planning. In response to this interest, the City developed a framework for moving forward in order to:

- greatly expand opportunities for community engagement;
- improve our water conservation efforts; and,
- help set a course for the future approach to improving the reliability of the City's water supply.

In early 2014, City Council appointed members to the Water Supply Advisory Committee (WSAC). The aim of the WSAC process was to 1) explore the City's water profile, including supply, demand and future risks; 2) analyze potential solutions to deliver a safe, adequate, reliable, affordable and environmentally sustainable water supply; and 3) develop recommendations for City Council consideration.

The backbone of the WSAC work is the problem statement developed for use by the City when addressing the assessment of supply reliability.

Committee Agreement on Problem Statement

On September 11, 2015, the Committee Agreed to the following problem statement:

Santa Cruz's water supply reliability issue is the result of having only a marginally adequate amount of storage to serve demand during dry and critically dry years when the system's reservoir doesn't fill completely. Both expected requirements for fish flow releases and anticipated impacts of climate change will turn a marginally adequate situation into a seriously inadequate one in the coming years.

Santa Cruz's lack of storage makes it particularly vulnerable to multi-year droughts. The key management strategy currently available for dealing with this vulnerability is to very conservatively manage available storage. This strategy typically results in regular calls for annual curtailments of demand that may lead to modest, significant, or even critical requirements for reduction. In addition,

the Santa Cruz supply lacks diversity, thereby further increasing the system's vulnerability to drought conditions and other risks.

The projected worst-year gap between peak-season available supply and demand during an extended drought is about 1.2 billion gallons. While aggressive implementation of conservation programs will help reduce this gap, conservation alone cannot close this gap. The Committee's goal is to establish a reasonable level of reliability for Santa Cruz water customers by substantially decreasing this worst-year gap while also reducing the frequency of shortages in less extreme years.

City of Santa Cruz, 2015

One of the primary objectives in creating the WSAC was to allow for broad representation of community interests by bringing together individuals with a diverse set of perspectives and viewpoints. The WSAC began and concluded the process with fourteen appointed members:

Water Supply Advisory Committee Members

David Green Baskin, Santa Cruz Water Commission	**Sarah Mansergh**, Surfrider Foundation
Peter Beckman, Think Local First	**Mark Mesiti-Miller**, Santa Cruz Chamber of Commerce
Doug Engfer, City Resident	**Greg Pepping**, Coastal Watershed Council
Suzanne Holt, Outside-City Water Customer	**Mike Rotkin**, Sustainable Water Coalition
Dana Jacobson, City Resident	**Sid Slatter**, Santa Cruz County Business Council
Charlie Keutmann, City Resident	**Erica Stanojevic**, Sierra Club
Rick Longinotti, Santa Cruz Desalination Alternatives	**David Stearns**, Santa Cruz Water Commission

The overarching goal of the WSAC process that concluded in October 2015 was "to provide significant improvement to the sufficiency and reliability of the Santa Cruz water supply by 2025." While this planning horizon is a decade shorter than the required UWMP 20-year outlook, it presents a strategy that can be built upon based on the analysis and progress during the first 10-12 years. The WSAC process recognized that "like all long range planning, water supply planning must deal with the realities of an uncertain future" and further that a final strategy requires the ability "to respond to the new information that will emerge and the potential changes in our understanding of circumstances that will occur over time." (City of Santa Cruz, 2015)

7.4.1 Water Supply Advisory Committee Final Report

In late 2015, consensus was achieved among WSAC members for how best to address an agreed-upon worst year gap of 1.2 billion gallons between water supply and water demand during times of extended drought.

A report was created to conclude the WSAC process and was presented to City Council, as a Final Report on Agreements and Recommendations in November 2015. The Final Report was accepted by the City Council and staff was directed to integrate the water supply portfolio strategy (including the entirety of the agreements and recommendations) into the Urban Water Management Plan update to be submitted to DWR in 2016. The guiding recommendations are provided below and further reference material for the underlying agreement details can be found in the full report provided as Appendix K (City of Santa Cruz, 2015).

> ***Article IV. Recommendations***
>
> ***Section 4.01 The Water Supply Augmentation Plan***
>
> *The Committee has worked on developing a Plan that would eliminate future water shortages by 2025, give or take two years, while allowing for robust stream flows to support and enhance fish habitat.*
>
> *The agreed-upon **Water Supply Augmentation Plan** (Plan) includes:*
>
> 1. *A **specific goal for Yield**, as well as the assumptions underlying this goal;*
> 2. *A **Timeframe** for improving the reliability of the Santa Cruz Water Supply;*
> 3. *The **Water Supply Augmentation Plan Elements**;*
> 4. *An **Adaptive Pathway** to provide a structure within which work on the Elements can be pursued and evaluated; and*
> 5. *A **Change Management Strategy** to guide adjustments and adaptations within the Plan, as described below.*
>
> ***Section 4.02 Yield Goal***
>
> *The Committee recommends the City implement additional demand management and supply augmentation programs and projects and address key infrastructure and operating constraints to reliably make available an additional 1.2 bgy during modeled worst-year conditions.*

Section 4.03 Timeframe for Improvement

The Committee recommends that the City adopt a goal of completing the improvements to Santa Cruz's water supply necessary to meet the specified yield goal by the end of 2025;

Section 4.04 Water Supply Augmentation Plan Portfolio Elements

The Water Supply Advisory Committee recommends that the City Council adopt a portfolio of measures for improving the reliability of the water supply. The recommended package includes the following Elements:

- ***Element 0:*** *Additional water conservation with a goal of achieving an additional 200 to 250 million gallons of demand reduction by 2035 by expanding water conservation programs;*
- ***Element 1:*** *Passive recharge of regional aquifers by working to develop agreements for delivering surface water as an in lieu supply to the Soquel Creek Water District and/or the Scotts Valley Water Districts so they can rest their wells, help the aquifers recover, and effectively store water for use by Santa Cruz Water Department in drought years;*
- ***Element 2:*** *Active recharge of regional aquifers by using existing infrastructure (wells, pipelines, and treatment capacity) and potential new infrastructure (wells, pipelines and treatment capacity) in the regionally shared Purisima aquifer in the Soquel-Aptos basin and/or in the Santa Margarita/Lompico/Butano aquifers in the Scotts Valley area to store water that can be available for use by Santa Cruz in drought years;*
- ***Element 3:*** *A potable water supply using advanced treated recycled water as its source, as a supplemental or replacement supply in the event the groundwater storage strategies described above prove insufficient to meet the Plan's goals of cost effectiveness, timeliness or yield. In the event advanced treated recycled water does not meet the needs, desalination would then become Element 3.*

Section 4.05 WSAC Value Statement on Implementing Plan Elements

The recommended Water Supply Augmentation Plan reflects the Committee's preference for pursuing a groundwater storage and retrieval strategy provided the yield goal can be achieved in a cost-effective and timely manner. Before making a choice to move away from groundwater storage, the Committee recommends that the City diligently pursue all reasonable measures to make the groundwater strategies work.

Recognizing the cost differential between some of the strategies the Committee considered in developing its recommendations, the WSAC agreed to express its preference for the Strategy One, groundwater storage and retrieval, over Strategy Two, and has agreed that as long as the annualized cost per million

gallons of average year yield (ACAYY) for implementing Strategy One is not more than 130% of the ACAYY for Strategy Two, while still meeting other metrics, Strategy One should be pursued.

Section 4.06 Adaptive Pathway Implementation Strategy

The Committee recommends that the Council adopt a staggered Adaptive Pathway to guide implementation of the Plan and that decision-making at the various decision-nodes identified in this Adaptive Pathway be guided by the provisions of the Change Management Strategy.

Section 4.07 Change Management Strategy

The Committee recommends that the Council adopt the Change Management Strategy described in Section 3.24 (City of Santa Cruz, 2015).

Section 4.08 Additional Recommendations Related to Infrastructure and Operating Constraints

(a) Infrastructure Constraints

The Committee also supports the Water Department's plans to address certain key infrastructure constraints that are keeping the City from fully utilizing available water, especially during the high flow season. These include, but are not limited to:

- *Rehabilitation of the pipeline between the Felton Diversion and Loch Lomond that would allow the City to increase diversions to Loch Lomond during the high flow season;*
- *Evaluation of additional pumping capacity at Felton to push more water to Loch Lomond through the replacement pipeline; and*
- *If proven cost-effective, and needed for the implementation of Strategy One, complete improvements that will allow the Department to treat water with turbidities that are higher than can be effectively treated by the current Graham Hill Water Treatment Plant facilities and processes. The specific method for how to address the water treatment constraint should include evaluating a range of potential options, including, but not limited to Ranney Collectors or satellite treatment plants, and choosing the most cost-effective approach.*

(b) Operating Constraints

Another focus of the Committee's review relates to some system operational constraints. Operating constraints typically include both daily parameters for drawing water from the City's sources and operating constraint parameters that are used in modeling system performance.

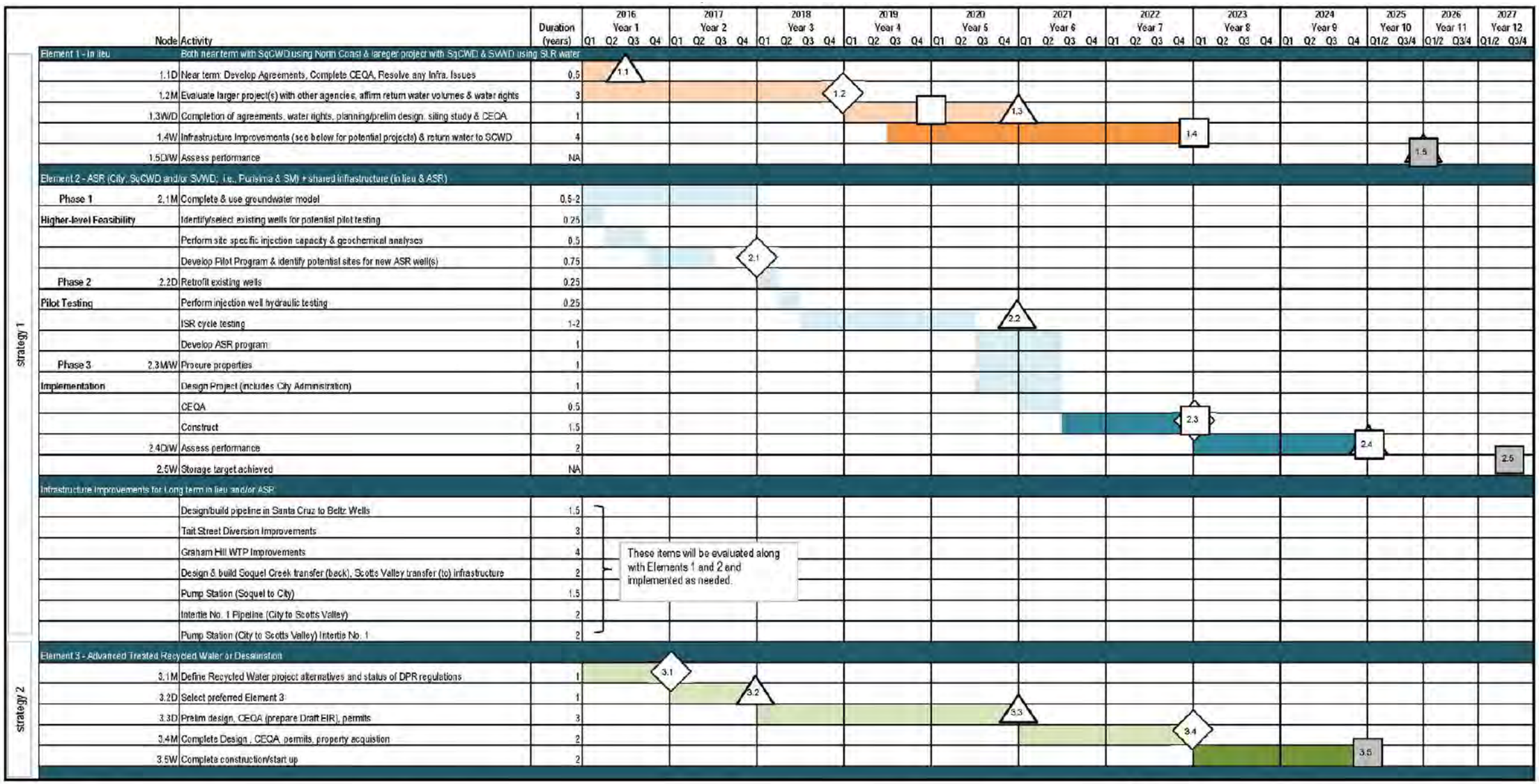
The Committee recommends that the Water Department identify and regularly evaluate operating constraints to determine whether those constraints continue to be justified as necessary to protect the system and finished water quality and to support efficient and cost-effective operations. Early focus should be given to issues related to Loch Lomond year-end carry over storage requirements, particularly if/when in lieu and/or ASR have provided a sufficient drought supply, and to the "first flush" constraint impacting the City's ability to pump water from Felton to Loch Lomond under critically dry year conditions.

Section 4.09 Implementation Plan and Timeline

As part of the process for developing the WSAC Agreement, City Staff and the technical team developed a Gantt chart shown in Figure 12. This Gantt chart, together with the Decision Node Table (Table 16) and the Staggered Adaptive Pathways Map (Figure 11) comprise the Implementation Plan and Timeline.

On the following page, Figure 7-3 is a reproduction of the Gantt chart originally included as Figure 12 in the Final Report and referenced in Article IV. Recommendations provided above. This Strategy Implementation Plan and Timeline was developed by City Staff and the technical team as a tool to move the City into the work plan phase.

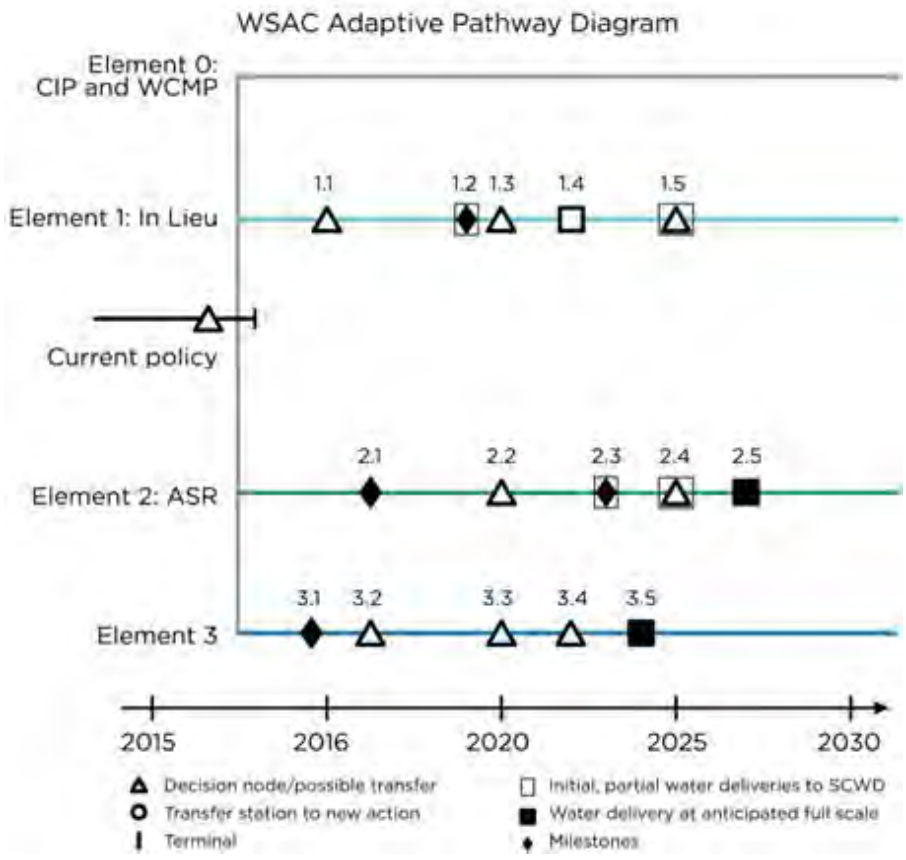
Figure 7-3. Water Supply Strategy Implementation Plan and Timeline, Water Supply Advisory Committee. Final Report, 2015



Upon acceptance of the Report by City Council, development began on the supply augmentation strategy work plan that further defines the components of the implementation plan and timeline included in the WSAC Final Report. The initial phase of the strategy involves enhancement of the existing conservation programs as well as significant exploration of feasibility and potential alternatives for future supply projects focused on solving the 1.2 billion gallon supply gap.

As shown in Figure 7-4 below and discussed as the "Staggered Adaptive Pathway" in the recommendations, the City will use the WSAC change management strategy to determine when and why adjustment of the progressing elements will occur. This movement will occur between the component elements of Strategies 1 and 2 while the tasks within the Capital Improvement Plan (CIP) and the Water Conservation Master Plan (WCMP) shown as Element 0 will continue along a consistent trajectory.

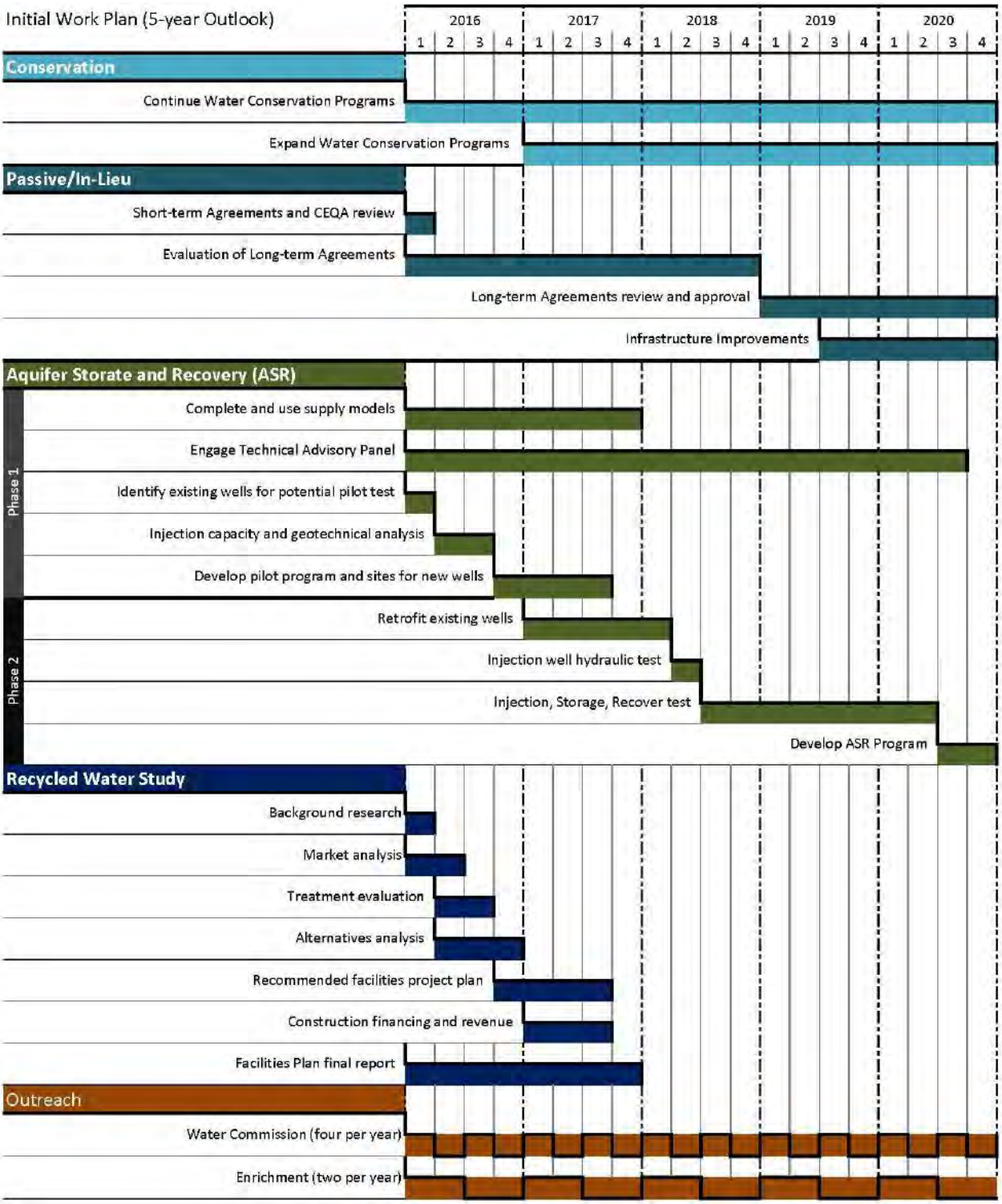
Figure 7-4. Change Management Strategy



The final components of the supply augmentation portfolio are not yet fully defined and will not be known prior to the adoption of this Plan. Therefore, the City provided projections on the long-term reliability of demand relative to supply based solely on the

information available at this time. Development of the work plan to support the progress of the Elements began in Spring 2016 with a snapshot of the current associated tasks and timelines provided in Figure 7-5 below.

Figure 7-5. Water Supply Augmentation Strategy, Implementation Timeline



The City intends to implement the recommendations developed through the WSAC process as accepted by City Council in the Final Report. Adopting this update to the UWMP signifies adoption of the recommendations as the City's water supply strategy and the new course to overcome known supply reliability constraints and challenges.

7.5 Regional Supply Reliability

> ***CWC 10620***
>
> ***(f)*** *An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.*

The City of Santa Cruz continues to focus supply planning and reliability efforts on programs and projects that emphasize the maximization of available resources. To date, the City has avoided supply planning that included importing water from outside the Central Coast hydrologic region by concentrating on options within Santa Cruz County.

Currently, all of the City's water resources are obtained from local sources. In order to build drought supply reliability, the City continually works to develop partnerships within the region that promote responsible and sustainable water resource management. A known constraint on the regional supply are the over drafted, threatened, and recovering aquifers. The City's future supply vision includes projects serving to benefit regional aquifer recovery and increased reliability of groundwater sources. Recognizing the path toward regional reliability requires a comprehensive framework that supports dependability of all recognized supplies within the region, the types of tools being proposed and evaluated at present seek to benefit multiple stakeholders.

At this point in time, the City is participating in two recognized regional teams formed to increase coordination of activities among resource agencies. The first is the Santa Cruz Integrated Regional Water Management Group (IRWM) made up of nine local agencies. Several of the City's augmentation plan elements may benefit from the ability to work collaboratively with the partners and stakeholders that include government and non-government resource management agencies. Additionally, the City is one of four members of the Mid-County Groundwater Agency (MGA). As discussed in Chapter 6, the MGA was only formally established in May 2016 and the City has participated in several partnership groups with the mission to promote responsible management of the Soquel-Aptos Basin over the past several decades. Coordination and collaboration is expected to increase even further within Santa Cruz County in the coming decades with the potential for similar programs throughout the Central Coast Region.

Chapter 8

WATER SHORTAGE CONTINGENCY PLANNING

This chapter presents information about how the City of Santa Cruz manages the water system during a water shortage emergency that arises as a result of drought. It also describes actions that would be undertaken in response to a catastrophic interruption of water supplies, including a regional power outage, earthquake, or other emergency situation.

8.1 Background

In 2009, the City of Santa Cruz completed a comprehensive update of its Water Shortage Contingency Plan. This project was an outgrowth of a previous Urban Water Management Plan, which recognized the many changes in regional conditions and local water supply planning that had taken place over the previous decade and identified a need to better prepare for the possibility of future water shortages in advance of the next major drought. Since then, the City has had to declare a water shortage in five of the past seven years, including a Stage 3 Water Shortage Emergency in both 2014 and 2015.

The City's Water Shortage Contingency Plan describes the conditions which constitute a water shortage and provides guidelines, actions, and procedures for managing water supply and demands during a declared water shortage. The primary focus of the plan is on measures that reduce customer demand for water, but it also covers actions that can be implemented to stretch or increase the water supply.

The overarching goals of this plan are as follows:

1. to conserve the water supply of the City for the greatest public benefit,

2. to mitigate the effects of a water supply shortage on public health and safety, economic activity, and customer lifestyle, and

3. to budget water use so that a reliable and sustainable minimum supply will be available for the most essential purposes for the entire duration of the water shortage.

Development of the City's Water Shortage Contingency Plan was a collaborative effort among the City Water Department staff, the City's Water Commission, City Council, and the public over a three year period beginning in 2006. Research involved reviewing state regulations and legal requirements (Water Code section 350 et seq.) and the water shortage plans of 21 other urban water utilities from throughout California, and from selected cities in the western United States and across the country. The Water Commission provided its input and recommendations throughout the process.

The plan is based on lessons learned here and from other water agencies during past droughts. Nevertheless, it is important to note that every drought will evolve differently and that it is not practical to develop a set of hard and fast rules that apply to all situations. The plan should be thought of as a general framework that will need to be adjusted and refined based on actual conditions.

Early in the planning process, staff and the Water Commission developed a set of principles to guide the water shortage planning process. These principles are as follows:

- **Shared contribution.** All customers will be asked to save their share in order to meet necessary reduction goals during water shortages.

- **Reduce non-essential uses first.** The plan concentrates on the elimination of non-essential water uses and on outdoor reductions, and gives the highest priority to essential health and safety uses.

- **Preserve jobs and protect the local economy.** The plan minimizes actions that would have substantial impact on the community's economy and provides large users the flexibility to determine their own reduction strategies within a water budget.

- **Existing conservation measures recognized.** Customers that have already implemented water conservation measures are acknowledged to have less potential for reduction and should not be penalized for conserving.

- **Communication at every stage.** A public information campaign at every level of shortage is essential for customer preparation and will encourage confidence in the City's ability to respond to water shortages.

- **Public participation.** Public participation in the development and implementation of the plan will help to ensure fairness, encourage cooperation, and facilitate implementation and with demand reduction measures in times of shortage.

The final Water Shortage Contingency Plan was adopted by resolution of the City Council of the City of Santa Cruz in March 2009 as an amendment to the City's Urban Water Management Plan (Appendix L) and is adopted herein by reference. Subsequently, the City Council adopted an ordinance implementing the water shortage regulations and restrictions contained in the plan (Santa Cruz Municipal Code Chapter 16.01, Appendix M). The water shortage regulations and restrictions were updated in early 2015 to integrate some changes recognized as being needed during implementation of rationing in 2014.

Portions of the City's Water Shortage Contingency Plan have since been published and highlighted by the American Water Works Association in its new Manual of Water Supply Practices, *M60: Drought Preparedness and Response* as an example of a model staged demand reduction program (AWWA, 2011).

8.2 Stages of Action

The updated Water Shortage Contingency Plan uses a staged approach that classifies a shortage event into one of five levels spanning a range from less than 5 percent up to 50 percent (Table 8-1).

Table 8-1. Stages of Water Shortage Contingency Plan

Stage	Percent Supply Reduction[1] *Numerical value as a percent*	Water Supply Condition
1	0-5%	Water Shortage Alert
2	5-15%	Water Shortage Warning
3	15-25%	Water Shortage Emergency
4	25-35%	Severe Water Shortage Emergency
5	35-50%	Critical Water Shortage Emergency

[1] One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.

NOTES:

The overall concept is that water shortages of different magnitudes require different measures to overcome the deficiency. Because there is so little the City can do in the short run to increase the supply of water, the focus of this plan is primarily on measures that reduce demand. Each stage includes a set of demand reduction measures that

become progressively more stringent as the shortage condition escalates. When a demand reduction is necessary, typically one of these five stages would be put into effect by a resolution of the Santa Cruz City Council at the recommendation of the Water Director in the spring and remain in force for the entire dry season.

8.2.1 Assessing Water Supply and Demand

There is no one single criterion, trigger, or definition that is used to determine if a water shortage exists. The determination of a shortfall involves consideration of multiple indicators of water supply, as well as expected system demand.

Rainfall, runoff, reservoir storage, and water year classification are the key hydrologic indicators used by the City to evaluate water conditions. The plan describes these factors affecting the City's water supply and discusses the forecasting process and management considerations used in dry years to determine whether a water shortage is expected for the year ahead and how much water use must be cut back system-wide in response. In recent years, the City has also considered statewide drought intensity, long-range weather predictions, and local instream flow requirements in its analysis.

In Santa Cruz, a water shortage occurs when the combination of low surface flows in the coast and river sources and depleted surface water storage in Loch Lomond Reservoir reduces the available supply to a level that cannot support existing demand.

After an unusually dry winter or period of consecutive dry years, when a lack of supply appears possible, the Water Department undertakes an analysis to determine whether water supplies will be deficient relative to estimated water needs for the coming dry season. This analysis involves first comparing projected water supply and demand on a monthly basis, assuming no restriction on water use, to forecast the end of season water level and storage volume in Loch Lomond Reservoir. The Department then evaluates whether the amount of carryover storage in Loch Lomond at the end of the year will be sufficient to meet essential health and safety needs in case the dry weather pattern continues into the following year. If this analysis shows that Loch Lomond Reservoir would be depleted to a dangerously low level, then a decision is made regarding how much reservoir water is available to use in the current year and how much should be banked as a safeguard against the possibility of another dry year. The amount of cutback in demand needed to reduce the rate of reservoir depletion and end the year at a safer level of storage is then determined. If necessary, cutbacks would go into effect in late April/early May and span the entire dry season, typically through late

October. A hypothetical situation is provided in the full plan to illustrate this decision-making process.

The degree of shortage is normally defined as the supply deficiency in relation to normal water use over a given period of time, and expressed as a percentage. For example, a 25 percent shortage means the City has one-quarter less water supply available than what is normally used during the seven-month long dry season.

8.2.2 Timeline for Declaring Water Shortage

The timeline showing when the City evaluates water supply conditions and, if necessary, declares a water shortage is presented in Table 8-2 below.

Table 8-2. Calendar for Declaring Water Shortage

Target Date	Action
Months of Oct -Dec	Monitor rainfall, reservoir level, and runoff amounts
Late January	Prepare written status report on water supply conditions
Early February	Present initial estimate of water supply availability for year ahead
Early March	Present revised estimate of water supply availability for year ahead
Mid-March	SCWD announces existence of water shortage (if applicable)
Mid to late March	SCWD determines monthly water production budget and need for voluntary or mandatory response.
Early April	Present shortage response recommendation to Water Commission; notice of public hearing published
Mid-April	City Council formally declares a water shortage, adopts emergency ordinance
May	Water shortage regulations become effective
NOTES:	

8.2.3 Process for Declaring Water Shortage

Once the water shortage condition has been defined (as soon as reasonably certain), recommendations regarding water shortage rules and regulations consistent with this contingency plan are discussed with the City Water Commission. Monthly Water Commission meetings serve as a public forum for discussing water conditions and for hearing issues associated with implementation of the water shortage ordinance throughout the entire duration of the water shortage event.

Following consideration by the Water Commission, a declaration of water shortage is made by a resolution of the City Council. The legal requirements for such action are covered in Section 350 et seq. of the California Water Code. The code requires the following process be followed:

- That City Council hold a public hearing on the matter;
- That the public hearing be properly noticed (minimum of publishing once in newspaper at least seven days prior to the date of the hearing);
- Upon determining and declaring the existence of a water shortage, City Council may then adopt regulations and restrictions governing the use and delivery of water.

In accordance with Municipal Code section 16.04.480, rules adopted by the City Council establishing water use regulations become effective immediately after their publication in a newspaper of general circulation published in the City of Santa Cruz.

8.3 Demand Reduction Strategy

The City's strategy for dealing with water shortages of all levels involves the following four interrelated components:

1. An allocation system to establish reduction goals for different customer groups
2. Demand reduction measures
3. Publicity and communications
4. Operating actions

These four components are summarized below.

8.3.1 Allocation System

A fundamental issue any water supplier faces in managing a water shortage involves the allocation of water and how to distribute the available supply among customer categories when supplies fall short. In the process of updating this plan, various options and alternatives were reviewed and a priority-based allocation system was selected. This allocation system produces specific demand reduction goals for each major customer category at various levels of shortfall based on the unique usage characteristics of each customer category.

Customer reduction goals for all but the first stage were developed by evaluating the composition of demand for each major group and dividing it into three usage priorities. These priorities are, from highest to lowest, 1) health/safety, i.e., all domestic and sanitary uses, 2) business and industrial uses and, 3) irrigation and other outdoor uses. Normal demands were then scaled back in accordance with the schedule presented in Table 8-3.

Table 8-3. Reduction in Water Delivery by Usage Priority (percent of normal deliveries)

Stage	Magnitude of Water Shortage:	Health/Safety	Business	Irrigation
2	15%	95	95	64
3	25%	95	90	34
4	35%	90	85	12
5	50%	75	67	0

In essence, this allocation system strives to balance available supplies in times of drought as much as possible through cutbacks in outdoor water use. At each level of shortfall, public health and sanitation usage is afforded the highest priority by cutting back on interior usage the least. The importance of water in protecting the City's employment base is also acknowledged through disproportionate, modest cutbacks to the commercial sector as compared to the overall system shortfall. Irrigation and other outdoor uses are cut back the most. The larger the water shortage, the greater the cutbacks, but this same order of priorities is maintained throughout the range of potential shortages.

The heavy reliance on outdoor use reductions makes sense, both from a water system perspective because it reduces peak demands, which is important to preserving storage in Loch Lomond Reservoir, and from a public health and welfare perspective, because irrigation and other outdoor uses are the most discretionary of all uses when drinking water is in short supply. It also makes sense from an operational perspective because outdoor water use cutback can be achieved relatively quickly. From a legal perspective, this allocation system is consistent with the priorities and requirements of Water Code section 354. The resulting water supply allocation and customer reduction goals are presented in Table 8-4.

Because both total and categorical water demand has undergone a significant decline in the intervening time since this allocation was initially developed in 2009, it is recommended that this schedule and the monthly rationing allotments be revised once demand stabilizes again following the 2014-2015 implementation of residential/irrigation water rationing.

Table 8-4. Water Supply Allocation and Customer Reduction Goals

Normal Peak Season Demand = 2,473 mil gal	No Deficiency		Stage 2 15% Deficiency		Stage 3 25% Deficiency		Stage 4 35% Deficiency		Stage 5 50% Deficiency	
	Delivery		Delivery		Delivery		Delivery		Delivery	
Customer Category:	%	Volume (mil gal)	%	Volume (mil gal)	%	Volume (mil gal)	%	Volume (mil gal)	%	Volume (mil gal)
Single Family Residential	100	1,031	84%	864	73%	753	62%	639	48%	495
Multiple Residential	100	524	87%	454	78%	411	69%	361	55%	287
Business	100	438	95%	416	92%	402	87%	381	70%	307
UC Santa Cruz	100	132	85%	113	76%	100	66%	87	52%	68
Other Industrial	100	23	95%	22	90%	21	85%	20	67%	15
Municipal	100	48	76%	36	57%	27	41%	20	28%	14
Irrigation	100	110	64%	70	34%	37	12%	13	0%	0
Golf Course Irrigation	100	106	73%	78	51%	54	34%	36	20%	21
Coast Agriculture	100	59	95%	56	90%	53	85%	50	67%	40
Other	100	2	95%	2	90%	2	50%	1	50%	1
Total	**100**	**2,473**	**85%**	**2,111**	**75%**	**1,861**	**65%**	**1,607**	**50%**	**1,247**
Demand Reduction %, Million gallons	**0**	**0**	**15%**	**-362**	**25%**	**-612**	**35%**	**-866**	**50%**	**-1,226**

8.3.2 Demand Reduction Measures

The City's Water Shortage Contingency Plan uses a combination of voluntary and mandatory demand reduction measures, which vary depending on level of cutback. As mentioned earlier, the regulations against water waste are in effect in Santa Cruz on a permanent basis. Once a water shortage is declared, however, enforcement of this ordinance is increased and enhanced by the use of fines.

The primary demand reduction measures used in **Stage 1** are to restrict all landscape irrigation to certain hours of the day and to prohibit certain uses defined as non-essential.

The main approach to reducing water use in **Stage 2** involves expanding mandatory water restrictions and limiting landscape irrigation to specified days, times, and durations. Large landscape users are required to adhere to water budgets.

A **Stage 3** water shortage constitutes an emergency situation. The three primary measures to meet this emergency reduction goal are 1) residential water rationing, 2) mandatory water shortage signage in all commercial buildings, and 3) reduced water budgets for large landscapes. Single family residential customers are rationed using a hybrid approach that provides a base allocation for a family of four and an additional amount per person for larger households. Multi-family residential accounts are rationed based on the number of dwelling units at an account.

A **Stage 4** water shortage requires expanding water rationing to cover all water customers, including business, and reducing residential allocations. At this severe level of shortage, only minimal water is available for outdoor purposes.

Stage 5 represents an extraordinary crisis threatening health, safety, and security of the community. It would involve reduced rationing levels for all customers and a ban on outdoor uses to cut back normal water use by half.

A summary of the demand reduction methods and mandatory prohibitions against specific water use practices is provided in Table 8-5.

8.3.3 Publicity and Communications

Effective communication is essential to the success of any water shortage contingency plan in achieving the desired water use reductions. All customers need to be adequately

informed about water supply conditions, understand the need to conserve, and know what actions they are being requested or required to take to mitigate the shortage. The full Water Shortage Contingency Plan articulates the City's communications strategy, identifies the main customers and groups that need to be kept updated, advised, and informed, and outlines various communication and public outreach measures to employ in a water shortage. The plan also provides prepared public statements for each of the 5 stages that are intended to help communications stay on message and set the tone for subsequent communications through the duration of the incident.

8.3.4 Operating Actions

The City's Water Shortage Contingency Plan outlines the added responsibilities and internal actions taken Water Department when a water shortage arises. Many represent increased costs to the Department for additional personnel, services, and supplies. An important initial step is to designate a working group consisting of the Water Director and senior staff to lead and manage the Department's internal and external water shortage response. The Water Department then must mobilize the necessary personnel, resources, and equipment to undertake the various activities that are critical to implementing an effective response. These initial actions may include, among other things:

- Establishing water production budgets
- Coordinating with other city departments and affected public agencies
- Establishing a public communications program to publicize use restrictions and to engage and involve the community and key water-using sectors in curtailing their demand
- Ensuring adequate staff and training to effectively respond to customer inquiries and enforce water shortage regulations
- Adapting utility billing format and database capabilities
- Expanding water conservation assistance, outreach, and education
- Instituting a system for processing exception requests and appeals
- Addressing policy issues and updating status with decision makers
- Implementing monitoring mechanisms to track actual usage and measure performance

A summary of these key operating and communications actions is provided in Table 8-5.

Table 8-5. Summary of Demand Reduction Actions and Measures

Water Shortage Condition	Key Water Department Communication and Operating Actions	Customer Demand Reduction Measures
Stage 1: Water Shortage Alert (0-5%)	• Initiate public information and advertising campaign • Publicize suggestions and requirements to reduce water use • Adopt water shortage ordinance prohibiting nonessential uses • Step up enforcement of water waste • Coordinate conservation actions with other City Departments, green industry	• Voluntary water conservation requested of all customers • Adhere to water waste ordinance • Landscape irrigation restricted to early morning and evening • Non-essential water uses banned • Shutoff nozzles on all hoses used for any purpose • Encourage conversion to drip, low volume irrigation
Stage 2: Water Shortage Warning (5-15%)	• Intensify public information campaign • Send direct notices to all customers • Establish conservation hotline • Conduct workshops on large landscape requirements • Optimize existing water sources; intensify system leak detection and repair; suspend flushing • Increase water waste patrol • Convene and staff appeals board	• Continue all Stage 1 measures • Landscape irrigation restricted to designated watering days and times • Require large landscapes to adhere to water budgets • Prohibit exterior washing of structures • Require large users to audit premises and repair leaks • Encourage regular household meter reading and leak detection
Stage 3: Emergency Water Shortage (15-25%)	• Expand, intensify public information campaign • Provide regular media briefings; publish weekly consumption reports • Modify utility billing system and bill format to accommodate residential rationing, add penalty rates • Convert outside-City customers to monthly billing • Hire additional temporary staff in customer service, conservation, and water distribution • Give advance notice of possible moratorium on new connections if shortage continues	• Institute water rationing for residential customers • Reduce water budgets for large landscapes • Require all commercial customers to prominently display “save water” signage and develop conservation plans • Maintain restrictions on exterior washing • Continue to promote regular household meter reading and leak detection
Stage 4: Severe Water Shortage Emergency (25-35%)	• Contract with advertising agency to carry out major publicity campaign • Continue to provide regular media briefings • Open centralized drought information center • Promote gray water use to save landscaping • Scale up appeals staff and frequency of hearings • Expand water waste enforcement to 24/7 • Develop strategy to mitigate revenue losses and plan for continuing/escalating shortage	• Reduce residential water allocations • Institute water rationing for commercial customers • Minimal water budgets for large landscape customers • Prohibit turf irrigation, installation in new development • Prohibition on on-site vehicle washing • Rescind hydrant and bulk water permits
Stage 5: Critical Water Shortage Emergency (35-50%)	• Continue all previous actions • Implement crisis communications plan and campaign • Activate emergency notification lists • Coordinate with CA Department of Public Health regarding water quality, public health issues and with law enforcement and other emergency response agencies to address enforcement challenges • Continue water waster enforcement 24/7	• Further reduce residential water allocations • Reduce commercial water allocations • Prohibit outdoor irrigation • No water for recreational purposes, close pools • Continue all measures initiated in prior stages as appropriate

8.4 Prohibitions on End Uses

As identified above, the City's water shortage regulations and restrictions include a variety of temporary prohibitions on various end uses of water, which vary according to the stage of shortage. These prohibitions fall into four main categories:

- Landscape irrigation
- Washing of outdoor surfaces, structures, and vehicles
- Commercial end uses
- Swimming pools, spas and water features

These restriction and prohibitions are summarized in Table 8-6 below:

Table 8-6. Restrictions and Prohibitions on End Uses (continues on next page)

Stage	Restrictions and Prohibitions on End Uses	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1-3	Landscape - Limit landscape irrigation to specific times		Yes
1-3	Landscape - Restrict or prohibit runoff from landscape irrigation		Yes
2,3	Landscape - Limit landscape irrigation to specific days	1-2 days per week	Yes
2-4	Landscape - Other landscape restriction or prohibition	Limit on duration of watering with automatic irrigation systems	Yes
4	Landscape - Prohibit certain types of landscape irrigation		Yes
5	Landscape - Prohibit all landscape irrigation		Yes
3	Landscape - Other landscape restriction or prohibition	within 48 hours of measureable rainfall	
2-4	Landscape - Other landscape restriction or prohibition	Require large landscapes to adhere to water budgets	Yes
4,5	Landscape - Other landscape restriction or prohibition	Prohibit installation in new development	Yes
1-5	CII - Lodging establishment must offer opt out of linen service		Yes
1-5	CII - Restaurants may only serve water upon request		Yes

Stage	Restrictions and Prohibitions on End Uses	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
2-5	CII - Other CII restriction or prohibition	Mandatory water conservation plans for large businesses	
3-5	CII - Other CII restriction or prohibition	Business water conservation plans required	Yes
3-5	CII - Other CII restriction or prohibition	Mandatory water waste signage for all business establishments	Yes
1-2	Other water feature or swimming pool restriction	Prohibit initial filling or draining and refilling of residential swimming pools	Yes
2-5	Water Features - Restrict water use for decorative water features, such as fountains		Yes
3	Other water feature or swimming pool restriction	Prohibit initial filling or draining and refilling of all swimming pools	Yes
4-5	Other water feature or swimming pool restriction	Prohibit filling or topping off swimming pools and outdoor spas	Yes
1-5	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		Yes
1-5	Other - Require automatic shut of hoses		Yes
4-5	Other - Prohibit use of potable water for construction and dust control		Yes
4,5	Other	Prohibit vehicle washing, except at commercial car washes that use recycled water	Yes

8.5 Penalties, Charges, Other Enforcement of Prohibitions

The City's water shortage regulations and restrictions ordinance contains provisions for enforcing water use rules and regulations, and processes for issuing exceptions and hearing appeals. Administrative enforcement methods include the following:

Administrative Penalties These penalties are for failure to comply with water waste prohibitions and mandatory water use restrictions and are applied to the customer's

next utility bill. The object of imposing increasingly significant penalties is to assure compliance by creating a meaningful disincentive to commit future code violations. When a violation occurs, the Water Department first provides a written notice and gives the customer an opportunity to correct the situation. Additional violations are penalized as follows:

2nd Violation $100
3rd Violation $250
4th Violation $500

Large users (defined as using over a million gallons per year) are penalized at triple the amounts listed above.

Excessive Water Use Penalties These penalties are assessed when a customer uses more water in a given billing cycle that their rationing allocation provides. Excessive use penalties are in addition to ordinary water consumption charges, as follows:

1% to 10% over customer rationing allotment:	$25.00/CCF
More than 10% over customer rationing allotment:	$50.00/CCF

In addition to any administrative penalties and excess water use penalties, a flow restrictor and/or discontinuation of service may be ordered for willful violations of the City's water shortage regulations and restrictions ordinance.

The ordinance contains an exception process and that allows the Water Department, upon making specified findings, to provide for special or exceptional circumstances that otherwise would create undue hardship for an individual customer or class of customers. It also allows any water service customer who considers an enforcement action to have been erroneously undertaken to appeal their case before an independent hearing officer. The hearing officer considers the evidence presented by the customer and by the City and decides whether to uphold the enforcement action or to provide relief.

In 2014 and 2015, the City created and administered a "Water School" to provide one-time relief from excessive use penalties in exchange for customers attending a 2-hour evening class about the drought and ways to save water. More than 1,200 penalties totaling over $800,000 were waived through Water School during this time.

8.6 Consumption Reduction Methods

Refer to Section 8.3.2 and Table 8.5 above for a discussion and summary of the primary consumption reduction methods used by the City at various stages of water shortage. The City also implements measures listed in Table 8-7 below:

Table 8-7. Stages of Water Shortage Contingency Plan - Consumption Reduction Methods

Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference *(optional)*
1-5	Expand Public Information Campaign	
3	Increase Frequency of Meter Reading	The City permanently changed to monthly meter reading in 2014 to facilitate water rationing
1-5	Provide Rebates on Plumbing Fixtures and Devices	Increased marketing of ongoing programs
1-5	Provide Rebates for Landscape Irrigation Efficiency	Increased marketing of ongoing programs
1-5	Provide Rebates for Turf Replacement	Increased marketing of ongoing programs
1-5	Decrease Line Flushing	
1-5	Increase Water Waste Patrols	
5-Mar	Implement or Modify Drought Rate Structure or Surcharge	
NOTES:		

8.7 Determining Water Shortage Reductions

Under normal water supply conditions, water production and gross consumption are recorded daily and monthly by treatment plant operators and reported to the Production Superintendent. Metered water consumption is reported on a monthly basis through automated sales reports generated by the utility billing system.

During a water shortage, a monthly production forecast and budget are developed for each source of supply. Actual production and the lake level are closely monitored on a daily and weekly basis to verify that the budgeted goals are being met. Consumption by large users is monitored and reported on a frequent basis. In severe stages of a water shortage, production and consumption data would be evaluated daily and the status reported to the Water Director's office. If the trend in consumption is such that the rate of drawdown at Loch Lomond is greater than anticipated, the City Manager and Council

are notified so that corrective action (such as increased publicity and enforcement or consideration of declaring the next higher stage) can be taken.

Beginning in August 2014, the Water Department began reporting its monthly water production on a statewide database used to keep track of urban water use in response to emergency water conservation regulations. These reports include the amount of potable water produced in the preceding month, an estimate of the gallons of water used per person per day by its residential customers, and various enforcement statistics. This reporting is expected to become a permanent requirement in 2016.

The University of California, the City's largest customer, closely tracks its consumption on campus and meets regularly with the City to ensure it is meeting its reduction target.

Figures 8-1 and 8-2 below show two examples of charts used by the Water Department to track production and water savings goals in the 2014 and 2015 drought and to publicize the community's success in meeting water reduction goals.

Figure 8-1. 2015 Water Production Goals (mgd)

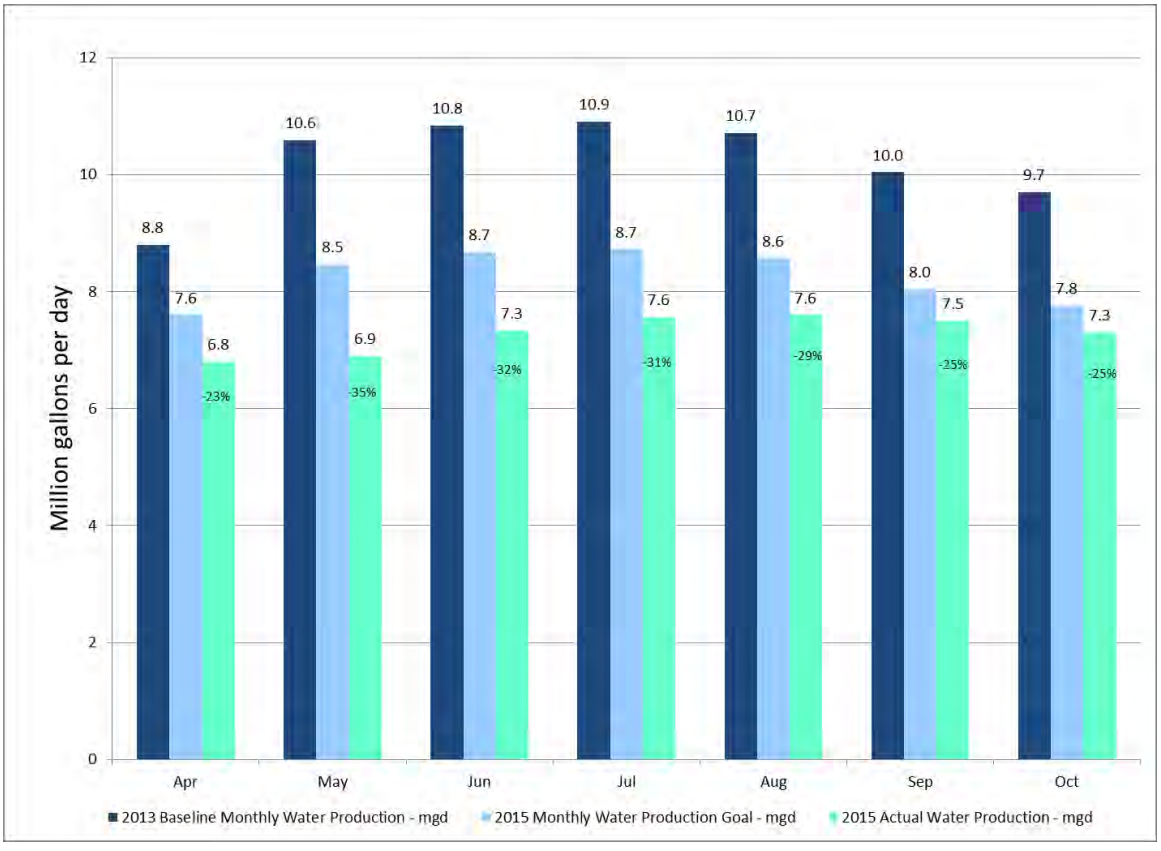
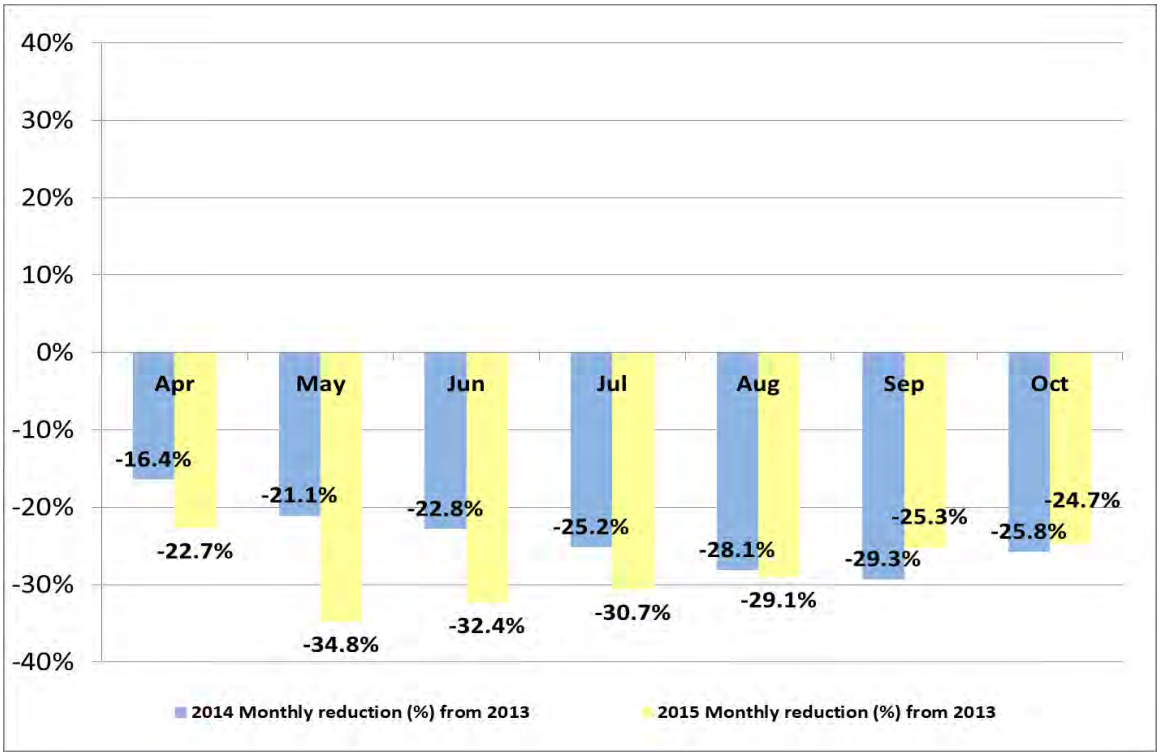


Figure 2. Monthly Water Savings Compared to 2013 (%)



8.8 Revenue and Expenditure Impacts

One of the negative consequences of using demand reduction to deal with water shortages is the corresponding reduction in revenue that occurs to the City's Water Fund as a result of reduced water sales. The full plan provides an analysis of the magnitude of revenue losses that the Water Fund might experience for each of the five stages, based on annual revenues at the time of just over $22 million.

The analysis assumes the "ready-to-serve" or fixed monthly service charge that is based on meter size would remain unaffected while the volumetric portion of the Department's revenue derived from water sales would vary by customer class in accordance with the allocation presented in Table 8-4 over the seven month period in which water shortage regulations are likely to be in effect.

The analysis shows revenue losses ranging from just under $0.6 million in a 5 percent water shortage situation to almost $5.8 million in a critical 50 percent water shortage. These estimates of losses were considered ballpark figures only and probably underestimate the problem. Actual revenue losses would be different for the following reasons:

- The spreadsheet did not model the effect of tiered pricing in the single family residential category, which would exacerbate revenue losses from this group;

- It is unlikely that system water use would immediately recover to normal levels in the months following a period of curtailment as modeled, thereby further depressing income;

- The table above does not include added operating costs of staff, equipment, and materials related to the water shortage response.

On the other hand, the time of year in which regulations would take effect is spread over two fiscal years, so the full effect of revenue losses of a single year drought would not impact the Department's annual budget to such a large degree. In addition, there would be relatively minor cost savings associated with reduced power and chemical usage at the Graham Hill water treatment plant, ranging from <$0.1 million in Stage 1 to about $0.4 million in Stage 5. Finally, some of the revenue loss would be offset by penalty and/or excess use fees. On the expenditure side, the major expense of implementing the water shortage plan identified was for added personnel costs for temporary field and office positions, which were estimated to range from approximately $100,000 in Stage 1 to $600,000 in Stage 5, and power cost for pumping water from Felton to Loch Lomond.

The Water Department's total annual revenue has increased somewhat since the Water Shortage Contingency Plan was prepared in 2009, but the actual revenue impact of the recent drought was fairly close to the $2.9 million projected annual loss estimated for Stage 3.

To address this problem, the City in 2014 instituted a new Drought Cost Recovery Fee, which is a surcharge that is automatically triggered by City Council action declaring a water shortage and continues through the end of the fiscal year following the shortage (Appendix N). The fee is a fixed monthly amount that varies by meter size and stage of shortage. It is designed to mitigate the risk of revenue shortfalls associated with usage curtailment events. The maximum targeted cost recovery amount ranges from $1.0 million in Stage 1 to $7.5 million in Stage 5. Table 9-4 below shows the Drought Cost Recovery fees in effect in 2015 and 2016.

Table 8-8. Drought Cost Recovery Fee Rate (2015)	
Meter Size	Inside & Outside City (monthly)
5/8 & 3/4''	$7.37
1''	$18.43
1.5''	$36.85
2''	$58.96
3''	$110.55
4''	$184.25
6''	$368.50
8''	$847.55
10''	$1,046.54

8.9 Resolution or Ordinance

The City's water shortage regulations and restrictions were adopted as an ordinance and codified as Santa Cruz Municipal Code Chapter 16.01 (Appendix M). The water shortage regulations and restrictions were last updated in early 2015.

8.10 Plan Evaluation

In 2009, after a year's experience implementing a Stage 2 Water Shortage Warning, Water Department staff prepared a report to document the response and compile records for future reference. This report, entitled: The 2009 Water Shortage: An Evaluation of Water Management Strategies, Actions, and Results evaluates which aspects of the plan succeeded and which didn't, and why, and makes recommendations and refinements to the plan for the next time a water shortage occurs. Much progress was made with putting enforcement systems, procedures, and tools in place that were not in place prior to 2009 and will help in future events. Even so, there were numerous lessons learned from this experience and several areas where improvements could be made to better manage water shortages in the future.

It is recommended that the Water Department conduct a similar review and prepare an "After Action" report based on the lessons learned during the recent 2014/15 Stage 3 Water Shortage Emergency.

8.11 Catastrophic Supply Interruption

CWC 10632

(a)(3) *Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.*

The City plans for and responds to emergency incidents, including floods, earthquakes, fires, and hazardous materials incidents in accordance with the Santa Cruz County Operational Area Memorandum of Understanding (MOU). The MOU ratifies local government agreements to follow the Standardized Emergency Management System or SEMS, as mandated under California law. The City maintains an Emergency Management Plan, which defines and describes the emergency management organization and guides the response of appropriate personnel to a major emergency. The City Manager, functioning as the City's Director of Emergency Services, would coordinate the emergency response to maintain water delivery and/or restore service as necessary. The Emergency Management Plan also addresses the integration and coordination with other government agencies and levels when required.

The Water Department maintains a mutual assistance agreement with other water agencies through the Water/Wastewater Agency Response Network (WARN) to share equipment, personnel, and supplies in times of an emergency. The City is within the California Office of Emergency Services Coastal Region II, which includes the counties in the San Francisco Bay region and northern California coast.

The Water Department has its own **General Emergency Plan and Emergency Response Plan for Terrorist Activity and Natural Disasters** in accordance with state and federal laws. This document sets forth the primary objectives of the Department in an emergency as follows:

- Maintain water service for domestic and firefighting purposes,
- Protect the water supply from possible contamination,
- Control the loss of water, and
- Keep the public informed

The plan outlines the roles and responsibilities of key Departmental personnel during an emergency at both the City Emergency Operations Center and Water Department

Operations Center. It also describes general actions to be taken to 1) assess situation status and extent of damage to the water system, 2) prevent contamination and loss of water, and 3) restore water service in response to the following types of emergencies:

- Earthquake
- Tsunami
- Flood
- Fire
- Suspected Contamination of Water Supply
- Civil Disorder
- Power Outage
- Treatment Plant Failure
- Damage to Distribution Storage Reservoirs or Booster Pumping Station
- Telecommunications Failure

The plan contains an emergency water rationing plan intended to preserve treated water supplies in the event a catastrophe results in impairment of the water system. The emergency rationing plan has two stages, which are defined as follows:

Serious shortage: This condition exists when the system is unable to meet normal demand, but can supply enough water for basic public health and safely needs. In this situation, not taking swift action to ration water could jeopardize available water in storage, or could leave the City vulnerable in the event of further outages.

Critical shortage: This condition exists when production facilities are rendered incapable of meeting 50% or less of normal daily production levels and the current rate of consumption poses an immediate threat of draining Bay Street reservoir or other storage tank.

The restrictions that would be instituted in a serious or critical shortage are summarized in Table 8-9.

The City has four portable auxiliary generators to run booster pumps in case of an extended power outage. In addition, the treatment plant and major pump stations have stationary diesel-powered electrical generators as a stand-by source of power in case of a local or regional power outage.

Table 8-9. Emergency Water Rationing Plan	
Serious Shortage	
Prohibited Uses:	*Permitted Uses:*
1. Watering lawns, gardens or landscaping 2. Washing cars, boats, building exteriors 3. Washing sidewalks, driveways, or any exterior surfaces 4. No outdoor use for any reason 5. Car washes closed 6. Watering plants at nurseries, garden centers 7. Filling of swimming pools, hot tubs, decorative pools, or fountains (must be turned off) 8. Public showers closed	1. Normal domestic uses: drinking, cooking (paper plates and plastic utensils requested) 2. Toilet flushing, only when necessary 3. Limit showers to three minutes 4. Bathing only if absolutely necessary (no more than half full) 5. Minimize clothes and dish washing
Critical Shortage	
Prohibited Uses:	*Permitted Uses:*
1. Outdoor water use for any reason (garden, landscape, car washing, cleaning, maintenance) 2. Clothes washing and commercial laundering, except for health reasons 3. Janitorial cleaning 4. Businesses and institutions that use water in their operations may be forced to close or restrict operations: - Restaurants, bars, and coffee shops - Laundromats - Public and Private Schools - Manufacturing - Gyms and health spas - Beauty salons and barber shops 5. No water for construction 6. No water for crop irrigation	1. Water limited to health and safety only: drinking and cooking (paper plates and plastic utensils required) 2. Toilet flushing for solid waste only 3. Shower/bathing should be limited to every other day 4. Use water only when absolutely necessary

A separate Emergency Response and Public Notification Plan was developed in 2007 in anticipation of the deconstruction of Bay Street Reservoir. As part of this plan, communication and standard public notification procedures were put in place in the event a water emergency arose. This plan included developing the capability to trigger an automated call-out notification system (Reverse 911) to rapidly disseminate a generalized water emergency warning throughout the Santa Cruz water service area.

Finally, the Water Department has separate earthquake response procedures that outline responsibilities for inspection and reporting the status of critical structures, including Newell Creek Dam and other major water production facilities following an earthquake.

8.12 Minimum Supply Next Three Years

> ***CWC 10632***
>
> ***(a)(2)*** *An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.*

For this exercise, it is assumed that the next three water years spans the period 2016-2018. For water year 2016, more than half the year has already passed and conditions are fairly well known. The reservoir is currently at full capacity and the water year is classified as Normal. Accordingly, no water shortage is expected for the remainder of the 2016. It is assumed that the supply available under this circumstance is the same as in an Average year as listed in Table 7-1. But because system water demand continues to be low, the total annual supply available, 3.2 billion gallons, likely overstates actual production the City expects to see through the remainder of 2016.

For 2017 and 2018, water conditions are assumed to be as dry as they were in 1976 and 1977, corresponding with the first two years of the 3-year, multiple dry year sequence listed in Table 7-1. The supply available for those two years is substantially lower, and would likely require significant cutbacks to balance supply and demand, especially in 2018. For 2017, a production level of 2.4 billion gallons is close to what the City actually experienced in 2015 with a declared Stage 3 Water Shortage Emergency in place. For 2018, an annual production level of 1.9 billion gallons would represent a critical water shortage emergency and require a tough decision about whether to tap the 1.0 billion gallon reserve in Loch Lomond Reservoir to meet essential public health needs.

Table 8-10. Minimum Supply Next Three Years (mg)

	2016	2017	2018
Available Water Supply	3,252	2,430	1,969
NOTES: Reference Table 7-1.			

Chapter 9

DEMAND MANAGEMENT MEASURES

The City of Santa Cruz has long recognized the importance of conserving water as a responsible demand management strategy to help protect the area's natural resources, to stretch existing water supplies, to help downsize and/or delay the need for costly additional water supply, treatment, and distribution upgrades, and to fulfill the City's overall goal of ensuring a safe, reliable, and adequate water supply. This section describes the water demand management measures (DMMs) currently being implemented by the City and discusses the City's water conservation planning process that will guide water conservation activities over the next decade and beyond.

In June 2001, the City of Santa Cruz became a signatory to the MOU Regarding Urban Water Conservation in California and joined the California Urban Water Conservation Council (CUWCC) in promoting water conservation locally and statewide. By becoming a signatory, the City committed to implementing all 14 urban water conservation Best Management Practices (BMPs) contained in the MOU deemed to be locally cost-effective and to periodically report progress made to the CUWCC.

9.1 Demand Management Measures for Wholesale Agencies

The City of Santa Cruz currently is not a wholesale water supplier nor does it receive water from a wholesale agency. This requirement does not apply to the City.

9.2 Demand Management Measures for Retail Agencies

9.2.1 Water Waste Prevention Ordinances

The definition of water waste prevention under the MOU consists of enacting, enforcing, or supporting legislation, regulations, ordinances, or terms of service that prohibit water waste in new development and by existing users, or that facilitate implementation of water shortage response measures.

The City's water conservation ordinance (Santa Cruz Municipal Code 16.02) has been in operation since 1981 and was updated last in 2003 (Appendix O). Under the ordinance it is unlawful for any person to use water for any of the following:

- unauthorized use of water from a fire hydrant,
- watering of landscaping in a manner or to an extent that allows excess water running off the property,
- allowing plumbing leaks to go unrepaired,
- outdoor washing of structures, vehicles, or surfaces without the use of an automatic shut-off nozzle, and
- operation of a fountain unless water is recycled

Provisions of the ordinance regulating new development include prohibitions on:

- The use of water in new ice-making machines and any other new mechanical equipment that utilizes a single pass cooling system to remove and discharge heat to the sanitary sewer,
- washing of vehicles at a commercial car wash unless the facility utilizes water recycling equipment
- the use of water for new non-recirculating industrial clothes wash systems, and
- the use of potable water for dust control or soil compaction purposes in construction activities where there is a reasonably available source of reclaimed water appropriate for such use

The ordinance is in effect at all times and is upheld mainly through communication with the responsible customer. However, during mandatory water restrictions, violations of the water waste ordinance are enforced first by a warning and then by progressive series of fines ranging from $100 up to $500 and levied on the utility bill. Under a declared water shortage, field staff actively patrols the water service area to enforce restrictions, including water waste violations, seven days per week.

The public is also encouraged to report water waste, either by calling the Water Conservation Office's designated "leak line" (831 420-LEAK) or reporting water waste through the City website. When water waste is observed, site visits, in-person customer contact, phone, and/or mail correspondence is used to resolve the issue. Field staff will increase drive-by checks of sites receiving water waste complaints to help ensure the issue was resolved. New software was acquired in 2009 to help document, track and manage water waste complaints, including the photo evidence of water waste incidents. Since then, the City documented and addressed over 6,000 cases with this software.

Water waste prevention is also implemented through the City's Landscape Water Conservation Ordinance (Santa Cruz Municipal Code Chapter 16.16) to ensure

landscapes and irrigation systems in new and renovated development are designed to avoid runoff, overspray, low-head drainage and other similar conditions where water flows off site onto adjacent property.

9.2.2 Metering

All of the City's 24,534 water connections are fully metered with most using Automated Meter Reading (AMR) technology. Approximately 15 percent of all City water meters are now connected with Advanced Metering Infrastructure (AMI) technology, allowing access to hourly meter reads. Water meters are required for all new service connections. In addition, a separate, dedicated irrigation meter is required for all new and renovated multi-family and commercial landscape projects with over 5,000 square feet of landscaped area.

All meters are read and billed monthly according to the volume of water consumed. Monthly billing was first instituted inside the City in 2005 mainly to facilitate rising rates for all City utilities, but it also served in aiding in leak detection and allowing for more accurate monitoring of individual account usage and categorical water consumption. Outside City customers were later transitioned to monthly billing in April 2014 to facilitate water rationing.

As a member of the CUWCC, the City undertook two actions required under BMP 1.3 regarding metering. First, the Water Department in 2010 adopted a new Meter Testing, Repair, and Replacement Policy that accelerated large meter replacement and should help improve overall meter accuracy. In 2013, the Water Conservation Office completed a feasibility study to assess the merits of a program to switch mixed-use commercial accounts that have substantial irrigation demands by installing a dedicated landscape meter. Of the almost 1,900 commercial properties analyzed, only nine sites, mostly schools, were identified as potential commercial candidates meriting retrofitting or future sub-metering.

9.2.3 Conservation Pricing

The Customer Service section, also referred to as "Santa Cruz Municipal Utilities," provides customer service and handles utility billing for water, sewer, refuse, and recycling services to the residents and businesses of the City of Santa Cruz, and services for water only to the unincorporated surrounding areas and part of the City of Capitola.

The water portion of the City's utility bill consists of three components: 1) a fixed, monthly "Readiness-to-serve" charge, 2) a volumetric charge, and 3) for customers residing in elevated pressure zones, an elevation charge applies.

The current Readiness-to-serve charge varies by meter size and location (Table 9-1).

Table 9-1. Readiness to Serve Charges (2015)

Meter Size	Inside City (monthly)	Outside City (monthly)
5/8 and 3/4"	$21.08	$26.87
1"	$52.67	$67.16
1.5"	$105.34	$134.29
2"	$168.52	$214.86
3"	$315.99	$402.88
4"	$526.65	$671.47
6"	$1,053.27	$1,342.91
8"	$2,422.49	$3,089.55
10"	$2,991.23	$3,813.84

For the volumetric charges, the City has had a multi-block, inclining rate structure in place for single family residential customers since 1995. In 2004, following a comprehensive water rate study, a five-tier rate structure was adopted that applies to residential accounts with either one or two dwelling units. The current rates are listed in Table 9-2. For all other customers, including multi-family (3 or more dwelling units), business, industrial, municipal, and irrigation customers, water is billed at a uniform rate corresponding with Block 2.

Table 9-2. Single Family and Two-Unit Residential Water Rate Structure (2015)

Block	Category	Inside City (monthly)		Outside City (monthly)	
		Units	Rate	Units	Rate
1	Essential needs	1-4 ccf	$1.91	1-4 ccf	$2.42
2	Average indoor needs	5-9 ccf	$4.84	5-9 ccf	$6.18
3	Average outdoor needs	10-14 ccf	$6.23	10-14 ccf	$7.94
4	High use	15-18 ccf	$8.54.	15-18 ccf	$10.87
5	Inefficient or excessive use	>18 ccf	$10.64	>18 ccf	$13.58

Customers in elevated pressure zones also pay an elevation surcharge of $0.20/CCF for the cost of being served by an elevated storage reservoir.

In August 2014, the Santa Cruz City Council adopted an annual 10 percent water rate increase over the next five years to complete several critical infrastructure projects. These projects included: Phase 3 of the North Coast System pipeline ($10 mil), rehabilitating and replacing six filter basins at the Graham Hill Treatment Plant ($6 mil), converting the Bay Street Reservoir to two modern, 6-million gallon tanks ($25 mil), annually replacing 2-4 miles of aging main, and rehabilitated storage tanks, pumps, and completing the Beltz 12 well project. All utility rates and rate change proposals are established by resolution of the City Council. See Appendix P for the 2014 Notice of Proposed Rate Changes.

The City of Santa Cruz is currently in the process of developing a long-range, 10-year financial plan and undertaking a new, 5-year rate study to support the Department's ongoing operations and planned capital improvement programs (Appendix Q). Capital projects during the first five years will be focused on system rehabilitation and replacement projects. Major investments to implement the Water Supply Augmentation Strategy are anticipated to occur in the second five years of the financial planning horizon. The new rate study is expected to be completed in fall 2016. Table 9-3 shows the recommended rate design proposed to meet both conservation pricing and other pricing objectives.

Table 9-3. Recommended Basic Rate Structures for Customer Classes

Customer Category	Basic Rate Structure
Single Family Residential	Keep inclining rates but reduce both tier width and number of tiers
Multi-Family Residential	Change from uniform to tiered rates based on number of dwelling units
Commercial/Municipal/UCSC	Maintain uniform rate structure
Landscape Irrigation	Transition all irrigation accounts to a simple water budget-based rate
North Coast Agriculture	Maintain uniform rate structure

The rate structure being recommended will move from one that collects about 65 percent of revenue in volume charges (based on the amount of water used) to one that collects about 90 percent of revenues from volume charges. Other planned changes include:

- Establishing an Infrastructure Reinvestment Fee that will collect the funding needed to support pay-as-you-go capital and debt service costs. The fee would be collected as a separate charge based on water use.

- Establishing a $1.00/CCF surcharge on water use beginning in July 2017 to increase the Department's Rate Stabilization Fund. This fund would be used to mitigate the potential revenue instability associated with the recommended rate structure, and augment revenues in normal years should consumption fall below a level of 2.5 billion gallons per year.

- Retaining the existing Drought Cost Recovery Fees that are triggered by a City Council declared water shortage and would be collected as a fixed charge for the full fiscal year.

The financial plan and recommended rates are needed to ensure the long-term financial health of the utility, and enable the Water Department to support ongoing operations and maintenance of the water system and make the capital investments required to comply with regulations, rehabilitate and replace aging infrastructure. The notice of proposed new rates that would go into effect starting in October 2016 is included as Appendix R.

9.2.4 Public Education and Outreach

The City of Santa Cruz Water Department actively values and promotes public awareness and education about the City's water resources and the importance of water conservation. The City of Santa Cruz disseminates information to the general public in different forms including: 1) media, 2) workshops and community events, 3) billing and customer service, and 4) school education programs.

The City uses media coverage in order to broadly share information and updates on events, programs, and news to the public in the following ways:

- "SCMU Review", utility newsletter which includes news and information on water conservation topics;
- City of Santa Cruz Water Conservation website;
- Water Supply Advisory Committee website;
- Formal water supply outlook published three times a year sharing the water conditions/ supply availability;
- Weekly water conditions webpage;

- Paid advertising in local newspapers;
- Opinion page coverage;
- Marketing and advertising of EPA's "Fix a Leak Week"; and
- Television and radio news interviews and community television programs.

In addition, the City uses workshops and community events to engage and interact with the public by the following:

- Public meetings and speaking events to community organizations, industry and homeowners associations, and service groups;
- Tabling at local fairs, farmers markets, and events;
- Participation in regional water forums;
- Participation with other local water agencies in local events and sponsorships of water conservation-related activities;
- Free workshops on irrigation efficiency, new irrigation technologies, and water conservation strategies for the landscape; and
- Financial support to the Green Gardener Program, California Water Awareness Campaign, Water-Smart Gardening Faire, Green Business Program, and the Water Education Foundation.

The City of Santa Cruz also uses a personable approach to public education and outreach through billing and customer service, which includes the following:

- Marketing and distribution of free water conservation devices and literature;
- Marketing of rebates and distribution of rebate applications;
- Bill inserts;
- Field representatives showing customers how to read their meter and check for leaks at their properties;
- Partnership with the Monterey Bay Area Green Business Program;
- Messages and information on customer's bills showing daily consumption and a graph charting monthly consumption for the entire year; and
- Water supply tours.

The City offers school education activities for students ranging from upper elementary age children up to the University level. The program gives students an opportunity to learn about the City's water supply system and water conservation. School educational activities include:

- Field trips and ranger presentations at Loch Lomond Reservoir and San Lorenzo River;
- Loch Lomond Trout in the Classroom fish release field trip;
- Distribution of age and grade level appropriate curriculum and educational materials, including a water education booklet specially developed for Santa Cruz County students;
- Classroom presentations; and
- High School Watershed Academy program.

9.2.4.1 Water School

In summer 2014, the City of Santa Cruz Water Department started hosting Water School as a result of rationing and curtailment during a declared water shortage. Residential customers were required to stay within their assigned allotment or pay an excessive use penalty for each additional unit of water used over their allotment. Water School served as a one-time opportunity for customers who exceeded their monthly allotment to dismiss their penalty by attending a two-hour class session held at the local community center. The session was followed by a short quiz and a survey for feedback and additional questions. The class curriculum consisted of an overview of the City water system, statewide and local drought conditions, Santa Cruz Municipal Utility (SCMU) services, water use regulations and restrictions, and water conservation strategies to practice at home and outside. The purpose of water school was to educate customers about the water shortage and local impacts, show customers support, empower customers to conserve and think critically about their own usage, and prevent customers from exceeding their allotment in the future. The City's Water School curriculum was used as a model in the CUWCC's Water Shortage Toolkit for other water agencies starting their own water schools. In 2014, the city held 27 classes for 702 customers, which collectively waived $462,050 in penalties. In 2015, there were 14 classes for 461 customers, which dismissed $266,760.

The City of Santa Cruz also offered a separate Water School for large landscape account that exceeded their water budget created from landscape water budget software, Waterfluence. The landscape water school shared some elements with the residential water school curriculum and included tips on how to use Waterfluence effectively and communicate with different staff or stakeholders. In 2014, 28 irrigation customers attended and dismissed $40,375. In 2015, a pre-rationing water efficient workshop was offered to prepare irrigation accounts for rationing where 19 customers attended. The 2015 landscape water school consisted of 20 customers and dismissed $34,850 in excessive use penalties.

9.2.4.2 Water Supply Advisory Committee

In 2015, City Council created the Water Supply Advisory Committee to engage the community in an examination of water supply issues. The Committee consisted of 14 members of the community who represented various interests including the environment, business, education, and the Water Commission. The Water Supply Advisory Committee offered meetings, forums, and other opportunities for the public to learn, engage, and share their opinions about the future of Santa Cruz's water supply. In addition, the City invited the public to attend a series of Enrichment Session installments with different topics including climate change, groundwater, water reuse and more. The goal for these forums and workshops was to bring transparency and collaboration to the community regarding decision-making of water supply alternatives for the City of Santa Cruz.

9.2.5 Programs to Assess and Manage Distribution System Losses

As mentioned in section 4.4, the Water Conservation Office has conducted an annual water audit of the City's water distribution system since 1997 using the approach described in the AWWA M36 "Manual of Water Supply Practices". The purpose of the audit is to quantify how much water and revenue is lost through physical leaks and apparent losses and to identify steps to minimize system losses and improve the operational efficiency of the water system. Beginning in 2006, the City also began to use the water balance approach developed through the International Water Association (IWA), now advocated by AWWA, to better characterize water losses in the distribution system.

Water audit results indicate average system water loss from 1997 to 2014 is approximately 7.5 percent of total treated water production or 266 mgy. Of this amount, it is estimated that 5 to 6 percent (198 mgy) is lost due to physical leakage in the distribution system, also referred to as "real" losses, including leaking service lines, valves, fittings, and water mains. It is estimated that another 1 to 2 percent (68 mgy) is not physically lost but goes unreported on the billing system primarily due to sales meter inaccuracies, billing and accounting errors, and other factors. This second category of losses, labeled "apparent" losses, has a negative impact on both utility revenue and on consumption data accuracy.

In 2015, the City contracted with Water Systems Optimization, Inc. (WSO) to examine the City's water system and operations practices, validate where losses are occurring, evaluate options, and set forth a formal strategy to improve water accountability and reduce lost water. WSO's proposed scope of work is organized into three tasks, involving the following elements:

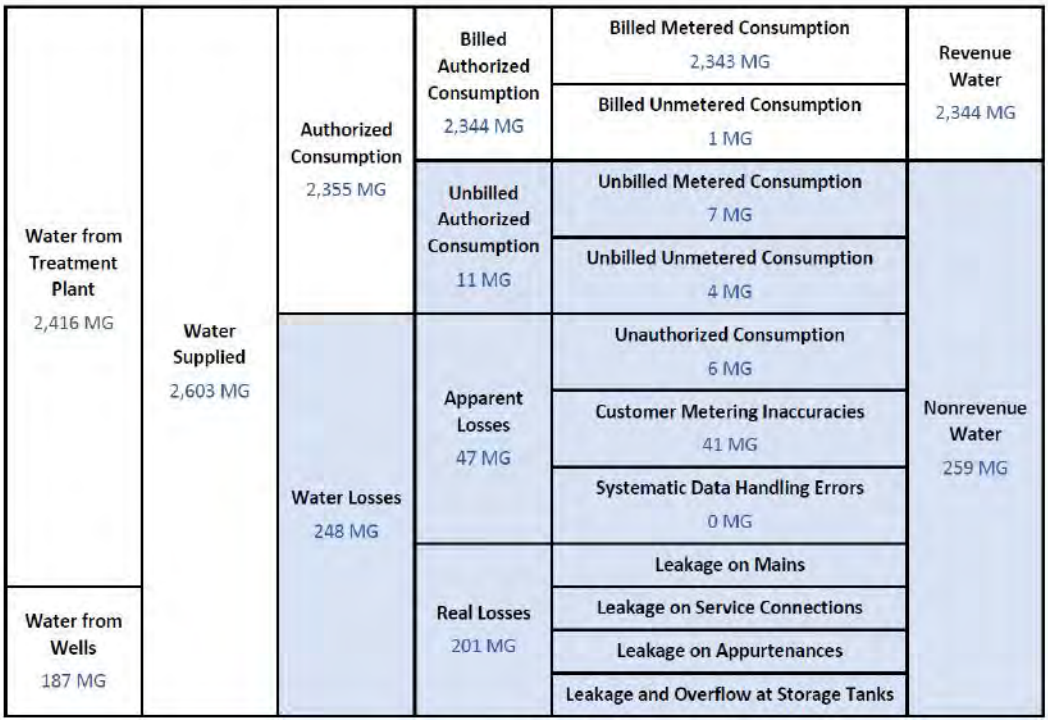
1. Water audit validation, to assess the accuracy of the system input meters and data transfer systems, and to perform a business process review of meter testing, reading, and billing activities;

2. Component analysis of real losses, to quantify the volume of different types of leaks and determine the economic level of leakage – the balance between the value of the water that is lost through leakage and the cost of finding and fixing leakage or reducing leakage through pressure management; and

3. Water loss control program design, to outline the most cost-effective strategies for reducing both real and apparent losses over time.

Results of the 2014 water audit that was validated as part of the project are summarized in Figure 9-1.

Figure 9-1. 2014 Water Balance



The recommendations produced from this year-long study will be used to guide development of a robust water loss control strategy and will serve as a foundation for completing and reporting future annual water audits to the state beginning in 2017 under the requirements of SB 555 of 2015.

Currently, the Water Department addresses physical leakage by expediting leak repairs on service connections and mains, and by performing service line and water main replacements on an ongoing basis. The Water Department budgets a total of about $1.25 million annually in its capital improvement program for water main replacement projects. Although a formal leak detection program is currently not in place, the Water Department uses sonic leak detection equipment to locate and repair leaks in the water system. In addition, the Department monitors for leaks on the customer's side of the meter by reviewing exception reports for high meter readings. Customers are notified so they can take appropriate action to repair leaks, even before they receive their water bills.

9.2.6 Water Conservation Program Coordination and Staffing Support

The Water Conservation section is responsible for promoting efficient water use and implementing management practices that reduce customer demand for water. This section consists of the Water Conservation Manager, one Water Conservation Analyst, and two Water Conservation Representatives. The Water Conservation Manager is responsible for planning, organizing, and directing the operations of the Water Conservation section and for reporting on BMP implementation. The Water Conservation Manager meets regularly with the Water Director and senior managers to coordinate conservation activities with the administration, engineering, production, distribution, and customer service sections. The Water Conservation Analyst and Water Conservation Representatives are responsible for operating existing programs and assisting with new program development.

9.2.6.1 Water Conservation Program Responsibilities and Activities

The responsibilities and major activities fall into the following four general categories:

Public Awareness and Education: to promote public awareness and education about the City's water resources and the importance of water conservation; and to provide timely and accurate information to utility customers and the general public about conservation practices and technologies, as well as the City's conservation programs and policies.

Water Demand Monitoring: to monitor water production, consumption and system water losses; to track weather and population data; to evaluate trends in per capita water use; to track demand associated with new service connections; to compare actual water demand with projected use by customer category; and to develop and support water demand forecasts for the water service area for use in supply planning.

Long-Term Water Conservation Programs: to develop and implement various conservation projects and programs that result in a sustained reduction in customer water demand; to track water savings from ongoing conservation programs; and to evaluate the need for program modifications to improve efficiency, customer service, and water savings in keeping with conservation goals.

Planning and Emergency Management: to periodically update and implement the City's Water Shortage Contingency Plan and the Urban Water Management Plan, and to assist in Departmental and City-wide emergency planning and management activities.

Between 2012 and 2015, drought management became the section's primary function, which dramatically accelerated public education and outreach activities as well as public interest and participation in long-term conservation programs.

9.2.6.2 Program Funding

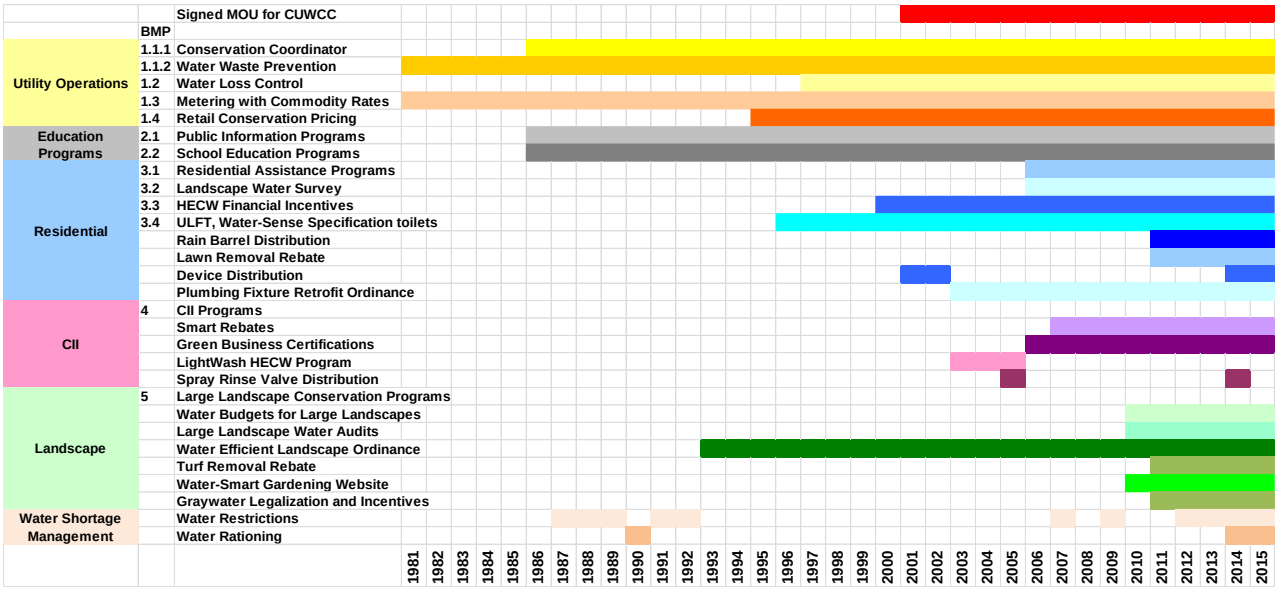
The City's water conservation program is funded by a combination of water rates, system development charges, and miscellaneous service fees. With regard to water conservation, revenues from system development charges are used primarily for various rebate programs, including residential and commercial toilets, urinals, clothes washers, Smart Rebates, and more recently, lawn removal rebates, which account for the majority of long-term water savings generated each year. The total amount resources budgeted for the Water Conservation Section in FY 2017 is $1.1 million.

9.2.7 Other Demand Management Practices

As a member of the California Urban Water Conservation Council, the City of Santa Cruz is implementing all the CUWCC's Best Management Practices. These demand management measures apply to all customer types including residential, business, and landscape accounts. Figure 9-2 below provides a summary and timeline of past and current water conservation activities, organized in accordance with the MOU.

The nature and extent of these measures are described below.

Figure 9-2. Timeline of Past and Current Water Conservation Activities



9.2.7.1 Demand Management Measures for Residential Customers

Residential water use constitutes almost two thirds of system consumption and therefore is a main focal point of the City's water conservation efforts. The residential water conservation programs consist of the following: 1) Home Water Survey Program, 2) High Efficiency Clothes Washer Rebate Program, 3) Toilet Rebate Program, 4) Laundry to Landscape Rebate Programs, 5) Rain Barrel Program and 6) Plumbing Fixture Retrofit Ordinance.

The Home Water Survey program is a free service offered to single and multi- family residences and consists of reviewing billing and consumption information, showing how to read a meter and detect leaks, inspecting home plumbing fixtures and offering free showerheads, faucet aerators, and rebate forms. The survey also assesses outdoor water use and needs by checking the irrigation system and timer, and evaluating the landscape area, design, and plants. Although home water surveys are not in high demand – only 124 were performed in the last five years - they play an important role in providing education and customer service.

The High Efficiency Clothes Washer Rebate program offers $100 for the purchase and installation of an Energy Star clothes washer to single and multi-family (non-communal laundry) residences. The City will soon be modifying the rebate program to offer an additional $100 for Energy Star Most Efficient models. The Energy Star Most Efficient

models have the lowest water factor and energy factor of all clothes washers. In addition, only these models qualify for a rebate through PG&E. By increasing the rebate amount for these specific models, the City is hoping to encourage customers to use clothes washers that have the lowest water factors. Between 2011 and 2015, the City approved rebates for about 3,000 water efficient clothes washers saving an estimated 25 million gallons per year.

The City has operated a rebate program to promote the installation of ultra-low-flush or high efficiency toilets in residential accounts since 1995. The program originally featured a $75 rebate as a financial incentive for customers to remove their higher-volume toilets and replace them with 1.6 gallon ultra-low-flush toilets. This $75 rebate was discontinued in 2010. The City's current toilet rebate program offers $150 rebate for toilets meeting Water Sense criteria of 1.28 gallon per flush maximum. Eligibility requirements depend on the flush volume of the toilet that customer is replacing. Older, higher usage toilets of 3.5+ gallons per flush are eligible with the replacement of a high efficiency toilet of 1.28 gpf or lower. Customers who have toilets less than 3.5 gallons per flush must install ultra-high efficiency toilets of 1.0 gallons per flush or less to be eligible. In the last five years, 2,257 water efficient toilets were installed under the program saving approximately 14.7 million gallons of water annually.

The City also offers a Laundry to Landscape rebate of $150 to customers who install a laundry to landscape greywater system and attend a workshop offered by Central Coast Grey Water Alliance. The requirement to attend a workshop is intended to ensure systems are installed in accordance with guidelines listed in the CA plumbing code. The program has attracted only very sporadic participation though.

The Rain Barrel Program currently offers a 50-gallon rain barrel catchment system at a subsidized rate of $50 per barrel. Customers are able to order online during the rainy season from Rainwater Solutions to reserve rain barrels for the upcoming distribution event. Several distribution events are held during the rain barrel sale for customers to pick up their orders at the City's corporation yard. At the beginning of the program in 2010, rain barrels were delivered to customers' homes, but this has since changed due to increased customer interest. A total of more than 4,000 rain barrels have been sold since then saving about 0.8 mgy.

In 2003, the City adopted a plumbing fixture retrofit ordinance, codified as Santa Cruz Municipal Code Chapter 16.03. This regulation requires that all residential, commercial, and industrial properties be retrofitted with low consumption showerheads, toilets, and urinals when real estate is sold. As part of the initial program implementation, the City worked closely with the County of Santa Cruz and the City of Capitola to have similar

ordinances passed in these other jurisdictions. Under the law, the seller of the property is responsible for retrofitting any older toilets, urinals, and showerheads on the property with low consumption fixtures, and for obtaining a water conservation certificate from the Water Department. There is an option in the ordinance that allows the responsibility for retrofitting to be transferred from the seller to the buyer, if both parties agree. In either case, the City tracks real estate sales and requires every property to be inspected to verify that the plumbing fixtures on the property being sold meet the low consumption standards, with the exception of already existing 1.6 gallon per flush toilets. A custom database program was developed by a consultant to manage property sales data on local properties and retrofitting records, as well as follow-up enforcement of the ordinance. In the last five years, 2,359 properties have been certified under the program, saving about 12.5 million gallons per year.

9.2.7.2 Demand Management Measures for Commercial Customers

The City provides water to about 1,900 commercial and industrial accounts within the service area, which together represents about 26 percent of total system water use. The City offers several programs to encourage commercial customers to become more water efficient by using water-saving technology. These include: 1) Smart Business Rebate Program and 2) The Monterey Bay Green Business Program.

The Smart Business Rebate Program was offered as a result of the conclusion of the statewide Smart Rebate program in 2013. The City's Smart Business Rebate Program mirrors the old statewide program by offering businesses rebates for installing water efficient fixtures including:

- High Efficiency (1.28 gpf) or Ultra High Efficiency (1.0 gpf) toilets- $200
- High Efficiency Urinals (0.125 gpf)- $300
- High Efficiency Clothes Washer- $400

The eligibility requirements for these rebates are the same for the other programs. Clothes washers must be Energy Star certified and inspected if five or more are installed. Toilet rebate eligibility depends on what is currently being replaced, like the residential program. In the last five years, 46 businesses have taken advantage of the program, saving an estimated 10.2 million gallons per year.

The Monterey Bay Area Green Business program is a partnership of environmental agencies, utilities, and nonprofit organizations that assist, recognize and promote businesses that volunteer to operate sustainably. To be certified "green," participants

must be in compliance with all regulations and program standards for conserving water and energy, preventing pollution, and minimizing waste. The City became a participant in the program in 2006, which is coordinated through the Public Works Department.

Businesses must meet a set of indoor and outdoor water conservation standards as part of achieving their Green Business Certification. All businesses are required to meet basic, mandatory measures and a minimum number of elective requirements from several categories. Customers are also required to meet additional measures specific to their type of business (e.g. low flow spray rinse valves for restaurants). In order to certify a business, a water conservation representative meets with the applicants and inspects the site, checks for leaks and interviews the applicants.

The City has also distributed water conservation materials to all local hotels, and drinking water upon request table tents to all local restaurants, and continues to make them available upon request.

9.2.7.3 Demand Management Measures for Landscapes

The City of Santa Cruz also offers rebates and programs for outdoor water use and landscapes which include: 1) Lawn Removal Rebate Program, 2) Large Landscape Water Budgets, and 3) Water Efficient Landscape Ordinance.

The Lawn Removal Rebate Program currently offers $.50 per square foot of lawn removed for single family, multi-family, and commercial customers. Single family residences are eligible to receive up to $500 (1,000 square feet) and multi-family or commercial are eligible for up to $2,500 (5,000 square feet). The general requirements are the following:

- Lawn that is maintained or previously maintained prior to drought,
- Lawn must be watered by an in-ground irrigation system,
- Removal or capping of the overhead spray system in the area to be converted,
- Replacement of lawn with very low or low water use plants and mulch (with or without low volume drip irrigation) or install no water use permeable hardscape options,
- Agreement to pre- and post- inspections to take measurements and ensure eligibility requirements have been met,
- Completion of landscape conversion within a year, and
- One rebate per customer per year.

The City plans on increasing the rebate to $1.00 per square foot removed with the same limitations of rebating up to 1,000 square feet for single family residences and 5,000 square feet for multi-family and commercial. The City hopes to encourage more lawn conversions by offering a higher rebate. Over the last five years, this program has resulted in a total of over 395,000 square feet (9.0 acres) of turf to be removed, saving an estimated 7.5 million gallons of water per year.

In July, 2010, the City launched a new program for customers with large landscapes and dedicated irrigation accounts. After converting all dedicated irrigation accounts to monthly meter reading, the City contracted with a consultant, Waterfluence LLC, to map landscape areas using aerial imagery, to develop irrigation budgets for the City's 110 largest irrigation customers, and to distribute the information through monthly Landscape Water Use Reports. Since then the program has expanded its participation to 230 sites representing 426 acres or 18.5 million square feet of irrigated area and over 250 million gallons per year of water. For each site, Waterfluence provides a site-specific irrigation budget based on landscape size and plantings, type of irrigation, and real-time local weather conditions that is obtained from the CIMIS station located at the DeLaveaga golf course. Customers receive monthly reports via mail or email comparing their actual consumption to the irrigation budget over a 1-3 year long period. A 2013 program assessment showed annual savings equal to about 15 million gallons per year. With these accounts being rationed the last two years, however, water use at large landscape sites was temporarily reduced by more than 130 million gallons in 2015. Further evaluation is needed in the future to better quantify long-term program impact.

In addition to receiving monthly reports, participants in the program are also eligible for a professional irrigation audit performed by Waterfluence. The audits include an assessment of irrigation efficiency, notation of irrigation issues (scheduling, tilted nozzles, leaks, breaks, pressure, overspray etc.), and a confirmation of the landscape area measurements. Customers receive a detailed report with site photos noting irrigation problems, a sprinkler condition analysis, cost-effective recommendations, scheduling suggestions, and a list of water management essentials.

The City is currently enrolling more participants into the program in order to continue adding customers that have recent history of high usage or water waste of over 100 CCF per year. Large landscape and irrigation account customers that used between 10-100 CCF per year are being mapped for potential enrollment in the future. Irrigation customers that used under 10 CCF were simply noted. The City is measuring all landscape irrigation accounts using over 10 CCF in anticipation of changing over to a simple water budget-based rate structure.

The City's Water Efficient Landscape Ordinance was first adopted to establish landscape water conservation regulations for major development projects situated in the City's service area in 1993 (Santa Cruz Municipal Code Chapter 16.16). Since then it has been rewritten and revised in 2001 and 2010. It is in the process of being updated again in response to 2015 emergency conservation regulations. The overall purpose of the ordinance is to ensure that the City's limited water supply is used efficiently and effectively in new landscapes within the City's water service area and to avoid certain landscape and irrigation design aspects that have the potential to result in water waste.

The City's ordinance applies throughout the entire water service area as a condition of receiving water service. It covers all new and renovated, commercial, industrial, and public projects, new single-family and multifamily development projects resulting in three or more dwelling units where: 1) the landscape is installed by the developer, and 2) the total landscape area of the project is 500 square feet or more, and new single family and two-unit residential development projects on properties equal to or larger than 10,000 square feet. Certain provisions also apply to pre-existing landscapes over one acre in size. The ordinance contains provisions for:

- Dedicated irrigation meters for new landscapes or expansion of existing landscapes over 5,000 square feet in area;
- Landscape water budget based on 55 % (residential) and 45% (non-residential) of reference evapotranspiration;
- Turf is limited to 25% on residential projects (turf not permitted for non-residential);
- Requiring very low to moderate water using plant materials, grouping plants with similar water needs;
- Irrigation design to avoid conditions that lead to runoff and overspray;
- Appropriate irrigation equipment, including requiring weather-based irrigation controllers and flow sensors to maximize water efficiency and detect leaks;
- Soil preparation and mulching;
- Storm water management; and
- Alternative water sources.

A complete landscape plan must be submitted and found to satisfy the standards before a building permit can be issued. Water Conservation staff reviews the landscape plans for compliance with the ordinance, coordinates plan review with Water Engineering and other City Departments and jurisdictions, and once installed, performs final inspections of the completed landscape.

9.3 Implementation over the Past Five Years

All of the water conservation programs described above in Section 9. 2 and illustrated in Figure 9-1 have been actively implemented over the past 5 years. Since 2011, however, most activity has been devoted to addressing four consecutive years of water shortage. In particular, emergency water shortages in both 2014 and 2015 saw a dramatic increase in the level of public information and outreach, water waste enforcement, conservation program and staffing support, short-term changes in pricing, and huge increases in participation in the City's turf removal, rain barrel, and conservation device distribution programs, as well as a repurposing of the landscape water budget program from an informational aid to a water rationing tool. A second round of a pre-rinse spray nozzle replacement program was completed in 2014, and the new water loss control study was begun. On top of all that, the City continued working on its long-term Water Conservation Master Plan, which is described further below.

9.4 Planned Implementation to Achieve Water Use Targets

In 2013, the City contracted with Maddaus Water Management, Inc. (MWM) to develop an updated Water Conservation Master Plan. The goal of the updated plan is to define the next generation of water conservation activities and serve as a roadmap to help the community achieve maximum, practical water use efficiency. Strengthening water conservation efforts has been identified as a top priority by the City Council, the City's Water Commission, and more recently by the City's Water Supply Advisory Committee in its effort aimed at delivering a safe, adequate, affordable, and environmentally sustainable water supply.

The process used to develop the plan included analyzing conservation measures and programs using the consultant's Least Cost Planning Water Demand Management Decision Support System Model (DSS Model). Work was divided into two phases separated by a year of in-depth review of the work by the City's Water Supply Advisory Committee. The Recommended Plan, which covers the same 2035 planning horizon as this Urban Water Management Plan, matches the recommended measures list published in the Final Report on Agreements and Recommendations (Appendix K). The WSAC's involvement helped shape the plan in two important ways: 1) it shifted conservation program emphasis to the peak season period (April – October) to better address the City's supply-demand gap, and 2) it produced recommendations leading to several additional conservation measures.

The plan includes a total of 35 measures for implementation between now and 2021 (Figure 9-3). Many are already underway. The City Council accepted the plan in concept as a Technical Memorandum in April 2016 (Appendix S), and the final report is almost complete. The goal is to include and adopt the Water Conservation Master Plan in its entirety as an element of this 2015 Urban Water Management Plan.

Figure 9-3. Recommended Program Implementation Schedule

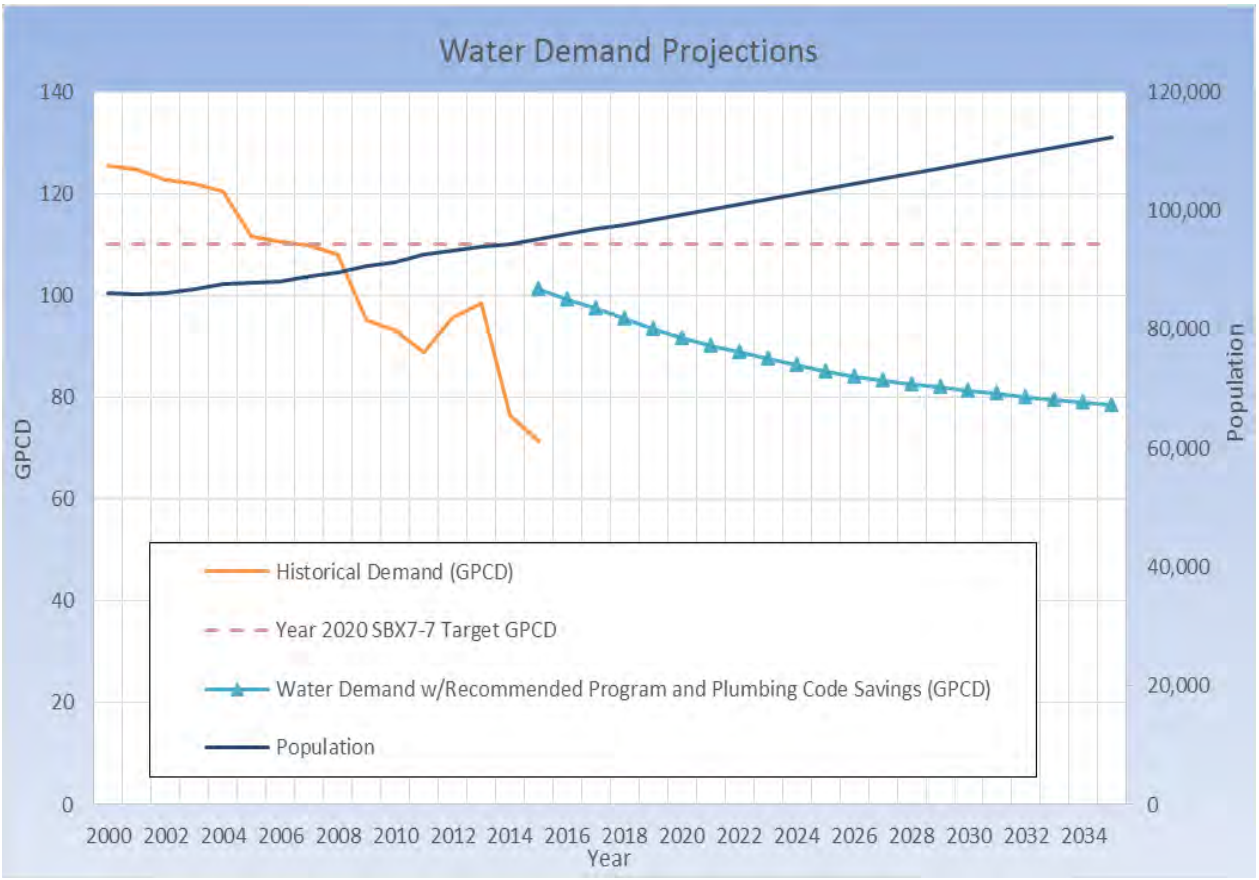
No.	Measure	Time Period	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	System Water Loss Reduction	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2	Advanced Metering Infrastructure	2021 - 2035							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3	Large Landscape Budget-Based Water Rates	2018 - 2020				■	■	■															
4	General Public Information	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5	Public Information (Home Water Use Report)	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
6	Residential Leak Assistance	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
7	Single Family Residential Surveys	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
8	Plumbing Fixture Giveaway/Opt	2015 - 2017	■	■	■																		
9	Residential Ultra High Efficiency Toilet Rebates	2015 - 2020	■	■	■	■	■	■															
10	High Efficiency Clothes Washer Rebates	2015 - 2026	■	■	■	■	■	■	■	■	■	■	■	■									
11	High Efficiency Clothes Washer - New Development	2021 - 2035							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
12	Hot Water On Demand - New Development	2021 - 2035							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
13	Toilet Retrofit at Time of Sale	2015 - 2019	■	■	■	■	■																
14	CII MF Common Laundry Room High Efficiency Clothes Washer	2015 - 2024	■	■	■	■	■	■	■	■	■	■											
15	CII Incentives	2021 - 2026							■	■	■	■	■	■									
16	Pre-Rinse Spray Nozzle Installation	2015 - 2016	■	■																			
17	CII Surveys	2021 - 2026							■	■	■	■	■	■									
18	High Efficiency Urinal Program	2015 - 2018	■	■	■	■																	
19	Public Restroom Faucet Retrofit - MUN	2021 - 2023							■	■	■												
20	Public Restroom Faucet Retrofit - COM	2021 - 2030							■	■	■	■	■	■	■	■	■	■					
21	School Retrofit	2021 - 2030							■	■	■	■	■	■	■	■	■	■					
22	Water Efficient Landscape Ordinance	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
23	Single Family Residential Turf Removal	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
24	Multifamily Residential/CII Turf Removal	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
25	Expand Large Landscape Survey/Water Budgets	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
26	Sprinkler Nozzle Rebates	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
27	Gray Water Retrofit	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
28	Residential Rain Barrels	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
29	Climate Appropriate Landscaping and Rainwater Infiltration	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
30SF	SF Conservation Pricing - Water and Sewer	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
30MF	MF Conservation Pricing - Water and Sewer	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
30COM	COM Conservation Pricing - Water and Sewer	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
31	Single Family Multifamily Dishwasher Rebates	2018 - 2022				■	■	■	■	■													
32	Hot Water Recirculation Systems	2018 - 2022				■	■	■	■	■													
33	Rewarding Businesses For Adopting Best Practices	2020 - 2035						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
34	Additional Building Code Requirements for New Development	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
35	Innovation Incubator Program	2021 - 2035							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Table 9-5 presents the projected water savings in 5-year increments, broken down into two components: the passive plumbing codes savings referenced in Chapter 4, and active water savings associated with the Recommended Program, expressed in millions of gallons per year.

Table 9-5. Long-Term Conservation Program Savings (mgy)				
Conservation Program	2020	2025	2030	2035
Plumbing Code	96	179	269	329
Recommended Program	137	232	269	291
Recommended Program with Plumbing Code Savings	233	411	538	620
NOTES: Maddaus Water Management, Inc., 2016				

Figure 9-4 shows the projected per capita water use in gallons per person per day (GPCD) in 5-year increments for the projected demand with the recommended program implementation and plumbing code savings. The model indicates that the City's GPCD in 2020 will decline to about 92 gallons per person per day, far below the City's 2020 target of 110 GPCD under SB X7-7, and continuing to decline to a level of about 78 GPCD by 2035.

Figure 9-4. Water Conservation Program Savings, GPCD



9.5 Members of the California Urban Water Conservation Council

CUWCC members have the option of submitting their 2013–2014 Best Management Practice (BMP) annual reports in lieu of, or in addition to, describing the DMMs in their UWMP. The City is including its 2013 and 2014 BMP reports for additional informational purposes in Appendix T. In 2013 and 2014, the City was considered to be "On Track" by the California Urban Water Conservation Council in all areas with the following exceptions:

BMP 1.2 Water Loss Control:

- Completed training in component analysis process? No (Since completed in 2016)
- Component Analysis? No (Since completed in 2016)

BMP 1.4 Retail Conservation Pricing:

- Conservation pricing for sewer service: For water agencies that provide retail sewer service, rates that charge customers a fixed amount per billing cycle for sewer service regardless of the units of service consumed do not satisfy the CUWCC's definition of conservation pricing of sewer service. This applies to City's single family and multifamily sewer charges, which are charged a flat monthly rate for sewer service[1].

The Water Department has raised this matter previously and will continue to discuss sewer rates and conservation pricing as a matter of policy within the City organization.

[1]Low water users who meet an average winter use criteria of 2.25 CCF/month or less qualify for a reduced sewer rate.

Chapter 10

PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

The City of Santa Cruz began the process of developing the 2015 Urban Water Management Plan after participating in a webinar and workshop sponsored by DWR in late 2015. While Chapter 2 describes the process of preparing the plan, this chapter summarizes the process of plan adoption, submittal, and implementation including the steps for amendment if it becomes necessary.

10.1 Inclusion of all 2015 Data

As mentioned in Section 2.3, the City is reporting on a calendar year basis. The plan was prepared in 2016 and accordingly includes water use and planning data for the entire calendar year of 2015, except where noted.

10.2 Notice of Public Hearing

Water suppliers must hold a public hearing before adopting an Urban Water Management Plan. The public hearing provides an opportunity for the public to provide input before it is adopted by City Council.

Prior to the public hearing, the draft plan was made available for public inspection, review, and comment on the City's web site, at the Water Department office, and at the City's Central Library beginning in late July 2016.

In addition, the City Water Commission reviewed the draft plan and provided comments at its August 1, 2016 meeting. Water Commission meetings serve to encourage active involvement and participation of diverse groups and individuals, in accordance with section 10642 of the Act. In the process of reviewing the plan, the Water Commission recommended several changes and additions for the final plan, including the following:

- Updating Table 6-10 regarding volume of water transferred to Soquel Creek, and include recent interagency agreement,
- Updating language about water rights (flexibility, place of use) needed to support regional solutions,
- Correcting statement of storage amount needed to overcome supply/demand gap,
- Better characterizing the distinctions between inside and outside customers, and
- Miscellaneous editorial clarifications and corrections

The Water Commission's full written comments, and all other written comments received from the public are included as Appendix W.

The draft plan was also circulated in July 2016, along with notice of the time and place of the public hearing, to the County of Santa Cruz and the City of Capitola as required by law. Notification letters included the location where the 2015 UWMP could be viewed, the hearing schedule, and contact information of the preparer for the City. Copies of these letters are provided in Appendix U.

Table 10-1 below lists all the cities and counties that receive water service from the City of Santa Cruz and that were sent a notice of the public hearing. As mentioned in Section 2.4, these jurisdictions were previously sent written notice regarding the plan review and update process well in advance of 60 days before the public hearing (Appendix D), in accordance with the Section 10621(b) of the Act.

Table 10-1 Retail: Notification to Cities and Counties

City Name	60 Day Notice	Notice of Public Hearing
City of Capitola	☑	☑
City of Santa Cruz	☑	☑
County Name	**60 Day Notice**	**Notice of Public Hearing**
Santa Cruz County	☑	☑

In addition to these jurisdictions, the City provided the notice of the public hearing to the Association of Monterey Bay Area Governments, local elected officials, the Santa Cruz Local Agency Formation Commission, and to all major public water utilities in Santa Cruz County, including the following:

- Soquel Creek Water District
- San Lorenzo Valley Water District
- Scotts Valley Water District
- Central Valley Water District
- City of Watsonville

The public hearing was noticed to the public in the local newspaper as prescribed in Government Code 6066. The notice included the time and place of the hearing, as well as the various locations where the plan was made available for public review. A copy of the notice of the public hearing published in the newspaper is provided as Appendix V.

10.3 Public Hearing and Adoption

The City Council held the public hearing on the plan in accordance with CWC section 10642 on August 9, 2016. At the public hearing, City Council directed that the final plan be brought back for adoption at its August 23, 2016 meeting. Copies of all written comments received during the public review process and at the public hearing are included in Appendix W. The official minutes of the public hearing are included with the Notice of Public Hearing in Appendix V.

City Council adopted the plan, as modified by input from the Water Commission, on August 23 2016. The official resolution adopting the plan is provided as Appendix X.

In accordance with the City Council resolution adopting the plan, the Water Supply Advisory Committee's Final Report on Agreements and Recommendations, the Water Shortage Contingency Plan, and the City's final Water Conservation Master Plan are adopted by reference in their entirety as elements of the City's 2015 Urban Water Management Plan.

10.4 Plan Submittal

The final plan was then submitted electronically to DWR and the California State Library within 30 days of its adoption, and transmitted to all jurisdictions receiving water service from the City of Santa Cruz within 60 days of its submission to DWR, in accordance with CWC sections 10644(a) and 10635(b). Additionally, the final data tables were submitted using the WUE data tool available online through the DWR Urban Water Management webpage.

10.5 Public Availability

The final, adopted plan was also made available to the public in accordance with section 10645 of the Act by posting it on the City's web site.

10.6 Amending an Adopted UWMP

If the City of Santa Cruz chooses or needs to amend the adopted 2015 plan, proper notification including copies of the amendments will be provided in accordance with sections 10644(a) and 10621 in a manner set forth for the notification, public hearing, adoption and submittal.

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28 American Water Works Association (AWWA), 2011. M60: Drought Preparedness and Response, First Edition.

List of Appendices

A Urban Water Management Planning Act (Water Code 10610-10656)

B Water Conservation Act of 2009 (SBx 7-7, Water Code 10608)

C Changes to the Water Code Since 2010

D Notice to City of Capitola, County of Santa Cruz

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F City of Santa Cruz Water Demand Forecast

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I Joint Powers Agreement – Mid-County Groundwater Agency

J Recycled Water Facilities Planning Study - Scope of Work

K Water Supply Advisory Committee – Final Report on Agreements and Recommendations

L City of Santa Cruz Water Shortage Contingency Plan

M Santa Cruz Municipal Code Chapter 16.01 – Water Shortage regulations and Restrictions

N City Council Resolution – Drought Cost Recovery Fee

O Santa Cruz Municipal Code Chapter 16.02 – Water Conservation

P 2014 Notice of Proposed Water Rate Changes

Q City of Santa Cruz Water Department – Long Range Financial Plan

R 2016 Notice of Proposed Water Rate Changes

S Water Conservation Master Plan Final Technical Memorandum

T Santa Cruz BMP Coverage Report, 2013 and 2014

U Notice of Public Hearing to County of Santa Cruz and City of Capitola

V Notice of Public Hearing and Meeting Minutes

W Written Comments Received From Public

X City Council Resolution Adopting 2015 Urban Water Management Plan

Y Cooperative Water Transfer Pilot Project for Groundwater Recharge and Water Resource Management

California Water Code Division 6, Part 2.6.

Chapter 1. General Declaration and Policy §10610-10610.4
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Chapter 1. General Declaration and Policy

SECTION 10610-10610.4

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

Chapter 2. Definitions

SECTION 10611-10617

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. “Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses,

reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

Chapter 3. Urban Water Management Plans

Article 1. General Provisions

SECTION 10620-10621

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that

share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero, except as provided in subdivision (d).

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

(d) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

Article 2. Contents of Plan

SECTION 10630-10634

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of

water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) (1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(A) An average water year.

(B) A single-dry water year.

(C) Multiple-dry water years.

(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(3) (A) For the 2015 urban water management plan update, the distribution system water loss shall be quantified for the most recent 12-month period available. For all subsequent updates, the distribution system water loss shall be quantified for each of the five years preceding the plan update.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(4) (A) If available and applicable to an urban water supplier, water use projections may display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

(g) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water

use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(h) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(i) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivision (f) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.

(j) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan may, but is not required to, include any of the following information:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies.

(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has

submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

10631.7. The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's recommendations and comments regarding the panel process and the panel's recommendations.

10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

(1) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions that are applicable to each stage.

(2) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(4) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are

appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(6) Penalties or charges for excessive use, where applicable.

(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(8) A draft water shortage contingency resolution or ordinance.

(9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

(b) Commencing with the urban water management plan update due July 1, 2016, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5. Water Service Reliability

SECTION 10635

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Article 3. Adoption and Implementation of Plans

SECTION 10640-10645

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area.

After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) (1) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part.

The report prepared by the department shall identify the exemplary elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

(2) A report to be submitted pursuant to paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

(c) (1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section 10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.

(2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).

(3) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

Chapter 4. Miscellaneous Provisions

SECTION 10650-10656

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26

(commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

Appendix B
California Water Code
Sustainable Water Use and Demand Reduction

California Water Code Division 6, Part 2.55.

Chapter 1. General Declarations and Policy §10608-10608.8
Chapter 2. Definitions §10608.12
Chapter 3. Urban Retail Water Suppliers §10608.16-10608.44
Chapter 4. Agricultural Water Suppliers §10608.48
Chapter 5. Sustainable Water Management §10608.50
Chapter 6 Standardized Data Collection §10608.52
Chapter 7 Funding Provisions §10608.56-10608.60
Chapter 8 Quantifying Agricultural Water Use Efficiency §10608.64

Chapter 1. General Declarations and Policy

SECTION 10608-10608.8

10608. The Legislature finds and declares all of the following:

(a) Water is a public resource that the California Constitution protects against waste and unreasonable use.

(b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.

(c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.

(d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.

(e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.

(f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.

(g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.

(h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.

(i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

10608.4. It is the intent of the Legislature, by the enactment of this part, to do all of the following:

(a) Require all water suppliers to increase the efficiency of use of this essential resource.

(b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.

(c) Measure increased efficiency of urban water use on a per capita basis.

(d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.

(e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.

(f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.

(g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.

(h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.

(i) Require implementation of specified efficient water management practices for agricultural water suppliers.

(j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.

(k) Advance regional water resources management.

10608.8. (a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

(b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.

(c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

(d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

Chapter 2 Definitions

SECTION 10608.12

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

(b) "Base daily per capita water use" means any of the following:

(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retailwater supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) "Commercial water user" means a water user that provides or distributes a product or service.

(e) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

(f) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

(g) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

(h) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification

System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

(i) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

(j) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

(k) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(l) "Process water" means water used for producing a product or product content or water used for research and development, including, but not limited to, continuous manufacturing processes, water used for testing and maintaining equipment used in producing a product or product content, and water used in combined heat and power facilities used in producing a product or product content. Process water does not mean incidental water uses not related to the production of a product or product content, including, but not limited to, water used for restrooms, landscaping, air conditioning, heating, kitchens, and laundry.

(m) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050, that is used to offset potable demand, including recycled water supplied for direct use and indirect potable reuse, that meets the following requirements, where applicable:

(1) For groundwater recharge, including recharge through spreading basins, water supplies that are all of the following:

(A) Metered.

(B) Developed through planned investment by the urban water supplier or a wastewater treatment agency.

(C) Treated to a minimum tertiary level.

(D) Delivered within the service area of an urban retail water supplier or its urban wholesale water supplier that helps an urban retail water supplier meet its urban water use target.

(2) For reservoir augmentation, water supplies that meet the criteria of paragraph (1) and are conveyed through a distribution system constructed specifically for recycled water.

(n) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

(o) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(p) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

(q) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

(r) "Urban wholesale water supplier," means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

Chapter 3 Urban Retail Water Suppliers

SECTION 10608.16-10608.44

10608.16. (a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.

(b) The state shall make incremental progress towards the state target specified in subdivision (a) by reducing urban per capita water use by at least 10 percent on or before December 31, 2015.

10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its Internet Web site, and make written copies available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with subdivision (l) of Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) (1) An urban retail water supplier is granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow the use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

(2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water supplier and urban retail water suppliers.

10608.22. Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph(3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

10608.24. (a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.

(b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

(c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.

(d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.

(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

(e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.

(f) (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.

(2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section 10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

10608.26. (a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

(b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.

(c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's

implementation plan for complying with this part shall consider the conservation of that military installation under federal Executive Order 13514.

(d) (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.

(2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

10608.28. (a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

10608.32. All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

10608.36. Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

10608.42. (a) The department shall review the 2015 urban water management plans and report to the Legislature by July 1, 2017, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets to achieve the 20-percent reduction and to reflect updated efficiency information and technology changes.

(b) A report to be submitted pursuant to subdivision (a) shall be submitted in compliance with Section 9795 of the Government Code.

10608.43. The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and institutional users and an assessment of the potential statewide water use efficiency improvement in the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

(a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.
(b) Evaluation of water demands for manufacturing processes, goods, and cooling.
(c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.
(d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.
(e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

10608.44. Each state agency shall reduce water use at facilities it operates to support urban retail water suppliers in meeting the target identified in Section 10608.16.

Chapter 4 Agricultural Water Suppliers

SECTION 10608.48

10608.48. (a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

(b) Agricultural water suppliers shall implement all of the following critical efficient management practices:

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

(1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.

(2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.

(3) Facilitate the financing of capital improvements for on-farm irrigation systems.

(4) Implement an incentive pricing structure that promotes one or more of the following goals:

(A) More efficient water use at the farm level.

(B) Conjunctive use of groundwater.

(C) Appropriate increase of groundwater recharge.

(D) Reduction in problem drainage.

(E) Improved management of environmental resources.

(F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.

(5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

(6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.

(7) Construct and operate supplier spill and tailwater recovery systems.

(8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.

(9) Automate canal control structures.

(10) Facilitate or promote customer pump testing and evaluation.

(11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.

(12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:

(A) On-farm irrigation and drainage system evaluations.

(B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.

(C) Surface water, groundwater, and drainage water quantity and quality data.

(D) Agricultural water management educational programs and materials for farmers, staff, and the public.

(13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.

(14) Evaluate and improve the efficiencies of the supplier's pumps.

(d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.

(e) The data shall be reported using a standardized form developed pursuant to Section 10608.52.

(f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.

(g) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.

(h) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

(i) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

Chapter 5 Sustainable Water Management

Section 10608.50

10608.50. (a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:

(1) Revisions to the requirements for urban and agricultural water management plans.

(2) Revisions to the requirements for integrated regional water management plans.

(3) Revisions to the eligibility for state water management grants and loans.

(4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.

(5) Increased funding for research, feasibility studies, and project construction.

(6) Expanding technical and educational support for local land use and water management agencies.

(b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

Chapter 6 Standardized Data Collection

SECTION 10608.52

10608.52. (a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.

(b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

Chapter 7 Funding Provisions

Section 10608.56-10608.60

10608.56. (a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.

(f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

10608.60. (a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.

(b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

Chapter 8 Quantifying Agricultural Water Use Efficiency

SECTION 10608.64

10608.64. The department, in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders, shall develop a methodology for quantifying the efficiency of agricultural water use. Alternatives to be assessed shall include, but not be limited to, determination of efficiency levels based on crop type or irrigation system distribution uniformity. On or before December 31, 2011, the department shall report to the Legislature on a proposed methodology and a plan for implementation. The plan shall include the estimated implementation costs and the types of data needed to support the methodology. Nothing in this section authorizes the department to implement a methodology established pursuant to this section.

Appendix C
Changes to the Water Code since 2010 UWMPs

Topic	CWC Section	Legislative Bill	Summary	Guidebook Section
Demand Management Measures	10631 (f)(1) and (2)	AB 2067 Weber 2014	Requires water suppliers to provide narratives describing their water demand management measures, as provided. Requires retail water suppliers to address the nature and extent of each water demand management measure implemented over the past 5 years and describe the water demand management measures that the supplier plans to implement to achieve its water use targets.	Chapter 9
Submittal Date	10621 (d)	AB 2067 Weber 2014	Requires each urban water supplier to submit its 2015 plan to the Department of Water Resources by July 1, 2016.	Chapter 10
Submittal Format	10644 (a) (2)	SB 1420 Wolk 2014	Requires the plan, or amendments to the plan, to be submitted electronically to the department.	Chapter 10
Standardized Forms	10644 (a) (2)	SB 1420 Wolk 2014	Requires the plan, or amendments to the plan, to include any standardized forms, tables, or displays specified by the department.	CH 1, Section 1.4
Water Loss	10631 (e) (1) (J) and (e) (3) (A) and (B)	SB 1420 Wolk 2014	Requires a plan to quantify and report on distribution system water loss.	Appendix L

Voluntary Reporting of Passive Savings	10631 (e) (4)	SB 1420 Wolk 2014	Provides for water use projections to display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans, when that information is available and applicable to an urban water supplier.	Appendix K
Voluntary Reporting of Energy Intensity	10631.2 (a) and (b)	SB 1036	Provides for an urban water supplier to include certain energy-related information, including, but not limited to, an estimate of the amount of energy used to extract or divert water supplies.	Appendix O
Defining Water Features	10632		Requires urban water suppliers to analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	CH 8, Section 8.2.4

CITY OF SANTA CRUZ

WATER DEPARTMENT

212 Locust Street, Santa Cruz, CA 95060 • (831) 420-5200 • Fax (831) 420-5201 • www.cityofsantacruz.com

December 15, 2015

Susan Mauriello, County Administrative Officer
County of Santa Cruz
701 Ocean Street, Room 520
Santa Cruz, CA 95060

SUBJECT: Urban Water Management Plan Update

Dear Ms. Mauriello,

The City of Santa Cruz is preparing an update to its Urban Water Management Plan, as required by state law. This letter is to notify the County of Santa Cruz that the Santa Cruz Water Department will be reviewing the plan and considering changes and amendments over the next few months and welcomes your input and comments during the update process. The updated plan is scheduled to be presented to the Santa Cruz City Council at a public hearing in June 2016 to meet the state's submittal deadline of July 1, 2016. We will send you notice of the time and place of the public hearing, along with information on where the 2015 UWMP can be viewed, in advance of that meeting.

Please contact Toby Goddard, Administrative Services Manager, at 420-5232, if you have any questions or wish to discuss the information covered in the plan.

Sincerely,

Rosemary Menard
Water Director

cc: Kathy Previsich, Planning Director

CITY OF SANTA CRUZ

WATER DEPARTMENT

212 Locust Street, Santa Cruz, CA 95060 • (831) 420-5200 • Fax (831) 420-5201 • www.cityofsantacruz.com

December 15, 2015

Jamie Goldstein, City Manager
City of Capitola
420 Capitola Ave.
Capitola, CA 95010

SUBJECT: Urban Water Management Plan Update

Dear Mr. Goldstein,

The City of Santa Cruz is preparing an update to its Urban Water Management Plan, as required by state law. This letter is to notify the City of Capitola that the Santa Cruz Water Department will be reviewing the plan and considering changes and amendments over the next few months and welcomes your input and comments during the update process. The updated plan is scheduled to be presented to the Santa Cruz City Council at a public hearing in June 2016 to meet the state's submittal deadline of July 1, 2016. We will send you notice of the time and place of the public hearing, along with information on where the 2015 UWMP can be viewed, in advance of that meeting.

Please contact Toby Goddard, Administrative Services Manager, at 420-5232, if you have any questions or wish to discuss the information covered in the plan.

Sincerely,

Rosemary Menard
Water Director

cc: Richard Grunow, Community Development Director

Appendix E:

City of Santa Cruz General Plan 2030 Policies Regarding Water Service

Goal CC 3 A safe, reliable, and adequate water supply

CC3.1 *Implement the City's Integrated Water Plan.*

CC3.1.1 Implement the City's Long-Term Water Conservation Plan to reduce average daily water demand and maximize the use of existing water resources.

CC3.1.2 Periodically update the City's Water Shortage Contingency Plan to prepare for responding to future water shortages.

CC3.1.3 Develop a desalination plant of 2.5 mgd for drought protection, with the potential for incremental expansion to 4.5 mgd, if it is environmentally acceptable and financially feasible.

CC3.2 *Meet or exceed all regulatory drinking water standards.*

CC3.2.1 Regularly and comprehensively evaluate the water system relative to federal and State water quality regulations and standards, and develop recommendations and an action plan to address findings.

CC3.2.2 Develop, maintain, and update sampling and analysis programs, and laboratory procedures for the treated water distribution system and storage facilities.

CC3.2.3 Maintain required federal and State laboratory certification.

CC3.2.4 Prepare and submit compliance reports to all regulatory agencies.

CC3.2.5 Regularly sample and analyze finished water in accordance with approved methods and parameters identified by the State, U.S. Environmental Protection Agency, and the City.

CC3.2.6 Monitor the quality of water from all sources.

CC3.2.7 Provide annual drinking water quality reports to all consumers of city water.

CC3.3 *Safeguard existing surface and groundwater sources.*

CC3.3.1 Manage City watershed lands relative to protecting the sources of drinking water.

CC3.3.2 Maintain compliance with all applicable drinking water source protection-related regulations.

CC3.3.3 Secure and maintain all City water rights to existing and future water supplies to provide certainty and operational flexibility for the water system.

CC3.3.4 Review and comment on new State Water Resources Control Board water rights applications and timber harvest plans on City drinking water source watersheds.

CC3.3.5 Pursue appropriate regulatory enforcement of environmental violations committed by other watershed stakeholders.

CC3.3.6 Conduct hydrologic and biotic monitoring throughout drinking water source watersheds to protect water supplies and habitat. Cf. CD4.3.3 and NRC2.1, 2.2, 2.4, and 6.3.

CC3.3.7 Ensure that fisheries conservation strategies address and protect water storage, drinking water source quality, and water system flexibility, as well as protect the environmental resource.

CC3.3.8 Provide adequate pumping, treatment, and distribution facilities for peak season production of groundwater of 170 mgy in normal years and 215 mgy during droughts.

CC3.3.9 Monitor groundwater levels and quality.

CC3.3.10 Participate with the Soquel-Aptos Groundwater Management Alliance in cooperative efforts to assure the quality and production of groundwater resources.

CC3.4 *Maintain and improve the integrity of the water system.*

CC3.4.1 Maintain and improve water facilities to meet pressure and fire flow requirements and ensure customer delivery. Cf. HZ1.4.3.

CC3.4.2 Modernize City water treatment plants.

CC3.4.3 Optimize storage, transmission, and distribution capacities and efficiencies.

CC3.4.4 Evaluate and improve the water system so as to minimize water outages due to emergencies and disasters.

CC3.5 Promote maximum water use efficiency.

CC3.5.1 Implement 14 urban water conservation “best management practices” and meet reporting requirements in the Memorandum of Understating Regarding Urban Water Conservation in California.

CC3.5.2 Promote public education and awareness about the City’s water resources and the importance of water conservation.

CC3.5.3 Offer water audit programs and technical assistance for homes, businesses, and large landscapes to help customers reduce their average daily water use and control their utility bills.

CC3.5.4 Provide financial incentives to City water customers for installing high efficiency plumbing fixtures, appliances, and equipment.

CC3.5.5 Provide public information regarding onsite water catchment systems.

CC3.5.6 Administer and enforce water waste regulations, plumbing fixture retrofit requirements, and water efficient landscape standards for new development.

CC3.5.7 Explore and consider promoting or requiring new opportunities and technologies for more efficient use of water and energy.

CC3.5.8 Evaluate water use by residential, commercial, industrial and other customer categories and trends per capita.

CC3.5.9 Regularly audit the water distribution system and implement programs to minimize system losses and underground leaks.

CC3.5.10 Participate in regional water conservation partnerships, events, and opportunities.

CC3.5.11 Play a leadership role in supporting research, policy development, standards, and legislation aimed at furthering water use efficiency across the state.

CC3.5.12 Implement additional water conservation programs that provide a reliable gain in supply and can be justified in terms of their cost.

CC3.6 Coordinate major land use planning decisions in all three jurisdictions served by the City water system based on water supply availability.

CC3.6.1 Implement the City's Urban Water Management Plan and update it periodically as required by State law.

CC3.6.2 Provide annual updates to the city council on the status of remaining water supply.

CC3.6.3 Confirm or adjust the estimate of remaining supply to avoid oversubscribing the water system.

CC3.6.4 Consider developing criteria for determining significance of environmental impacts of development projects on the City water system to streamline the environmental review process.

CC3.7 Allow extension of the Water Service Area only if an application is approved by city council and/or LAFCO

CC3.8 Prohibit additional connections to the North Coast water system, in accordance with City Council Resolutions NS-17372 and NS-21056.

CC3.9 Sustain long-term fiscal stability.

CC3.9.1 Maintain a rate schedule based on cost of service and designed to provide an economic incentive for conservation.

CC3.9.2 Collect sufficient revenues to assure adequate maintenance of the water system infrastructure.

CC3.9.3 Maintain a Water Rate Stabilization Fund to protect against unanticipated emergencies, and Operating Reserves as needed for cash flow.

CC3.9.4 Confine long-term borrowing to major capital improvements.

CC3.9.5 Develop and implement a long-term Capital Improvements Plan for prioritizing and financing major projects.

CC3.10 Investigate new supply options to meet planned growth.

CC3.10.1 Explore opportunities to use recycled water for future water supply.

CC3.11 Conserve water resources. Cf. NRC1.3.1 and 3.1.

CC3.11.1 Promote water conservation.

CC3.11.2 Regularly update guidelines and standards for new landscaping that emphasizes xeriscaping, climate-appropriate landscape design, and other water-conserving practices.

CC3.11.3 Conduct a landscape irrigation audit program and target large water consumers to reduce consumption. Examples of large consumers are large turf customers, large commercial and industrial customers, and property management firms.

CITY OF SANTA CRUZ WATER DEMAND FORECAST

Abstract

This report presents an econometric analysis of water demand and forecasts of class-level customer demands and total system production through 2035. The report was commissioned by the City of Santa Cruz Water Department and the City's Water Supply Advisory Committee to update the Department's existing demand forecast to reflect current information on water usage and to account for effects of conservation, water rates, and other factors expected to impact the future demand for water.

Prepared by
David Mitchell
M.Cubed

October 2015

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EXECUTIVE SUMMARY

The City of Santa Cruz is currently undertaking a comprehensive evaluation of its future water supply and infrastructure requirements. The forecast of future water demand is a foundational component to this assessment. In recent years the historical patterns of water demand have been upended by a variety of factors, including the cumulative effects of tighter efficiency standards for appliances and plumbing fixtures, greater investment in conservation, a significant uptick in water rates, an equally significant downturn in economic activity during the Great Recession, and on-going drought. These events have resulted in even more uncertainty than usual regarding future water demand and have placed even greater importance on sorting out the effect each has had on demand in recent years as well as how they are likely to affect demand going forward.

The City of Santa Cruz has appointed a public Water Supply Advisory Committee (WSAC) to examine the City's water supply situation. Its specific charge, as stated in its Charter, is to

> *explore, through an iterative, fact-based process, the City's water profile, including supply, demand and future risks; analyze potential solutions to deliver a safe, adequate, reliable, affordable, and environmentally sustainable water supply and develop recommendations for City Council consideration.*

The Water Department last prepared a formal forecast of water demand as part of its 2010 Urban Water Management Plan (UWMP). That forecast covered the period 2010 to 2030. The forecast reflected average consumption levels circa 2008 and growth projections based on the City's General Plan, UC Santa Cruz's (UCSC) Long Range Development Plan (LRDP) and Association of Monterey Bay Area Governments (AMBAG) population and housing projections. The 2010 UWMP forecast did not account for potential effects of future conservation, higher water rates, or other factors affecting average water use over time. Since the adoption of its 2010 UWMP, actual demand has trended well below forecasted demand. Drought, economic recession, higher water rates, and conservation have been cited as possible reasons for the divergence.

One of the first requests made by the WSAC was for the Water Department to update the demand forecast to reflect current information on water usage and to account for effects of conservation, water rates, and other factors expected to impact the future demand for water.

Statistical Models of Average Demand

This report develops statistically-based models of average water demand. The demand forecasts based on these models cover the period 2020-2035 and incorporate empirical relationships between water use and key explanatory variables, including season, weather, water rates, household income, employment, conservation, and drought restrictions. The approach builds on similar models of water demand developed for the California Urban Water Conservation Council (Western Policy Research, 2011), Bay Area Water Supply and Conservation Agency (Western Policy Research, 2014), California Water Services Company (A&N Technical Services, 2014, M.Cubed 2015), and Contra Costa Water District (M.Cubed 2014).

The statistical models of demand were estimated using historical data on class water use, weather, water price, household income, conservation, and other economic variables driving water demand. The

monthly models of average water demand are combined with service and housing growth forecasts to predict future water demands. The average demand models explain 90 to 99% of the observed variation in historical average use over the 14 year estimation period.

The forecasts of average demand by customer class are summarized in Table ES-1. The forecasts include adjustments for future effects of plumbing codes and the City's baseline conservation program[1] and are predicated on average weather and normal economic conditions.

Table ES - 1. Forecasted Average Demand by Customer Class (CCF/Year)

YEAR		2013	2020		2025		2030		2035	
	Per	Actual 1/	Forecast	CI	Forecast	CI	Forecast	CI	Forecast	CI
Single Family	Housing Unit	87	86	± 3	83	± 3	80	± 4	78	± 4
Multi Family	Housing Unit	53	56	± 2	52	± 2	50	± 2	49	± 3
Business	Service	405	400	± 12	389	± 12	382	± 13	377	± 13
Municipal	Service	388	296	± 26	290	± 27	283	± 29	277	± 30
Irrigation	Service	365	286	± 28	271	± 28	257	± 28	244	± 28
Golf	Acre	990	671	± 130	641	± 134	606	± 137	593	± 144

1/ Actual use, unadjusted for weather or economy. Stage 1 drought water use restrictions in effect May - Dec.

CI = 95% confidence interval.

Industrial and UCSC Demand Forecast

Because of their unique characteristics, industrial and UCSC demands were forecasted separately from the other customer categories. In the case of industrial demand, there is a strong relationship between Santa Cruz County manufacturing employment and aggregate industrial water use. This relationship is used to generate the industrial demand forecast shown in Table ES-2.

Table ES - 2. Industrial Demand Forecast (MGY)

	2013 1/	2020	2025	2030	2035
Mfg Employment Forecast2/		5,900	6,200	6,400	6,500
Industrial Water Demand (MG)					
Low	56	56	58	59	60
Primary	56	57	59	61	62
High	56	57	60	63	64

Notes
1/ Actual per Water Department billing records.
2/ Caltrans Economic Forecast for Santa Cruz County.

The forecast of future UCSC demand is based on a linear projection of the university's buildout demand in its 2005 LRDP, assuming two alternative buildout dates. In both cases, buildout demand is 349 MGY. In the lower bound forecast, buildout occurs in 2050. In the upper bound forecast it occurs in 2035. The primary forecast is the midpoint between the lower and upper bound forecasts. The forecast of UCSC

[1] The baseline conservation program level is Program A in the City's forthcoming water conservation master plan.

demand is given in Table ES-3. The primary forecast almost exactly replicates a forecast based on projected enrollment and average rates of water use per student.[2]

Table ES - 3. UCSC Water Demand Forecast (MGY)

	2013 1/	2020	2025	2030	2035
Low	182	186	213	240	268
Primary	182	196	234	271	308
High	182	207	254	302	349

Notes
1/ Actual per Water Department billing records.

Population, Housing, and Non-Residential Connection Forecasts

Forecasts of population, housing units, and non-residential connections are anchored to AMBAG's 2014 Regional Growth Forecast (AMBAG 2014). Projected growth in single- and multi-family housing units are shown in Table ES-4 and projected growth in non-residential services (excluding industrial and UCSC) are summarized in Table ES-5.[3]

Table ES - 4. Forecast of Occupied Housing Units

	2014 1/	2020	2025	2030	2035
Inside-City					
Single Family	12,246	12,534	12,780	13,030	13,246
Multi Family	9,583	10,958	11,398	12,106	12,679
Subtotal	21,829	23,492	24,177	25,136	25,925
Outside-City					
Single Family	6,743	6,922	7,074	7,230	7,390
Multi Family	7,901	7,910	8,033	8,310	8,495
Subtotal	14,644	14,832	15,107	15,540	15,884
Service Area					
Single Family	18,989	19,456	19,854	20,260	20,636
Multi Family	17,484	18,868	19,431	20,416	21,174
Total	36,473	38,324	39,284	40,676	41,809

Notes
1/ Actual per Water Department billing records.

[2] The enrollment-based approach yields a 2035 demand of 304 MG, which differs from the primary forecast by less than 2%.

[3] The decrease in forecasted golf acreage is due to the intention of Pasatiempo golf course to shift to non-City sources of irrigation water.

Table ES - 5. Forecast of Non-Residential Services and City-Irrigated Golf Acreage

	2013 [1/]	2020	2025	2030	2035
Business [2/]	1,889	1,948	1,971	2,008	2,055
Municipal [3/]	218	218	218	218	218
Irrigation [4/]	452	651	723	845	951
Golf					
Delaveaga	79	79	79	79	79
Pasatiempo	68	40	30	20	20
Total Golf	146	119	109	99	99

Notes
1/ Actual per Water Department billing records.
2/ Based on ratio of business to residential demand.
3/ No expected growth in number of municipal services.
4/ Based on historical rate of gain in irrigation services per gain in multi-family and business services.

Demand Forecasts

The primary, low, and high forecasts of system demand are provided in Tables ES-6, ES-7, and ES-8. Under the primary forecast, total system demand is expected to remain stable at about 3,400 MGY over the forecast period, despite a 13 percent increase in population over the same period. Per capita water use is projected to go from 93 gallons per day in 2020 to 84 gallons per day in 2035, a decrease of approximately 10 percent.

Forecasted demands are significantly lower than the 2010 UWMP forecast, as shown in Figure ES-1. The primary reasons for this are that the 2010 UWMP forecast (1) did not include adjustments for the future effects of passive and active conservation and higher water rates on future water use and (2) assumed higher UCSC demand.

While the econometric demand models were under development, an interim demand forecast was developed for the WSAC by adjusting the 2010 UWMP forecast for future conservation and other economic effects and by adjusting downward the UC demands (M.Cubed, 2015b). Figure ES-2 provides a comparison of the econometric model and WSAC interim demand forecasts. On average, the econometric demand forecast is approximately five and a half percent greater than the WSAC interim forecast. The econometric forecast represented by the dark blue line essentially tracks the upper-bound of the WSAC interim forecast while the WSAC interim forecast represented by the dark yellow line essentially tracks the lower-bound of the econometric forecast. Between these two lines, the forecasts overlap. Future production in the range of 3,200 to 3,400 MGY is consistent with both forecasts.

Figure ES-3 shows a comparison of historical production and the primary, lower, and upper bound forecasts. It is interesting to see how historical production has been influenced by weather and economic events. The forecast does not exhibit a similar degree of variability because it is based on average weather and normal economic conditions. In other words, it is a forecast of *expected future demand*. Realized future demand will certainly not be smooth like the forecast. It will vary about the expected value depending on year-to-year variation in future weather and economic conditions. The forecast, however, provides the baseline around which this variability is likely to occur.

Figure ES - 1. Comparison of Demand Forecast with 2010 UWMP Forecast

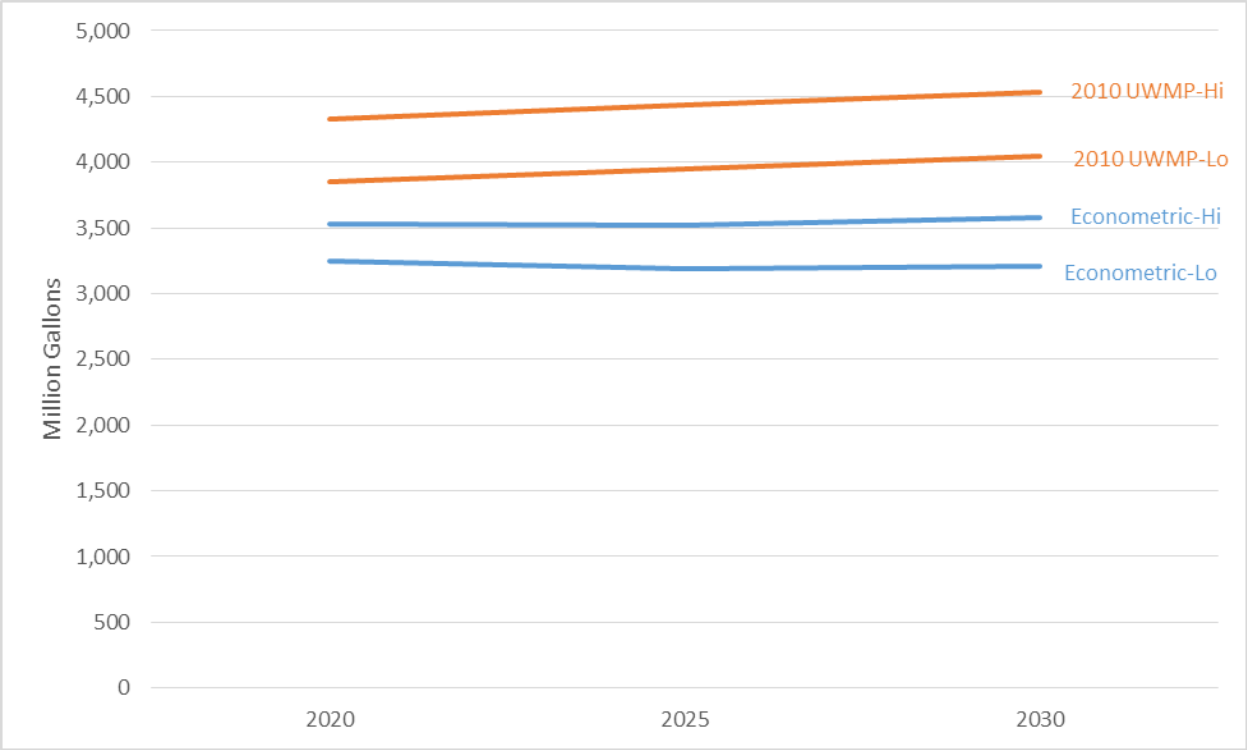


Figure ES - 2. Comparison of Demand Forecast with Interim WSAC Demand Forecast

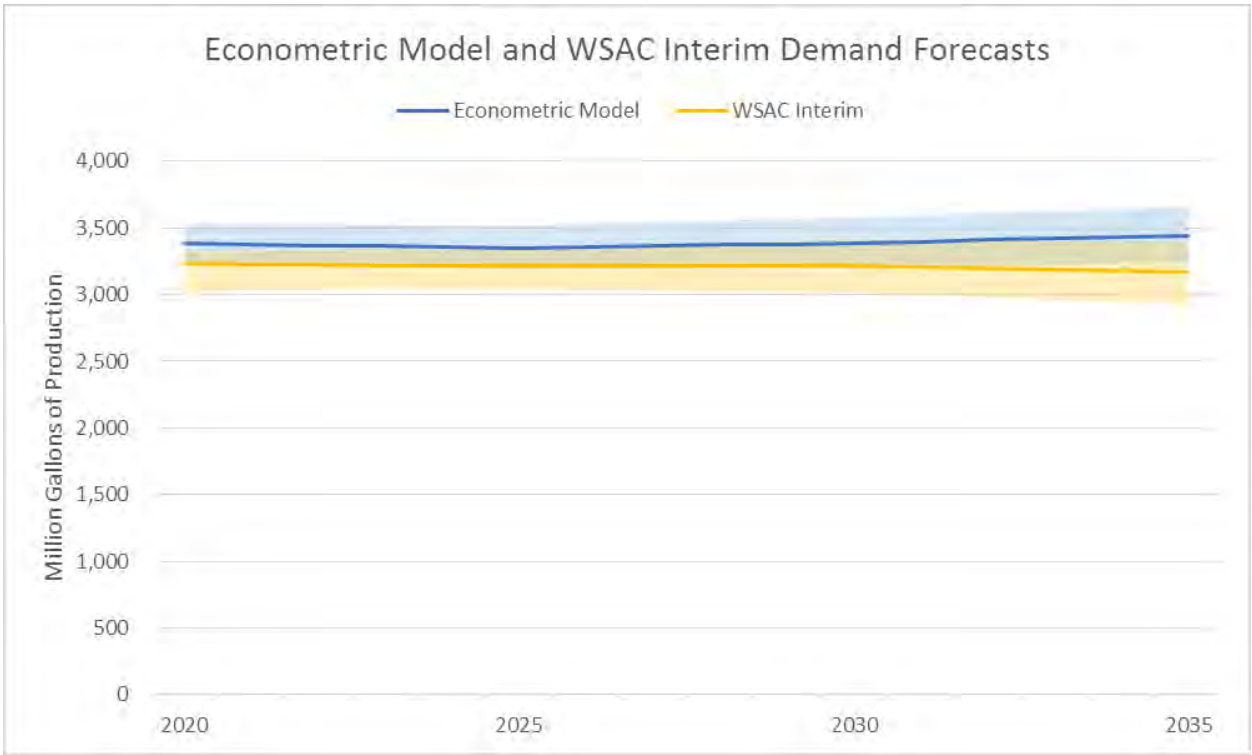


Figure ES - 3. Historical and Forecast Production in Millions of Gallons

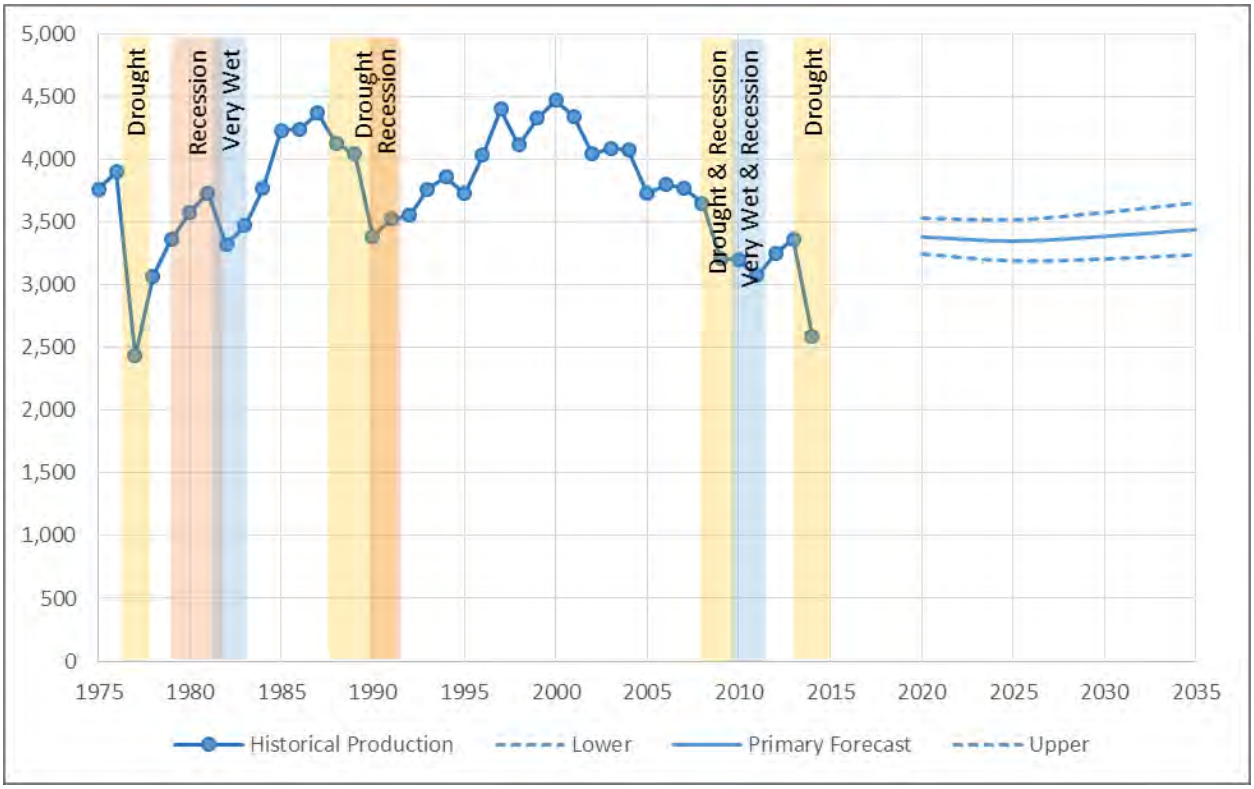


Table ES - 6. Primary Forecast of Class Demands and System Production

YEAR		**2020**	**2025**	**2030**	**2035**
		Forecast	Forecast	Forecast	Forecast
Service Units	**Units**				
SFR	Housing Units	19,456	19,854	20,260	20,636
MFR	Housing Units	18,867	19,430	20,416	21,174
BUS	Services	1,948	1,971	2,008	2,055
IND	NA	NA	NA	NA	NA
MUN	Services	218	218	218	218
IRR	Services	651	723	845	951
GOLF	Acres	119	109	99	99
UC	NA	NA	NA	NA	NA
Avg Demand	**Units**				
SFR	CCF	86	83	80	78
MFR	CCF	56	52	50	49
BUS	CCF	400	389	382	377
IND	NA	NA	NA	NA	NA
MUN	CCF	296	290	283	277
IRR	CCF	286	271	257	244
GOLF	CCF	671	641	606	593
UC	NA	NA	NA	NA	NA
Annual Demand	**Units**				
SFR	MG	1,256	1,228	1,208	1,196
MFR	MG	792	759	766	775
BUS	MG	583	573	575	580
IND	MG	57	59	61	62
MUN	MG	48	47	46	45
IRR	MG	139	147	163	174
GOLF	MG	60	52	45	44
UC	MG	196	234	271	308
Total Demand	**MG**	**3,131**	**3,099**	**3,134**	**3,184**
MISC/LOSS	MG	254	251	254	258
Total Production	**MG**	**3,385**	**3,351**	**3,388**	**3,442**
Rounded	**MG**	**3,400**	**3,400**	**3,400**	**3,400**

Table ES - 7. Lower Bound Forecast of Class Demands and System Production

YEAR		**2020**	**2025**	**2030**	**2035**
		Forecast	Forecast	Forecast	Forecast
Service Units	**Units**				
SFR	Housing Units	19,456	19,854	20,260	20,636
MFR	Housing Units	18,867	19,430	20,416	21,174
BUS	Services	1,948	1,971	2,008	2,055
IND	NA	NA	NA	NA	NA
MUN	Services	218	218	218	218
IRR	Services	651	723	845	951
GOLF	Acres	119	109	99	99
UC	NA	NA	NA	NA	NA
Avg Demand	**Units**				
SFR	CCF	83	79	76	74
MFR	CCF	54	50	48	46
BUS	CCF	389	377	370	364
IND	NA	NA	NA	NA	NA
MUN	CCF	271	264	256	248
IRR	CCF	260	245	231	218
GOLF	CCF	553	521	485	466
UC	NA	NA	NA	NA	NA
Annual Demand	**Units**				
SFR	MG	1,208	1,178	1,155	1,142
MFR	MG	764	728	731	736
BUS	MG	567	556	556	560
IND	MG	56	58	59	60
MUN	MG	44	43	42	40
IRR	MG	126	133	146	155
GOLF	MG	49	42	36	35
UC	MG	186	213	240	268
Total Demand	**MG**	**3,001**	**2,951**	**2,965**	**2,995**
MISC/LOSS	MG	243	239	240	243
Total Production	**MG**	**3,244**	**3,190**	**3,206**	**3,238**
Rounded	**MG**	**3,200**	**3,200**	**3,200**	**3,200**

Table ES - 8. Upper Bound Forecast of Class Demands and System Production

YEAR		2020	2025	2030	2035
		Forecast	Forecast	Forecast	Forecast
Service Units	**Units**				
SFR	Housing Units	19,456	19,854	20,260	20,636
MFR	Housing Units	18,867	19,430	20,416	21,174
BUS	Services	1,948	1,971	2,008	2,055
IND	NA	NA	NA	NA	NA
MUN	Services	218	218	218	218
IRR	Services	651	723	845	951
GOLF	Acres	119	109	99	99
UC	NA	NA	NA	NA	NA
Avg Demand	**Units**				
SFR	CCF	90	86	83	81
MFR	CCF	58	54	53	52
BUS	CCF	412	401	395	391
IND	NA	NA	NA	NA	NA
MUN	CCF	323	318	313	308
IRR	CCF	315	300	287	274
GOLF	CCF	814	790	758	754
UC	NA	NA	NA	NA	NA
Annual Demand	**Units**				
SFR	MG	1,305	1,280	1,262	1,253
MFR	MG	820	792	803	816
BUS	MG	601	591	594	601
IND	MG	57	60	63	64
MUN	MG	53	52	51	50
IRR	MG	153	162	181	195
GOLF	MG	72	64	56	56
UC	MG	207	254	302	349
Total Demand	**MG**	**3,268**	**3,255**	**3,311**	**3,383**
MISC/LOSS	MG	265	264	268	274
Total Production	**MG**	**3,533**	**3,519**	**3,580**	**3,658**
Rounded	**MG**	**3,500**	**3,500**	**3,600**	**3,700**

1 INTRODUCTION

1.1 NEED FOR UPDATED DEMAND FORECAST

The City of Santa Cruz is currently undertaking a comprehensive evaluation of its future water supply and infrastructure requirements. The forecast of future water demand is a foundational component to this assessment. In recent years the historical patterns of water demand have been upended by a variety of factors, including the cumulative effects of tighter efficiency standards for appliances and plumbing fixtures, greater investment in conservation, a significant uptick in water rates, an equally significant downturn in economic activity during the Great Recession, and on-going drought. These events have resulted in even more uncertainty than usual regarding future water demand and have placed even greater importance on sorting out the effect each has had on demand in recent years as well as how they are likely to affect demand going forward.

The City of Santa Cruz has appointed a public Water Supply Advisory Committee (WSAC) to examine the City's water supply situation. Its specific charge, as stated in its Charter, is to

> *explore, through an iterative, fact-based process, the City's water profile, including supply, demand and future risks; analyze potential solutions to deliver a safe, adequate, reliable, affordable, and environmentally sustainable water supply and develop recommendations for City Council consideration.*

The Water Department last prepared a formal forecast of water demand as part of its 2010 Urban Water Management Plan (UWMP). That forecast covered the period 2010 to 2030. The forecast reflected average consumption levels circa 2008 and growth projections based on the City's General Plan, UC Santa Cruz's (UCSC) Long Range Development Plan (LRDP) and Association of Monterey Bay Area Governments (AMBAG) population and housing projections. The 2010 UWMP forecast did not account for potential effects of future conservation, higher water rates, or other factors affecting average water use over time. Since the adoption of its 2010 UWMP, actual demand has trended well below forecasted demand. Drought, economic recession, higher water rates, and conservation have been cited as possible reasons for the divergence.

One of the first requests made by the WSAC was for the Water Department to update the demand forecast to reflect current information on water usage and to account for effects of conservation, water rates, and other factors expected to impact the future demand for water. Because of timing considerations, it was decided to do this in two steps. First, the Water Department would prepare an interim demand forecast based on the 2010 UWMP forecast. The interim forecast would extend the forecast period to 2035 and include adjustments for conservation and rate effects as well as incorporate new information on economic development and expansion of UCSC. The data and methods used to develop the interim forecast are documented in two Technical Memoranda (M.Cubed 2015a, M.Cubed 2015b). Second, the Water Department would compile data and complete statistical models needed to prepare a new demand forecast. The remainder of this report describes the data and methods used to prepare the new demand forecast that replaces the interim forecast.

1.2 Project Objective

The objective of this project is to develop statistically-based models of water demand that will be used to support WSAC deliberations as well as the 2015 UWMP being developed by the Water Department. Demand forecasts based on these models will cover the period 2020-2035 and will incorporate empirical relationships between water use and key explanatory variables, including season, weather, water rates, household income, employment, and drought restrictions.

1.3 Report Organization

The remainder of this report is organized as follows. In Section 2, the statistical models of average demand are presented, including general approach, data development, model definition, model estimation, and forecasts of average demand by customer class. In Section 3, forecasts of population, housing units, and services are presented. The population and housing unit forecasts are derived from the most recently adopted AMBAG regional forecasts (AMBAG, 2014). Forecasts of non-residential services (e.g. business, irrigation, golf, and municipal) are derived from the residential projections using empirical relationships between the different sectors. In Section 4, forecasts of water demand are developed by combining the forecasts of average demand with the forecasts of housing units and non-residential services. Industrial and UCSC demands, which are treated separately from the other customer categories, are also addressed in this section. In Section 5, a comparison of the new forecast with previous forecasts is presented.

2 Statistical Models of Average Demand

2.1 Approach

The general approach is to statistically estimate class-level conditional expectation functions of water demand using historical data on class water use, weather, water price, household income, conservation, and other economic variables driving water demand. The result for each customer class is a monthly model of average water use per housing unit (for single- and multi-family residential classes), service (for business, municipal, and irrigation classes), or acre (for golf courses), which can then be combined with forecasts of housing units, services, and acres, to forecast future water demands. The conditional expectation functions are used with forecasts of future conservation, water rates, household income, unemployment, and other economic factors to predict the trajectory of average water use over the forecast period. This represents a key departure from the 2010 UWMP forecast methodology, which relied on static average use estimates to forecast future demands.

2.2 Model Definition

The model of expected demand builds on similar models of water demand developed for the California Urban Water Conservation Council (Western Policy Research, 2011), Bay Area Water Supply and Conservation Agency (Western Policy Research, 2014), California Water Services Company (A&N Technical Services, 2014, M.Cubed 2015), and Contra Costa Water District (M.Cubed 2014).

The model of expected demand has several useful features. First, climate and weather effects on demand are decomposed into two distinct components. The climate component measures the seasonal

load shape of monthly demand under normal weather conditions. The weather component measures the effect on demand when weather departs from normal conditions. The seasonal and weather components can be interacted to get season-specific weather effects. This is useful if the response to weather is expected to vary by season. For example, the effect of above normal rainfall on demand in winter, when outdoor water uses are lower, may be different than its effect in spring or fall, when outdoor water uses are higher. Second, prior to model estimation, monthly water use is adjusted for historical conservation from plumbing codes. This helps to address the confounding effect of conservation on the estimation of other demand parameters like price, employment, and income. Third, the model includes economic parameters (e.g. price, household income, unemployment) known to influence urban water demand (Renzetti, 2002; Billings and Jones, 1996). Fourth, the model includes drought policy parameters to measure the effect of drought restrictions on demand. Thus, expected demand can be expressed conditional on season, weather, conservation, economic conditions, and drought stage.

The model of expected demand is stated as:

$$ln(\tilde{y}_{it}) = \mu_i + \beta_S Season_t + \beta_W Weather_t + \beta_E Economic_{it} + \beta_D Drought_t + \varepsilon_{it} \quad (1)$$

Where:

$\tilde{y}_{it}$	average use in month t for service region i adjusted to remove the effects of water savings due to plumbing codes and appliance standards
μ_i	model intercept for service region i
$\beta_S Season_t$	seasonal component of average use in month t
$\beta_W Weather_t$	weather component of average use in month t
$\beta_E Economic_{it}$	economic component of average use in month t
$\beta_D Drought_t$	drought component of average use in month t
ε_{it}	stochastic component (error term)

The seasonal component is specified using eleven monthly indicator variables. The monthly indicator variables take the value of one if t = j, and zero otherwise.

$$\beta_S Season_t = \sum_{j=2}^{12} \beta_j \, month_{jt} \quad (2)$$

The eleven monthly parameters plus the model intercept describe the seasonal load shape of average demand. A seasonal index of monthly demand, where January has an index value of one, is easily constructed as shown in Table 1. The eleven seasonal parameters are seen to scale monthly demand relative to January demand.

Table 1. Seasonal Index of Monthly Average Demand

Month	Seasonal Index	Month	Seasonal Index
Jan	1	Jul	e^{β_7}
Feb	e^{β_2}	Aug	e^{β_8}
Mar	e^{β_3}	Sep	e^{β_9}
Apr	e^{β_4}	Oct	$e^{\beta_{10}}$
May	e^{β_5}	Nov	$e^{\beta_{11}}$
Jun	e^{β_6}	Dec	$e^{\beta_{12}}$

The weather component is comprised of weather measures (monthly rainfall, monthly average of maximum daily air temperatures, monthly ETo) that are transformed logarithmically with their monthly average subtracted away. In the case of rainfall, both contemporaneous and lagged measures are included in the model.

$$\beta_W Weather_t = \beta_{w1} dlR_t + \beta_{w2} dlR_{t-1} + \beta_{w3} dlR_{t-2} + \beta_{w4} dlT_t \ (or\ dlET_t) \quad (3)$$

Where[4]

$$dlR_t = ln(Rain_t + 1) - \overline{ln(Rain_t + 1)} \quad (4)$$

$$dlT_t = ln(Temp_t) - \overline{ln(Temp_t)} \quad (5)$$

$$dlET_t = ln(ET_t) - \overline{ln(ET_t)} \quad (6)$$

For the residential and business customer classes, average daily maximum air temperature is used rather an ET. For the golf, irrigation, and municipal categories, which have greater landscape water uses, ET is used.

The percentage effect on demand due to changes in weather can be calculated from the model parameters and weather observations. Let α be a scalar that expresses the weather measure as a percentage of the observed weather measure. If, for example, α is 1.1, then αR_t would be 110% of observed rainfall. For any αR_t, the expected change in average demand, all else equal, is

$$\%\ change\ in\ average\ demand\ given\ (\alpha - 1)\%\ change\ in\ rain = \left(\frac{\alpha R_t + 1}{R_t + 1}\right)^{\beta_{w1}} - 1 \quad (7)$$

For temperature or ET, which do not have one added to their values prior to transforming them logarithmically, the calculation is even simpler.

$$\%\ change\ in\ average\ demand\ given\ (\alpha - 1)\%\ change\ in\ temp\ or\ ET = \alpha^{\beta_{w4}} - 1 \quad (8)$$

[4] One is added to monthly rain totals to ensure the rainfall measure is defined in months in which total rainfall is zero.

During model estimation, the weather component is interacted with seasonal indicators to estimate separate seasonal weather effects for fall-winter (Nov-Mar), spring (Apr-Jun), and summer-fall (Jul-Oct).[5]

Weather normalization of historical demands can be done in two ways. The first way is to use the predicted model values assuming average weather. In this case the model's weather component simply falls away and we are left with:

$$Weather\ Normalized\ \tilde{y}_{it} = exp(\mu_i + \beta_S Season_t + \beta_E Economic_{it}) \quad (9)$$

The second approach is to rescale observed water use using the estimated weather effects. The ratio of observed to weather normalized demand is

$$WeatherEffect_t = exp\left(\beta_{w1} dlR_t + \beta_{w2} dlR_{t-1} + \beta_{w3} dlR_{t-2} + \beta_{w4} dlT_t\ (or\ dlET_t)\right) \quad (10)$$

Weather normalized observed demand is then given by

$$Weather\ Normalized\ \tilde{y}_{it} = \frac{\tilde{y}_{it}}{WeatherEffect_t} \quad (11)$$

The economic component consists of economic variables that influence average water demand, including water price, household income, vacancy rate, and unemployment rate.

$$\beta_E Economic_{it} = \beta_{E1} lPrice_{it} + \beta_{E2} lInc_{it} + \beta_{E3} dlVac_t + \beta_{E4} dlUnempl_t \quad (12)$$

Where

$$lPrice_{it} = ln(marginal\ price)\ in\ service\ region\ i, period\ t \quad (13)$$

$$lInc_{it} = ln(median\ household\ income)\ in\ service\ region\ i, period\ t \quad (14)$$

$$dlVac_t = ln(housing\ vacancy\ rate) - \overline{ln(housing\ vacancy\ rate)} \quad (15)$$

$$dlUnempl_t = \ln(unemployment\ rate) - \overline{\ln(unemployment\ rate)} \quad (16)$$

The economic variables are logarithmically transformed prior to model estimation. The vacancy rate and unemployment rate variables are expressed as departures from their long-run average values. Each customer class model uses a restricted form of equation 12, as shown in the following table. These restrictions are guided both by economic theory and model diagnostics. For the single family model, the primary economic drivers are marginal water price and household income. For the multi-family model, vacancy rate replaces household income. For the business and municipal class models, marginal price and unemployment measures are used. For golf and irrigation, only marginal price is included in the models.

[5] The seasonal construct follows the CUWCC's GPCD weather normalization methodology (Western Policy Research, 2011).

Table 2. Economic Variable Restrictions in Customer Class Models

Customer Class Model	Economic Variable Restrictions
Single Family	$\beta_{E3} = \beta_{E4} = 0$
Multi Family	$\beta_{E2} = \beta_{E4} = 0$
Business, Municipal	$\beta_{E2} = \beta_{E3} = 0$
Golf, Irrigation	$\beta_{E2} = \beta_{E3} = \beta_{E4} = 0$

2.3 DATA DEVELOPMENT

2.3.1 Water Consumption

The models were estimated with monthly consumption data for the period January 2000 to November 2014. Class-level aggregated meter read data were obtained from the Water Department. The Water Department data were separated between Inside City and Outside City accounts, and contained aggregated data from both bi-monthly and monthly meter read cycles. Before the data could be used for model estimation, it had to be transformed into estimated aggregate monthly consumption. This was done as follows:

- Aggregated meter read data were allocated to consumption month using the share of total consumption days in each month represented in the aggregated meter read data.
- In the case of aggregated data from bi-monthly meter reads done in month t, the aggregated consumption was allocated approximately 25% to month t-2, 50% to month t-1, and 25% to month t. Thus for data from meters read in March, approximately 25% of the consumption was allocated to January, 50% to February, and 25% to March.
- In the case of aggregated data from monthly meter reads done in month t, the aggregated consumption was allocated approximately 50% to month t-1 and 50% to month t. Thus for data from monthly meters read in March, approximately 50% was allocated to February and 50% to March.
- The allocation percentages cited above are approximate values. To do the actual allocations, seasonal weights were applied to each month to account for the seasonal shape of consumption. The seasonal weights and allocation percentages for each customer class are provided in Attachment 1.
- For Inside City customers, meters were read on a bi-monthly schedule until 2005, when the City started billing customers on a monthly cycle. In the case of Outside City customers, bi-monthly billing was continued until 2014.

Once aggregate monthly consumption was estimated, it was divided by the annual number of housing units (for single and multi-family classes), services (for business, municipal, and irrigation classes), or acres (for golf courses) to get average monthly consumption. Figure 1 illustrates the transformation of the raw aggregated meter read data into its corresponding estimated monthly aggregate and average consumption for the Inside City Single Family customer class. The erratic pattern in the raw meter read

data prior to 2005 is primarily due to variability in the number of meters being read in a month and thus total consumption recorded in the aggregate data.[6]

2.3.2 Weather

The weather variables were constructed from monthly data on precipitation, ETo, and average maximum air temperature from October 1990 to April 2015 taken from CIMIS Station 104 (De Laveaga), which is situated within Santa Cruz city limits. Even though model estimation uses monthly data from 2000 to 2014, the average weather values used in equations (4) – (6) are based on the full 1990 to 2015 data series – i.e., they are 25 year normals. The weather data used to estimate the models are provided in Attachment 2.

2.3.3 Economic Variables

The economic data came from multiple sources. The water rate data set was constructed with Water Department records of water rates for each customer class. Annual unemployment rates in Santa Cruz for the period 1990 to 2014 come from the California Employment Development Department. Median and per capita income estimates for Inside City and Outside City customers come from Decennial Census and American Community Survey data. The income data cover estimation years 2000 and 2005-2013. Values for other years were imputed. Average annual residential vacancy rates for City of Santa Cruz for the years 1991-2014 are taken from the California Department of Finance (DOF E-8). These data sets are provided in Attachment 3.

2.3.4 Conservation Adjustment

Prior to estimating the model given by equation (1), average monthly use was adjusted to remove the effect of plumbing codes. That is, if y_{it} is observed average use and c_{it} is estimated average water savings from plumbing codes in month t, then adjusted average monthly use, $\tilde{y}_{it}$, is given by:

$$\tilde{y}_{it} = y_{it} + c_{it} \tag{17}$$

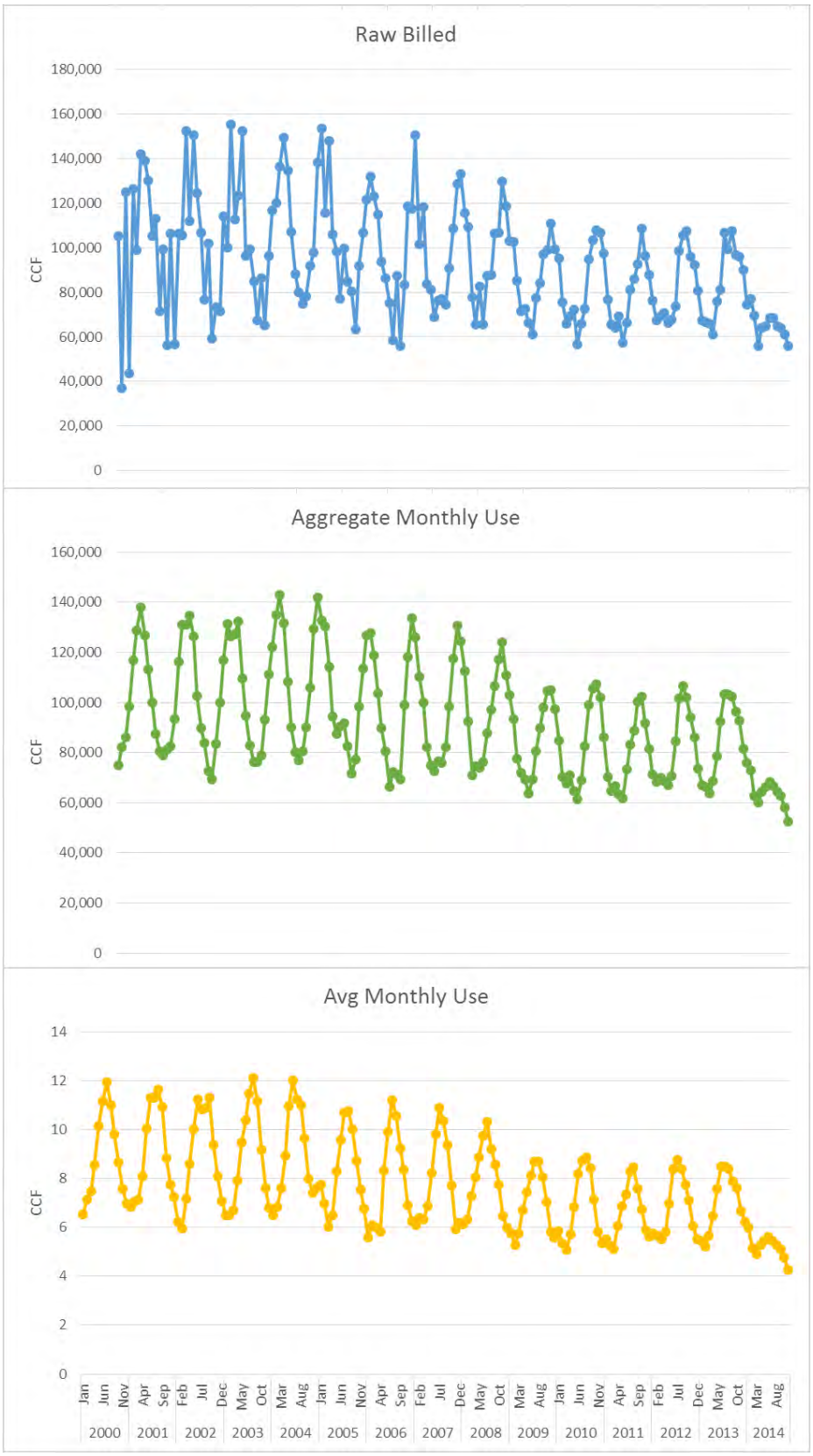
The estimated model yields a predicted value for adjusted monthly use, which we symbolize as $\widehat{\tilde{y}_{it}}$. The predicted value for observed average use, $\hat{y}_{it}$, is then given by:

$$\hat{y}_{it} = \widehat{\tilde{y}_{it}} - c_{it} \tag{18}$$

This adjustment is made to limit the confounding effect of passive conservation on the estimation of the other economic parameters (e.g. price, income, unemployment). Average monthly passive water savings over the estimation period were estimated using the Alliance for Water Efficiency's Water Conservation Tracking Tool. The conservation adjustment, c_{it}, and adjusted average monthly use from which the models were estimated, $\tilde{y}_{it}$, are given in Attachment 4.

[6] In Jan 2000, for example, 7,823 Inside City Single Family meters were read. In Feb 2000, only 3,004 meters were read. In March 2000, 9,529 meters were read, and so on.

Figure 1. Inside City Single Family Consumption Data



2.4 Model Estimation Results

The average demand models were estimated with R version 3.2 statistical software. Robust regression methods were applied to down-weight outlier consumption data. For customer classes that had both Inside City and Outside City customers (e.g. residential, business, irrigation, and golf) fixed effects models were estimated so that the data could be pooled. Estimation results as summarized by adjusted R-squared are shown in Table 3. Across all classes, the models explain 90% to 99% of the observed variation in the data. All statistically significant model coefficients have the expected signs and magnitudes. Estimation results for each customer class are provided in Attachment 5.

Table 3. Average Demand Model Estimation, Adjusted R-Square

Customer Class	Number of Observations	Adjusted R-Square
Single Family	358	0.917
Multi Family	351	0.900
Business	353	0.942
Municipal	177	0.951
Irrigation	358	0.916
Golf	352	0.988

2.4.1 Seasonal Load Shape

The seasonal load shape describes how monthly average demand changes over the year due to seasonal effects. Average demand is lower in the winter months and peaks in the summer months. However, the degree of difference between these periods varies by customer class depending on the extent of irrigation uses. Table 1 shows how the seasonal parameter estimates can be used to estimate a seasonal index for each customer class. The estimated seasonal indices are given in Table 4.[7] The indices express average monthly demand as a percentage of total annual demand. For example, from Table 4 it is seen that single family average demand in May is about 1.6 times greater than average demand in January. More generally, single family average demand in the summer months is a bit less than double winter average demand. Summer peaking for multi-family is much less pronounced, with summer average demand only about 20% greater than winter average demand. Business average demand mostly falls between single- and multi-family average demands. The municipal and irrigation classes show greater peaking than the residential or business categories, with summer average demand five to eight times greater than winter average demand.[8] Average demands by the two golf courses served by the City are almost entirely in the summer. There is very little golf course demand in the winter months.

[7] These have been expressed as average monthly share of total annual demand. Thus the 12 monthly values sum to 100.

[8] Summer peak demands have been greatly reduced during the current drought so that the differential between winter and summer average use has been almost erased. This is likely to be a transitory response to the drought. However, peak demand may not fully return to its historical pattern if the drought induces more drought-tolerant landscaping or the elimination of landscaped area within the service area.

Table 4. Seasonal Indices of Average Demand

	Inside City Seasonal Index [1/]					
Month	**SFR**	**MFR**	**BUS**	**MUN**	**IRR**	**GOLF**
Jan	6.0	7.6	7.0	3.1	2.0	0.0
Feb	5.9	7.7	7.2	3.1	2.1	0.0
Mar	6.1	7.6	7.3	3.5	2.9	0.0
Apr	7.1	7.9	7.8	6.8	6.9	2.2
May	9.5	8.8	8.9	10.6	10.8	8.5
Jun	10.6	9.2	9.7	13.0	13.7	16.6
Jul	11.3	9.3	10.3	14.8	15.0	19.7
Aug	11.1	9.2	10.2	15.2	14.4	21.4
Sep	10.4	8.9	9.1	12.2	13.4	17.1
Oct	8.6	8.5	8.3	9.1	9.9	11.2
Nov	7.0	7.9	7.3	5.3	5.8	2.7
Dec	6.3	7.6	6.9	3.4	3.2	0.7
	Outside City Seasonal Index [1/]					
Month	**SFR**	**MFR**	**BUS**	**MUN**	**IRR**	**GOLF**
Jan	6.0	7.4	7.0	NA	2.0	0.2
Feb	5.9	7.3	7.0	NA	2.1	0.3
Mar	6.1	7.4	7.2	NA	2.9	0.4
Apr	7.1	8.1	8.0	NA	6.9	3.9
May	9.5	8.7	8.7	NA	10.8	9.5
Jun	10.6	9.1	9.5	NA	13.7	15.3
Jul	11.3	9.4	9.8	NA	15.0	17.9
Aug	11.1	9.3	9.6	NA	14.4	19.3
Sep	10.4	9.1	9.3	NA	13.4	15.6
Oct	8.6	8.4	8.5	NA	9.9	11.3
Nov	7.0	8.0	7.8	NA	5.8	5.0
Dec	6.3	7.7	7.3	NA	3.2	1.2
1/ Average monthly share of total annual demand.						

2.4.2 Weather Effects

The average demand models include controls for the effects of weather – rainfall and temperature for residential and business classes and rainfall and ETo for municipal, irrigation, and golf classes. During model estimation, the weather component is interacted with seasonal indicators to estimate separate seasonal weather effects for fall-winter (Nov-Mar), spring (Apr-Jun), and summer-fall (Jul-Oct).[9] Estimated weather effects were found to be largest in the spring, when outdoor irrigation can be either accelerated or delayed depending on weather. Spring weather effects are statistically significant in

[9] The seasonal construct follows the CUWCC's GPCD weather normalization methodology (Western Policy Research, 2011).

every class model whereas they are not always statistically significant in the fall-winter or the summer-fall seasons. Table 5 shows the estimated weather parameters for each customer class. As would be expected, average demand is negatively correlated with rainfall and positively correlated with temperature and ETo. With the exception of the multi-family category, average monthly demand is also negatively correlated with lagged rainfall.

Table 5 shows that municipal, irrigation, and golf average demands are more weather sensitive than residential and business average demands. This is expected since outdoor water use makes up a larger share of average demand in these three customer classes. Multi-family demand is the least sensitive to weather.

Table 5. Statistically Significant Weather Parameters in Average Demand Models

Rainfall	**SFR**	**MFR**	**BUS**	**MUN**	**IRR**	**GOLF**
Fall-Winter (Nov-Mar)	-0.016	NS	NS	NS	-0.044[1/]	-0.129
Spring (Apr-Jun)	-0.069	-0.020	-0.034	-0.147	-0.116	-0.441
Summer-Fall (Jul-Oct)	-0.040	-0.018	-0.028	NS	-0.085	-0.038[1/]
Lagged 1 month	-0.034	NS	-0.017[2/]	-0.097	-0.166	-0.546
Lagged 2 months	-0.026	NS	NS	-0.063	-0.090	-0.074[1/]
Temperature						
Fall-Winter (Nov-Mar)	0.203	0.100[1/]	0.243	NA	NA	NA
Spring (Apr-Jun)	0.422	0.338	0.400	NA	NA	NA
Summer-Fall (Jul-Oct)	0.636	NS	NS	NA	NA	NA
ETo						
Fall-Winter (Nov-Mar)	NA	NA	NA	0.516	0.509	1.135
Spring (Apr-Jun)	NA	NA	NA	0.804	0.660	0.173[1/]
Summer-Fall (Jul-Oct)	NA	NA	NA	0.357	0.163	0.792
1/ Correct sign but not statistically significant. 2/ Apr-Jun only. NA = Not applicable. NS= Not statistically different from 0.						

Using equations (7) and (8), the effect of a given change in a weather measure on average demand can be calculated using the parameter estimates in Table 5. An example is provided in Table 6, which shows the percentage effect on average demand in January, April, and July, given weather that is one standard deviation above the average for the month. Note that in Table 6 the percentage effect for each weather measure is being calculated independently of the other weather measures to show their relative impact. When doing weather normalization or forecasting, the weather effects need to be combined. For example, if in April, rainfall was one standard deviation above its average and temperature was one standard deviation below its average (i.e., April is wet and cool), the combined effect on single-family demand would be -5.3%.[10]

The estimated weather parameters in Table 5 can also be used to weather normalize historical average demand using equations (10) and (11). An example is provided in Table 7. It shows the estimated

[10] This presumes average lagged rainfall. In this example and in Table 6 the effect of lagged rainfall is being ignored for sake of simplicity.

monthly weather effects and weather normalization factors for the single family and irrigation classes for water year (WY) 2011. Rainfall in WY 2011 was above average in most months and the spring, in particular, was unusually wet. WY 2011 was also cooler than normal in every month. As shown in the table, above average rainfall and below average temperature (and ETo) had a negative effect on average demand. The effect is more pronounced in the irrigation class than in the single family class, but in both cases the effect is substantial, especially in the May-August period.

Table 6. Percentage Effect on Average Demand if Weather Measure is 1 S.D. above its Average

Rainfall	**SFR**	**MFR**	**BUS**	**MUN**	**IRR**	**GOLF**
Jan	-0.9%	NS	NS	NS	NS	-7.0%
Apr	-3.2%	-0.9%	-1.6%	-6.6%	-5.3%	-18.6%
Jul	-0.5%	-0.2%	-0.4%	NS	-1.1%	-1.6%
Temperature						
Jan	1.1%	NS	1.3%	NA	NA	NA
Apr	2.1%	1.7%	2.0%	NA	NA	NA
Jul	3.7%	NS	NS	NA	NA	NA
ETo						
Jan	NA	NA	NA	10.8%	10.6%	25.3%
Apr	NA	NA	NA	10.1%	8.3%	2.1%
Jul	NA	NA	NA	3.1%	1.4%	6.9%

Note: Rainfall effect is only for change in contemporaneous rainfall. Effects of lagged rainfall are not shown in the table.

Table 7. Single Family and Irrigation Class Monthly Weather Effects for WY 2011

	Monthly Weather Measures				SFR Weather Parameters				Weather Effect [1/]	Normalization Factor [2/]
WY 2011	dlR_t	dlR_{t-1}	dlR_{t-2}	dlT_t	dlR_t	dlR_{t-1}	dlR_{t-2}	dlT_t		
Oct-10	0.707	-0.142	0.088	-0.042	-0.040	-0.034	-0.026	0.636	0.95	1.05
Nov-10	0.460	0.707	-0.142	-0.021	-0.016	-0.034	-0.026	0.203	0.97	1.03
Dec-10	0.826	0.460	0.707	-0.024	-0.016	-0.034	-0.026	0.203	0.95	1.05
Jan-11	-0.483	0.826	0.460	0.039	-0.016	-0.034	-0.026	0.203	0.98	1.02
Feb-11	0.312	-0.483	0.826	-0.038	-0.016	-0.034	-0.026	0.203	0.98	1.02
Mar-11	1.180	0.312	-0.483	-0.042	-0.016	-0.034	-0.026	0.203	0.97	1.03
Apr-11	-0.400	1.180	0.312	-0.010	-0.069	-0.034	-0.026	0.422	0.98	1.03
May-11	0.481	-0.400	1.180	-0.031	-0.069	-0.034	-0.026	0.422	0.94	1.07
Jun-11	1.028	0.481	-0.400	-0.068	-0.069	-0.034	-0.026	0.422	0.90	1.11
Jul-11	0.080	1.028	0.481	-0.018	-0.040	-0.034	-0.026	0.636	0.94	1.06
Aug-11	-0.027	0.080	1.028	-0.065	-0.040	-0.034	-0.026	0.636	0.93	1.07
Sep-11	-0.056	-0.027	0.080	-0.027	-0.040	-0.034	-0.026	0.636	0.98	1.02
	Monthly Weather Measures				IRR Weather Parameters				Weather Effect	Normalization Factor
WY 2011	dlR_t	dlR_{t-1}	dlR_{t-2}	$dlET_t$	dlR_t	dlR_{t-1}	dlR_{t-2}	$dlET_t$		
Oct-10	0.707	-0.142	0.088	-0.165	-0.085	-0.166	-0.090	0.163	0.93	1.07
Nov-10	0.460	0.707	-0.142	0.048	-0.044	-0.166	-0.090	0.509	0.90	1.11
Dec-10	0.826	0.460	0.707	-0.337	-0.044	-0.166	-0.090	0.509	0.71	1.42
Jan-11	-0.483	0.826	0.460	0.194	-0.044	-0.166	-0.090	0.509	0.94	1.06
Feb-11	0.312	-0.483	0.826	0.156	-0.044	-0.166	-0.090	0.509	1.07	0.93
Mar-11	1.180	0.312	-0.483	-0.120	-0.044	-0.166	-0.090	0.509	0.89	1.13
Apr-11	-0.400	1.180	0.312	0.016	-0.116	-0.166	-0.090	0.660	0.85	1.18
May-11	0.481	-0.400	1.180	0.022	-0.116	-0.166	-0.090	0.660	0.92	1.08
Jun-11	1.028	0.481	-0.400	-0.108	-0.116	-0.166	-0.090	0.660	0.79	1.26
Jul-11	0.080	1.028	0.481	0.057	-0.085	-0.166	-0.090	0.163	0.81	1.24
Aug-11	-0.027	0.080	1.028	-0.149	-0.085	-0.166	-0.090	0.163	0.88	1.14
Sep-11	-0.056	-0.027	0.080	-0.060	-0.085	-0.166	-0.090	0.163	0.99	1.01
1/ Calculated with equation (10). 2/ The inverse of the weather effect, per equation (11).										

2.4.3 Economic Effects

The estimated economic parameters are summarized in Table 8. The price and income parameters are elasticities, which measure the percentage change in average demand given a one percent change in price or income. For example, a one percent increase in price would be expected to cause 0.075 and 0.139 percent decreases in winter and summer single family demands, respectively. Similarly, a one percent increase in price would be expected to result in 0.237 and 0.545 percent decreases in municipal and irrigation average demands, respectively.

The estimated price responses for single family are significantly lower than what the interim WSAC forecast assumed: -0.15 versus -0.075 for winter and -0.30 versus -0.139 for summer.[11] However, the estimated price responses for multi-family and business (inside city) are essentially identical to what was assumed in the interim forecast: -0.12 for multi-family and -0.10 for business. Outside city business use showed significantly more price response. As discussed in the next section, it also showed greater response to drought restriction.

[11] In terms of an average annual price response, the interim WSAC forecast assumed an elasticity of -0.24 whereas the econometric analysis indicates the true value is in the neighborhood of -0.11.

The estimated income elasticity for the single family customer class is also very close to the 0.25 assumption used in the interim WSAC forecast. Thus, the econometric analysis mostly confirms the price and income elasticity assumptions used to prepare the interim WSAC demand forecast. Table 8 also confirms the expectation that the magnitude of price response is positively correlated with outdoor irrigation water use. The Pasatiempo golf course is an exception to this general finding. Its price response was not statistically different from zero. Perhaps this is because it is a top tier course and has a substantially higher willingness to pay for water than other irrigators.

Table 8. Economic Parameter Estimates

Parameter	SFR	MFR	BUS	MUN	IRR	GOLF
Price	winter: -0.075 Summer: -0.139	-0.124	Inside City: -0.099 Outside City: -0.262	-0.237	-0.545	-0.358[1/]
Income	0.228					
Vacancy		-0.164				
Unemployment			-0.160	-0.142		
1/Delaveaga price response. Pasatiempo price response not statistically significant.						

The vacancy and unemployment rate parameters measure the effect that deviations from normal have on average demand. That is, how average demand is expected to change if the vacancy or unemployment rate is above or below its long-term average. Both parameters are negative, as expected. A higher rate of vacancy is expected to decrease average multi-family demand. Likewise, a higher rate of unemployment is expected to decrease average business demand. The effect of a departure from normal on average demand can be calculated in the same manner that temperature (or ETo) effects are calculated, per equation (8). For example, a 50% increase in the unemployment rate from its long-term average would be expected to reduce average business demand by approximately 6.4% and municipal demand by approximately 5.6%.[12] Similarly, a vacancy rate that is 20% above its long-term average would be expected to decrease average multi-family demand by about 2.9%.

2.4.4 Drought Effects

The model's drought component uses an indicator variable for each drought stage that takes the value of one if the drought stage was in effect and zero otherwise. The months in which each drought stage was in effect during the model estimation period are shown in Attachment 6. The estimated drought stage parameters are shown in Table 9.

[12] For business, the effect is calculated as $1.5^{-0.16} - 1 = 0.0643$; while for municipal the effect is calculated as $1.5^{-0.142} - 1 = 0.0559$.

Table 9. Estimated Drought Stage Parameters

Parameter	SFR	MFR	BUS	MUN	IRR	GOLF
Stage 1	-0.051	-0.009 1/	NS	NS	-0.077 1/	NS
Stage 2	-0.071	-0.028	NS	-0.108	-0.250	NS
Stage 3	-0.431	-0.192	Inside City: -0.123 Outside City: -0.191	-0.621	-0.930	-0.319
NS = not statistically different from zero. 1/ correct sign but not statistically different from zero.						

The average percentage effect of a drought stage on average demand is estimated by exponentiating the parameter estimates in Table 9 and subtracting one from the result. Thus, the expected reduction in single family average demand during a Stage 1 drought restriction is $e^{-0.051} - 1 = -0.0497$, or about 5%. Table 10 shows the estimated average change in monthly demand by drought stage and customer class.

Table 10. Percent Reduction in Average Demand by Drought Stage and Customer Class

Stage	SFR	MFR	BUS	MUN	IRR	GOLF
Stage 1	-5%	-1% 1/	NS	NS	-7% 1/	NS
Stage 2	-7%	-3%	NS	-10%	-22%	NS
Stage 3	-35%	-17%	Inside City: -12% Outside City: -17%	-46%	-61%	-27%
NS = not statistically different from zero. 1/ correct sign but not statistically different from zero.						

2.5 Forecasts of Average Demand by Customer Class

Class-level forecasts of average demand derived from the econometric models are shown in Table 11. These forecasts are based on the water rate and income growth assumptions developed for the interim WSAC demand forecast and have been adjusted for plumbing code and Program A water savings. The water rate and income growth forecasts are provided in Attachment 7. The plumbing code and Program A water savings forecasts are provided in Attachment 8. The forecasts in Table 11 assume normal weather and economic conditions.[13] The 95% confidence interval for each forecast is shown in the column to the right of the forecast.[14]

[13] This means the weather, unemployment rate, and housing vacancy rate variables are set to their long-term average values in the forecast.

[14] Given a vector of forecast inputs, $\mathbf{x}_0$, the predicted mean response, y_0, is $y_0 = \mathbf{x}_0'\mathbf{b}$, where $\mathbf{b}$ is the vector of estimated model coefficients. The 100(1-α)% confidence interval for the expected value of the mean response is $\pm t_c(\frac{\alpha}{2}, n-p-1)\sqrt{\hat{\sigma}^2 \mathbf{x}_0'(\mathbf{X}'\mathbf{W}\mathbf{X})^{-1}\mathbf{x}_0}$, where $\mathbf{X}$ is the n x p design matrix used to estimate the model, $\mathbf{W}$ is the n x n diagonal matrix of estimation weights, $\hat{\sigma}$ is the estimated standard error of the model, n is the number of

The predicted decreases in residential and business average use over the forecast period is due to the combination of plumbing code and Program A water savings and the effects of increasing water rates. Higher water costs are the primary factor in the predicted decreases for municipal and irrigation average uses. The predicted decrease in average golf use reflects both a response to higher water costs and the expected decrease in acreage irrigated with City water at the Pasatiempo golf course.[15]

The 95% confidence intervals are generally in the ± 3 to 10% range. The confidence intervals for golf are an exception. They are wider because of the significant within-month variation in water use over the model estimation period. The increasing width of all the intervals over the forecast horizon is a reflection of the greater uncertainty associated with outer years of the forecast.[16]

Table 11. Forecasted Average Demand by Customer Class (CCF/Year)

YEAR		2013	2020		2025		2030		2035	
	Per	Actual [1/]	Forecast	CI	Forecast	CI	Forecast	CI	Forecast	CI
Single Family	Housing Unit	87	86	± 3	83	± 3	80	± 4	78	± 4
Multi Family	Housing Unit	53	56	± 2	52	± 2	50	± 2	49	± 3
Business	Service	405	400	± 12	389	± 12	382	± 13	377	± 13
Municipal	Service	388	296	± 26	290	± 27	283	± 29	277	± 30
Irrigation	Service	365	286	± 28	271	± 28	257	± 28	244	± 28
Golf	Acre	990	671	± 130	641	± 134	606	± 137	593	± 144

1/ Actual use, unadjusted for weather or economy. Stage 1 drought water use restrictions in effect May - Dec.

CI = 95% confidence interval.

observations, p is the number of parameter estimates, and t_c is the t-distribution critical value given n-p-1 degrees of freedom.

[15] Average golf use in Table 11 is an acreage-weighted average of the two golf courses the City serves. Historically, Pasatiempo average water use per acre has been greater than Delaveaga. Therefore, as Pasatiempo's share of total golf acreage irrigated with City water decreases over the forecast, average use per acre also decreases.

[16] The confidence intervals only reflect uncertainty in the estimate of adjusted average use, $\widehat{\bar{y}_{it}}$, which is derived from the econometric models. The DSS model, which generated the forecast of plumbing code and Program A water savings, is not a statistical model and forecast errors cannot be derived from its output. The confidence intervals in Table 11 therefore are implicitly assuming 100% accuracy in the plumbing code and Program A water savings forecasts.

3 FORECASTS OF POPULATION, HOUSING, AND SERVICES

3.1 APPROACH

The population and housing unit forecasts are based on the AMBAG 2014 Regional Growth Forecast (AMBAG 2014). The forecasts of business and irrigation services are in turn driven by the residential forecasts. Currently, Water Department staff do not expect appreciable growth in the number of municipal services. Municipal services are therefore assumed to remain at their current number throughout the forecast period.

3.2 FORECAST DEVELOPMENT

3.2.1 Population

The forecast of service area population is divided into its inside-city and outside-city components. The inside-city component comes directly from the AMBAG 2014 Regional Growth Forecast (AMBAG 2014) and is inclusive of the UCSC population. The outside-city component was derived by Water Department staff using data from the 2014 Regional Growth Forecast. The component population forecasts and total service area population forecast are shown in Table 12.

Table 12. Service Area Population Forecast

	2010 [1/]	2020	2025	2030	2035
Inside-City [2/]	59,946	66,860	70,058	73,375	76,692
Outside-City [3/]	31,342	32,543	33,562	34,614	35,698
Service Area	91,288	99,403	103,620	107,989	112,390

Notes:
1/ Actual per 2010 Census
2/ AMBAG 2014 Regional Growth Forecast (adopted June 11, 2014). Includes UCSC population.
3/ Developed by Water Department Staff from 2014 Regional Growth Forecast data.

3.2.2 Housing Units

The forecast of occupied housing units is calculated by dividing the population in households by average household size. This is the same methodology AMBAG uses, but we use our own forecast of population in households.[17]

For the inside-city portion of the service area, the population in households is the total inside-city population from Table 12 less the UCSC campus population and the off campus population in group quarters. AMBAG's student enrollment forecast is multiplied by the ratio of students living on campus to total enrollment to get the UCSC campus population estimate (see Attachment 9). The ratio of group quarters population to total (non-campus) population is then multiplied by total (non-campus)

[17] We use our own forecast for two reasons. First, the AMBAG forecast only covers the inside-city (i.e. City of Santa Cruz) portion of the service area. Second, AMBAG's City of Santa Cruz housing unit forecast incorrectly equates student enrollment with campus population, causing it to underestimate off-campus housing units.

population to get the group quarters population estimate.[18] The household population is the residual population. These calculations are shown in Table 13 for the inside-city portion of the service area.

The same approach is used to forecast household population for the outside-city portion of the service area, except that no adjustment for campus population is required. Table 14 gives the outside-city household population forecast.

Table 13. Inside-City Household Population Forecast

	2010 [1/]	**2020**	**2025**	**2030**	**2035**
Total Population	59,946	66,860	70,058	73,375	76,692
Adjustments					
Campus population [2/]	7,331	8,845	9,602	10,359	11,116
Group quarters [3/]	1,904	2,099	2,188	2,280	2,373
Non-household population	9,235	10,944	11,790	12,639	13,489
Population In households [4/]	50,711	55,916	58,268	60,736	63,203

Notes
1/ Actual per 2010 Census.
2/ See Attachment 9 for calculation.
3/ Ratio of group quarters population to total (non-campus) population from 2010 Census multiplied by total (non-campus) population.

Table 14. Outside-City Household Population Forecast

	2010 [1/]	**2020**	**2025**	**2030**	**2035**
Total Population	31,342	32,543	33,562	34,614	35,698
Group quarters adjustment [2/]	665	690	712	734	757
Population In households	30,677	31,853	32,850	33,880	34,941

Notes
1/ Actual per 2010 Census
2/ Ratio of group quarters population to total population from 2010 Census multiplied by total population.

Total occupied housing units are then estimated by dividing household population by average household size. Average household size starts with the 2010 Census estimate, which is then scaled to increase at the same rate as average household size in the AMBAG 2014 Regional Growth Forecast. The forecast of

[18] The ratio of within-city population in group quarters to total population (excluding campus population) is calculated from 2010 Census data. This ratio is approximately 0.0362, or 3.62% of the population.

total occupied housing units for the inside- and outside-city portions of the service are shown in Table 15.[19]

Table 15. Forecast of Occupied Housing Units

	2010 1/	2020	2025	2030	2035
Household Population					
Inside-City	50,711	55,916	58,268	60,736	63,203
Outside-City	30,677	31,853	32,850	33,880	34,941
Average Household Size 2/					
Inside-City	2.34	2.38	2.41	2.42	2.44
Outside-City	2.39	2.43	2.46	2.46	2.48
Occupied Housing Units					
Inside-City	21,657	23,492	24,177	25,136	25,925
Outside-City	12,856	13,132	13,376	13,759	14,064

Notes
1/ Actual per 2010 Census
2/ Average household size starts with the 2010 Census estimate, which is then scaled to increase at the same rate as average household size in the AMBAG 2014 Regional Growth Forecast.

The last step in the forecast of service area housing units is to allocate total housing units between single-family and multi-family units. This is shown in Table 16. It starts with the Water Department's 2014 estimates of housing units calculated from its billing data. Single-family housing units are then increased at their historical growth rate. In the case of inside-city single-family housing, growth is capped at 1,000 units based on the General Plan's estimate of potential for new single family housing.[20] No cap is applied to the outside-city forecast. Multi-family units are then the difference between the forecast of total units and single-family units. For the inside-city portion of the service area, three-fourths of the gain in housing units is in the multi-family category. For the outside-city portion of the service area, a little less than half of the gain is in the multi-family category. For the whole service area, more than two-thirds of the gain in housing units is in the multi-family category.

Total housing units shown for the inside-city portion of the service area in Table 16 calibrates exactly to the total shown in Table 15. This is not the case for the outside-city total in Table 16. There is a discrepancy between Water Department data on total outside-city housing units in 2014 and the forecast of occupied housing units in Table 15. The Water Department's estimate is higher by several hundred housing units. The water demand forecast uses the housing unit forecasts shown in Table 16.[21]

[19] Occupied housing units rather than total housing units are used to forecast water demand because it is assumed that water use in vacant units is negligible.
[20] The General Plan, which extends to 2030, identified a potential for 840 new single family units. This was increased to 1000 units since this forecast runs to 2035.
[21] The outside-city housing unit forecast in Table 16 assumes the same rate of growth in the housing stock as the forecast in Table 15, but starts with the Water Department's higher estimate of housing units in 2014.

Table 16. Service Area Single-Family and Multi-Family Housing Unit Forecast

	2014 [1/]	2020	2025	2030	2035	Gain From 2014	% of Gain
Inside-City							
Single Family	12,246	12,534	12,780	13,030	13,246	1,000	24%
Multi Family	9,583	10,958	11,398	12,106	12,679	3,096	76%
Subtotal	21,829	23,492	24,177	25,136	25,925	4,096	
Outside-City							
Single Family	6,743	6,922	7,074	7,230	7,390	647	52%
Multi Family	7,901	7,910	8,033	8,310	8,495	594	48%
Subtotal	14,644	14,832	15,107	15,540	15,884	1,240	
Service Area							
Single Family	18,989	19,456	19,854	20,260	20,636	1,647	31%
Multi Family	17,484	18,868	19,431	20,416	21,174	3,690	69%
Total	36,473	38,324	39,284	40,676	41,809	5,336	

Notes
1/ Actual per Water Department billing records.

3.2.3 Non Residential Services and City-Irrigated Golf Acreage

The forecast of business services is based on the ratio of business to residential water use. Historically this ratio has averaged about 0.295 with very little variation (see Figure 2). The number of new business services is forecast such that the ratio of business to residential water use is maintained at 0.295 over the forecast period. This results in a gain of 166 new business services between 2013 and 2035.[22]

As seen in Figure 3, there is a strong relationship between growth in irrigation services and growth in multi-family and business services. On average, 0.6 irrigation services are added for each new multi-family or business service. This growth factor is used with the forecast of multi-family and business services to project new irrigation services over the forecast horizon.

The City is currently the sole water sources for the Delaveaga and Pasatiempo golf courses. This is not forecast to change for Delaveaga. However, interviews with Pasatiempo staff indicate it has plans to reduce its reliance of City water starting this year. It expects to irrigate not more than 40 acres with City

[22] As a check on the forecast, it is noted that over the 18 year period 1996-2013, there was a gain of 120 business services. Extending this rate of growth to 22 years to match the length of our forecast would results in 147 new services, which is very close to the forecast of 166 new services for the 22 year period 2013 to 2035.

water by 2020 and not more than 20 acres by 2030. It currently irrigates about 67.5 acres with City water.

The forecasts of non-residential services and City-irrigated golf acreage are given in Table 17.

Table 17. Forecast of Non-Residential Services and City-Irrigated Golf Acreage

	2013 [1/]	2020	2025	2030	2035	Gain From 2013
Business [2/]	1,889	1,948	1,971	2,008	2,055	166
Municipal [3/]	218	218	218	218	218	0
Irrigation [4/]	452	651	723	845	951	499
Golf						
Delaveaga	79	79	79	79	79	0
Pasatiempo	68	40	30	20	20	-48
Total Golf	146	119	109	99	99	-48

Notes

1/ Actual per Water Department billing records.

2/ Based on ratio of business to residential demand.

3/ No expected growth in number of municipal services.

4/ Based on historical rate of gain in irrigation services per gain in multi-family and business services.

Figure 2. Ratio of Business to Residential Water Demand: 1999-2013

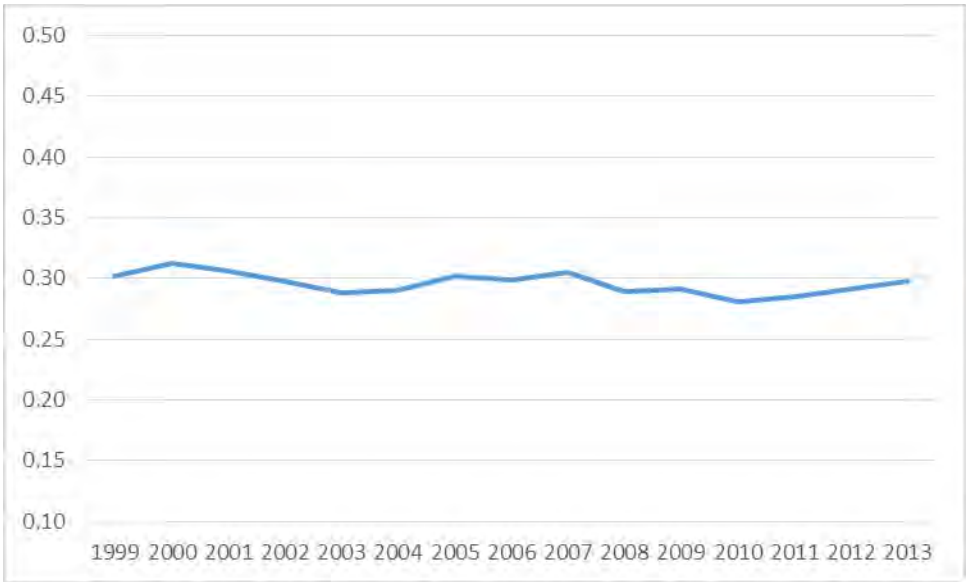
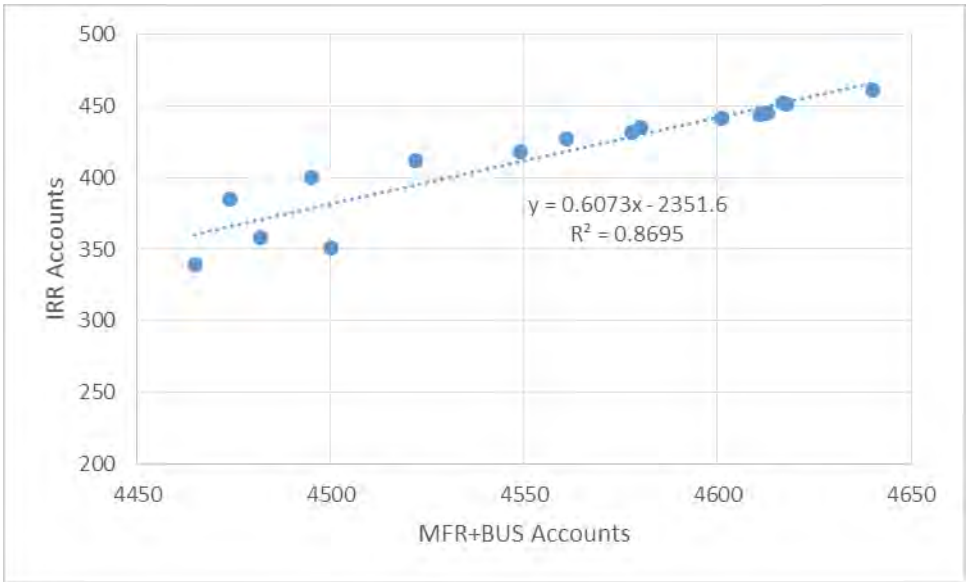


Figure 3. Irrigation vs Multi-Family + Business Accounts: 1999-2013



4 FORECASTS OF WATER DEMAND

4.1 APPROACH

4.1.1 Class Demands other than Industrial and UCSC

The approach to the forecast of customer class demands other than industrial and UCSC is straightforward. The class average use forecasts from Table 11 are multiplied by their respective housing unit, service, or acreage forecasts from Tables 16 and 17 to yield the class-level demand forecasts. Lower and upper bounds are put on the forecasts using the confidence intervals in Table 11. In all cases, the forecasts are assuming normal economic conditions, average weather, and no drought or other restrictions on customer water use.

4.1.2 Industrial and UCSC Demands

There is a strong relationship between Santa Cruz County manufacturing employment and industrial water demand. This relationship is illustrated in Figure 4. Prior to the recession, annual industrial demand increased by 11.9 CCF per manufacturing job, on average. Immediately after the recession this increased to about 38.3 CCF per job. We use the pre-recession rate with a forecast of manufacturing employment in Santa Cruz County to project future industrial water demand. The pre-recession rate of water use per job is used because it does not include the transitory effects of the economic recovery. The 95% confidence interval for the water use per job parameter is used to produce the lower and upper bound forecasts.[23] The Caltrans forecast of manufacturing employment for Santa Cruz County is used to forecast industrial water use. The California Employment Development Department also has a forecast of manufacturing employment, but this forecast extends only to 2022. However, the two forecasts are consistent. The forecast of industrial demand is given in Table 18.

Table 18. Industrial Demand Forecast

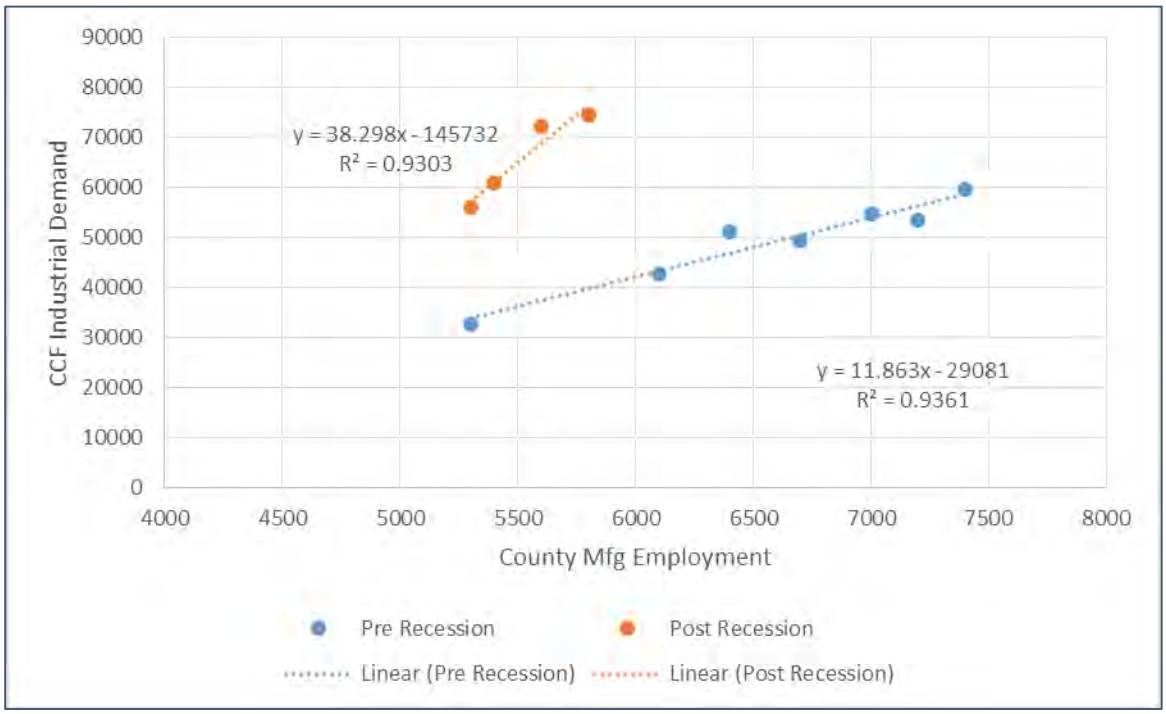
	2013 1/	2020	2025	2030	2035
Mfg Employment Forecast					
Cal Trans		5,900	6,200	6,400	6,500
Industrial Water Demand (MG)					
Low	56	56	58	59	60
Primary	56	57	59	61	62
High	56	57	60	63	64

Notes

1/ Actual per Water Department billing records.

[23] The 95% confidence interval is [8.4, 15.3]. The data and model output are provided in Attachment 10.

Figure 4. Industrial Demand vs County Manufacturing Employment



The forecast of UCSC demand is the same as in the interim WSAC demand forecast. The interim forecast was based on a linear projection of the UCSC demand requirement under its LRDP, assuming two alternative buildout dates. In both cases, buildout demand is 349 MGY. In the lower bound forecast, buildout occurs in 2050. In the upper bound forecast it occurs in 2035. The primary forecast is the midpoint between the lower and upper bound forecasts. The forecast of UCSC demand is given in Table 19. The primary forecast almost exactly replicates a forecast based on projected enrollment and average rates of water use per student.[24]

Table 19. UCSC Water Demand Forecast

	2013 [1/]	**2020**	**2025**	**2030**	**2035**
Low	182	186	213	240	268
Primary	182	196	234	271	308
High	182	207	254	302	349

Notes

1/ Actual per Water Department billing records.

[24] The enrollment-based approach yields a 2035 demand of 304 MG, which differs from the primary forecast by less than 2%.

4.1.3 System Production

System production is calculated as the sum of the demand forecasts plus miscellaneous uses and system losses, which are estimated at 7.5% of total production. The 7.5% rate of system loss and miscellaneous use is based on historical rates of system loss.

4.2 Class Demands and System Production Forecasts

Complete summaries of the primary, lower, and, upper bound forecasts of class demands and system production are provided in Tables 20, 21, and 22, respectively.

Table 20. Primary Forecast of Class Demands and System Production

YEAR		2020	2025	2030	2035
		Forecast	Forecast	Forecast	Forecast
Service Units	**Units**				
SFR	Housing Units	19,456	19,854	20,260	20,636
MFR	Housing Units	18,867	19,430	20,416	21,174
BUS	Services	1,948	1,971	2,008	2,055
IND	NA	NA	NA	NA	NA
MUN	Services	218	218	218	218
IRR	Services	651	723	845	951
GOLF	Acres	119	109	99	99
UC	NA	NA	NA	NA	NA
Avg Demand	**Units**				
SFR	CCF	86	83	80	78
MFR	CCF	56	52	50	49
BUS	CCF	400	389	382	377
IND	NA	NA	NA	NA	NA
MUN	CCF	296	290	283	277
IRR	CCF	286	271	257	244
GOLF	CCF	671	641	606	593
UC	NA	NA	NA	NA	NA
Annual Demand	**Units**				
SFR	MG	1,256	1,228	1,208	1,196
MFR	MG	792	759	766	775
BUS	MG	583	573	575	580
IND	MG	57	59	61	62
MUN	MG	48	47	46	45
IRR	MG	139	147	163	174
GOLF	MG	60	52	45	44
UC	MG	196	234	271	308
Total Demand	**MG**	**3,131**	**3,099**	**3,134**	**3,184**
MISC/LOSS	MG	254	251	254	258
Total Production	**MG**	**3,385**	**3,351**	**3,388**	**3,442**
Rounded	**MG**	**3,400**	**3,400**	**3,400**	**3,400**

Table 21. Lower Bound Forecast of Class Demands and System Production

YEAR		**2020**	**2025**	**2030**	**2035**
		Forecast	Forecast	Forecast	Forecast
Service Units	**Units**				
SFR	Housing Units	19,456	19,854	20,260	20,636
MFR	Housing Units	18,867	19,430	20,416	21,174
BUS	Services	1,948	1,971	2,008	2,055
IND	NA	NA	NA	NA	NA
MUN	Services	218	218	218	218
IRR	Services	651	723	845	951
GOLF	Acres	119	109	99	99
UC	NA	NA	NA	NA	NA
Avg Demand	**Units**				
SFR	CCF	83	79	76	74
MFR	CCF	54	50	48	46
BUS	CCF	389	377	370	364
IND	NA	NA	NA	NA	NA
MUN	CCF	271	264	256	248
IRR	CCF	260	245	231	218
GOLF	CCF	553	521	485	466
UC	NA	NA	NA	NA	NA
Annual Demand	**Units**				
SFR	MG	1,208	1,178	1,155	1,142
MFR	MG	764	728	731	736
BUS	MG	567	556	556	560
IND	MG	56	58	59	60
MUN	MG	44	43	42	40
IRR	MG	126	133	146	155
GOLF	MG	49	42	36	35
UC	MG	186	213	240	268
Total Demand	**MG**	**3,001**	**2,951**	**2,965**	**2,995**
MISC/LOSS	MG	243	239	240	243
Total Production	**MG**	**3,244**	**3,190**	**3,206**	**3,238**
Rounded	**MG**	**3,200**	**3,200**	**3,200**	**3,200**

Table 22. Upper Bound Forecast of Class Demands and System Production

YEAR		**2020**	**2025**	**2030**	**2035**
		Forecast	Forecast	Forecast	Forecast
Service Units	**Units**				
SFR	Housing Units	19,456	19,854	20,260	20,636
MFR	Housing Units	18,867	19,430	20,416	21,174
BUS	Services	1,948	1,971	2,008	2,055
IND	NA	NA	NA	NA	NA
MUN	Services	218	218	218	218
IRR	Services	651	723	845	951
GOLF	Acres	119	109	99	99
UC	NA	NA	NA	NA	NA
Avg Demand	**Units**				
SFR	CCF	90	86	83	81
MFR	CCF	58	54	53	52
BUS	CCF	412	401	395	391
IND	NA	NA	NA	NA	NA
MUN	CCF	323	318	313	308
IRR	CCF	315	300	287	274
GOLF	CCF	814	790	758	754
UC	NA	NA	NA	NA	NA
Annual Demand	**Units**				
SFR	MG	1,305	1,280	1,262	1,253
MFR	MG	820	792	803	816
BUS	MG	601	591	594	601
IND	MG	57	60	63	64
MUN	MG	53	52	51	50
IRR	MG	153	162	181	195
GOLF	MG	72	64	56	56
UC	MG	207	254	302	349
Total Demand	**MG**	**3,268**	**3,255**	**3,311**	**3,383**
MISC/LOSS	MG	265	264	268	274
Total Production	**MG**	**3,533**	**3,519**	**3,580**	**3,658**
Rounded	**MG**	**3,500**	**3,500**	**3,600**	**3,700**

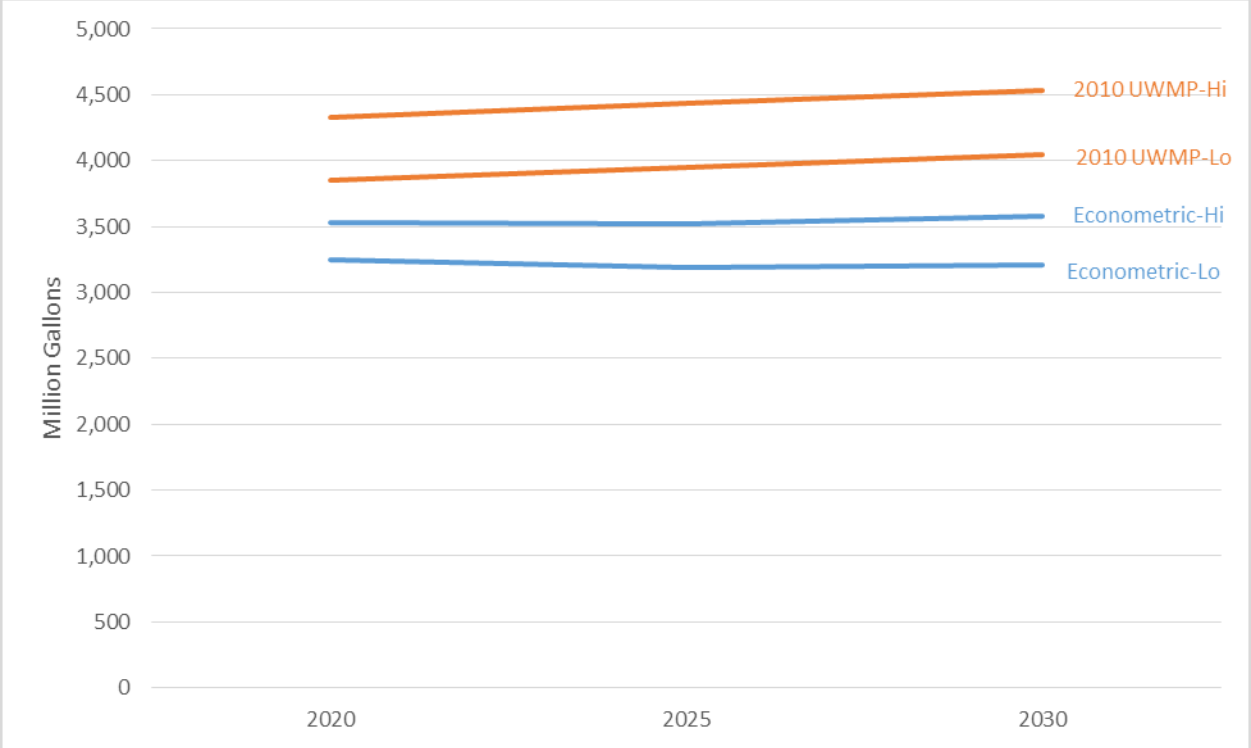
5 COMPARISON WITH PREVIOUS FORECASTS AND HISTORICAL PRODUCTION

5.1 2010 UWMP FORECAST

The 2010 UWMP included two water demand forecast scenarios that run to 2030. The lower scenario is based on class-level average water use for 2007-08. The higher scenario is based on class-level average water use for 1999-2004. Neither scenario makes adjustments for future effects of conservation or other economic factors on average water use. Each scenario uses the same service growth assumptions, which are tied to the City's General Plan 2030 buildout analysis and AMBAG's regional population forecasts. Importantly, both scenarios assume UCSC demands reach their buildout level of 349 MG by 2030, five years sooner than we assume in the upper bound forecast and 20 years sooner than we assume in the lower bound forecast.

Predicted future demand in both scenarios is significantly higher than the forecast presented in this report, as illustrated in Figure 5. The primary reasons for this are stated above: (1) not including adjustments for the effects of passive and active conservation and higher water rates on future water use and (2) the higher UCSC forecast. As shown in this report, future conservation and price effects are expected to be significant. Indeed, the econometric analysis shows that the effects of conservation and higher water rates have been working to reduce average demand for some time. These trends are predicted to continue. This plus the lower UCSC forecast explain the report's lower forecast compared to the 2010 UWMP forecast.

Figure 5. Comparison of Demand Forecast with 2010 UWMP Forecast

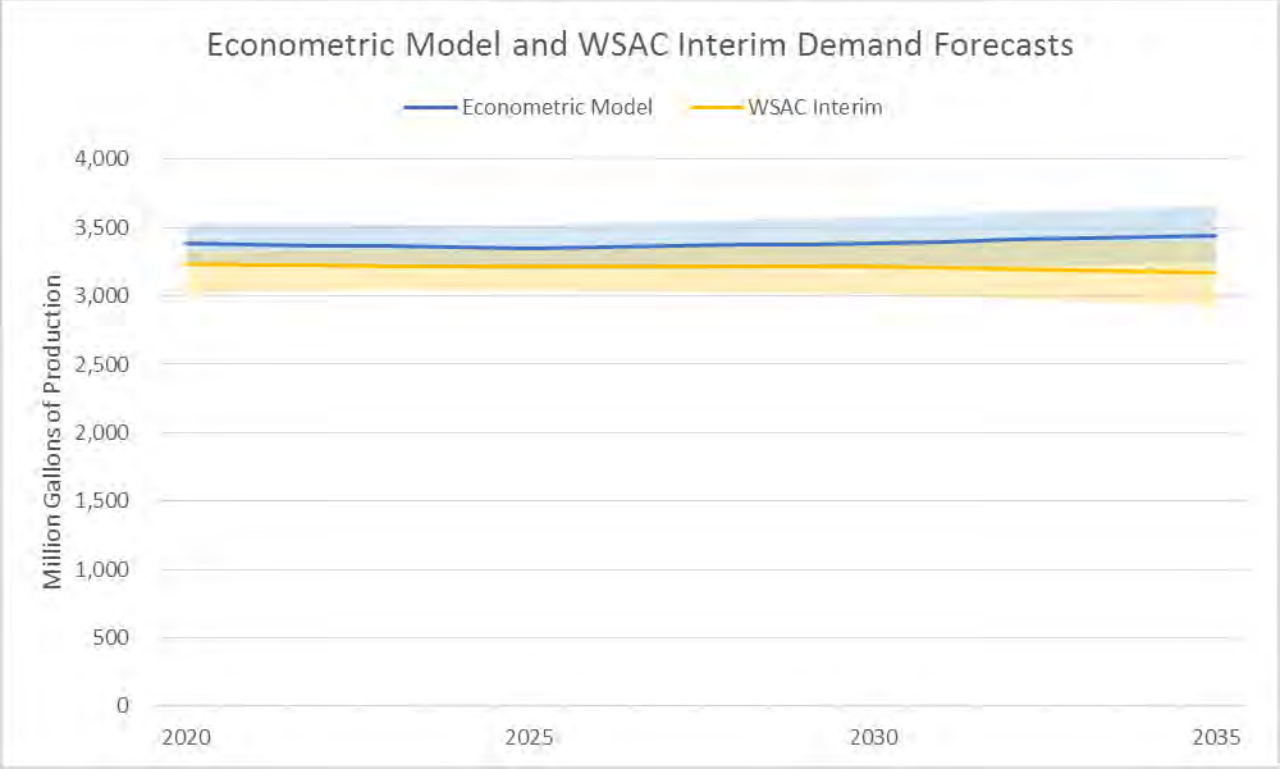


5.2 INTERIM WSAC DEMAND FORECAST

The WSAC interim demand forecast (M.Cubed, 2015b) was developed from the 2010 UWMP demand forecast by adjusting that forecast for future conservation and other economic effects and by replacing the UCSC demand forecast with the one in Table 19.

The WSAC Interim and econometric demand forecasts are compared in Figure 6. On average, the econometric demand forecast is approximately five and a half percent greater than the WSAC interim forecast. Figure 6 also shows the uncertainty band around each forecast – light blue for the econometric model forecast and light yellow for the WSAC interim forecast. The uncertainty band on the econometric forecast is based on the 95% confidence intervals for the class-level average use per service forecasts developed with the econometric models. The uncertainty band on the WSAC interim forecast is the range between the low and high interim forecasts. From Figure 6 it is seen that the econometric forecast represented by the dark blue line essentially tracks the upper-bound of the WSAC interim forecast while the WSAC interim forecast represented by the dark yellow line essentially tracks the lower-bound of the corrected econometric forecast. Between these two lines, the forecasts overlap. Future production in the range of 3,200 to 3,400 MGY is consistent with both forecasts.[25]

Figure 6. Comparison of Demand Forecast with Interim WSAC Demand Forecast

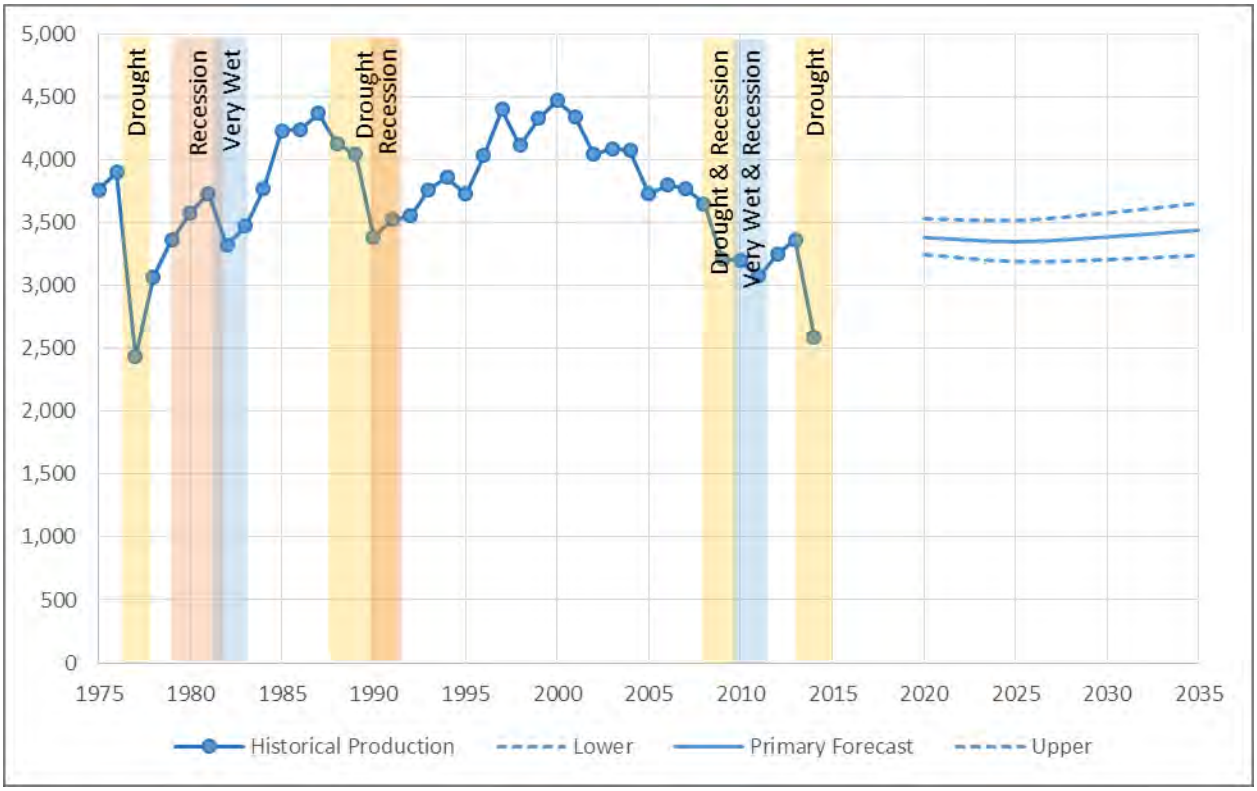


[25] A more conservative uncertainty band obtained by taking the union of the two forecasts suggests future production in the range of 3,000 to 3,500 MGY over most of the forecast period, with a slightly wider band in the last five years of the forecast.

5.3 HISTORICAL PRODUCTION

Figure 7 shows a comparison of historical production and the primary, lower, and upper bound forecasts. It is interesting to see how historical production has been influenced by weather and economic events. The forecast does not exhibit a similar degree of variability because it is based on average weather and normal economic conditions. In other words, it is a forecast of *expected future demand*. Realized future demand will certainly not be smooth like the forecast. It will vary about the expected value depending on year-to-year variation in future weather and economic conditions. The forecast, however, provides the baseline around which this variability is likely to occur.

Figure 7. Historical and Forecast Production in Millions of Gallons



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ATTACHMENT 1 MONTHLY ALLOCATION PERCENTAGES FOR AGGREGATED METER READ DATA

The customer class seasonal use indices in the following table were used to weight the monthly allocation percentages that were used to distribute the aggregated meter read data into consumption months. The season indices were taken from Weber Analytical (2010).

Seaonal Use Indices

Month	SFR	MFR	BUS	IRR/GOLF	MUNI
Jan	0.74	0.90	0.84	0.24	0.34
Feb	0.80	0.97	0.91	0.24	0.31
Mar	0.78	0.92	0.89	0.34	0.39
Apr	0.82	0.92	0.89	0.53	0.65
May	1.05	1.04	1.04	1.21	1.13
Jun	1.25	1.02	1.16	1.57	1.60
Jul	1.28	1.11	1.16	1.80	1.70
Aug	1.29	1.14	1.24	1.83	1.91
Sep	1.22	1.08	1.11	1.65	1.79
Oct	1.07	1.04	1.03	1.35	1.06
Nov	0.89	0.94	0.89	0.71	0.75
Dec	0.81	0.91	0.85	0.53	0.38
Total	12.00	12.00	12.00	12.00	12.00

The next two tables provide the monthly allocation percentages for aggregated meter read data from bi-monthly billing cycles.

	SFR			MFR			BUS		
	% Allocated to Month			% Allocated to Month			% Allocated to Month		
Read Month (t)	t-2	t-1	t	t-2	t-1	t	t-2	t-1	t
Jan	26%	52%	23%	24%	51%	25%	24%	51%	25%
Feb	25%	49%	26%	23%	51%	26%	23%	50%	26%
Mar	27%	48%	25%	27%	48%	24%	27%	48%	25%
Apr	23%	51%	26%	24%	51%	25%	24%	51%	25%
May	22%	47%	30%	24%	48%	27%	24%	48%	28%
Jun	18%	52%	30%	21%	53%	25%	20%	52%	28%
Jul	22%	52%	27%	25%	49%	27%	23%	51%	26%
Aug	23%	52%	25%	22%	52%	26%	23%	51%	26%
Sep	24%	52%	24%	23%	53%	24%	23%	54%	23%
Oct	27%	51%	22%	26%	50%	24%	28%	50%	23%
Nov	27%	52%	21%	25%	52%	23%	26%	52%	22%
Dec	29%	49%	22%	27%	49%	24%	28%	49%	23%

	IRR/GOLF			MUNI		
	% Allocated to Month			% Allocated to Month		
Read Month (t)	t-2	t-1	t	t-2	t-1	t
Jan	33%	55%	12%	38%	43%	19%
Feb	40%	40%	20%	26%	51%	23%
Mar	26%	42%	32%	28%	43%	29%
Apr	15%	49%	36%	17%	46%	37%
May	13%	41%	46%	14%	46%	40%
Jun	11%	55%	34%	13%	52%	35%
Jul	20%	51%	29%	19%	53%	28%
Aug	21%	53%	26%	22%	51%	28%
Sep	24%	53%	23%	22%	54%	24%
Oct	28%	51%	21%	29%	55%	16%
Nov	31%	55%	14%	36%	48%	16%
Dec	41%	43%	16%	36%	51%	13%

The next two tables provide the monthly allocation percentages for aggregated meter read data from monthly billing cycles.

	SFR		MFR		BUS	
Read Month (t)	t-1	t	t-1	t	t-1	t
Jan	52%	48%	50%	50%	50%	50%
Feb	48%	52%	48%	52%	48%	52%
Mar	51%	49%	51%	49%	51%	49%
Apr	49%	51%	50%	50%	50%	50%
May	44%	56%	47%	53%	46%	54%
Jun	46%	54%	51%	49%	47%	53%
Jul	49%	51%	48%	52%	50%	50%
Aug	50%	50%	49%	51%	48%	52%
Sep	51%	49%	51%	49%	53%	47%
Oct	53%	47%	51%	49%	52%	48%
Nov	55%	45%	52%	48%	54%	46%
Dec	52%	48%	51%	49%	51%	49%

	IRR/GOLF		MUNI	
Read Month (t)	t-1	t	t-1	t
Jan	69%	31%	53%	47%
Feb	50%	50%	52%	48%
Mar	41%	59%	45%	55%
Apr	39%	61%	38%	62%
May	30%	70%	36%	64%
Jun	44%	56%	42%	58%
Jul	47%	53%	48%	52%
Aug	50%	50%	47%	53%
Sep	53%	47%	52%	48%
Oct	55%	45%	63%	37%
Nov	66%	34%	59%	41%
Dec	57%	43%	66%	34%

ATTACHMENT 2 WEATHER DATA

The weather data are from CIMIS Station 104 (DeLaveaga)

Average maximum daily air temperature (F)

	Month											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1990										75.0	67.0	58.0
1991	59.5	65.6	57.0	66.9	66.3	66.9	68.6	74.8	71.0	72.8	68.3	61.3
1992	61.8	63.8	62.9	71.7	69.6	69.3	77.2	75.9	74.6	73.8	67.7	58.1
1993	59.1	59.2	66.2	68.8	69.2	76.0	70.1	74.2	73.9	72.8	66.4	60.9
1994	62.8	58.6	65.8	66.3	67.1	75.3	66.8	74.4	72.8	71.0	58.8	57.7
1995	58.4	63.9	62.2	64.7	64.4	71.4	76.6	75.4	75.2	72.9	70.1	61.0
1996	61.1	64.2	69.5	75.8	78.0	84.5	88.2	93.4	78.3	71.0	63.9	59.9
1997	58.8	63.1	66.2	69.2	76.8	72.5	71.1	77.5	81.4	73.7	65.8	61.4
1998	59.6	58.3	62.1	64.0	64.5	68.8	73.3	76.3	72.7	71.5	62.4	58.5
1999	60.8	58.4	57.9	63.6	65.1	67.8	72.2	74.1	70.1	73.5	63.2	62.5
2000	57.7	60.3	63.2	67.8	71.5	70.5	72.1	72.6	74.9	66.5	61.2	63.7
2001	58.7	57.7	63.9	63.3	73.0	77.0	69.7	73.9	70.6	69.1	63.7	57.3
2002	56.8	63.2	61.3	63.3	68.2	73.4	71.6	72.1	75.4	68.8	68.5	59.0
2003	64.8	61.3	65.0	61.0	70.4	71.6	74.7	76.9	76.8	76.6	61.4	58.1
2004	57.5	58.3	70.4	68.2	72.4	72.4	72.0	74.3	78.2	68.3	61.6	60.5
2005	59.4	61.6	64.2	65.9	69.9	70.4	71.9	71.0	70.3	69.0	65.7	55.2
2006	56.8	63.7	56.1	60.7	68.4	72.9	76.8	70.0	71.4	70.5	64.7	60.2
2007	57.9	59.7	66.9	66.7	68.8	73.3	75.2	75.0	73.9	70.3	66.0	56.6
2008	55.9	60.3	65.5	67.7	68.5	74.8	73.0	73.6	75.0	75.2	66.6	57.9
2009	65.2	58.9	62.9	66.6	68.1	70.2	73.4	74.7	77.2	69.1	66.5	57.5
2010	60.0	60.0	63.2	62.5	67.5	73.2	68.3	70.4	76.6	68.7	63.6	57.9
2011	62.9	58.9	61.1	65.7	67.5	67.5	71.4	69.9	72.4	72.0	62.1	60.3
2012	62.5	62.2	59.4	65.4	69.8	72.5	70.2	73.7	71.2	72.8	66.7	56.6
2013	60.6	61.4	65.4	68.7	73.2	73.1	69.6	75.3	77.6	70.3	67.1	64.2
2014	68.5	61.4	66.5	68.4	75.6	71.5	72.9	72.8	74.3	77.2	66.4	60.1
2015	66.9	66.2	71.7	68.0								
Avg	**60.6**	**61.2**	**63.9**	**66.4**	**69.7**	**72.4**	**72.8**	**74.7**	**74.4**	**71.7**	**65.0**	**59.4**

Monthly total precipitation (in)

	Month											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1990										4.8	0.6	1.6
1991	0.8	4.9	11.6	0.8	0.1	0.3	0.0	0.1	0.1	2.4	1.5	4.2
1992	3.2	11.3	4.1	0.3	0.0	0.7	0.0	0.5	0.4	1.5	0.3	7.9
1993	14.8	8.7	3.8	1.5	1.5	1.1	0.6	0.5	0.3	0.7	2.0	3.9
1994	2.6	8.0	0.0	2.1	2.3	0.6	0.5	0.6	0.4	1.0	5.1	3.3
1995	18.6	0.5	9.6	5.0	1.2	2.5	0.0	0.0	0.7	1.5	0.0	0.7
1996	10.3	8.6	4.1	2.2	3.5	0.0	0.0	0.0	0.2	2.5	6.8	15.2
1997	10.1	0.3	1.4	0.8	0.1	0.1	0.0	0.5	0.2	0.5	8.9	3.6
1998	15.0	18.7	4.3	3.1	3.3	0.1	0.0	0.0	0.1	0.9	6.0	1.4
1999	7.9	10.3	3.6	2.8	0.0	0.3	0.0	0.0	0.1	0.3	3.7	0.5
2000	11.4	9.9	2.3	1.7	1.4	0.2	0.0	0.2	0.5	4.6	1.2	1.1
2001	5.7	7.0	3.4	1.9	0.0	0.1	0.0	0.0	0.2	0.8	6.2	11.3
2002	3.7	2.3	4.0	0.4	0.8	0.0	0.0	0.0	0.0	0.0	4.4	5.7
2003	2.0	1.9	1.6	0.5	1.1	0.0	0.0	0.0	0.0	0.1	1.8	9.4
2004	3.2	5.9	1.4	0.8	0.1	0.0	0.0	0.0	0.0	5.3	2.9	10.5
2005	5.7	5.9	7.5	2.9	1.0	0.0	0.0	0.0	0.0	0.2	2.0	13.4
2006	6.2	2.7	11.1	6.9	0.8	0.0	0.0	0.0	0.0	0.0	2.0	4.9
2007	0.8	6.2	0.3	1.7	0.6	0.0	0.0	0.0	0.0	1.1	0.6	1.5
2008	12.6	6.5	0.5	0.6	0.1	0.0	0.0	0.0	0.0	1.0	2.1	3.0
2009	1.8	11.3	2.0	0.6	1.7	0.0	0.0	0.0	0.0	4.7	0.3	4.4
2010	9.4	6.5	4.0	4.6	0.8	0.0	0.0	0.2	0.0	3.4	4.2	10.2
2011	2.2	6.3	11.9	0.7	1.8	2.5	0.1	0.1	0.1	2.7	2.6	0.1
2012	3.7	1.0	7.3	3.0	0.1	0.3	0.0	0.0	0.0	0.1	6.0	9.0
2013	0.9	0.3	1.7	0.9	0.0	0.1	0.0	0.1	0.1	0.1	0.3	0.1
2014	0.0	3.2	1.4	0.5	0.0	0.1	0.2	0.0	1.0	0.0	3.2	11.8
2015	0.0	0.0	0.0	0.0								
Avg	**6.1**	**5.9**	**4.1**	**1.8**	**0.9**	**0.4**	**0.1**	**0.1**	**0.2**	**1.6**	**3.0**	**5.5**

Monthly total ETo (in)

	Month											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1990										3.4	2.2	1.7
1991	1.7	2.1	2.3	4.5	4.6	4.7	4.5	4.3	3.3	2.8	2.1	1.5
1992	1.8	1.9	2.8	4.9	5.1	5.0	5.7	5.1	4.1	2.8	1.9	1.1
1993	1.2	1.6	3.5	4.9	4.9	6.1	4.8	4.8	3.7	2.8	2.1	1.4
1994	1.9	1.9	3.9	4.1	4.7	6.3	4.2	5.2	3.9	2.8	1.3	0.9
1995	0.9	1.9	2.8	3.7	3.0	5.3	5.9	5.3	4.1	3.2	2.0	1.2
1996	1.5	1.7	3.9	4.7	5.4	5.6	5.6	5.3	3.9	3.1	1.5	1.1
1997	1.3	2.7	3.9	5.0	6.1	5.5	4.7	5.1	4.9	3.3	1.6	1.6
1998	1.2	1.4	3.2	4.2	4.2	4.5	5.2	5.3	3.4	3.1	1.6	1.5
1999	1.6	1.9	3.3	4.4	5.1	5.3	5.5	4.8	3.3	3.4	1.6	1.8
2000	1.1	1.6	4.0	4.7	5.4	5.4	5.3	4.7	3.9	2.4	1.8	1.6
2001	1.7	2.1	3.6	4.4	6.0	6.4	4.9	4.9	3.6	2.8	1.5	1.0
2002	1.6	2.4	3.7	3.6	5.4	5.9	5.2	4.5	4.3	2.8	2.1	1.7
2003	1.8	2.2	3.9	3.9	5.3	5.0	5.6	5.3	4.2	3.5	1.6	1.0
2004	1.5	1.9	4.3	4.9	5.9	5.6	4.6	4.6	4.3	2.7	1.8	1.4
2005	1.5	1.9	3.3	4.2	4.7	4.9	4.7	3.9	3.2	2.6	1.9	1.0
2006	1.4	2.2	2.6	2.7	4.9	5.0	5.3	4.1	3.4	2.9	1.6	1.3
2007	2.0	1.7	4.1	4.5	5.4	5.9	5.5	5.3	4.0	3.1	2.0	1.4
2008	1.3	2.3	4.1	5.4	5.6	6.0	5.9	5.6	4.6	3.8	1.9	1.5
2009	2.0	2.0	4.0	4.7	4.7	5.4	5.5	5.1	4.4	3.0	2.0	1.2
2010	1.3	1.7	3.7	3.9	5.2	6.1	4.7	4.6	4.2	2.5	1.9	0.9
2011	1.9	2.3	3.1	4.5	5.3	4.9	5.4	4.2	3.7	2.8	1.8	1.8
2012	2.0	2.6	3.0	4.5	5.6	6.0	5.1	4.8	3.9	2.8	1.7	1.1
2013	2.0	2.5	3.8	4.9	5.9	5.3	5.0	5.0	4.4	3.2	2.1	2.1
2014	2.4	1.9	3.7	4.7	6.2	5.5	5.1	4.6	3.7	2.9	1.7	1.1
2015	2.2	2.4	4.5	4.7								
Avg	**1.6**	**2.0**	**3.6**	**4.4**	**5.2**	**5.5**	**5.2**	**4.8**	**3.9**	**3.0**	**1.8**	**1.4**

ATTACHMENT 3 ECONOMIC DATA

Inside city water rate per unit (100 cubic feet = 748 gallons = 1 billing unit)

			SFR and duplex* customers, In City							
Year	Billing cycle	Effective date	Units 1-4	Units 5-8	Unit 9	Units 10-14	Units 15-18	Units 19-40	Units 40+	MFR and CII
1999	Bi-monthly		0.76	0.76	1.81	1.81	1.81	1.81	3.31	1.81
2000	Bi-monthly		0.76	0.76	1.81	1.81	1.81	1.81	3.31	1.81
2001	Bi-monthly		0.76	0.76	1.81	1.81	1.81	1.81	3.31	1.81
2002	Bi-monthly		0.76	0.76	1.81	1.81	1.81	1.81	3.31	1.81
2003	Bi-monthly		0.76	0.76	1.81	1.81	1.81	1.81	3.31	1.81
2004	Bi-monthly	6/9/2004	0.90	2.30	2.30	2.95	4.05	5.05	5.05	2.30
2005	Monthly	1/1/2005	1.08	2.76	2.76	3.54	4.86	6.06	6.06	2.76
2005	Monthly	9/1/2005	1.05	2.68	2.68	3.44	4.72	5.88	5.88	2.68
2006	Monthly	1/1/2006	1.21	3.08	3.08	3.95	5.43	6.77	6.77	3.08
2007	Monthly	1/1/2007	1.36	3.47	3.47	4.45	6.10	7.61	7.61	3.47
2008	Monthly	1/1/2008	1.49	3.81	3.81	4.89	6.71	8.37	8.37	3.81
2009	Monthly		1.49	3.81	3.81	4.89	6.71	8.37	8.37	3.81
2010	Monthly		1.49	3.81	3.81	4.89	6.71	8.37	8.37	3.81
2011	Monthly	1/1/2011	1.57	4.00	4.00	5.14	7.05	8.79	8.79	4.00
2012	Monthly		1.57	4.00	4.00	5.14	7.05	8.79	8.79	4.00
2013	Monthly		1.57	4.00	4.00	5.14	7.05	8.79	8.79	4.00
2014	Monthly	1/1/2014	1.73	4.40	4.40	5.66	7.76	9.67	9.67	4.40

Outside city water rate per unit (100 cubic feet = 748 gallons = 1 billing unit)

			SFR and duplex* customers							
Year	Billing cycle	Effective date	Units 1-4	Units 5-8	Unit 9	Units 10-14	Units 15-18	Units 19-40	Units 40+	MFR and CII
1999	Bi-monthly		0.97	0.97	2.29	2.29	2.29	2.29	3.79	2.29
2000	Bi-monthly		0.97	0.97	2.29	2.29	2.29	2.29	3.79	2.29
2001	Bi-monthly		0.97	0.97	2.29	2.29	2.29	2.29	3.79	2.29
2002	Bi-monthly		0.97	0.97	2.29	2.29	2.29	2.29	3.79	2.29
2003	Bi-monthly		0.97	0.97	2.29	2.29	2.29	2.29	3.79	2.29
2004	Bi-monthly	6/9/2004	1.15	2.93	2.93	3.76	5.16	6.44	6.44	2.93
2005	Bi-monthly	1/1/2005	1.38	3.52	3.52	4.51	6.19	7.73	7.73	3.52
2005	Bi-monthly	9/1/2005	1.34	3.42	3.42	4.38	6.01	7.50	7.50	3.42
2006	Bi-monthly	1/1/2006	1.54	3.93	3.93	5.04	6.91	8.63	8.63	3.93
2007	Bi-monthly	1/1/2007	1.73	4.42	4.42	5.67	7.78	9.71	9.71	4.42
2008	Bi-monthly	1/1/2008	1.91	4.86	4.86	6.23	8.56	10.68	10.68	4.86
2009	Bi-monthly		1.91	4.86	4.86	6.23	8.56	10.68	10.68	4.86
2010	Bi-monthly		1.91	4.86	4.86	6.23	8.56	10.68	10.68	4.86
2011	Bi-monthly	1/1/2011	2.00	5.10	5.10	6.55	8.98	11.21	11.21	5.10
2012	Bi-monthly		2.00	5.10	5.10	6.55	8.98	11.21	11.21	5.10
2013	Bi-monthly		2.00	5.10	5.10	6.55	8.98	11.21	11.21	5.10
2014	Monthly	1/1/2014	2.20	5.61	5.61	7.21	9.88	12.34	12.34	5.61

Per capita and median household income (2013 dollars)

		Per Capita			Median Household		
Year	**Source**	**County**	**Inside City**	**Outside City**	**County**	**Inside City**	**Outside City**
1999	Census	37,605	36,696	40,980	76,688	71,845	76,369
2000	imputed	42,919	35,797	48,603	87,525	70,681	89,610
2001	imputed	33,542	42,936	50,199	68,402	84,777	92,552
2002	imputed	31,937	33,580	42,814	65,129	66,302	78,936
2003	imputed	32,876	31,349	39,566	67,044	61,898	72,948
2004	imputed	34,384	32,439	40,287	70,120	64,050	74,278
2005	imputed	39,701	35,403	41,088	71,081	69,901	75,755
2006	imputed	37,448	36,600	42,144	73,033	72,265	77,700
2007	imputed	38,394	35,945	44,607	72,534	67,295	82,242
2008	imputed	38,512	37,986	44,979	74,414	69,710	82,928
2009	ACS	32,865	36,359	40,101	67,341	65,474	73,816
2010	ACS	31,390	31,790	40,161	65,969	63,899	73,206
2011	ACS	32,026	29,917	39,611	65,813	62,507	72,032
2012	ACS	34,279	29,949	38,713	69,483	64,215	73,334
2013	ACS	31,609	29,604	37,847	68,630	62,756	68,983
2014	imputed	31,812	29,793	38,090	69,069	63,157	69,425

California Department of Finance Report E-8
Housing Vacancy Rates

Year	Date	Santa Cruz	Capitola	County
1991	1/1/1991	6.3	11.4	3.6
1992	1/1/1992	6.1	11.4	3.4
1993	1/1/1993	6.0	11.5	3.3
1994	1/1/1994	5.8	11.5	3.1
1995	1/1/1995	5.7	11.5	3.0
1996	1/1/1996	5.5	11.5	2.8
1997	1/1/1997	5.4	11.6	2.8
1998	1/1/1998	5.2	11.6	2.6
1999	1/1/1999	5.1	11.6	2.5
2000	1/1/2000	5.0	11.6	2.4
2001	1/1/2001	5.1	12.0	2.5
2002	1/1/2002	5.3	12.5	2.7
2003	1/1/2003	5.4	13.0	2.9
2004	1/1/2004	5.6	13.5	3.1
2005	1/1/2005	6.9	13.9	3.3
2006	1/1/2006	6.6	14.4	3.6
2007	1/1/2007	6.7	14.9	3.8
2008	1/1/2008	6.9	15.3	3.9
2009	1/1/2009	6.9	15.8	4.1
2010	1/1/2010	7.1	16.3	4.3
2011	1/1/2011	7.1	16.4	9.6
2012	1/1/2012	7.0	16.4	9.5
2013	1/1/2013	7.0	16.4	9.4
2014	1/1/2014	6.8	16.3	9.2

California Employment Development Department
Unemployment Rates

Year	County	Santa Cruz
1990	7.2	
1991	8.8	
1992	9.7	
1993	10.4	
1994	9.7	
1995	9.3	
1996	8.5	
1997	7.9	
1998	7.3	
1999	6.4	
2000	5.1	4.2
2001	5.7	4.7
2002	7.3	6.1
2003	7.7	6.4
2004	7	5.8
2005	6.3	5.2
2006	5.6	4.6
2007	5.9	4.9
2008	7.4	6.1
2009	11.1	9.4
2010	13.3	11.9
2011	13.1	11.7
2012	11.8	10.6
2013	10.3	9.2
2014	8.7	7.8

ATTACHMENT 4 CONSERVATION ADJUSTMENT DATA

SFR Inside City Plumbing Code Water Savings Since 2000 (MG)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	8.1
2002	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	15.7
2003	1.4	1.5	1.6	1.7	1.8	1.9	1.9	2.0	2.1	2.2	2.3	2.4	22.8
2004	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.6	29.6
2005	2.6	2.7	2.8	2.8	2.9	3.0	3.0	3.1	3.2	3.2	3.3	3.4	36.0
2006	3.4	3.4	3.4	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6	41.9
2007	3.6	3.7	3.8	3.8	3.9	3.9	4.0	4.0	4.1	4.2	4.2	4.3	47.5
2008	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5	52.8
2009	4.6	4.6	4.7	4.7	4.8	4.8	4.8	4.9	4.9	5.0	5.0	5.1	57.9
2010	5.1	5.1	5.2	5.2	5.2	5.2	5.2	5.3	5.3	5.3	5.3	5.3	62.7
2011	5.4	5.4	5.5	5.5	5.5	5.6	5.6	5.7	5.7	5.8	5.8	5.8	67.3
2012	5.9	5.9	5.9	5.9	5.9	6.0	6.0	6.0	6.0	6.1	6.1	6.1	71.8
2013	6.1	6.2	6.2	6.2	6.3	6.3	6.4	6.4	6.4	6.5	6.5	6.5	76.0
2014	6.6	6.6	6.7	6.7	6.8	6.8	6.9	6.9	7.0	7.0	7.0		74.9

SFR Outside City Plumbing Code Water Savings Since 2000 (MG)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.7	4.5
2002	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	8.8
2003	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	12.8
2004	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	16.7
2005	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	20.3
2006	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	23.6
2007	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.4	26.7
2008	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	29.7
2009	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.9	32.6
2010	2.9	2.9	2.9	2.9	2.9	2.9	2.9	3.0	3.0	3.0	3.0	3.0	35.3
2011	3.0	3.1	3.1	3.1	3.1	3.1	3.2	3.2	3.2	3.2	3.3	3.3	37.9
2012	3.3	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	40.4
2013	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.7	3.7	42.7
2014	3.7	3.7	3.8	3.8	3.8	3.8	3.9	3.9	3.9	3.9	4.0		42.1

SFR Inside City Housing Units

	Month											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2000	11,516	11,519	11,523	11,526	11,530	11,533	11,537	11,540	11,544	11,547	11,551	11,554
2001	11,559	11,564	11,569	11,574	11,579	11,584	11,588	11,593	11,598	11,603	11,608	11,613
2002	11,624	11,634	11,645	11,656	11,666	11,677	11,688	11,698	11,709	11,720	11,730	11,741
2003	11,748	11,755	11,762	11,769	11,776	11,783	11,789	11,796	11,803	11,810	11,817	11,824
2004	11,827	11,829	11,832	11,835	11,837	11,840	11,843	11,845	11,848	11,851	11,853	11,856
2005	11,859	11,862	11,865	11,867	11,870	11,873	11,876	11,879	11,882	11,884	11,887	11,890
2006	11,896	11,903	11,909	11,915	11,922	11,928	11,934	11,941	11,947	11,953	11,960	11,966
2007	11,972	11,978	11,984	11,990	11,996	12,003	12,009	12,015	12,021	12,027	12,033	12,039
2008	12,039	12,039	12,039	12,039	12,039	12,039	12,038	12,038	12,038	12,038	12,038	12,038
2009	12,042	12,045	12,049	12,052	12,056	12,060	12,063	12,067	12,070	12,074	12,077	12,081
2010	12,084	12,088	12,091	12,095	12,098	12,102	12,105	12,108	12,112	12,115	12,119	12,122
2011	12,123	12,125	12,126	12,127	12,129	12,130	12,131	12,133	12,134	12,135	12,137	12,138
2012	12,141	12,144	12,147	12,149	12,152	12,155	12,158	12,161	12,164	12,166	12,169	12,172
2013	12,175	12,178	12,181	12,184	12,187	12,190	12,192	12,195	12,198	12,201	12,204	12,207
2014	12,210	12,214	12,217	12,220	12,223	12,227	12,230	12,233	12,236	12,240	12,243	

SFR Outside City Housing Units

	Month											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2000	6,257	6,263	6,268	6,273	6,279	6,284	6,289	6,295	6,300	6,305	6,311	6,316
2001	6,321	6,325	6,330	6,334	6,339	6,344	6,348	6,353	6,357	6,362	6,366	6,371
2002	6,377	6,383	6,389	6,394	6,400	6,406	6,412	6,418	6,424	6,429	6,435	6,441
2003	6,443	6,445	6,447	6,449	6,451	6,454	6,456	6,458	6,460	6,462	6,464	6,466
2004	6,469	6,471	6,474	6,476	6,479	6,481	6,484	6,486	6,489	6,491	6,494	6,496
2005	6,501	6,506	6,510	6,515	6,520	6,525	6,529	6,534	6,539	6,544	6,548	6,553
2006	6,557	6,561	6,565	6,569	6,573	6,577	6,580	6,584	6,588	6,592	6,596	6,600
2007	6,609	6,618	6,627	6,636	6,645	6,654	6,662	6,671	6,680	6,689	6,698	6,707
2008	6,708	6,709	6,711	6,712	6,713	6,714	6,715	6,716	6,718	6,719	6,720	6,721
2009	6,722	6,723	6,725	6,726	6,727	6,728	6,729	6,730	6,732	6,733	6,734	6,735
2010	6,735	6,736	6,736	6,737	6,737	6,738	6,738	6,738	6,739	6,739	6,740	6,740
2011	6,741	6,741	6,742	6,742	6,743	6,743	6,744	6,744	6,745	6,745	6,746	6,746
2012	6,747	6,748	6,748	6,749	6,750	6,751	6,751	6,752	6,753	6,754	6,754	6,755
2013	6,754	6,754	6,753	6,752	6,751	6,751	6,750	6,749	6,748	6,748	6,747	6,746
2014	6,746	6,746	6,745	6,745	6,745	6,745	6,744	6,744	6,744	6,744	6,743	

SFR Inside City Plumbing Code Water Savings Since 2000 (CCF/Housing Unit)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
2002	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	1.8
2003	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	2.6
2004	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.3
2005	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	4.1
2006	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.7
2007	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	5.3
2008	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5.9
2009	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	6.4
2010	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	6.9
2011	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	7.4
2012	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	7.9
2013	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	8.3
2014	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8		8.2

SFR Outside City Plumbing Code Water Savings Since 2000 (CCF/Housing Unit)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
2002	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.8
2003	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	2.7
2004	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.4
2005	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	4.2
2006	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.8
2007	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	5.4
2008	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5.9
2009	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	6.5
2010	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	7.0
2011	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	7.5
2012	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	8.0
2013	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	8.5
2014	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8		8.4

SFR Inside City Avg Use (CCF/Housing Unit)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	6.5	7.1	7.5	8.6	10.1	11.2	12.0	11.0	9.8	8.7	7.6	7.0	106.9
2001	6.8	7.0	7.1	8.1	10.1	11.3	11.3	11.6	10.9	8.8	7.7	7.2	108.1
2002	6.2	5.9	7.2	8.6	10.0	11.2	10.8	10.9	11.3	9.4	8.1	7.1	106.7
2003	6.5	6.5	6.7	7.9	9.5	10.4	11.5	12.1	11.2	9.2	7.6	6.8	105.7
2004	6.5	6.8	7.6	8.9	10.9	12.0	11.2	11.0	9.6	8.0	7.4	7.6	107.7
2005	7.7	7.0	6.0	6.5	8.3	9.6	10.7	10.7	10.0	8.7	7.6	6.8	99.6
2006	5.6	6.1	6.0	5.8	8.3	9.9	11.2	10.6	9.2	8.4	6.9	6.3	94.2
2007	6.1	6.4	6.3	6.9	8.2	9.8	10.9	10.4	9.4	7.7	5.9	6.2	94.1
2008	6.1	6.3	7.3	8.0	8.8	9.7	10.3	9.2	8.5	7.8	6.5	6.0	94.6
2009	5.8	5.3	5.8	6.7	7.4	8.1	8.7	8.7	8.1	7.0	5.8	5.6	83.0
2010	5.9	5.4	5.1	5.7	6.8	8.2	8.7	8.9	8.4	7.1	5.8	5.3	81.3
2011	5.5	5.2	5.1	6.1	6.9	7.3	8.3	8.4	7.6	6.7	5.9	5.6	78.6
2012	5.8	5.6	5.5	5.8	7.0	8.4	8.8	8.4	7.7	7.1	6.0	5.5	81.6
2013	5.4	5.2	5.6	6.4	7.6	8.5	8.5	8.4	7.9	7.6	6.7	6.2	84.1
2014	6.0	5.1	4.9	5.3	5.4	5.6	5.5	5.3	5.1	4.8	4.3		57.3

SFR Outside City Avg Use (CCF/Housing Unit)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	7.1	7.2	7.7	9.2	10.4	11.4	12.9	11.9	11.7	9.5	8.4	7.7	115.1
2001	7.4	7.0	6.8	8.8	10.6	11.7	12.8	11.8	11.6	9.9	8.8	7.5	114.6
2002	6.9	6.9	7.1	8.7	10.3	11.6	13.3	12.5	12.6	10.2	8.8	7.6	116.4
2003	7.0	7.1	7.2	8.1	9.0	11.0	13.9	13.0	12.8	10.4	9.0	7.6	116.1
2004	6.9	7.0	7.6	9.6	11.2	12.0	13.3	12.6	12.6	9.9	8.4	7.7	118.8
2005	7.4	6.7	6.1	7.4	8.7	10.2	12.5	11.5	11.3	9.4	8.5	7.2	107.0
2006	6.4	6.2	5.9	7.0	8.3	10.0	12.2	11.3	11.2	9.4	8.3	7.3	103.5
2007	6.8	6.8	6.7	7.9	8.9	10.0	11.5	10.4	10.3	8.6	7.9	7.0	102.9
2008	6.3	6.0	5.9	7.7	11.0	12.7	9.0	8.4	13.0	11.5	7.4	6.5	105.5
2009	6.0	5.6	6.5	7.6	8.6	9.4	9.6	9.8	8.6	7.5	6.4	5.9	91.5
2010	5.6	5.5	5.8	6.4	7.7	9.1	9.5	9.8	8.8	7.4	6.1	5.7	87.6
2011	5.5	5.4	6.0	6.8	7.8	8.6	8.9	9.2	8.0	7.0	6.3	6.2	85.6
2012	5.9	5.7	6.1	6.7	8.1	9.4	9.4	9.3	8.3	7.3	6.2	5.8	88.3
2013	5.6	5.7	6.4	7.4	8.5	9.3	9.3	9.4	8.7	8.1	7.2	6.7	92.2
2014	6.5	6.8	7.1	5.7	6.0	6.3	6.2	5.9	5.5	5.1	4.5		65.6

SFR Inside City Adjusted Avg Use (CCF/Housing Unit)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	6.5	7.1	7.5	8.6	10.1	11.2	12.0	11.0	9.8	8.7	7.6	7.0	106.9
2001	6.8	7.0	7.2	8.1	10.1	11.4	11.4	11.7	11.0	9.0	7.9	7.4	109.0
2002	6.4	6.1	7.3	8.7	10.2	11.4	11.0	11.0	11.5	9.5	8.2	7.2	108.5
2003	6.7	6.7	6.9	8.1	9.7	10.6	11.7	12.3	11.4	9.4	7.9	7.1	108.3
2004	6.8	7.1	7.9	9.2	11.2	12.3	11.5	11.3	9.9	8.3	7.7	7.9	111.0
2005	8.0	7.3	6.3	6.8	8.6	9.9	11.0	11.1	10.4	9.1	7.9	7.2	103.6
2006	6.0	6.5	6.4	6.2	8.7	10.3	11.6	11.0	9.6	8.8	7.3	6.7	98.9
2007	6.5	6.8	6.7	7.3	8.6	10.2	11.3	10.8	9.8	8.2	6.4	6.7	99.4
2008	6.6	6.8	7.8	8.5	9.3	10.2	10.8	9.7	9.0	8.2	7.0	6.5	100.5
2009	6.3	5.8	6.3	7.2	8.0	8.7	9.2	9.2	8.6	7.6	6.4	6.2	89.4
2010	6.4	5.9	5.6	6.3	7.4	8.7	9.3	9.4	9.0	7.7	6.4	5.9	88.2
2011	6.1	5.8	5.7	6.7	7.5	7.9	8.9	9.1	8.2	7.4	6.5	6.3	86.0
2012	6.4	6.3	6.2	6.5	7.6	9.0	9.4	9.0	8.4	7.8	6.7	6.2	89.5
2013	6.1	5.9	6.3	7.1	8.3	9.2	9.2	9.1	8.6	8.3	7.4	6.9	92.4
2014	6.7	5.9	5.6	6.0	6.2	6.3	6.2	6.0	5.9	5.5	5.0		65.4

SFR Outside City Adjusted Avg Use (CCF/Housing Unit)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	7.1	7.2	7.7	9.2	10.4	11.4	12.9	11.9	11.7	9.5	8.4	7.7	115.1
2001	7.4	7.0	6.8	8.8	10.7	11.7	12.9	11.9	11.8	10.0	8.9	7.6	115.6
2002	7.0	7.0	7.2	8.9	10.4	11.7	13.5	12.7	12.8	10.4	8.9	7.8	118.3
2003	7.2	7.3	7.4	8.3	9.2	11.2	14.1	13.2	13.1	10.7	9.2	7.9	118.7
2004	7.1	7.3	7.9	9.9	11.5	12.3	13.6	12.8	12.9	10.2	8.7	8.0	122.2
2005	7.7	7.0	6.4	7.7	9.1	10.5	12.8	11.9	11.7	9.8	8.9	7.6	111.1
2006	6.8	6.6	6.3	7.4	8.7	10.4	12.6	11.7	11.6	9.8	8.7	7.7	108.3
2007	7.2	7.2	7.2	8.4	9.4	10.4	12.0	10.9	10.7	9.1	8.4	7.5	108.2
2008	6.8	6.5	6.4	8.2	11.5	13.2	9.5	8.9	13.5	12.0	7.9	7.0	111.4
2009	6.5	6.1	7.0	8.1	9.2	10.0	10.1	10.3	9.1	8.0	7.0	6.5	98.0
2010	6.2	6.0	6.4	7.0	8.3	9.7	10.1	10.4	9.4	8.0	6.7	6.3	94.6
2011	6.1	6.0	6.6	7.4	8.4	9.2	9.5	9.8	8.7	7.6	6.9	6.8	93.1
2012	6.6	6.4	6.7	7.4	8.8	10.1	10.1	9.9	9.0	7.9	6.9	6.5	96.3
2013	6.3	6.3	7.1	8.1	9.2	10.0	10.0	10.1	9.4	8.8	7.9	7.5	100.7
2014	7.3	7.5	7.8	6.4	6.7	7.0	7.0	6.7	6.3	5.9	5.3		74.0

MFR Inside City Plumbing Code Water Savings Since 2000 (MG)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.9	1.0	6.4
2002	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	12.4
2003	1.1	1.2	1.3	1.3	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.9	18.2
2004	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	23.7
2005	2.1	2.2	2.2	2.3	2.3	2.4	2.4	2.5	2.5	2.6	2.7	2.7	28.9
2006	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.9	2.9	2.9	2.9	33.8
2007	2.9	3.0	3.0	3.1	3.1	3.2	3.2	3.3	3.3	3.4	3.4	3.5	38.4
2008	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.7	3.7	42.9
2009	3.7	3.8	3.8	3.8	3.9	3.9	3.9	4.0	4.0	4.1	4.1	4.1	47.2
2010	4.2	4.2	4.2	4.2	4.2	4.3	4.3	4.3	4.3	4.3	4.4	4.4	51.2
2011	4.4	4.5	4.5	4.5	4.6	4.6	4.7	4.7	4.8	4.8	4.8	4.9	55.7
2012	4.9	4.9	4.9	5.0	5.0	5.0	5.0	5.0	5.1	5.1	5.1	5.1	60.1
2013	5.2	5.2	5.2	5.3	5.3	5.3	5.4	5.4	5.4	5.5	5.5	5.6	64.3
2014	5.6	5.6	5.7	5.7	5.8	5.8	5.9	5.9	5.9	6.0	6.0		64.0

MFR Outside City Plumbing Code Water Savings Since 2000 (MG)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.9	5.6
2002	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	11.0
2003	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.4	1.5	1.6	1.6	1.7	16.1
2004	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	21.0
2005	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.3	2.4	2.4	25.6
2006	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.6	30.0
2007	2.6	2.7	2.7	2.7	2.8	2.8	2.9	2.9	2.9	3.0	3.0	3.1	34.1
2008	3.1	3.1	3.1	3.1	3.1	3.2	3.2	3.2	3.2	3.2	3.2	3.3	38.0
2009	3.3	3.3	3.4	3.4	3.4	3.5	3.5	3.5	3.6	3.6	3.6	3.7	41.8
2010	3.7	3.7	3.7	3.7	3.8	3.8	3.8	3.8	3.8	3.8	3.9	3.9	45.4
2011	3.9	4.0	4.0	4.0	4.1	4.1	4.1	4.2	4.2	4.2	4.3	4.3	49.4
2012	4.3	4.4	4.4	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.5	53.3
2013	4.6	4.6	4.6	4.7	4.7	4.7	4.8	4.8	4.8	4.9	4.9	4.9	57.0
2014	5.0	5.0	5.0	5.1	5.1	5.2	5.2	5.2	5.3	5.3	5.4		56.8

MFR Inside City Housing Units

	Month											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2000	8,667	8,668	8,669	8,670	8,671	8,672	8,673	8,674	8,675	8,675	8,676	8,677
2001	8,682	8,686	8,691	8,695	8,699	8,704	8,708	8,713	8,717	8,722	8,726	8,731
2002	8,732	8,733	8,735	8,736	8,737	8,739	8,740	8,741	8,743	8,744	8,745	8,747
2003	8,755	8,763	8,771	8,779	8,787	8,795	8,802	8,810	8,818	8,826	8,834	8,842
2004	8,858	8,873	8,888	8,903	8,918	8,933	8,948	8,963	8,978	8,993	9,009	9,024
2005	9,036	9,048	9,060	9,072	9,084	9,096	9,108	9,120	9,132	9,144	9,156	9,168
2006	9,170	9,172	9,174	9,176	9,179	9,181	9,183	9,185	9,188	9,190	9,192	9,194
2007	9,205	9,216	9,226	9,237	9,248	9,258	9,269	9,280	9,290	9,301	9,312	9,322
2008	9,325	9,328	9,331	9,335	9,338	9,341	9,344	9,347	9,350	9,353	9,356	9,359
2009	9,365	9,371	9,377	9,383	9,388	9,394	9,400	9,406	9,411	9,417	9,423	9,429
2010	9,434	9,439	9,443	9,448	9,453	9,458	9,463	9,468	9,473	9,478	9,483	9,487
2011	9,488	9,488	9,489	9,489	9,490	9,490	9,491	9,491	9,491	9,492	9,492	9,493
2012	9,493	9,493	9,493	9,493	9,493	9,493	9,493	9,493	9,493	9,493	9,493	9,493
2013	9,495	9,496	9,498	9,500	9,502	9,503	9,505	9,507	9,509	9,510	9,512	9,514
2014	9,518	9,523	9,527	9,532	9,536	9,541	9,545	9,550	9,554	9,558	9,563	

MFR Outside City Housing Units

	Month											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2000	7,940	7,938	7,935	7,932	7,929	7,926	7,924	7,921	7,918	7,915	7,912	7,910
2001	7,910	7,911	7,912	7,912	7,913	7,914	7,915	7,915	7,916	7,917	7,917	7,918
2002	7,915	7,912	7,910	7,907	7,904	7,901	7,898	7,896	7,893	7,890	7,887	7,885
2003	7,885	7,886	7,887	7,887	7,888	7,889	7,889	7,890	7,891	7,892	7,892	7,893
2004	7,893	7,893	7,893	7,893	7,893	7,893	7,893	7,893	7,893	7,893	7,893	7,893
2005	7,896	7,900	7,903	7,907	7,910	7,914	7,917	7,921	7,924	7,928	7,931	7,935
2006	7,936	7,938	7,939	7,940	7,942	7,943	7,945	7,946	7,947	7,949	7,950	7,952
2007	7,950	7,949	7,947	7,946	7,945	7,943	7,942	7,940	7,939	7,938	7,936	7,935
2008	7,933	7,932	7,931	7,929	7,928	7,926	7,925	7,924	7,922	7,921	7,919	7,918
2009	7,917	7,915	7,914	7,912	7,911	7,910	7,908	7,907	7,905	7,904	7,903	7,901
2010	7,903	7,904	7,905	7,907	7,908	7,910	7,911	7,912	7,914	7,915	7,917	7,918
2011	7,915	7,912	7,910	7,907	7,904	7,901	7,898	7,896	7,893	7,890	7,887	7,885
2012	7,885	7,886	7,887	7,887	7,888	7,889	7,889	7,890	7,891	7,892	7,892	7,893
2013	7,893	7,893	7,893	7,893	7,893	7,893	7,893	7,893	7,893	7,893	7,893	7,893
2014	7,894	7,894	7,895	7,896	7,896	7,897	7,898	7,898	7,899	7,900	7,901	

MFR Inside City Plumbing Code Water Savings Since 2000 (CCF/Housing Unit)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.0
2002	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.9
2003	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	2.8
2004	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.5
2005	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	4.2
2006	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.9
2007	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5.5
2008	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	6.1
2009	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	6.7
2010	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	7.2
2011	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	7.9
2012	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	8.5
2013	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	9.0
2014	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8		9.0

MFR Outside City Plumbing Code Water Savings Since 2000 (CCF/Housing Unit)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
2002	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.9
2003	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	2.7
2004	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.6
2005	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.3
2006	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	5.0
2007	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5.7
2008	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	6.4
2009	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	7.1
2010	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	7.7
2011	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	8.4
2012	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	9.0
2013	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	9.7
2014	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9		9.6

MFR Inside City Avg Use (CCF/Housing Unit)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	5.1	5.3	5.3	5.6	6.2	6.5	6.5	6.5	6.1	5.8	5.5	5.2	69.5
2001	5.2	5.3	5.0	5.3	6.1	6.5	6.2	6.2	6.1	5.8	5.4	5.1	68.2
2002	4.5	4.5	5.3	5.7	5.8	6.2	5.7	5.8	5.9	5.5	5.1	4.8	64.8
2003	4.6	4.6	4.7	5.0	5.6	5.8	5.9	6.3	6.0	5.3	4.8	4.7	63.2
2004	4.8	5.4	5.3	5.0	6.0	6.3	5.9	5.6	5.0	4.9	4.8	5.3	64.2
2005	5.9	5.6	4.4	4.3	5.3	5.3	5.6	5.6	5.3	5.0	4.8	4.6	61.6
2006	4.1	4.7	4.2	3.8	5.5	5.3	5.8	5.4	5.1	5.0	4.2	4.4	57.7
2007	4.2	4.7	4.2	4.1	4.7	5.3	6.0	5.6	5.2	4.8	3.8	4.1	56.7
2008	4.6	4.7	5.0	4.8	4.7	5.2	5.6	5.1	4.9	4.7	4.2	3.9	57.5
2009	4.0	3.9	4.0	4.3	4.6	4.7	4.8	4.8	4.6	4.5	4.1	3.9	52.2
2010	4.3	4.0	3.7	4.0	4.5	4.7	4.8	4.9	4.7	4.6	4.1	3.8	52.4
2011	4.0	3.9	3.7	4.2	4.5	4.5	4.7	4.8	4.5	4.2	4.0	3.8	51.0
2012	3.9	4.1	3.9	4.0	4.4	4.8	4.9	4.7	4.4	4.4	4.2	3.9	51.5
2013	3.9	3.7	3.9	4.1	4.5	4.7	4.6	4.6	4.5	4.6	4.3	4.0	51.6
2014	3.9	3.6	3.6	3.7	3.7	3.7	3.6	3.6	3.5	3.4	3.2		39.7

MFR Outside City Avg Use (CCF/Housing Unit)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	5.1	5.2	5.4	5.8	6.1	6.1	6.6	6.5	6.7	6.0	5.8	5.5	70.8
2001	5.3	4.9	4.9	5.8	6.4	6.4	6.6	6.4	6.6	6.0	5.8	5.5	70.5
2002	5.2	4.8	4.9	5.5	5.9	6.1	6.5	6.3	6.6	5.8	5.5	5.1	68.4
2003	4.9	4.9	5.0	5.2	5.5	6.0	6.6	6.3	6.4	5.7	5.3	4.9	66.8
2004	4.7	4.8	4.9	5.5	6.0	5.9	6.2	6.1	6.2	5.5	5.2	5.0	66.0
2005	5.1	4.6	4.3	4.8	5.4	5.6	5.9	5.7	5.9	5.4	5.1	4.7	62.4
2006	4.5	4.3	4.3	4.7	5.0	5.3	5.7	5.5	5.7	5.2	4.9	4.5	59.6
2007	4.3	4.2	4.2	4.6	4.9	5.0	5.3	5.0	5.1	4.7	4.7	4.5	56.6
2008	4.3	4.0	3.9	4.5	6.0	6.0	4.2	4.2	6.6	6.1	4.2	4.2	58.2
2009	4.0	3.9	4.2	4.6	4.9	5.1	5.1	5.2	4.6	4.4	4.1	4.0	54.1
2010	3.9	4.0	4.1	4.2	4.8	5.3	5.3	5.3	4.7	4.5	4.1	4.0	54.2
2011	3.9	3.9	4.2	4.6	4.8	5.0	5.1	5.1	4.5	4.3	4.1	4.2	53.6
2012	4.0	3.9	4.1	4.3	4.8	5.4	5.2	5.1	4.6	4.4	4.2	4.1	54.2
2013	3.9	3.9	4.2	4.5	4.9	5.3	5.2	5.2	4.8	4.7	4.4	4.2	55.3
2014	3.9	4.4	5.0	3.9	3.8	3.9	4.0	3.9	3.8	3.6	3.4		43.5

MFR Inside City Adjusted Avg Use (CCF/Housing Unit)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	5.1	5.3	5.3	5.6	6.2	6.5	6.5	6.5	6.1	5.8	5.5	5.2	69.5
2001	5.2	5.3	5.0	5.3	6.2	6.6	6.3	6.3	6.2	5.9	5.5	5.3	69.1
2002	4.6	4.6	5.4	5.9	6.0	6.3	5.9	6.0	6.1	5.7	5.3	5.0	66.7
2003	4.8	4.8	4.9	5.2	5.8	6.0	6.1	6.5	6.2	5.5	5.1	5.0	66.0
2004	5.1	5.6	5.5	5.3	6.3	6.6	6.2	5.9	5.3	5.2	5.1	5.6	67.8
2005	6.2	5.9	4.7	4.7	5.6	5.6	6.0	6.0	5.6	5.4	5.2	4.9	65.9
2006	4.5	5.1	4.6	4.2	5.9	5.8	6.2	5.8	5.5	5.5	4.7	4.8	62.6
2007	4.6	5.1	4.7	4.5	5.2	5.8	6.5	6.0	5.7	5.3	4.2	4.6	62.3
2008	5.1	5.2	5.5	5.4	5.3	5.7	6.2	5.6	5.4	5.3	4.7	4.5	63.6
2009	4.6	4.4	4.6	4.9	5.1	5.2	5.3	5.4	5.2	5.1	4.7	4.5	58.9
2010	4.9	4.6	4.3	4.6	5.1	5.3	5.4	5.5	5.3	5.2	4.8	4.4	59.6
2011	4.7	4.5	4.4	4.8	5.2	5.2	5.4	5.5	5.2	4.9	4.7	4.5	58.8
2012	4.6	4.8	4.6	4.7	5.1	5.5	5.6	5.4	5.2	5.1	4.9	4.6	60.0
2013	4.6	4.5	4.6	4.9	5.3	5.5	5.4	5.4	5.3	5.4	5.1	4.8	60.7
2014	4.7	4.4	4.4	4.5	4.5	4.5	4.5	4.4	4.3	4.3	4.1		48.7

MFR Outside City Adjusted Avg Use (CCF/Housing Unit)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	5.1	5.2	5.4	5.8	6.1	6.1	6.6	6.5	6.7	6.0	5.8	5.5	70.8
2001	5.3	5.0	4.9	5.8	6.4	6.5	6.7	6.5	6.7	6.1	5.9	5.7	71.5
2002	5.4	5.0	5.1	5.7	6.1	6.3	6.7	6.5	6.7	6.0	5.7	5.3	70.3
2003	5.1	5.1	5.1	5.4	5.7	6.3	6.8	6.6	6.7	6.0	5.6	5.2	69.5
2004	5.0	5.1	5.2	5.8	6.2	6.2	6.5	6.4	6.5	5.8	5.5	5.3	69.6
2005	5.4	4.9	4.6	5.2	5.7	6.0	6.3	6.1	6.2	5.8	5.5	5.1	66.8
2006	4.9	4.7	4.7	5.1	5.4	5.7	6.1	5.9	6.1	5.6	5.3	5.0	64.6
2007	4.8	4.7	4.7	5.0	5.3	5.5	5.8	5.5	5.6	5.3	5.2	5.0	62.3
2008	4.8	4.5	4.4	5.0	6.6	6.5	4.7	4.7	7.2	6.7	4.7	4.8	64.6
2009	4.6	4.4	4.8	5.2	5.4	5.7	5.7	5.8	5.2	5.0	4.7	4.6	61.2
2010	4.5	4.6	4.7	4.9	5.4	5.9	6.0	6.0	5.4	5.2	4.7	4.6	61.9
2011	4.5	4.5	4.9	5.2	5.5	5.7	5.8	5.8	5.2	5.0	4.8	4.9	62.0
2012	4.7	4.7	4.9	5.0	5.6	6.1	6.0	5.9	5.3	5.2	4.9	4.9	63.2
2013	4.7	4.7	5.0	5.3	5.7	6.1	6.0	6.0	5.6	5.6	5.2	5.0	65.0
2014	4.7	5.3	5.8	4.7	4.6	4.8	4.9	4.8	4.7	4.5	4.3		53.1

BUS Inside City Plumbing Code Water Savings Since 2000 (MG)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	2.3
2002	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.6
2003	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	6.8
2004	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	8.9
2005	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	10.9
2006	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	12.8
2007	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	14.6
2008	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	16.4
2009	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	18.1
2010	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	19.8
2011	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	21.5
2012	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	23.2
2013	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	24.9
2014	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1		23.6

BUS Outside City Plumbing Code Water Savings Since 2000 (MG)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	1.1
2002	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.3
2003	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.3
2004	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.4
2005	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	5.4
2006	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	6.3
2007	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	7.2
2008	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	8.1
2009	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	8.9
2010	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	9.7
2011	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	10.6
2012	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	11.4
2013	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	12.3
2014	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1		11.6

BUS Inside City Services

	Month											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2000	1,273	1,276	1,278	1,280	1,283	1,285	1,287	1,290	1,292	1,294	1,297	1,299
2001	1,297	1,294	1,292	1,289	1,287	1,285	1,282	1,280	1,277	1,275	1,272	1,270
2002	1,269	1,269	1,268	1,267	1,267	1,266	1,265	1,265	1,264	1,263	1,263	1,262
2003	1,262	1,263	1,263	1,264	1,264	1,265	1,265	1,265	1,266	1,266	1,267	1,267
2004	1,266	1,266	1,265	1,265	1,264	1,264	1,263	1,262	1,262	1,261	1,261	1,260
2005	1,260	1,260	1,260	1,259	1,259	1,259	1,259	1,259	1,259	1,258	1,258	1,258
2006	1,258	1,258	1,258	1,258	1,258	1,258	1,257	1,257	1,257	1,257	1,257	1,257
2007	1,257	1,257	1,257	1,257	1,257	1,258	1,258	1,258	1,258	1,258	1,258	1,258
2008	1,258	1,258	1,258	1,257	1,257	1,257	1,257	1,257	1,257	1,256	1,256	1,256
2009	1,256	1,257	1,257	1,258	1,258	1,259	1,259	1,259	1,260	1,260	1,261	1,261
2010	1,261	1,260	1,260	1,260	1,259	1,259	1,259	1,258	1,258	1,258	1,257	1,257
2011	1,257	1,258	1,258	1,259	1,259	1,260	1,260	1,260	1,261	1,261	1,262	1,262
2012	1,262	1,262	1,262	1,261	1,261	1,261	1,261	1,261	1,261	1,260	1,260	1,260
2013	1,260	1,259	1,259	1,259	1,258	1,258	1,258	1,257	1,257	1,257	1,256	1,256
2014	1,256	1,257	1,257	1,258	1,258	1,259	1,259	1,259	1,260	1,260	1,261	

BUS Outside City Services

	Month											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2000	620	621	621	622	623	624	624	625	626	627	627	628
2001	628	628	628	628	628	628	628	628	628	628	628	628
2002	628	628	628	628	628	629	629	629	629	629	629	629
2003	629	629	628	628	628	628	627	627	627	627	626	626
2004	626	626	626	626	626	626	626	626	626	626	626	626
2005	626	626	625	625	625	625	624	624	624	624	623	623
2006	624	624	625	625	626	626	627	627	628	628	629	629
2007	629	628	628	627	627	626	626	625	625	624	624	623
2008	623	623	623	623	623	623	622	622	622	622	622	622
2009	622	623	623	624	624	625	625	625	626	626	627	627
2010	627	627	627	627	627	628	628	628	628	628	628	628
2011	628	628	628	628	628	628	628	628	628	628	628	628
2012	629	629	630	630	631	631	632	632	633	633	634	634
2013	634	634	634	634	634	634	633	633	633	633	633	633
2014	634	634	635	635	636	637	637	638	638	639	639	

BUS Inside City Plumbing Code Water Savings Since 2000 (CCF/Service)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	2.4
2002	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.8
2003	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	7.2
2004	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	9.4
2005	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.1	1.1	11.6
2006	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	13.6
2007	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	15.6
2008	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	17.4
2009	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	19.2
2010	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	21.0
2011	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	22.8
2012	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	24.6
2013	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	26.5
2014	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3		25.1

BUS Outside City Plumbing Code Water Savings Since 2000 (CCF/Service)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	2.4
2002	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.8
2003	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	7.1
2004	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	9.3
2005	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	11.5
2006	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	13.5
2007	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	15.4
2008	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	17.3
2009	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	19.1
2010	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	20.7
2011	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	22.6
2012	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	24.2
2013	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	25.9
2014	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2		24.4

BUS Inside City Avg Use (CCF/Service)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	31.0	33.1	34.3	37.3	42.4	45.1	45.7	46.1	41.2	38.6	34.9	32.3	462.1
2001	33.2	33.8	32.5	35.3	44.4	48.1	43.7	43.0	41.1	38.3	32.6	30.3	456.4
2002	26.9	27.8	35.0	39.2	40.5	42.6	40.3	42.0	40.6	37.1	32.5	30.1	434.5
2003	29.6	30.9	31.8	34.6	39.2	40.8	43.8	49.5	43.9	34.1	28.6	28.5	435.2
2004	29.9	35.8	36.0	34.8	42.1	45.0	44.0	40.8	32.8	31.9	30.3	33.1	436.6
2005	38.1	34.8	28.7	29.8	37.7	37.3	44.8	46.5	39.4	35.7	32.6	31.2	436.6
2006	27.4	31.9	27.6	26.0	40.1	40.0	48.3	45.0	37.1	35.0	28.1	29.3	415.8
2007	27.9	33.3	30.4	31.1	36.7	43.4	53.1	48.3	41.0	35.0	24.9	27.1	432.2
2008	30.4	29.8	32.4	32.3	34.3	38.8	43.4	39.9	34.6	32.4	27.4	25.5	401.1
2009	25.6	24.6	27.1	29.6	31.7	34.1	38.1	39.3	34.1	29.7	25.3	23.8	363.0
2010	26.4	24.5	24.4	27.1	30.5	34.5	37.2	37.0	33.3	29.4	25.0	22.2	351.5
2011	24.1	23.4	23.2	27.3	30.1	32.3	36.7	36.4	32.0	28.8	26.2	25.2	345.7
2012	25.1	25.5	26.0	27.0	29.9	35.0	38.4	37.5	34.0	30.7	27.8	25.4	362.4
2013	25.1	24.6	26.9	29.3	33.2	37.3	39.0	38.3	35.0	33.3	30.6	27.9	380.6
2014	27.1	25.1	27.2	29.8	30.8	32.7	34.2	32.5	29.3	27.3	24.2		320.4

BUS Outside City Avg Use (CCF/Service)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	43.5	43.8	45.2	50.3	54.0	56.6	60.2	58.1	59.1	52.0	48.5	45.5	616.6
2001	42.8	40.2	40.1	47.2	52.8	55.0	57.9	56.4	57.9	51.9	48.7	44.6	595.7
2002	41.9	42.7	43.8	47.7	51.2	55.2	59.5	58.3	60.0	51.2	45.1	40.8	597.3
2003	38.0	38.4	39.3	41.4	44.0	51.0	56.9	53.6	53.1	46.1	42.4	39.0	543.2
2004	36.3	37.9	40.8	47.3	51.8	54.3	58.7	57.7	57.7	49.1	44.6	42.8	579.1
2005	41.9	38.1	35.4	41.0	46.8	49.6	52.8	51.4	53.3	47.7	44.7	39.6	542.5
2006	35.3	34.2	34.3	38.4	42.3	47.4	51.8	49.6	51.3	45.5	41.4	37.7	509.2
2007	35.8	36.1	36.8	39.4	42.0	45.8	49.4	46.9	47.6	42.9	41.3	38.1	502.1
2008	34.9	33.3	33.3	39.6	55.9	55.0	36.0	37.9	61.1	56.3	35.7	33.8	512.6
2009	31.8	30.7	34.8	39.3	42.0	43.9	44.2	45.5	38.8	36.1	31.6	29.3	448.0
2010	29.4	30.1	30.8	31.2	36.7	41.9	41.8	42.7	37.3	34.8	29.8	27.4	414.0
2011	27.2	27.7	30.5	33.6	36.4	38.8	41.0	44.0	37.7	34.9	32.0	31.8	415.6
2012	30.7	29.9	31.7	33.8	39.3	43.9	42.5	43.2	38.7	37.1	33.2	31.5	435.4
2013	30.9	31.6	34.9	38.2	41.4	43.2	41.7	42.6	39.6	40.5	36.5	32.7	453.8
2014	30.0	35.0	40.0	31.9	34.2	36.7	36.0	34.8	33.6	31.9	28.3		372.4

BUS Inside City Adjusted Avg Use (CCF/Service)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	31.0	33.1	34.3	37.3	42.4	45.1	45.7	46.1	41.2	38.6	34.9	32.3	462.1
2001	33.2	33.9	32.6	35.5	44.6	48.3	43.9	43.3	41.3	38.6	32.9	30.7	458.9
2002	27.3	28.2	35.4	39.5	40.9	43.0	40.7	42.5	41.0	37.5	32.9	30.5	439.4
2003	30.0	31.4	32.3	35.1	39.8	41.4	44.4	50.1	44.5	34.8	29.3	29.2	442.4
2004	30.7	36.6	36.7	35.5	42.9	45.8	44.8	41.6	33.6	32.7	31.1	33.9	446.0
2005	39.0	35.6	29.6	30.7	38.6	38.2	45.8	47.5	40.5	36.7	33.7	32.3	448.2
2006	28.5	33.0	28.8	27.1	41.2	41.1	49.4	46.2	38.3	36.2	29.3	30.5	429.4
2007	29.1	34.5	31.7	32.4	37.9	44.7	54.4	49.6	42.3	36.3	26.3	28.5	447.8
2008	31.8	31.2	33.8	33.7	35.7	40.3	44.9	41.3	36.1	33.8	28.8	27.0	418.5
2009	27.1	26.1	28.7	31.2	33.3	35.7	39.7	40.9	35.7	31.4	27.0	25.5	382.2
2010	28.1	26.2	26.1	28.8	32.3	36.2	38.9	38.8	35.1	31.1	26.8	24.0	372.5
2011	25.9	25.2	25.0	29.2	31.9	34.2	38.6	38.3	34.0	30.8	28.2	27.2	368.6
2012	27.1	27.6	28.0	29.1	31.9	37.1	40.5	39.6	36.0	32.7	29.9	27.5	387.0
2013	27.3	26.7	29.0	31.5	35.4	39.5	41.2	40.6	37.2	35.6	32.9	30.2	407.0
2014	29.4	27.4	29.5	32.0	33.1	35.0	36.5	34.8	31.6	29.6	26.5		345.5

BUS Outside City Adjusted Avg Use (CCF/Service)

	Month												
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Annual**
2000	43.5	43.8	45.2	50.3	54.0	56.6	60.2	58.1	59.1	52.0	48.5	45.5	616.6
2001	42.9	40.3	40.2	47.3	53.0	55.2	58.2	56.7	58.2	52.2	49.1	44.9	598.1
2002	42.2	43.0	44.2	48.1	51.6	55.6	59.9	58.7	60.4	51.6	45.5	41.3	602.1
2003	38.5	38.9	39.8	41.9	44.6	51.6	57.5	54.2	53.7	46.8	43.2	39.7	550.3
2004	37.1	38.6	41.6	48.0	52.6	55.1	59.5	58.5	58.5	49.9	45.5	43.6	588.5
2005	42.8	39.0	36.3	41.9	47.7	50.5	53.8	52.4	54.4	48.8	45.8	40.7	554.0
2006	36.4	35.3	35.4	39.5	43.4	48.5	52.9	50.8	52.4	46.7	42.5	38.8	522.6
2007	37.0	37.3	38.0	40.6	43.2	47.0	50.7	48.2	48.9	44.3	42.7	39.5	517.5
2008	36.3	34.7	34.7	41.0	57.3	56.4	37.4	39.3	62.6	57.8	37.2	35.3	530.0
2009	33.3	32.2	36.3	40.8	43.6	45.5	45.8	47.1	40.4	37.8	33.3	30.9	467.1
2010	31.1	31.8	32.5	32.9	38.4	43.7	43.6	44.4	39.1	36.6	31.5	29.2	434.8
2011	29.0	29.5	32.4	35.4	38.3	40.7	42.9	45.9	39.7	36.8	34.0	33.8	438.2
2012	32.7	31.9	33.7	35.8	41.4	45.9	44.5	45.2	40.7	39.1	35.3	33.5	459.6
2013	33.0	33.7	37.0	40.3	43.6	45.4	43.9	44.8	41.8	42.7	38.7	35.0	479.7
2014	32.3	37.2	42.2	34.1	36.4	38.9	38.2	37.0	35.8	34.1	30.5		396.8

ATTACHMENT 5 MODEL ESTIMATION RESULTS

Single Family Customer Class Model

Heteroscedastic and auto-correlation consistent standard errors reported in parentheses.

	Dependent variable:
	ln.adj.use
geooutside	0.061 (0.018)***
fmonthFeb	-0.013 (0.010)
fmonthMar	0.014 (0.015)
fmonthApr	0.159 (0.015)***
fmonthMay	0.451 (0.021)***
fmonthJun	0.564 (0.021)***
fmonthJul	0.632 (0.022)***
fmonthAug	0.615 (0.023)***
fmonthSep	0.550 (0.018)***
fmonthOct	0.360 (0.017)***
fmonthNov	0.143 (0.014)***
fmonthDec	0.053 (0.009)***
temp.nov.mar	0.203 (0.091)**
temp.apr.jun	0.422 (0.204)**
temp.jul.oct	0.636 (0.191)***
rain.nov.mar	-0.016 (0.009)*
rain.apr.jun	-0.069 (0.014)***
rain.jul.oct	-0.040 (0.020)**
ln.rain.dev.lag1	-0.034 (0.006)***
ln.rain.dev.lag2	-0.026 (0.007)***
ln.price.winter	-0.075 (0.010)***
ln.price.summer	-0.139 (0.017)***
ln.hh.inc	0.228 (0.076)***
drght.stage1	-0.051 (0.019)***
drght.stage2	-0.071 (0.017)***
drght.stage3	-0.431 (0.019)***
geooutside:ln.price.summer	0.020 (0.009)**
Constant	-0.605 (0.845)
Observations	358
R2	0.923
Adjusted R2	0.917
Residual Std. Error	0.064 (df = 330)
F Statistic	147.089*** (df = 27; 330)
Note:	*p<0.1; **p<0.05; ***p<0.01

Multi Family Customer Class Model

Heteroscedastic and auto-correlation consistent standard errors reported in parentheses.

	Dependent variable:
	ln.adj.use
geooutside	0.055 (0.012)***
fmonthFeb	0.009 (0.014)
fmonthMar	-0.006 (0.014)
fmonthApr	0.031 (0.014)**
fmonthMay	0.141 (0.013)***
fmonthJun	0.185 (0.012)***
fmonthJul	0.194 (0.015)***
fmonthAug	0.189 (0.013)***
fmonthSep	0.150 (0.012)***
fmonthOct	0.111 (0.011)***
fmonthNov	0.033 (0.015)**
fmonthDec	-0.001 (0.013)
temp.nov.mar	0.100 (0.066)
temp.apr.jun	0.338 (0.099)***
temp.jul.oct	-0.037 (0.089)
rain.nov.mar	0.001 (0.005)
rain.apr.jun	-0.020 (0.009)**
rain.jul.oct	-0.018 (0.008)**
ln.price	-0.124 (0.029)***
ln.vac.cap.dev	-0.164 (0.058)***
drght.stage1	-0.009 (0.010)
drght.stage2	-0.028 (0.008)***
drght.stage3	-0.192 (0.010)***
geooutside:fmonthFeb	-0.030 (0.017)*
geooutside:fmonthMar	0.002 (0.021)
geooutside:fmonthApr	0.051 (0.017)***
geooutside:fmonthMay	0.018 (0.016)
geooutside:fmonthJun	0.022 (0.018)
geooutside:fmonthJul	0.044 (0.017)***
geooutside:fmonthAug	0.031 (0.016)**
geooutside:fmonthSep	0.057 (0.018)***
geooutside:fmonthOct	0.017 (0.014)
geooutside:fmonthNov	0.041 (0.016)**
geooutside:fmonthDec	0.033 (0.014)**
Constant	1.726 (0.035)***
Observations	351
R2	0.909
Adjusted R2	0.900
Residual Std. Error	0.035 (df = 316)
F Statistic	93.266*** (df = 34; 316)
Note:	*p<0.1; **p<0.05; ***p<0.01

Business Customer Class Model

Heteroscedastic and auto-correlation consistent standard errors reported in parentheses.

	Dependent variable:
	ln.adj.use
geooutside	0.486 (0.048)***
fmonthFeb	0.033 (0.017)*
fmonthMar	0.048 (0.017)***
fmonthApr	0.116 (0.015)***
fmonthMay	0.250 (0.016)***
fmonthJun	0.330 (0.015)***
fmonthJul	0.396 (0.017)***
fmonthAug	0.380 (0.018)***
fmonthSep	0.273 (0.015)***
fmonthOct	0.172 (0.014)***
fmonthNov	0.044 (0.020)**
fmonthDec	-0.005 (0.020)
temp.nov.mar	0.243 (0.103)**
temp.apr.jun	0.400 (0.193)**
temp.jul.oct	-0.135 (0.121)
rain.nov.mar	0.001 (0.007)
rain.apr.jun	-0.034 (0.013)***
rain.jul.oct	-0.028 (0.010)***
rain.lag1.apr.jun	-0.017 (0.008)**
ln.price	-0.099 (0.017)***
ln.unemp.rate.dev.city	-0.160 (0.011)***
drght.stage3	-0.123 (0.008)***
geooutside:fmonthFeb	-0.037 (0.021)*
geooutside:fmonthMar	-0.021 (0.026)
geooutside:fmonthApr	0.010 (0.020)
geooutside:fmonthMay	-0.037 (0.022)*
geooutside:fmonthJun	-0.031 (0.023)
geooutside:fmonthJul	-0.064 (0.022)***
geooutside:fmonthAug	-0.067 (0.024)***
geooutside:fmonthSep	0.007 (0.024)
geooutside:fmonthOct	0.018 (0.020)
geooutside:fmonthNov	0.062 (0.025)**
geooutside:fmonthDec	0.040 (0.022)*
geooutside:ln.price	-0.163 (0.028)***
geooutside:drght.stage3	-0.068 (0.011)***
Constant	3.488 (0.023)***
Observations	353
R2	0.948
Adjusted R2	0.942
Residual Std. Error	0.047 (df = 317)
F Statistic	163.460*** (df = 35; 317)

Municipal Customer Class Model

Heteroscedastic and auto-correlation consistent standard errors reported in parentheses.

	Dependent variable:
	ln.use
fmonthFeb	-0.025 (0.040)
fmonthMar	0.101 (0.057)*
fmonthApr	0.767 (0.052)***
fmonthMay	1.214 (0.049)***
fmonthJun	1.424 (0.046)***
fmonthJul	1.553 (0.040)***
fmonthAug	1.579 (0.041)***
fmonthSep	1.360 (0.045)***
fmonthOct	1.061 (0.042)***
fmonthNov	0.521 (0.039)***
fmonthDec	0.087 (0.034)**
eto.nov.mar	0.516 (0.138)***
eto.apr.jun	0.804 (0.242)***
eto.jul.oct	0.357 (0.107)***
rain.nov.mar	0.037 (0.036)
rain.apr.jun	-0.147 (0.050)***
rain.jul.oct	0.006 (0.038)
ln.rain.dev.lag1	-0.097 (0.019)***
ln.rain.dev.lag2	-0.063 (0.019)***
ln.price	-0.237 (0.063)***
ln.unemp.rate.dev.city	-0.142 (0.046)***
drght.stage2	-0.108 (0.034)***
drght.stage3	-0.621 (0.035)***
Constant	2.645 (0.076)***
Observations	177
R2	0.957
Adjusted R2	0.951
Residual Std. Error	0.137 (df = 153)
F Statistic	149.772*** (df = 23; 153)
Note:	*p<0.1; **p<0.05; ***p<0.01

Irrigation Customer Class Model

Heteroscedastic and auto-correlation consistent standard errors reported in parentheses.

	Dependent variable:
	ln.use
geooutside	0.150 (0.034)***
fmonthFeb	0.058 (0.039)
fmonthMar	0.380 (0.076)***
fmonthApr	1.256 (0.069)***
fmonthMay	1.697 (0.052)***
fmonthJun	1.938 (0.045)***
fmonthJul	2.028 (0.046)***
fmonthAug	1.992 (0.046)***
fmonthSep	1.920 (0.048)***
fmonthOct	1.614 (0.049)***
fmonthNov	1.073 (0.043)***
fmonthDec	0.479 (0.053)***
eto.nov.mar	0.509 (0.207)**
eto.apr.jun	0.660 (0.243)***
eto.jul.oct	0.163 (0.184)
rain.nov.mar	-0.044 (0.049)
rain.apr.jun	-0.116 (0.065)*
rain.jul.oct	-0.085 (0.040)**
ln.rain.dev.lag1	-0.166 (0.025)***
ln.rain.dev.lag2	-0.090 (0.021)***
ln.price	-0.545 (0.069)***
drght.stage1	-0.077 (0.048)
drght.stage2	-0.250 (0.044)***
drght.stage3	-0.930 (0.081)***
Constant	2.681 (0.080)***
Observations	358
R2	0.922
Adjusted R2	0.916
Residual Std. Error	0.216 (df = 333)
F Statistic	164.036*** (df = 24; 333)
Note:	*p<0.1; **p<0.05; ***p<0.01

Golf Customer Class Model

Heteroscedastic and auto-correlation consistent standard errors reported in parentheses.

	Dependent variable:
	ln.use
geooutside	7.105 (0.201)***
fmonthFeb	-0.242 (0.129)*
fmonthMar	-0.006 (0.100)
fmonthApr	9.812 (0.225)***
fmonthMay	11.174 (0.177)***
fmonthJun	11.845 (0.159)***
fmonthJul	12.018 (0.165)***
fmonthAug	12.098 (0.166)***
fmonthSep	11.876 (0.161)***
fmonthOct	11.448 (0.161)***
fmonthNov	10.043 (0.147)***
fmonthDec	8.628 (0.245)***
ln.eto.nov.mar	1.135 (0.329)***
ln.eto.apr.jun	0.173 (0.452)
ln.eto.jul.oct	0.792 (0.228)***
ln.rain.nov.mar	-0.129 (0.083)
ln.rain.apr.jun	-0.441 (0.140)***
ln.rain.jul.oct	-0.038 (0.055)
ln.rain.dev.lag1	-0.546 (0.060)***
ln.rain.dev.lag2	-0.074 (0.047)
ln.price.summer	-0.358 (0.098)***
drght.stage3	-0.319 (0.064)***
geooutside:fmonthFeb	0.749 (0.255)***
geooutside:fmonthMar	0.896 (0.275)***
geooutside:fmonthApr	-6.721 (0.297)***
geooutside:fmonthMay	-7.186 (0.277)***
geooutside:fmonthJun	-7.384 (0.258)***
geooutside:fmonthJul	-7.400 (0.263)***
geooutside:fmonthAug	-7.408 (0.258)***
geooutside:fmonthSep	-7.397 (0.262)***
geooutside:fmonthOct	-7.287 (0.256)***
geooutside:fmonthNov	-6.698 (0.232)***
geooutside:fmonthDec	-6.703 (0.332)***
geooutside:ln.price.summer	0.364 (0.124)***
Constant	-6.701 (0.103)***
Observations	332
R2	0.989
Adjusted R2	0.988
Residual Std. Error	0.367 (df = 297)
F Statistic	805.493*** (df = 34; 297)
Note:	*p<0.1; **p<0.05; ***p<0.01

ATTACHMENT 6 MONTHS DROUGHT STAGES IN EFFECT

Drought Stage 1: 0 = Not In Effect, 1 = In Effect

	Month											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	1	1	1	1	1	1	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	1	1	1	1	1	1	0	0
2013	0	0	0	0	1	1	1	1	1	1	1	1
2014	1	1	1	1	0	0	0	0	0	0	0	

Drought Stage 2: 0 = Not In Effect, 1 = In Effect

	Month											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	1	1	1	1	1	1	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	

Drought Stage 3: 0 = Not In Effect, 1 = In Effect

	Month											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	1	1	1	1	1	1	1	

ATTACHMENT 7 WATER RATE AND INCOME FORECASTS

Forecasted Increase in Water Rates

Year	Caltrans Inflation Rate Forecast	% Change in Water Rate	% Change Net of Inflation	Real Water Rate Index	% Change from 2014
2014	2.8%			100.0	
2015	3.3%	10.0%	6.7%	106.7	6.7%
2016	3.2%	10.0%	6.8%	114.0	14.0%
2017	2.4%	10.0%	7.6%	122.6	22.6%
2018	2.3%	10.0%	7.7%	132.1	32.1%
2019	2.4%	10.0%	7.6%	142.1	42.1%
2020	2.3%	4.4%	2.1%	145.1	45.1%
2021	2.5%	4.4%	1.9%	148.0	48.0%
2022	2.6%	4.4%	1.8%	150.7	50.7%
2023	2.5%	4.4%	1.9%	153.6	53.6%
2024	2.5%	4.4%	1.9%	156.6	56.6%
2025	2.5%	4.4%	1.9%	159.7	59.7%
2026	2.5%	4.4%	1.9%	162.8	62.8%
2027	2.5%	4.4%	1.9%	166.0	66.0%
2028	2.5%	4.4%	1.9%	169.2	69.2%
2029	2.5%	4.4%	1.9%	172.5	72.5%
2030	2.5%	4.4%	1.9%	175.9	75.9%
2031	2.5%	4.4%	1.9%	179.3	79.3%
2032	2.5%	4.4%	1.9%	182.8	82.8%
2033	2.5%	4.4%	1.9%	186.3	86.3%
2034	2.5%	4.4%	1.9%	190.0	90.0%
2035	2.5%	4.4%	1.9%	193.7	93.7%

The forecasted nominal annual percentage change in water rate for 2014-2019 is from the Water Department. The forecasted nominal annual percentage change in water rate from 2020-2035 is set to the long-term annual rate of increase in the BLS Consumer Price Index for Water, Sewer, and Solid Waste Services (http://data.bls.gov/timeseries/CUSR0000SEHG). The source of the Caltrans inflation rate forecast for Santa Cruz County is: http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic_files/2014/SantaCruz.pdf#zoom=75

Forecasted Increase in Income

Year	Caltrans Real Per Capita Income Forecast	% Change from 2014
2014	$56,085	
2015	$57,661	2.8%
2016	$59,004	5.2%
2017	$60,267	7.5%
2018	$61,653	9.9%
2019	$62,994	12.3%
2020	$64,379	14.8%
2021	$65,679	17.1%
2022	$66,829	19.2%
2023	$67,986	21.2%
2024	$69,191	23.4%
2025	$70,394	25.5%
2026	$71,482	27.5%
2027	$72,552	29.4%
2028	$73,614	31.3%
2029	$74,679	33.2%
2030	$75,749	35.1%
2031	$76,826	37.0%
2032	$77,844	38.8%
2033	$78,920	40.7%
2034	$80,043	42.7%
2035	$81,138	44.7%

The source of the Caltrans forecasted increase in real per capita income for Santa Cruz County is:

http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic_files/2014/SantaCruz.pdf#zoom=75

While per capita income is projected to grow over the forecast period, it is less clear that median household income will exhibit similar growth. According to Census data, median household income in Santa Cruz County after adjusting for inflation has been stagnant to declining since 1989. Consequently, the demand forecasts hold median household income constant at the 2013 level in the single family forecast.

Santa Cruz County, CA

Median Household Income

Year	Nominal	CPI	Inflator	2013 $
1989	$37,112	128.000	1.8877	$70,056

1999	$53,998	168.500	1.4340	$77,431
2005	$58,640	202.600	1.1926	$69,935
2009	$64,349	224.110	1.0781	$69,378
2010	$65,253	226.919	1.0648	$69,481
2013	$66,519	241.623	1.0000	$66,519

Source: US Census and ACS

ATTACHMENT 8 PLUMBING CODE AND PROGRAM A SAVINGS FORECASTS

Forecasts of plumbing code water savings, Program A water savings, and allocation of Program A savings to customer classes were produced by Maddaus Water Management's DSS model.

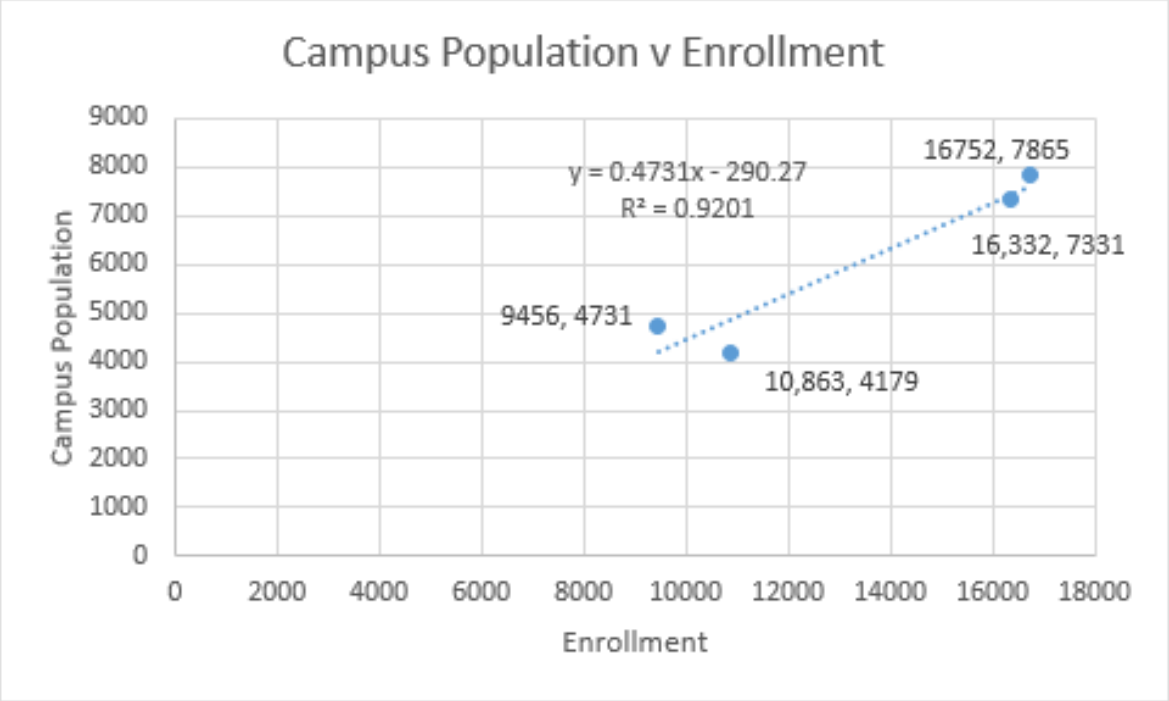
	SFR Code Savings, 2013 Base Year			
Year	MG/Yr	CCF/Yr	Services	CCF/Service
2020	32.7	43,717	19559	2.2
2025	68.0	90,909	19907	4.6
2030	103.3	138,102	20256	6.8
2035	124.7	166,711	20256	8.2
	SFR Prog A Savings, 2013 Base Year			
Year	MG/Yr	CCF/Yr	Services	CCF/Service
2020	55.8	74,663	19559	3.8
2025	61.6	82,393	19907	4.1
2030	59.8	79,932	20256	3.9
2035	57.2	76,533	20256	3.8
	MFR Code Savings, 2013 Base Year			
Year	MG/Yr	CCF/Yr	Services	CCF/Service
2020	29.6	39,544	18867	2.1
2025	58.6	78,394	19430	4.0
2030	87.7	117,286	20416	5.7
2035	103.2	137,991	21174	6.5
	MFR Prog A Savings, 2013 Base Year			
Year	MG/Yr	CCF/Yr	Services	CCF/Service
2020	33.0	44,082	18867	2.3
2025	50.9	68,078	19430	3.5
2030	48.0	64,205	20416	3.1
2035	45.7	61,048	21174	2.9
	BUS Code Savings, 2013 Base Year			
Year	MG/Yr	CCF/Yr	Services	CCF/Service
2020	3.1	4,110	2373	1.7
2025	4.9	6,498	2494	2.6
2030	6.3	8,477	2621	3.2
2035	6.9	9,249	2755	3.4
	BUS Prog A Savings, 2013 Base Year			
Year	MG/Yr	CCF/Yr	Services	CCF/Service
2020	18.4	24,557	2373	10.3
2025	28.1	37,553	2494	15.1
2030	28.5	38,047	2621	14.5
2035	28.3	37,848	2755	13.7

Program A Savings Allocation to Customer Classes

		Class Shares (%)				
Year	Total (MG)	SFR	MFR	BUS	MUN	IND
2020	110	51%	30%	17%	2%	0%
2025	143	43%	36%	20%	1%	0%
2030	139	43%	35%	21%	1%	0%
2035	134	43%	34%	21%	1%	0%

ATTACHMENT 9 UCSC CAMPUS POPULATION FORECAST

Data on enrollment and campus population were collected for 1990, 2000, 2010, and 2013. Enrollment data are from UCSC. Population data are for Census Tract 1004. The enrollment data are from University of California Office of the President. The relationship between enrollment and campus population is shown in the following figure.



The average gain in population per one student gain in enrollment over this period was 0.47. Over the 23 year period considered, campus population has averaged about 45% of total enrollment. According to the UCSC Long Range Development Plan (LRDP, p. 71), future campus development will maintain or possibly increase this ratio. The campus population forecast used for this report assumes the rate of campus population gain is the same as show in the figure above, resulting in the following campus population forecast.

UCSC	**2010**	**2020**	**2025**	**2030**	**2035**
AMBAG UCSC Enrollment Projection	16,300	19,500	21,100	22,700	24,300
Gain		3,200	4,800	6,400	8,000
Projected Campus Population	7,331	8,845	9,602	10,359	11,116
Gain		1,514	2,271	3,028	3,785

ATTACHMENT 10 INDUSTRIAL DEMAND FORECAST MODEL

Year	Industrial Water Use (CCF)	County Mfg Empl	Recovery Dummy
2003	54623	7000	0
2004	59656	7400	0
2005	53384	7200	0
2006	49297	6700	0
2007	51018	6400	0
2008	42607	6100	0
2009	32753	5300	0
2010	56145	5300	1
2011	60782	5400	1
2012	72070	5600	1
2013	74451	5800	1

Model: use = constant + recovery.dummy + employment + employment x recovery.dummy

```
================================================
                        Dependent variable:
                    ---------------------------
                                use
------------------------------------------------
recovery.dum         -116,651.400 (38,297.110)**
emp                      11.863 (1.451)***
recovery.dum:emp         26.434 (6.861)***
Constant              -29,081.030 (9,608.094)**
------------------------------------------------
Observations                  11
R2                           0.967
Adjusted R2                  0.953
Residual Std. Error     2,575.436 (df = 7)
F Statistic            69.305*** (df = 3; 7)
================================================
Note:                *p<0.1; **p<0.05; ***p<0.01
```

POLICY ANALYSIS FOR THE PUBLIC AND PRIVATE SECTORS
M.CUBED

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OAKLAND, CA 94618
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MITCHELL@MCUBED-ECON.COM

DATE: March 30, 2016
TO: Toby Goddard, City of Santa Cruz
FR: David Mitchell
RE: Effect of Temperature on City of Santa Cruz Water Demands

Summary

This memorandum presents estimates of the expected percentage change in demand per a 1 degree F change in monthly average maximum daily air temperature. These estimates are shown in Table 1. Per the table, a 1 degree F increase in monthly average maximum daily air temperature would be expected to increase SFR demand by 0.62 percent, but golf course demand by 1.38 percent. Total system demand would be expected to increase by 0.45 percent.

The estimates in Table 1 assume a 1 degree F increase from the long-term average in monthly average maximum daily air temperature across all twelve months. Thus it is the average change across the entire year given a uniform increase in temperature. The expected change in demand for specific months would differ from the estimates in Table 1, being generally higher in the spring and fall and lower in the winter.

Table 1. Expected % Change in Demand per 1 Degree F Change in Monthly Average Maximum Daily Air Temperature

Customer Category	% change in demand per 1 degree F
SFR	0.62
MFR	0.19
BUS	0.29
MUN	1.09
IRR	0.80
GOLF	1.38
IND	0.00
Weighted Average	0.45

Estimation

The following analytical steps were taken to develop the estimates in Table 1.

Step 1: Estimate relationship between temperature, rainfall, and ETo

Weather effects for City of Santa Cruz water demand were estimated econometrically. For the residential and business customer categories, the weather effects were measured based on deviations in rainfall and temperature from their 25-year normal. However, for the municipal, irrigation, and golf course customer categories, ETo was used instead of temperature. It therefore is necessary to translate

a 1 degree F change in temperature to the corresponding change in ETo. This was done by regressing rainfall and temperature against ETo for each month to get the average change in monthly ETo per 1 degree change in temperature. The results are shown in Table 2.

Table 2. Change in ETo per 1 Degree F Change in Temperature

Month	Mean Monthly Value		Change in ETo per Degree Change in Temp
	Max Daily Temp F	ETo Inches	
Jan	60.6	1.63	0.0478
Feb	61.2	2.03	0.0000
Mar	63.9	3.56	0.0485
Apr	66.4	4.42	0.0760
May	69.7	5.18	0.1064
Jun	72.4	5.48	0.1233
Jul	72.8	5.16	0.0648
Aug	74.7	4.85	0.0623
Sep	74.4	3.93	0.1322
Oct	71.7	2.98	0.0828
Nov	65.0	1.80	0.0491
Dec	59.4	1.35	0.0560

Step 2: Estimate % Change in Demand per 1 Degree F Change in Temp by Month and Customer Category

The next step was to use the results of the econometric demand models to estimate the percentage change in demand given a 1 degree F change in monthly average maximum daily air temperature by month and by customer category.

If all variables in the econometric demand models other than temperature or ETo are assumed constant, a customer category's expected monthly demand can be represented as:

$$y = kx^{\beta}$$

where y is expected monthly demand, x is temperature or ETo, k is a constant, and β is the econometrically estimated parameter for temperature or ETo.

Let $\bar{x}$ be the 25-year normal for monthly average maximum daily air temperature or ETo. Then for the residential and business demand categories, the expected percentage change in monthly demand given a 1 degree F increase in the 25-year normal temperature is given by

$$\frac{y_1 - y_0}{y_0} = \frac{k(\bar{x}+1)^{\beta} - k\bar{x}^{\beta}}{k\bar{x}^{\beta}} = \left(\frac{\bar{x}+1}{\bar{x}}\right)^{\beta} - 1$$

For the customer categories that utilize ETo the 1 degree F increase in temperature must be translated into the corresponding expected change in ETo using the results in Table 2. Denoting the change in ETo by ε, the expected percentage change in monthly demand for these customer categories is given by

$$\frac{y_1 - y_0}{y_0} = \frac{k(\bar{x} + \varepsilon)^\beta - k\bar{x}^\beta}{k\bar{x}^\beta} = \left(\frac{\bar{x} + \varepsilon}{\bar{x}}\right)^\beta - 1$$

The 25-year normals for temperature and ETo used to implement these equations are given in Table 2. The β parameters from the econometric demand models are given in Table 3.

Table 3. β Parameters for Temperature and ETo from Econometric Demand Models

	Temperature			ETo		
Month	SFR	MFR	BUS	MUN	IRR	GOLF
Jan	0.203	0.100	0.243	0.516	0.509	1.135
Feb	0.203	0.100	0.243	0.516	0.509	1.135
Mar	0.203	0.100	0.243	0.516	0.509	1.135
Apr	0.422	0.338	0.400	0.804	0.660	0.173
May	0.422	0.338	0.400	0.804	0.660	0.173
Jun	0.422	0.338	0.400	0.804	0.660	0.173
Jul	0.636	0.000	0.000	0.357	0.163	0.792
Aug	0.636	0.000	0.000	0.357	0.163	0.792
Sep	0.636	0.000	0.000	0.357	0.163	0.792
Oct	0.636	0.000	0.000	0.357	0.163	0.792
Nov	0.203	0.100	0.243	0.516	0.509	1.135
Dec	0.203	0.100	0.243	0.516	0.509	1.135

The resulting estimates of the percentage change in demand given a 1 degree F increase in temperature by month and customer category are shown in Table 4.

Table 4. Expected % Change in Demand per 1 Degree F Change in Temperature

Month	SFR	MFR	BUS	MUN	IRR	GOLF
Jan	0.333	0.164	0.399	1.504	1.483	3.338
Feb	0.330	0.162	0.395	0.000	0.000	0.000
Mar	0.316	0.155	0.378	0.700	0.691	1.546
Apr	0.632	0.506	0.599	1.381	1.132	0.295
May	0.603	0.482	0.571	1.647	1.350	0.352
Jun	0.581	0.465	0.550	1.804	1.479	0.385
Jul	0.872	0.000	0.000	0.447	0.204	0.993
Aug	0.850	0.000	0.000	0.457	0.208	1.017
Sep	0.853	0.000	0.000	1.188	0.541	2.655
Oct	0.885	0.000	0.000	0.985	0.448	2.197
Nov	0.310	0.153	0.372	1.400	1.381	3.105
Dec	0.340	0.167	0.407	2.115	2.086	4.710

Step 3: Estimate Annual % Change in Demand per 1 Degree F Change in Temperature for Each Customer Category

The next step is to use each customer categories seasonal demand index to estimate the percentage change in annual demand per 1 degree F change in temperature. The seasonal demand indices for the customer categories were estimated using the econometric demand models and are shown in Table 5.

Table 5. Seasonal Demand Indices

Month	SFR	MFR	BUS	MUN	IRR	GOLF
Jan	6.02	7.62	6.96	3.14	1.97	0.18
Feb	5.94	7.69	7.19	3.06	2.09	0.29
Mar	6.11	7.57	7.30	3.47	2.88	0.43
Apr	7.06	7.86	7.81	6.75	6.92	3.89
May	9.45	8.77	8.94	10.55	10.75	9.54
Jun	10.58	9.17	9.68	13.03	13.69	15.32
Jul	11.33	9.25	10.34	14.81	14.97	17.92
Aug	11.14	9.21	10.18	15.22	14.44	19.26
Sep	10.44	8.85	9.14	12.21	13.44	15.59
Oct	8.63	8.51	8.26	9.06	9.90	11.35
Nov	6.95	7.88	7.27	5.28	5.76	5.02
Dec	6.35	7.61	6.92	3.42	3.18	1.21
Total	100.00	100.00	100.00	100.00	100.00	100.00

Denoting the monthly change in demand from Table 4 for customer category j as d_{ij} and the monthly seasonal index value from Table 5 as s_{ij}, then the percentage change in annual demand for customer category j, D_j, per 1 degree F change in temperature is given by

$$D_j = \frac{1}{100}\sum_{i=1}^{12} d_{ij} \times s_{ij}$$

The results of this calculate for each customer category is given in Table 6.

Table 6. Expected % Change in Demand per 1 Degree F Change in Monthly Average Maximum Daily Air Temperature

Customer Category	% change in demand per 1 degree F
SFR	0.62
MFR	0.19
BUS	0.29
MUN	1.09
IRR	0.80
GOLF	1.38

Step 4: Estimate Annual % Change in Demand per 1 Degree F Change in Temperature for Total Demand

The final step is to construct the consumption-weighted average change in annual demand across all customer categories. This was done using the customer category demand shares given in Table 7.

Table 7. Customer Category Demand Shares

Year	SFR	MFR	BUS	MUN	IRR	GOLF	IND
2001	1486	859	717	63	130	110	342
2002	1503	836	696	60	129	114	233
2003	1502	812	666	64	132	108	247
2004	1521	798	671	55	124	80	229
2005	1424	798	671	55	124	80	229
2006	1359	752	630	53	118	83	236
2007	1357	728	636	59	131	111	238
2008	1374	735	610	66	137	120	240
2009	1217	687	554	46	91	91	185
2010	1185	691	527	49	96	78	227
Total	13928	7696	6378	570	1212	975	2406
% Total	42%	23%	19%	2%	4%	3%	7%

Denoting the annual change in demand from Table 6 for customer category j as D_j and the customer category j's share of demand from Table 7 as δ_j, then the weighted average percentage change in annual demand, D, per 1 degree F change in temperature is given by

$$D = \frac{1}{100}\sum_{j=1}^{7} D_j \times \delta_j$$

In this calculation, it is assumed the temperature effect for the industrial customer category is zero. The resulting value for the percentage change in total demand per 1 degree F increase in temperature is 0.45, as shown in the last row of Table 1.

Calculation Workbook

The calculations described above are provided in the workbook "uwmp_climate_effects_workbook.xlsx."

Figure D-2
Water conservation baseline and targets development process

JOINT EXERCISE OF POWERS AGREEMENT

by and among

CENTRAL WATER DISTRICT

CITY OF SANTA CRUZ

COUNTY OF SANTA CRUZ

and

SOQUEL CREEK WATER DISTRICT

creating the

SANTA CRUZ MID-COUNTY GROUNDWATER AGENCY

March 17, 2016

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JOINT EXERCISE OF POWERS AGREEMENT OF THE SANTA CRUZ MID-COUNTY GROUNDWATER AGENCY

This **Joint Exercise of Powers Agreement ("Agreement")** is made and entered into as of March 17, 2016 ("Effective Date"), by and among the Central Water District, the City of Santa Cruz, the County of Santa Cruz, and the Soquel Creek Water District, sometimes referred to herein individually as a "**Member**" and collectively as the "**Members**" for purposes of forming the Santa Cruz Mid-County Groundwater Agency ("**Agency**") and setting forth the terms pursuant to which the Agency shall operate. Capitalized defined terms used herein shall have the meanings given to them in Article 1 of this Agreement.

RECITALS

A. Each of the Members is a local agency, as defined by the Sustainable Groundwater Management Act of 2014 ("**SGMA**"), duly organized and existing under and by virtue of the laws of the State of California, and each Member can exercise powers related to groundwater management.

B. SGMA requires designation of a groundwater sustainability agency ("**GSA**") by June 30, 2017, for groundwater basins designated by the California Department of Water Resources ("**DWR**") as medium- and high-priority basins.

C. SGMA requires adoption of a groundwater sustainability plan ("**GSP**") by January 31, 2020, for all medium- and high-priority basins identified as being subject to critical conditions of overdraft.

D. Each of the Members either extracts groundwater from or regulates land use activities overlying a common groundwater basin located within the mid-county coastal region of the County of Santa Cruz. This Basin includes all or part of four basins identified in DWR's Bulletin Number 118, including the following basins (designated by the name of the basin and number assigned to it in DWR-Bulletin No. 118): Soquel Valley (3-1), West Santa Cruz Terrace (3-26), Santa Cruz Purisima Formation (3-21), and Pajaro Valley Basin (3-2). All or some of these basins have been designated as medium or high priority basins. Through the Agency, the Members provided modifications to the Bulletin-118 boundaries as allowed by Title 23 of the California Code of Regulations to create a new consolidated basin called the "Santa Cruz Mid-County Groundwater Basin" with 3-1 as the number for the consolidated basin under DWR Bulletin No. 118 (hereafter "**Basin**").

E. The Members intend for the Agency to develop a GSP and manage the Basin pursuant to SGMA.

F. Under SGMA, a combination of local agencies may form a GSA through a joint powers agreement.

G. The Members have determined that the sustainable management of the Basin pursuant to SGMA may best be achieved through the cooperation of the Members operating through a joint powers agency.

H. The Joint Exercise of Powers Act of 2000 ("Act") authorizes the Members to create a joint powers authority, to jointly exercise any power common to the Members, and to exercise additional powers granted under the Act.

I. The Act, including the Marks-Roos Local Bond Pooling Act of 1985 (Government Code sections 6584, *et seq.*), authorizes an entity created pursuant to the Act to issue bonds, and under certain circumstances, to purchase bonds issued by, or to make loans to, the Members for financing public capital

improvements, working capital, liability and other insurance needs or projects whenever doing so results in significant public benefits, as determined by the Members. The Act further authorizes and empowers a joint powers authority to sell bonds so issued or purchased to public or private purchasers at public or negotiated sales.

J. The Members have a history of collaborating on groundwater management issues in the Santa Cruz Mid-County Groundwater Basin, originally with a joint powers agreement formed in 1995 by the Soquel Creek Water District and the Central Water District, which was subsequently amended in August of 2015 to include the City of Santa Cruz and the County of Santa Cruz, to form the Soquel-Aptos Groundwater Management Committee.

K. The Members agree that by approving the creation of the Santa Cruz Mid-County Groundwater Agency they are withdrawing from and disbanding the joint powers agency formed as a result of earlier joint powers agreements originally creating the Basin Implementation Group as subsequently amended to create the Soquel-Aptos Groundwater Management Committee.

L. Based on the foregoing legal authority, the Members desire to create a joint powers authority for the purpose of taking all actions deemed necessary by the joint powers authority to ensure sustainable management of the Basin as required by SGMA.

M. The governing board of each Member has determined it to be in the Member's best interest and in the public interest that this Agreement be executed.

TERMS OF AGREEMENT

In consideration of the mutual promises and covenants herein contained, the Members agree as follows:

ARTICLE 1
DEFINITIONS

The following terms have the following meanings for purposes of this Agreement:

1.1 "Act" means the Joint Exercise of Powers Act, set forth in Chapter 5 of Division 7 of Title 1 of the Government Code, sections 6500, *et seq.*, including all laws supplemental thereto.

1.2 "Agreement" has the meaning assigned thereto in the Preamble.

1.3 "Auditor" means the auditor of the financial affairs of the Agency appointed by the Board of Directors pursuant to Section 14.3 of this Agreement.

1.4 "Agency" has the meaning assigned thereto in the Preamble.

1.5 "Basin" has the meaning assigned thereto in Recital D.

1.6 "Board of Directors" or "Board" means the governing body of the Agency as established by Article 6 of this Agreement.

1.7 "Bylaws" means the bylaws, if any, adopted by the Board of Directors pursuant to Article 11 of this Agreement to govern the day-to-day operations of the Agency.

1.8 "Director" and "Alternate Director" mean a director or alternate director appointed pursuant to Sections 6.3 and 6.4 of this Agreement. "Member Director" is a Director or Alternate Director appointed by and representing a Member agency pursuant to Section 6.1.1 of this agreement.

1.9 "DWR" has the meaning assigned thereto in Recital B.

1.10 "GSA" has the meaning assigned thereto in Recital B.

1.11 "GSP" has the meaning assigned thereto in Recital C.

1.12 "Member" means each party to this Agreement that satisfies the requirements of Section 5.1 of this Agreement, including any new members as may be authorized by the Board, pursuant to Section 5.2 of this Agreement.

1.13 "Officer(s)" means the Chair, Vice Chair, Secretary, or Treasurer of the Agency to be appointed by the Board of Directors pursuant to Section 7.1 of this Agreement.

1.14 "SGMA" has the meaning assigned thereto in Recital A.

1.15 "State" means the State of California.

ARTICLE 2
CREATION OF THE AGENCY

2.1 Creation of a Joint Powers Authority. There is hereby created pursuant to the Act a joint powers authority, which will be a public entity separate from the Members to this Agreement, and shall be known as the Santa Cruz Mid-County Joint Powers Agency ("**Agency**"). Within 30 days after the Effective Date of this Agreement and after any amendment, the Agency shall cause a notice of this Agreement or amendment to be prepared and filed with the office of the California Secretary of State containing the information required by Government Code section 6503.5. Within 10 days after the Effective Date of this Agreement, the Agency shall cause a statement of the information concerning the Agency, required by Government Code section 53051, to be filed with the office of the California Secretary of State and with the County Clerk for the County of Santa Cruz, setting forth the facts required to be stated pursuant to Government Code section 53051(a).

2.2 Purpose of the Agency. Each Member to this Agreement has in common the power to study, plan, develop, finance, acquire, construct, maintain, repair, manage, operate, control, and govern the water supply and water management within the Basin, either alone or in cooperation with other public or private non-member entities, and each is a local agency eligible to serve as a GSA within the Basin, either alone or jointly through a joint powers agreement as provided for by SGMA. The purpose of this Agency is to serve as the GSA for the Basin and to develop, adopt, and implement the GSP for the Basin pursuant to SGMA and other applicable provisions of law.

ARTICLE 3
TERM

This Agreement shall become effective upon execution by each of the Members and shall remain in effect until terminated pursuant to the provisions of Article 17 (Withdrawal of Members) of this Agreement.

ARTICLE 4
POWERS

The Agency shall possess the power in its own name to exercise any and all common powers of its Members reasonably related to the purposes of the Agency, including but not limited to the following powers, together with such other powers as are expressly set forth in the Act and in SGMA. For purposes of Government Code section 6509, the powers of the Agency shall be exercised subject to the restrictions upon the manner of exercising such powers as are imposed on the County of Santa Cruz, and in the event of the withdrawal of the County of Santa Cruz as a Member under this Agreement, then the manner of exercising the Agency's powers shall be those restrictions imposed on the City of Santa Cruz.

4.1 To exercise all powers afforded to a GSA pursuant to and as permitted by SGMA.

4.2 To develop, adopt and implement the GSP pursuant to SGMA.

4.3 To adopt rules, regulations, policies, bylaws and procedures governing the operation of the Agency and adoption and implementation of the GSP.

4.4 To obtain rights, permits and other authorizations for or pertaining to implementation of the GSP.

4.5 To perform other ancillary tasks relating to the operation of the Agency pursuant to SGMA, including without limitation, environmental review, engineering, and design.

4.6 To make and enter into all contracts necessary to the full exercise of the Agency's power.

4.7 To employ, designate or otherwise contract for the services of agents, officers, employees, attorneys, engineers, planners, financial consultants, technical specialists, advisors, and independent contractors.

4.8 To exercise jointly the common powers of the Members, as directed by the Board, in developing and implementing a GSP for the Basin.

4.9 To investigate legislation and proposed legislation affecting the Basin and to make appearances regarding such matters.

4.10 To cooperate and to act in conjunction and contract with the United States, the State of California or any agency thereof, counties, municipalities, public and private corporations of any kind (including without limitation, investor-owned utilities), and individuals, or any of them, for any and all purposes necessary or convenient for the full exercise of the powers of the Agency.

4.11 To incur debts, liabilities or obligations, to issue bonds, notes, certificates of participation, guarantees, equipment leases, reimbursement obligations and other indebtedness, and, to the extent provided for in a duly adopted Agency to impose assessments, groundwater extraction fees or other charges, and other means of financing the Agency as provided in Chapter 8 of SGMA commencing at Section 10730 of the Water Code.

4.12 To collect and monitor data on the extraction of groundwater from, and the quality of groundwater in, the Basin.

4.13 To establish and administer a conjunctive use program for the purposes of maintaining sustainable yields in the Basin consistent with the requirements of SGMA.

4.14 To exchange and distribute water.

4.15 To regulate groundwater extractions as permitted by SGMA.

4.16 To impose groundwater extraction fees as permitted by SGMA.

4.17 To spread, sink and inject water into the Basin.

4.18 To store, transport, recapture, recycle, purify, treat or otherwise manage and control water for beneficial use.

4.19 To apply for, accept and receive licenses, permits, water rights, approvals, agreements, grants, loans, contributions, donations or other aid from any agency of the United States, the State of California, or other public agencies or private persons or entities necessary for the Agency's purposes.

4.20 To develop and facilitate market-based solutions for the use and management of water rights.

4.21 To acquire property and other assets by grant, lease, purchase, bequest, devise, gift or eminent domain, and to hold, enjoy, lease or sell, or otherwise dispose of, property, including real property, water rights, and personal property, necessary for the full exercise of the Agency's powers.

4.22 To sue and be sued in its own name.

4.23 To provide for the prosecution of, defense of, or other participation in actions or proceedings at law or in public hearings in which the Members, pursuant to this Agreement, may have an interest and may employ counsel and other expert assistance for these purposes.

4.24 To exercise the common powers of its Members to develop, collect, provide, and disseminate information that furthers the purposes of the Agency, including but not limited to the operation of the Agency and adoption and implementation of the GSP to the Members, legislative, administrative, and judicial bodies, as well the public generally.

4.25 To accumulate operating and reserve funds for the purposes herein stated.

4.26 To invest money that is not required for the immediate necessities of the Agency, as the Agency determines is advisable, in the same manner and upon the same conditions as Members, pursuant to Government Code section 53601, as it now exists or may hereafter be amended.

4.27 To undertake any investigations, studies, and matters of general administration.

4.28 To perform all other acts necessary or proper to carry out fully the purposes of this Agreement.

ARTICLE 5
MEMBERSHIP

5.1 Members. The Members of the Agency shall be the Central Water District, the City of Santa Cruz, the County of Santa Cruz, and the Soquel Creek Water District, as long as they have not, pursuant to the provisions hereof, withdrawn from this Agreement.

5.2 New Members. Any public agency (as defined by the Act) that is not a Member on the Effective Date of this Agreement may become a Member upon: (a) the approval of the Board of Directors by a supermajority of at least seventy-five (75%) of the votes held among all Directors as specified in Article 9 (Member Voting); (b) payment of a pro rata share of all previously incurred costs that the Board of Directors determines have resulted in benefit to the public agency, and are appropriate for assessment on the public agency; and (c) execution of a written agreement subjecting the public agency to the terms and conditions of this Agreement.

ARTICLE 6
BOARD OF DIRECTORS AND OFFICERS

6.1 Formation of the Board of Directors. The Agency shall be governed by a Board of Directors ("**Board**"). The Board shall consist of eleven (11) Directors consisting of the following representatives who shall be appointed in the manner set forth in Section 6.3:

6.1.1 Two representatives appointed by the governing board of each of the following public agency Members: the Central Water District, the City of Santa Cruz, the County of Santa Cruz, and the Soquel Creek Water District.

6.1.2 Three representatives of private well owners within the boundaries of the Agency.

6.2 Duties of the Board of Directors. The business and affairs of the Agency, and all of its powers, including without limitation all powers set forth in Article 4 (Powers), are reserved to and shall be exercised by and through the Board of Directors, except as may be expressly delegated to the staff or others pursuant to this Agreement, Bylaws, or by specific action of the Board of Directors.

6.3 Appointment of Directors. The Directors shall be appointed as follows:

6.3.1 The two representatives from the Central Water District shall be appointed by resolution of the Central Water District Board of Directors.

6.3.2 The two representatives from the City of Santa Cruz shall be appointed by resolution of the City of Santa Cruz City Council.

6.3.3 The two representatives from the County of Santa Cruz shall be appointed by resolution of the County of Santa Cruz Board of Supervisors.

6.3.4 The two representatives from the Soquel Creek Water District shall be appointed by resolution of the Soquel Creek Water District Board of Directors.

6.3.5 The three representatives of private well owners shall be appointed by majority vote of the eight public agency Member Directors. The procedures for nominating the private well owners shall be set forth in the Bylaws.

6.4 Alternate Directors. Each Member may have one Alternate to act as a substitute Director for either of the Member's Directors. One Alternate shall also be appointed to act as a substitute Director for any of the three Directors representing private well owners. All Alternates shall be appointed in the same manner as set forth in Section 6.3. Alternate Directors shall have no vote, and shall not participate in any discussions or deliberations of the Board unless appearing as a substitute for a Director due to absence or conflict of interest. If the Director is not present, or if the Director has a conflict of interest which precludes participation by the Director in any decision-making process of the Board, the Alternate Director appointed to act in his/her place shall assume all rights of the Director, and shall have the authority to act in his/her absence, including casting votes on matters before the Board. Each Alternate Director shall be appointed prior to the third meeting of the Board. Alternates are strongly encouraged to attend all Board meetings and stay informed on current issues before the Board.

6.5 Requirements. Each Member's Directors and Alternate Director shall be appointed by resolution of that Member's governing body to serve for a term of four years except, for the purpose of establishing staggered terms, one of the initially-appointed Directors of each Member shall, as designated by the Member, serve an initial term of two years. A Member's Director or Alternate Director may be removed during his or her term or reappointed for multiple terms at the pleasure of the Member that appointed him or her. A Director representing private well owners may be removed or reappointed in the same manner as he or she was appointed as set forth in Section 6.3. No individual Director may be removed in any other manner, including by the affirmative vote of the other Directors.

6.6 Vacancies. A vacancy on the Board of Directors shall occur when a Director resigns or at the end of the Director's term as set forth in Section 6.5. For Member Directors, a vacancy shall also occur when he or she is removed by his or her appointing Member. For Directors representing private well owners, a vacancy shall also occur when the Director is removed as set forth in Section 6.5. Upon the vacancy of a Director, the Alternate Director shall serve as Director until a new Director is appointed as set forth in Section 6.3 unless the Alternate is already serving as a substitute Director in the event of a prior vacancy, in which case, the seat shall remain vacant until a replacement Director is appointed as set forth in Section 6.3. Members shall provide notice of any changes in Director or Alternate Director positions to the Board of Directors or its designee in writing and signed by an authorized representative of the Member.

ARTICLE 7
OFFICERS

7.1 Officers. Officers of the Agency shall be a Chair, Vice Chair, Secretary, and Treasurer. The Treasurer shall be appointed consistent with the provisions of Section 14.3. The Vice Chair, or in the Vice Chair's absence, the Secretary, shall exercise all powers of the Chair in the Chair's absence or inability to act.

7.2 Appointment of Officers. Officers shall be elected annually by, and serve at the pleasure of, the Board of Directors. Officers shall be elected at the first Board meeting, and thereafter at the first Board meeting following January 1st of each year, or as duly continued by the Board. An Officer may serve for multiple consecutive terms, with no term limit. Any Officer may resign at any time upon written notice to the Board, and may be removed and replaced by a simple majority vote of the Board.

7.3 Principal Office. The principal office of the Agency shall be established by the Board of Directors, and may thereafter be changed by a simple majority vote of the Board.

ARTICLE 8
DIRECTOR MEETINGS

8.1 Initial Meeting. The initial meeting of the Board of Directors shall be held in the County of Santa Cruz, California, within thirty (30) days of the Effective Date of this Agreement.

8.2 Time and Place. The Board of Directors shall meet at least quarterly, at a date, time and place set by the Board within the jurisdictional boundaries of one or more of the Members, and at such other times as may be determined by the Board.

8.3 Special Meetings. Special meetings of the Board of Directors may be called by the Chair or by a simple majority of Directors, in accordance with the provisions of Government Code section 54956.

8.4 Conduct. All meetings of the Board of Directors, including special meetings, shall be noticed, held, and conducted in accordance with the Ralph M. Brown Act (Government Code sections 54950, *et seq.*). The Board may use teleconferencing in connection with any meeting in conformance with and to the extent authorized by applicable law.

8.5 Local Conflict of Interest Code. The Board of Directors shall adopt a local conflict of interest code pursuant to the provisions of the Political Reform Act of 1974 (Government Code sections 81000, *et seq.*)

ARTICLE 9
MEMBER VOTING

9.1 Quorum. A quorum of any meeting of the Board of Directors shall consist of an absolute majority of Directors plus one Director. In the absence of a quorum, any meeting of the Directors may be adjourned by a vote of the simple majority of Directors present, but no other business may be transacted. For purposes of this Article, a Director shall be deemed present if the Director appears at the meeting in person or participates telephonically, provided that the telephone appearance is consistent with the requirements of the Ralph M. Brown Act.

9.2 Director Votes. Voting by the Board of Directors shall be made on the basis of one vote for each Director. A Director, or an Alternate Director when acting in the absence of his or her Director, may vote on all matters of Agency business unless disqualified because of a conflict of interest pursuant to California law or the local conflict of interest code adopted by the Board of Directors.

9.3 Affirmative Decisions of the Board of Directors. Except as otherwise specified in this Agreement, all affirmative decisions of the Board of Directors shall require the affirmative vote of a simple majority of all appointed Directors participating in voting on a matter of Agency business, provided that if a Director is disqualified from voting on a matter before the Board because of a conflict of interest, that Director shall be excluded from the calculation of the total number of Directors that constitute a majority. Notwithstanding the foregoing, a unanimous vote of all Member Directors participating in voting shall be required to approve any of the following: (i) any capital expenditure that is estimated to cost $100,000 or more; (ii) the annual budget; (iii) the GSP for the Basin or any amendment thereto; (iv) the levying of assessments or fees; (v) issuance of indebtedness; or (vi) any stipulation to resolve litigation concerning groundwater rights within or groundwater management for the Basin.

ARTICLE 10
AGENCY ADMINISTRATION, MANAGEMENT AND OPERATION

The Board of Directors may select and implement an approach to Agency administration and management that is appropriate to the circumstances and adapted to the GSA's needs as they may evolve over time. Details of the Board's decision on Agency administration, management and operation shall be incorporated into the GSA's bylaws and reviewed and revised as needed using the established process for revising the GSA's bylaws.

ARTICLE 11
BYLAWS

The Board of Directors shall cause to be drafted, approve, and amend Bylaws of the Agency to govern the day-to-day operations of the Agency. The Bylaws shall be adopted at or before the first anniversary of the Board's first meeting.

ARTICLE 12
ADVISORY COMMITTEES

The Board of Directors may from time to time appoint one or more advisory committees or establish standing or ad hoc committees to assist in carrying out the purposes and objectives of the Agency. The Board shall determine the purpose and need for such committees and the necessary qualifications for individuals appointed to them.

ARTICLE 13
OPERATION OF COMMITTEES

Each committee shall include a Director as the chair thereof. Other members of each committee may be constituted by such individuals approved by the Board of Directors for participation on the committee. However, no committee or participant on such committee shall have any authority to act on behalf of the Agency except as duly authorized by the Board.

ARTICLE 14
ACCOUNTING PRACTICES

14.1 General. The Board of Directors shall establish and maintain such funds and accounts as may be required by generally accepted public agency accounting practices. The Agency shall maintain strict accountability of all funds and a report of all receipts and disbursements of the Agency.

14.2 Fiscal Year. Unless the Board of Directors decides otherwise, the fiscal year for the Agency shall run concurrent with the calendar year.

14.3 Appointment of Treasurer and Auditor: Duties. The Treasurer and Auditor shall be appointed in the manner, and shall perform such duties and responsibilities, specified in Sections 6505.5 and 6505.6 of the Act.

ARTICLE 15
BUDGET AND EXPENSES

15.1 Budget. Within 120 after the first meeting of the Board of Directors, and thereafter prior to the commencement of each fiscal year, the Board shall adopt a budget for the Agency for the ensuing fiscal

year no later than June 30th . In the event that a budget is not so approved, the prior year's budget shall be deemed approved for the ensuing fiscal year, and any groundwater extraction fee or assessment(s) of contributions of Members, or both, approved by the Board during the prior fiscal year shall again be assessed in the same amount and terms for the ensuing fiscal year.

15.2 Agency Funding and Contributions. For the purpose of funding the expenses and ongoing operations of the Agency, the Board of Directors shall maintain a funding account in connection with the annual budget process. The Board of Directors may fund the Agency and the GSP as provided in Chapter 8 of SGMA, commencing with Section 10730 of the Water Code, and may also issue assessments for contributions by the Members in the amount and frequency determined necessary by the Board. Such Member contributions shall be paid by each Member to the Agency within 30 days of assessment by the Board.

15.3 Return of Contributions. In accordance with Government Code section 6512.1, repayment or return to the Members of all or any part of any contributions made by Members and any revenues by the Agency may be directed by the Board of Directors at such time and upon such terms as the Board of Directors may decide; provided that (1) any distributions shall be made in proportion to the contributions paid by each Member to the Agency, and (2) any capital contribution paid by a Member voluntarily, and without obligation to make such capital contribution pursuant to Section 15.2, shall be returned to the contributing Member, together with accrued interests at the annual rate published as the yield of the Local Agency Investment Fund administered by the California State Treasurer, before any other return of contributions to the Members is made. The Agency shall hold title to all funds and property acquired by the Agency during the term of this Agreement.

15.4 Issuance of Indebtedness. The Agency may issue bonds, notes or other forms of indebtedness, as permitted under Section 4.11, provided such issuance be approved at a meeting of the Board of Directors by unanimous vote of the Member Directors as specified in Article 9 (Member Voting).

ARTICLE 16
LIABILITIES

16.1 Liability. In accordance with Government Code section 6507, the debt, liabilities and obligations of the Agency shall be the debts, liabilities and obligations of the Agency alone, and not the Members.

16.2 Indemnity. Funds of the Agency may be used to defend, indemnify, and hold harmless the Agency, each Member, each Director, and any officers, agents and employees of the Agency for their actions taken within the course and scope of their duties while acting on behalf of the Agency. Other than for gross negligence or intentional acts, to the fullest extent permitted by law, the Agency agrees to save, indemnify, defend and hold harmless each Member from any liability, claims, suits, actions, arbitration proceedings, administrative proceedings, regulatory proceedings, losses, expenses or costs of any kind, whether actual, alleged or threatened, including attorney's fees and costs, court costs, interest, defense costs, and expert witness fees, where the same arise out of, or are in any way attributable, in whole or in part, to negligent acts or omissions of the Agency or its employees, officers or agents or the employees, officers or agents of any Member, while acting within the course and scope of a Member relationship with the Agency.

ARTICLE 17
WITHDRAWAL OF MEMBERS

17.1 Unilateral Withdrawal. Subject to the Dispute Resolution provisions set forth in Section 18.9, a Member may unilaterally withdraw from this Agreement without causing or requiring termination of this Agreement, effective upon 30 days written notice to the Board of Directors or its designee.

17.2 Rescission or Termination of Agency. This Agreement may be rescinded and the Agency terminated by unanimous written consent of all Members, except during the outstanding term of any Agency indebtedness.

17.3 Effect of Withdrawal or Termination. Upon termination of this Agreement or unilateral withdrawal, a Member shall remain obligated to pay its share of all debts, liabilities and obligations of the Agency required of the Member pursuant to terms of this Agreement, and that were incurred or accrued prior to the effective date of such termination or withdrawal, including without limitation those debts, liabilities and obligations pursuant to Sections 4.11 and 15.4. Any Member who withdraws from the Agency shall have no right to participate in the business and affairs of the Agency or to exercise any rights of a Member under this Agreement or the Act, but shall continue to share in distributions from the Agency on the same basis as if such Member had not withdrawn, provided that a Member that has withdrawn from the Agency shall not receive distributions in excess of the contributions made to the Agency while a Member. The right to share in distributions granted under this Section 17.3 shall be in lieu of any right the withdrawn Member may have to receive a distribution or payment of the fair value of the Member's interest in the Agency.

17.4 Return of Contribution. Upon termination of this Agreement, any surplus money on-hand shall be returned to the Members in proportion to their contributions made. The Board of Directors shall first offer any property, works, rights and interests of the Agency for sale to the Members on terms and conditions determined by the Board of Directors. If no such sale to Members is consummated, the Board of Directors shall offer the property, works, rights, and interest of the Agency for sale to any non-member for good and adequate consideration. The net proceeds from any sale shall be distributed among the Members in proportion to their contributions made.

ARTICLE 18
MISCELLANEOUS PROVISIONS

18.1 No Predetermination or Irretrievable Commitment of Resources. Nothing herein shall constitute a determination by the Agency or any of its Members that any action shall be undertaken, or that any unconditional or irretrievable commitment of resources shall be made, until such time as the required compliance with all local, state, or federal laws, including without limitation the California Environmental Quality Act, National Environmental Policy Act, or permit requirements, as applicable, has been completed.

18.2 Notices. Notices to a Director or Member hereunder shall be sufficient if delivered to the respective Director or clerk of the Member agency and addressed to the Director or clerk of the Member agency. Delivery may be accomplished by U.S. Postal Service, private mail service or electronic mail.

18.3 Amendments to Agreement. This Agreement may be amended or modified at any time only by subsequent written agreement approved and executed by all of the Members.

18.4 Agreement Complete. The foregoing constitutes the full and complete Agreement of the Members. This Agreement supersedes all prior agreements and understandings, whether in writing or oral, related to the subject matter of this Agreement that are not set forth in writing herein.

18.5 Severability. Should any part, term or provision of this Agreement be decided by a court of competent jurisdiction to be illegal or in conflict with any applicable federal law or any law of the State of California, or otherwise be rendered unenforceable or ineffectual, the validity of the remaining parts, terms, or provisions hereof shall not be affected thereby, provided however, that if the remaining parts, terms, or provisions do not comply with the Act, this Agreement shall terminate.

18.6 Withdrawal by Operation of Law. Should the participation of any Member to this Agreement be decided by the courts to be illegal or in excess of that Member's authority or in conflict with any law, the validity of the Agreement as to the remaining Members shall not be affected thereby.

18.7 Assignment. The rights and duties of the Members may not be assigned or delegated without the written consent of all other Members. Any attempt to assign or delegate such rights or duties in contravention of this Agreement shall be null and void.

18.8 Binding on Successors. This Agreement shall inure to the benefit of, and be binding upon, the successors and assigns of the Members.

18.9 Dispute Resolution. In the event that any dispute arises among the Members relating to (i) this Agreement, (ii) the rights and obligations arising from this Agreement, or (iii) or a Member proposing to withdraw from membership in the Agency, the aggrieved Member or Member proposing to withdraw from membership shall provide written notice to the other Members of the controversy or proposal to withdraw from membership. Within thirty (30) days thereafter, the Members shall attempt in good faith to resolve the controversy through informal means. If the Members cannot agree upon a resolution of the controversy within thirty (30) days from the providing of written notice specified above, the dispute shall be submitted to mediation prior to commencement of any legal action or prior to withdraw of a Member proposing to withdraw from membership. The mediation shall be no less than a full day (unless agreed otherwise among the Members) and the cost of mediation shall be paid in equal proportion among the Members. The mediator shall be either voluntarily agreed to or appointed by the Superior Court upon a suit and motion for appointment of a neutral mediator. Upon completion of mediation, if the controversy has not been resolved, any Member may exercise all rights to bring a legal action relating to the controversy or (except where such controversy relates to withdrawal of a Member's obligations upon withdrawal) withdraw from membership as otherwise authorized pursuant to this Agreement.

18.10 Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original.

18.11 Singular Includes Plural. Whenever used in this Agreement, the singular form of any term includes the plural form and the plural form includes the singular form.

18.12 Member Authorization. The legislative bodies of the Members have each authorized execution of this Agreement, as evidenced by their respective signatures below.

IN WITNESS WHEREOF, the Members hereto have executed this Agreement by authorized officials thereof.

CENTRAL WATER DISTRICT

By: _____

Title: Board President - CWD

APPROVED AS TO FORM:

By: _____

Title: District Counsel

CITY OF SANTA CRUZ

By: _____

Title: City Manager

2-23-16

APPROVED AS TO FORM:

By: _____

Anthony P. Condotti

Title: City Attorney

COUNTY OF SANTA CRUZ

By: _____

Title: County Administrative Officer

APPROVED AS TO FORM:

By: _____

Title: County Counsel

SOQUEL CREEK WATER DISTRICT

By: Bruce David

Title: President, Board

APPROVED AS TO FORM:

By: _____

Title: District Counsel

Appendix A
Scope of Work for the City of Santa Cruz
Regional Recycled Water Facilities Planning Study

Detailed Scope of Work for City of Santa Cruz-Kennedy/Jenks Consultants Agreement

The following Tasks summarize the proposed scope of work to develop a Santa Cruz Regional Recycled Water Facilities Planning Study (RWFPS), which is prepared to meet the goals posed by the City of Santa Cruz (City) and satisfies the project report requirements under the State Water Resource Control Board (SWRCB) Water Recycling Funding Program Guidelines. The primary purpose of the RWFPS for the Water Department is to meet the timeline outlined in the WSAC Agreements and Recommendations Report with the development of information on recycled water alternatives by December 2016, and to develop information about the recommended recycled water alternative early in 2017 for inclusion in a separate evaluation of In Lieu/ASR, recycled water, and seawater desalination, which will be completed by the end of 2017. The primary purpose of the RWFPS for the Department of Public Works is to develop a plan to reduce wastewater discharge into the Monterey Bay by determining the footprint and cost effectiveness of its treatment, distribution, and sale to potential new customers of the regional wastewater resource managed by the City of Santa Cruz and the County of Santa Cruz Sanitation District. The Santa Cruz Regional RWFPS will also meet the requirements of the SWRCB planning grant, which will position the City to apply for future grants and financial incentives available for recycled water projects, should a recommended recycled water project rise to the top in the analysis of the three water supply options noted above. The purpose for public outreach in the Santa Cruz Regional RWFPS is to share information with the public about the topics in the RWFPS as directed by the Santa Cruz City Council, to involve stakeholders in the progress of the study, and to satisfy the requirements of the SWRCB recycled water planning grant with regard to public outreach.

Additionally, the Santa Cruz Regional RWFPS will bring together information from former and newer studies of recycled water regarding opportunities in the region, incorporating the feasibility studies that are nearing completion. Seasonal demands also require thought to make full use of the recycled water resource, which is climate independent. For example, the City may elect to implement direct potable reuse, groundwater replenishment, irrigation water of North Coast agriculture and golf courses, and/or surface water augmentation with recycled water in dry years from the Spring to the Fall. However, there could be some evaluation of utilizing more surface water from Loch Lomond reservoir during the winter season to meet regional potable water demands and rest groundwater pumping to make room for purified recycled water when dilution water is available, and bank the groundwater for use in the dry season. Kennedy/Jenks will evaluate the efficiency of using recycled water year-round for multiple end-uses, taking into consideration the combination of several end uses for tertiary and purified recycled water in the region. This work will efficiently build on previous planning and design documents by the City and other Regional entities, including the Soquel Creek Water District (District), County of Santa Cruz (County), Scotts Valley Water District (SVWD) and other

local agencies, as appropriate. This work will also build on the technical work described in the Water Supply Advisory Committee Agreements and Recommendations Final Report (City of SC, October 2015).

Summary of Work

The scope of work for the Regional RWFPS is organized to follow the State Water Resource Control Board's (SWRCB) Water Recycling Program Funding - Recommended Planning Outline for Water Recycling Projects (Appendix B). The scope is organized into ten tasks, as shown in Table 1, which align with chapters recommended in the SWRCB outline. A more detailed discussion of each task is provided in the Scope of Work section. Table 2 provides additional detail about each task, including subtasks, key deliverables, the associated format for each deliverable, the Regional RWFPS Chapter the work will feed into, the City's role, key Subconsultant roles and dependencies.

Table 1: Task Structure

Task	Regional RWFPS Chapter
Task 1 - Project Management & QA/QC	
Task 2 - Background Information	Chapter 1 – Study Area Characteristics Chapter 2 – Water Supply Characteristics and Facilities
Task 3 - RW Market Analysis	Chapter 3 – Wastewater Characteristics and Facilities Chapter 5 – Recycled Water Market
Task 4 - Treatment Evaluation / Reg Requirements	Chapter 4 – Treatment Requirements for Discharge and Reuse
Task 5 - Alternatives Analysis	Chapter 6 – Project Alternative Analysis
Task 6 – Stakeholder Involvement	Chapter 5 – Recycled Water Market
Task 7 - Recommended Project	Chapter 7 – Recommended Facilities Project Plan
Task 8 – Financial Analysis	Chapter 8 – Construction Financing Plan and Revenue Program
Task 9 – Regional RWFPS Report	
Task 10 - Meetings and Workshops	

Table 2: Sub-Task Structure, Deliverables, Roles and Dependencies

Task	Key Deliverable	Presentation Format	RWFPS Chapter(s)	Lead	City Role	Dependent on
Task 1 – PM & QA/QC						
1.1 Monthly Status Reports and Invoices	18 invoices	Email to City	n/a	K/J - Dawn	Approve Invoices	Effort to date
1.2 Status Calls/Web Meetings	36 - 1 hr calls	Conf Call/Web	n/a	K/J - Dawn	Participation	Include participants involved in current task as-needed
1.3 Subonctracting Agreements	n/a	n/a	n/a	K/J - Dawn	n/a	Scope of Work
1.4 Schedule	Monthly schedule update	digital	n/a	K/J - Dawn	Review / Comment, Schedule mtgs with Regional Stakeholders and TWG	TWG milestones and Stakeholder Mtgs
1.5 Project Setup and Establish QA/QC Program	Project Work Plan	Update as-needed	n/a	K/J - Dawn	Review / Comment	n/a
Task 2 – Background Info						
2.1 Data Collection and Review	Data Request	Tracking Table	n/a	Team	Respond/Fulfill	Availability and speed of acquisition
2.2 Study Area Characteristics	Summary Table/Figure	Draft	Chapter 1	K/J	Review and provide updated information	Data Collection and Review
2.3 Water Supply and Facilities	Summary Table/Figure	Draft	Chapter 2	K/J	Review and provide updated information	
Task 3 – Recycled Water Market Analysis						
3.1 WWTF Facility and Supply Analysis	Summary Table/Figure	Draft	Chapter 3	Trussell - K/J	Coordination with WWTF and Santa Cruz County Sanitation District (SCCSD)	SqCWD Groundwater Replenishment Recycled Water Feasibility Study
3.2 NPR Demand Analysis	Summary Tables/ Chapter Text	Draft	Chapter 5	K/J	Coordination with City Staff who will identify and communicate with customers	Available meter data from City, input from customers, input from CA State Parks and farmers regarding recycled water use on the North Coast
3.3 Recycled Water Market Survey Map	Market Survey Map	Draft	Chapter 5	K/J	Provide GIS files	RW IPR maps would include SVWD and SqCWD; Loch Lomond; RW NPR maps would include North Coast Ag, and irrigation/industrial
3.4 IPR Potential - GW Replenishment	Tech Memo #1	Draft	Chapter 5	K/J	Coordination with Groundwater Stakeholders (SVWD, SqCWD, and the Soquel-Aptos Groundwater Management Committee)	Available hydrogeologic assessments, In-Lieu ASR Feasibility Study Consultant Input from SqCWD on Mid-County GWR Project and from SVWD on RW Hansen Quarry project
3.5 IPR Potential - Reservoir Augmentation	Tech Memo #2	Draft	Chapter 5	Welch - K/J	Coordination with Stakeholders	
3.6 Streamflow Augmentation	Tech Memo #3	Draft	Chapter 5	K/J - Smith	Coordination with Stakeholders / Regulators	Input from Regulators
3.7 DPR Potential	Tech Memo #4	Draft	Chapter 5	K/J	Coordination with Stakeholders	Input from Brown and Caldwell on DPR Project
Task 4 – Treatment Eval/Reg Requirements						
4.1 Define Water Quality Objectives for Uses	Summary Tables	Draft	Chapter 4	K/J	Coordination with customers	Input from potential users
4.2 Summarize Regulatory Requirements	Summary Tables	Draft	Chapter 4	K/J		
4.3 Treatment Evaluation	Tech Memo #5	Draft	Chapter 4	Trussell - K/J	Coordination with WWTF	Input from WWTF
Task 5 – Alternatives Analysis						
5.1 Refine Long-List of Alternatives	Summary Table/Figure	Draft	Chapter 6	K/J	Coordination with Regional Stakeholders	Input from City & Regional Partners and TWG
5.2 Preliminary Screening	Summary Table	Draft	Chapter 6	K/J - GHD	Coordination with Regional Stakeholders/ Regulators	
5.3 Evaluate Short List of Alternatives	Screening Tables	Draft	Chapter 6	K/J	Coordination with Regional Stakeholders	
5.4 Alternative Capital, O&M and Life Cycle Costs	Cost Tables	Draft	Chapter 6	K/J		
Task 6 – Stakeholder Involvement						
6.1 Outreach Strategy and Advice	Materials as requested	Draft	Chapter 5	DI - K/J	Development of strategy for maintaining stakeholder communication	May include input from stakeholders and potential users
6.2 Outreach Materials and Support	Materials as requested	Draft	Chapter 5	DI - K/J	Coordination/Logistics/Materials for meetings	Questions/Requests received, collection of data for report regarding customer commitments
Task 7 – Recommended Project						
7.1 Preliminary Facilities Design Criteria	Summary Table/Figure	Draft	Chapter 7	K/J	Facilities Input	Outcome of Task 5 and City Preferences
7.2 Implementation Plan	Summary Table/Figure	Draft	Chapter 7	K/J	Operational Input	
Task 8 – Financial Analysis						
8.1 Anticipated Financing Plan	Tech Memo #6	Draft	Chapter 8	RFC	City Staff or Contract with Raftelis Financial Consultants, Inc	Cost Tables from Task 5
8.2 Revenue Projection Program	Tech Memo #6	Draft	Chapter 8	RFC	City Staff or Contract with Raftelis Financial Consultants, Inc	Cost Tables from Task 5
Task 9 – Regional RWFPS Report						
9.1 Admin Draft for City	Admin Draft	digital	n/a	K/J	Distrbute, coordinate and compile comments from City, Regional Partners and Stakeholders	
9.2 SWRCB Draft	Draft	digital/hard copy	n/a	K/J		
9.3 Final Report	Final	digital/hard copy	n/a	K/J	Distribute final document	
Task 10 - Meetings and Workshops						
10.1 Kick-off Meeting (1)	Meeting Materials	digital/hard copy	n/a	K/J	Meeting Minutes	
10.2 F2F Meeting (w/ City PW and Water, TWG & Regional Partners) (2)	Meeting Materials / ppt	Draft/Final	Chapter 4/5	K/J	Create/manage TWG, logistics for workshops (coordinate, distribute materials, meeting minutes), facilitate workshop, team meeting before and after workshop	Task 3 & 4
10.3 Workshops - Alternatives Analysis/Recommmended Project (2)	Meeting Materials / ppt	Draft/Final	Chapter 6	K/J		Task 5
10.4 Present Final RWFPS (1)	Meeting Materials / ppt	Draft/Final	Chapter 6	K/J		Task 5
10.5 SWRCB Mid-Course Mtg - Draft Report (1)	Meeting Materials / ppt	Draft/Final	Chapter 7	K/J		Task 7

General Assumptions

The general assumptions used to prepare this Scope of Work are summarized as follows.

- Regional Partners for this study include the Soquel Creek Water District, Scotts Valley Water District and the County of Santa Cruz Sanitation District.
- Project geographic area includes the City of Santa Cruz service area and portions of each Regional Partners service area and/or jurisdiction.
- This work will build on the technical team work described in the WSAC Agreement and Recommendations Final Report, other City and SqCWD consultants, and prior and ongoing planning work.
- Draft technical memoranda (TM), summary tables and figures produced under each task will be presented during meetings/workshops and are intended to be incorporated in the Regional RWFPS as-appropriate. Comments received will be integrated into a revised version to be incorporated into the Admin Draft Regional RWFPS for further review by the City and Regional Partners.
- Each subtask deliverable will include a draft presented during a conference call or meeting, and a final incorporating any comments. Summary tables, figures and associated text will be integrated into the Regional RWFPS as appropriate.
- The Regional RWFPS Report will include (1) administrative initial draft for review by the City and Regional Partners, (2) second draft for review by the City, Regional Partners and the SWRCB and (3) final Report for publication.
- For each deliverable, the City will provide a set of combined written comments from City and/or Regional Partners. The project schedule has been developed assuming all review comments will be received within two weeks of the draft documents' date. Comments will be discussed as required and incorporated into the final document as appropriate.
- The Kennedy/Jenks team will provide verbal progress updates to City staff during scheduled conference calls and a monthly status report will accompany each invoice for work.
- The work under this task order is assumed to be performed over an 18-month period starting upon receipt of the Notice to Proceed (NTP). If the work extends beyond this time period due to delays caused by others, the project management budget shall be increased as-required based on discussions with the City. This budget will be used to cover additional effort associated with additional meetings, invoices and coordination, etc resulting from the schedule extension.
- The Scope of Work shall be managed to be within the overall budget established for the project. Some tasks and subtasks may require more or less effort to complete, based on conditions that may be unforeseen at the time of scoping. Kennedy/Jenks reserves the right to move budget between tasks/subtasks for the base scope.
- Sampling and other field work is not included in this scope of work.
- Design or implementation of a pilot study is not included in this scope of work. Treatment technologies and facilities sizing will be evaluated using existing effluent water quality data from the Santa Cruz Wastewater Treatment Facility (WWTF), and other information provided by the City. Recommendations for bench-scale and/or pilot-scale treatment technology studies may be provided depending on the recommended project.

Public Outreach Assumptions

- Outreach activities will be coordinated with existing City Communications staff, who will provide services as described in the scope of work.
- The Kennedy/Jenks Team will prepare and present outreach materials within the scope described herein.

- As needed graphic support (layout, text & design) for collateral outreach materials and public meeting support materials such as posters, PowerPoint presentations and handouts is included up to the budgets established herein.

Services Provided by the City

The scope of work, schedule and budget assumes that the following services will be provided by City:

- The City will designate one or more individuals (as-needed) to:
  - Serve as a point of contact to assist the Kennedy/Jenks Team in obtaining needed data and scheduling meetings, workshops, site visits as defined in the scope of work.
  - Coordinate with other City Departments, other City consultants, potential customers, groundwater (GW) stakeholder groups, regulators and other stakeholders as-requested to support the scope of work.
  - Coordinate, schedule and provide logistics for meetings with potential users, workshops and meetings with Regional Partners.
  - Create and manage the Technical Working Group (TWG) and provide coordination and logistics for TWG workshops.
  - Distribute materials, take meeting minutes and provide support as-needed during meetings/workshops.
  - Distribute deliverables and coordinate the review process with the Regional Partners and other reviewers, and to provide consolidated comments and information to the Kennedy/Jenks team within the durations shown on the project schedule.
- The City will provide prior reports, technical memoranda, presentations and other information from prior planning efforts upon request, and in digital format if available.
- Aerial photos, GIS shapefiles, AutoCAD files and other facility information from previous planning and design efforts, or other City sources will be made available at no additional cost to the Kennedy/Jenks Team.
- The City Water Engineering and Public Works Staff will provide draft report text/tables/figures from previous planning efforts and will provide data to assist K/J GIS staff with the production of graphics for workshops as-requested.
- The City will provide relevant customer water use data including all meter data and previous demand estimates, at the start of the project to facilitate confirmation of the market assessment demands. These data will be provided in a digital format. If data input for hard copy information is required, additional scope and budget will be required.

Work by Subconsultants

- Merritt Smith Consulting– Regulatory Strategy Support
- Data Instincts – Stakeholder Outreach
- Trussell Technologies – WWTF Facility/Supply Analysis, Treatment Technologies and QA/QC Support
- Stratus Consulting/Abt Associates – Triple Bottom Line Analysis
- GHD Inc. – CEQA/Environmental Compliance Support
- Michael Welch, PhD. – Reservoir Augmentation

City of Santa Cruz
Water Supply Advisory Committee

Final Report on
Agreements and Recommendations

October, 2015

The Water Supply Advisory Committee

SantaCruzWaterSupply.com

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GLOSSARY

Active recharge: Regarding aquifer storage, active recharge implies artificially moving water from the surface into ground water systems.
Adaptation framework: General approach to enable the City and Water Department to adjust plans (i.e., to adapt) in the face of key future uncertainties, by taking account of future information as it becomes available.
Adaptive flexibility: The ability of a plan to adjust to changing circumstances and emerging information over time.
Adaptive pathway: The path forward through time, representing where and why plans may need adjustment (adaptation) as new information becomes available.
Adjustment framework: Similar to the adaptation framework, but pertaining to modest-sized adjustments to a path rather than a possible movement from one future path to another.
AFY, acre feet per year: A unit of measurement that demonstrates both water supply and demand on a municipal-wide scale. One acre foot is the volume of one acre of surface area to a depth of one foot. One acre foot is 43,560 cubic feet or 325,851 gallons.
Alternatives: Proposed solutions or alleviations to the system's supply shortfall that intend to use new or underutilized sources of water, expanding storage, and/or creating or adapting production methods.
CII: Commercial, institutional and industrial entities; non-residential customers of the Water Department.
CII MF: CII (see above) and multi-family residential customers.
Confluence®: An analytical water resources planning tool that simulates current and future water supply and demand scenarios, evaluates the results, and presents them in an understandable fashion. (Confluence was developed by Gary Fiske and Associates.)
Confluence model: The presentation of the Confluence results which provides a vast array of information in a flexible manner.
Conjunctive use: Using groundwater and surface waters together to improve water availability and reliability.
Decision nodes: Points along an adaptive pathway at which information is anticipated that may support a decision to either proceed as initially planned, or adjust the plan (e.g., switch to a different pathway forward).
Decision space: The factors, information, and time in which a decision is to be made.
Demand management: The guidance of reduced water consumption through conservation and other curtailment methods (e.g., departmental rebate for low-flow toilet installation).
Direct potable reuse: An approach to recycled water where advanced purified wastewater is introduced directly into a potable water supply distribution system.
Drought-resistant: Alternative water supply that is not highly dependent on rainfall for its source.
Econometric: A form of statistical analysis applied in the social sciences (e.g., to explain or forecast water demand).
Fish flows: Designation of specific stream flows at a particular location for a defined time, and typically follows seasonal variations with the intent of protecting and preserving resources for the surrounding environment and fish. [Ref. http://www.dfg.ca.gov/water/instream_flow.html]
Flow regime: The amount of water that is (or is required to be) found instream, across seasons and hydrologic years.

Forward osmosis (FO): Forward osmosis (FO) is an osmotic process that uses a semi-permeable membrane to effect separation of water from dissolved solutes. The driving force for this separation is an osmotic pressure gradient between a solution of high concentration, often referred to as a "draw" and a solution of lower concentration, referred to as the "feed".
Gantt chart: A bar chart that demonstrates components of a project's schedule.
GPCD: Gallons per capita per day, or the average daily water usage per person.
HCP: A Habitat Conservation Plan (HCP) is a required part of an application for permits to continue to take water from the San Lorenzo River and North Coast Streams. The HCP evaluates the impacts the City's water withdrawals have on endangered fish and spells out how they will be avoided or minimized. The HCP establishes an agreed upon amount of water that is needed for fish protection, and therefore how much remains for City consumption.
Indirect potable reuse: An approach to recycled water where advanced purified water is combined with water from a natural water source (often in an aquifer or reservoir) where it can later receive more treatment before being introduced to a potable water supply distribution system.
Interest-based bargaining: A method intended to increase the effectiveness of negotiations to develop consensus. The goal is for every member of the negotiation to win something, and to do so by addressing all interests, maintain a cooperative approach, and focus on the importance of relationships among members. There is usually more than one satisfactory solution in Interest-based bargaining.
Intertie: A connecting pipeline between water systems that allows the transfer of potable water.
Karst: A terrain with distinctive landforms and hydrology created from the dissolution of soluble rocks, principally limestone and dolomite. Karst terrain is characterized by springs, caves, sinkholes, and a unique hydrogeology that results in aquifers that are highly productive but extremely vulnerable to contamination. In the United States, about 40% of the groundwater used for drinking comes from karst aquifers. [Ref. http://water.usgs.gov/ogw/karst/pages/whatiskarst]
MGY, Million gallons per year: A unit of measurement that demonstrates both water supply and demand on a municipal-wide scale.
Modeling and forecasting: Water supply planning and analytical tools used in designing the water system and estimating its performance and demands under various future scenarios.
Multi criteria decision system (MCDS): A framework for organizing, analyzing, and communicating considerations of proposed approaches to water supply and demand. MCDS produces a model that contains criterion and alternatives. Each criterion and alternative has a description, ratings scales, and weights.
NTUs (Nephelometric Turbidity Units): A measure of the level of turbidity, or suspended particles, in a liquid. Drinking water standards require turbidity to be in the range of ~ 0-1NTU.
Passive recharge: Regarding aquifer storage, passive recharge implies moving water naturally from the surface into ground water systems (such as by substituting surface water to supply water users, and thereby resting extraction wells).
Peak season: The months between May and October where demand for water is higher than the remaining months due to dry weather conditions and a significant increase in tourist activity.
Portfolio: Collections of potential solutions and alleviations to the system's supply and demand shortfall distributed to the Committee to review, consider, and assess.
Production: The volume of potable water generated in a specific time period, which may vary during different times of the year and different hydrologic conditions. The difference between production

and yield is production measures each supply source, while yield measures the water supply system as a whole.

Price elasticity: Regarding demand, price elasticity is an economic term that represents the responsiveness of demand when the price of goods and/or services are subjected to changes.

Ranney collectors: A patented type of radial collector well used to extract water from a direct connection to a surface water source (e.g., a river) by extending radially under the surface floor (e.g., river bed). These radial or horizontal wells flow to a conventional well before being pumped to the surface.

Reverse osmosis: A system of filtering dissolved solids from water by driving the water through a semi-permeable membrane. Compared to forward osmosis, reverse osmosis is a high pressure driven system.

Rule curve: As applied to dam operations, for example, indicating the guidelines for how releases from the dam are managed (i.e., when to use the water, and when to store it).

Runoff: The flow of surface water from excess rain or other sources. This occurs when the source of water is distributed faster than the surface is able to absorb it, resulting in the flow of water.

Scalability: The capability to alter a project's plans to meet differing demand scenarios (ex.: adapting the plans regarding the size of a recycled water plant to produce less water for a smaller customer base than what was originally imagined).

Scenario planning: Exercises intended to demonstrate potential future water supply and demand situations (ex.: long periods of drought, lowered demand due to conservation, etc.).

Supply augmentation: Adding to the water supply.

Supply-demand gap: The difference between a water system's ability to sustainably store and provide water to its customers and the demand on the system. The amount by which demand may exceed supply, such as in the peak demand season.

Turbidity: The cloudiness or haziness of a fluid caused by the presence of particulates in the water.

UHET: Ultra high efficiency toilet.

Urban Water Management Plan: A report that fulfills the requirements described in the Urban Water Management Planning Act. The report describes the utility's water resource supplies and projects needs over a twenty-year planning horizon with relation to conservation, water service reliability, water recycling, opportunities for water transfers, and contingency plans for drought events. The latest report was published in 2010.

Yield: The resulting reduction in system-wide water shortages during the peak season when a new source is added to the system. Two measures of yield are typically shown: (1) under the worst hydrologic conditions; and (2) as an average across all hydrologic conditions. The difference between production and yield is production measures each supply source, while yield measures the water supply system as a whole.

Water year: Each water year begins October 1 and extends through September 30.

Water-neutral: As applied to development paths (i.e., levels of population or economic growth), signifying an approach that does not change overall demand for water.

Article I. Executive Summary

Appointed by City Council in 2014, the Water Supply Advisory Committee's (WSAC) charge was to *explore, through an iterative, fact-based process, the City's water profile, including supply, demand and future risks; analyze potential solutions to deliver a safe, adequate, reliable, affordable and environmentally sustainable water supply; and, to develop recommendations for City Council consideration.* This document lays out the WSAC Process, Information Developed and Considered, Analysis, Agreements and Recommendations.

The WSAC brought together a diverse set of perspectives and viewpoints from a broad sector of the community. The Committee placed a high value on transparency, trust and consensus. With that in mind, developing the "how" – the Agreements – was as critical as the "what" – the Recommendations.

The Agreements lay out strategies for how the recommendations will be implemented, with particular emphasis on how to approach managing change. The Committee agreed to a *Staggered Implementation Approach*, allowing work to begin on full scale implementation of the Strategy One elements, with clearly defined decision points, thresholds and metrics; and to begin preliminary work on Strategy Two elements. The implementation protocol is discussed in Section 3.22 of this document.

In addressing the issues of trust and transparency, the Agreements provide an in-depth *Change Management Strategy.* This strategy underscores the guidelines and principles that reflect the Committee's values and priorities, and establishes mechanisms for dealing with changes that will occur over time. The Change Management Strategy includes procedures for planning, doing, checking and acting; an Adaptive Pathway framework for implementing the three main supply recommendations; defined roles and responsibilities for Water Department staff and the Water Commission; and clear guidance for decision making. The Change Management Strategy is discussed in Section 3.24.

The overarching goal of the Committee's Plan is to provide significant improvement to the sufficiency and reliability of the Santa Cruz water supply by 2025. The recommendations made in this report reflect consensus among WSAC members for how best to address an agreed-upon worst year gap of 1.2 billion gallons between water supply and water demand during times of extended drought. The strategies recommended include: strengthened water conservation programs; storage of available San Lorenzo River flows during the rainy season in regional aquifers, through processes known as "In Lieu" water transfers, for passive recharge, and Aquifer Storage and Recovery (ASR) for active recharge; and a supply augmentation plan to use advanced-treated recycled water,[1] with desalination as a back-up, should the use of advanced-treated recycled water not be feasible. This report provides detailed information on each of the recommended strategies. Importantly, the Committee's Plan accomplishes the City's water supply goal while providing robust stream flows to support and enhance fish habitat restoration and protection.

In brief:

Strategy 0 – Conservation – In addition to the existing conservation programs such as home and business evaluations, water saving rebates, water budgets for large landscapes and free water-saving

[1] See Framework for Direct Potable Reuse: Water Reuse Foundation, American Water Works Association, Water Environment Foundation, National Water Research Institute, September 2015.

devices, the WSAC recommends looking at new programs, such as increased rebates and better management of peak season demand. The goal of these additional programs would be to further reduce demand by 200 to 250 million gallons per year (mgy) by 2035, with a particular focus on producing savings during the peak season.

Strategy One – Groundwater Storage: In Lieu Water Exchanges – In normal years, the Santa Cruz Water Department (SCWD) receives more rainfall than is needed to meet customer demand and can be stored in Loch Lomond Reservoir. Using In Lieu Water Exchanges, available winter flows would be delivered to Soquel Creek Water District (SqCWD) and/or Scotts Valley Water District (SVWD) customers, thus allowing reduced pumping from these regional aquifers and enabling the aquifer to passively rest and recharge. Using **Aquifer Storage and Recover (ASR),** available winter flows would be injected into aquifers through new and existing wells owned by the SCWD, SVWD and/or SqCWD, thereby actively recharging aquifers. A portion of the water delivered using In Lieu or ASR would be effectively banked in the aquifers to be extracted and returned to SCWD when needed in future dry years.

Strategy Two – Advanced Treated Recycled Water or Desalinated Water would be developed as a supplemental or replacement supply in the event the groundwater storage strategies described above prove insufficient to meet the plan's goals of cost-effectiveness, timeliness or yield. If it is determined that recycled water cannot meet our needs, then desalinated seawater would be used.

With these recommendations, the Water Supply Advisory Committee has met its charge to reach consensus on how best to deliver a safe, adequate, reliable, affordable and environmentally sustainable water supply to our community by 2025. The body of this report provides the detailed information that which supports the findings reported in this Executive Summary.

Article II. Preamble

Section 2.01 Committee Charge

The Committee's purpose is to explore, through an iterative, fact-based process, the City's water profile, including supply, demand and future risks; analyze potential solutions to deliver a safe, adequate, reliable, affordable and environmentally sustainable water supply and develop recommendations for City Council consideration.

Section 2.02 Committee Membership

The following individuals were appointed to the Water Supply Advisory Committee to represent the interests listed:

Community Interest	**Representative**
Business Organization (Think Local First)	Peter Beckmann
City Resident	Doug Engfer
Santa Cruz Water Commission	David Green Baskin
Non-City Resident (Outside-City Water Customer)	Sue Holt
City Resident	Dana Jacobson
City Resident	Charlie Keutmann
Santa Cruz Desalination Alternatives	Rick Longinotti
Environmental Organization (Surfrider Foundation)	Sarah Mansergh
Business Organization (Santa Cruz Chamber of Commerce)	Mark Mesiti-Miller
Environmental Organization (Coastal Watershed Council)	Greg Pepping
Santa Cruz Sustainable Water Coalition	Mike Rotkin
Business Organization (Santa Cruz County Business Council)	Sid Slatter
Environmental Organization (Sierra Club)	Erica Stanojevic
Santa Cruz Water Commission	David Stearns
Santa Cruz Water Department (ex officio/non-voting member)	Rosemary Menard

Section 2.03 Committee Agreement about Decision-Making

The Committee's decision-making processes will differ from the Council or City Commissions in that it is intended to reach consensus through a collaborative process. Therefore, the Committee will use this hierarchy of decision tools:

i. The preferred decision tool is for the Committee to arrive at a "sense of the meeting."

ii. Consensus is highly desirable.

iii. Informal voting may only be used to explore the decision space.

iv. Formal voting may be used as a fallback when consensus fails as long as there is consensus that a vote should take place. The voting shall be by a supermajority of 10.

Section 2.04 General Context and Framing Issues

The most important element of a problem solving process is defining the problem. Yet one of the characteristics of long range planning for complex systems is that even the problem itself is difficult to define. This is true of Santa Cruz's water planning.

Like all long range planning, water supply planning must deal with the realities of an uncertain future. In a historical context, water supply planning uncertainties have included the normal sources of variability:

- Weather and its impacts on supply;
- Demand increases in the future due to growth and development;
- Demand decreases resulting from changing plumbing codes, technologies, demographics, or consumer behaviors (conservation); and
- Potential supply decreases due to regulatory requirements to release water to support threatened or endangered fish species.

Today, uncertainties related to impacts of climate change must be added to this list.

During the first phase of the WSAC's work, the Committee was presented information about a variety of decision tools that the technical and facilitation teams believed could be useful in the Committee's work. The Committee considered and applied a variety of tools:

1. Scenario planning, including portfolio development,
2. Risk analysis and risk management, and
3. Criteria based evaluation of alternatives and portfolios using a Multi-Criteria Decision Support tool (MCDS).

The Committee explored or applied all of these tools as it did its work. The Adaptation Strategy described in more detail in Section 3.24 later in this document exists largely as a result of the Committee's efforts to create a plan that would be able to respond to the new information that will emerge and the potential changes in our understanding of circumstances that will occur over time.

Section 2.05 Overview of Committee Process

The Committee's process was divided into three phases:

- A Reconnaissance Phase where the Committee learned about the water system and its issues and identified a broad range of alternatives approaches for addressing the system reliability issues;

- An Analysis Phase where more detailed information about supply, demand, the supply shortfall, and the alternative approaches to solving the problem were explored in some detail; and
- An Agreements Phase where the Committee developed the agreements and recommendations that they conveyed to the City Council. The process has been iterative without stark boundaries between the phases but with a steadily increasing level of understanding of the issues, drivers, opportunities and constraints that the Committee was dealing with.

The Committee's process has been supported by a technical team that brought a diverse range of skills, experience and expertise to the tasks the Committee defined. The Committee also selected a group of four water professionals to serve as an Independent Review Panel and provide perspective about technical issues that the Committee dealt with. Finally, the Committee was professionally facilitated by a team of individuals experienced in collaborative problem solving and multi-party negotiations.

All Committee meetings were open to the public and opportunities for public comment and input were regularly provided including, specifically, in advance of the Committee's taking action on any important decisions. The Committee had its own website and received and responded to all website communications received from the public. All public communications received via the website were shared with all Committee members, and with City staff and the technical team.

Section 2.06 WSAC Process and Support Team

In addition to their monthly meetings, a number of other opportunities were made available to inform the WSAC on the myriad topics and issues associated with water supply planning. Six "Modeling and Forecasting" workshops were offered to WSAC members and the community on the various tools used by the Water Department related to water supply planning. These workshops covered topics on surface and groundwater supplies, forecasting water demand, demand management, and water shortage contingency planning. There were also a series of "Enrichment" meetings which included discussions on building code impacts on water demand, fishery agency perspective on protecting and enhancing fish habitat, climate change, water transfers/exchanges as a water supply augmentation, conservation, and recycled water.

The WSAC was supported by a Facilitation Team, Independent Review Panel, and Technical Support Team as described below.

Facilitation Team: The facilitation team was hired to guide the WSAC through its process including assessing community concerns; designing the WSAC process; reviewing committee composition; assisting with establishing committee meeting agendas, format and structure, legal and ethical guidelines and other process considerations; proposing work plans, objectives and deliverables; interfacing with City staff, consultants and community members; and maintaining strong lines of communications and relationships between the City, Committee and the greater community toward the end of timely delivering a set of water supply recommendations for City Council consideration. The prime consultant was Nicholas Dewar (Public Policy Collaboration) with subconsultants Carie Fox (Fox Mediation) and Philip Murphy (InfoHarvest).

Independent Review Panel: The WSAC hired four individuals to assist them to effectively interact with the technical consulting support team by providing critical review of products created by the technical

team and offering advice or suggestions to the WSAC regarding lines of inquiry or technical questions that should be evaluated by the technical team.

- Michael A. Cloud, Registered Geologist, County of Santa Cruz (retired)
- Patrick T. Ferraro, Water Resource management, Executive Director The Silicon Valley Pollution Prevention Center (1995 – 2004); Director on the Board of the Santa Clara Valley Water District (1973 – 1995)
- Brian L. Ramaley, P.E., Drinking water supply, treatment, distribution; Director City of Newport News Department of Public Works (1989 – 2013) (retired)
- Roy L. Wolfe, PH.D., Environmental science, water resources, utility management, water research, Metropolitan Water District of Southern California (retired).

Technical Team: A number of consultants were available to develop and provide information on the various topics considered by the WSAC. Stratus Consulting functioned as a general contractor and, together with Water Department staff, orchestrated the work of a number of subject matter experts. Stratus Consulting and the other consultants listed below were approved by the WSAC at their May, June, August and September 2014 meetings.

- Stratus Consulting Inc. acted as general contractor to the WSAC. Stratus provided environmental research, analytics and consulting services and responded to technical and analytical issues.
- Brown and Caldwell provided engineering support services, developing conceptual level designs and cost estimates on a myriad of options.
- Balance Hydrologics provided information related to stream flows and impacts to those flows resulting from climate change and potential release requirements for fish and other habitat.
- Gary Fiske and Associates developed the Confluence model to assist utilities manage water supply resources. Gary has consulted to the City for many years and assisted the WSAC evaluate various water supply alternatives.
- Hagar Environmental Science provided information to the WSAC on fisheries and aquatic issues as they relate to water resource management and aquatic species conservation.
- Lennihan Law provided information related to water rights.
- Maddaus Water Management Inc. has several decades of experience with water resource planning, water demand management and conservation. Maddaus has worked with the Water Department on several water conservation master planning efforts and worked with the WSAC on several occasions to discuss conservation practices and approaches to lower Santa Cruz demands.
- M. Cubed developed an econometric demand model during the WSAC to more comprehensively evaluate the water demands of the city and its influencing factors.

Article III. Agreements

Section 3.01 Introduction

This Article summarizes the work the Committee members did in several major topic areas that were key to developing their understanding of the issues and their recommendations to the Council. Each of the following sections describes a topic, summarizes the Committee's work on that topic, presents any agreement that the Committee reached about that topic, and articulates the key assumptions.

The analysis, assumptions and agreements presented in this section create the foundation for the Committee's recommendations to the City Council presented in Article IV.

Section 3.03 begins with a brief statement about the nature of Santa Cruz's water supply problem that was based on conventional wisdom and past studies and analysis. The analysis described in Section 3.04 through Section 3.07 deconstructs and then reconstructs that conventional wisdom to quantify the supply-demand gap and to include the potential impacts of fish flow releases and climate change on the size and characteristics of Santa Cruz's water supply reliability issues.

Section 3.02 Background

The Water Supply Advisory Committee's Analysis Phase work program was designed around the use of scenario planning to explore and evaluate a range of alternatives. This section summarizes the basic work to date and provides an overview of the products developed to support the Committee's work. Several additional documents are attached to this document as appendices; they provide more detailed information where such information was thought to be relevant and potentially of interest.

The key ingredients of the Committee's scenario planning include:

- Problem definition
    1. Forecasts of current and future water demand;
    2. Analyses of supply available to meet current and future water demand; and
    3. Identification of probable and plausible challenges that will need to be addressed in the future; in this case these include a probable requirement for releasing water for fish flows and plausible impacts of climate change.
- Solution development
    - A range of demand management (water conservation) and supply augmentation alternatives that can be combined in various portfolios to meet the supply demand gap; and
    - Evaluation criteria to use in considering the portfolios created.

The following sections provide a high level summary of the Committee's progress in their work related to scenario planning and, where relevant, links are provided to more detailed information, typically found in materials developed for committee meetings. In addition, comprehensive information about the Committee's work is available through its website: www.santacruzwatersupply.com.

Section 3.03 Preliminary Problem Definition

Over the many years that Santa Cruz has been studying ways to improve the reliability of its water supply, the problem has been defined in a variety of ways that were relevant at the time. Today, it is fair to say that the fundamental cause of the Santa Cruz water system's reliability problem is the inability to store sufficient volumes of available winter flows for use in the driest years and/or the lack of a supply that does not depend on those flows. At least one of these is needed to ensure an adequate and dependable supply during water years classified as critically dry and, to some degree, dry.

Section 3.04 Historical Context – The Challenge of Variability

The City uses a water year classification system as an index of water supply conditions for operations, to forecast river flows, and to communicate its water supply status to the public. The system is based on total annual runoff in the San Lorenzo River, the City's most important source, measured at the Big Trees gage in Henry Cowell Redwoods State Park.

Annual discharge of the San Lorenzo River was selected as the best individual benchmark of the City's water supply condition for two reasons. First, the river is the city's single largest source of drinking water, providing about half the normal annual supply. Second, about three quarters of all the water used by city water customers is obtained from a flowing source of supply. In general, the higher the volume discharged from the San Lorenzo River means that:

- the local watersheds in the Santa Cruz mountains are more saturated;
- the stream sources will flow at higher levels later into the dry season; and
- there is more water available from all surface water sources, including the reservoir, to meet system demands over the course of the year.

The converse is also generally true: the lower the volume discharged by the San Lorenzo River means less water is available from all surface water sources to meet system demands.

Under this classification system, the water year (October 1- September 30) is designated as one of four types: wet, normal, dry, or critically dry, depending on the total annual river discharge, as follows:

Table 1 – Water Year Classification System

Classification	Runoff (ac-ft)
Wet	> 119,000
Normal	49,000 - 119,000
Dry	29,000 – 49,000
Critically Dry	<29,000

Figure 1 and Figure 2 show two versions of local, historical information for water years (October 1 to September 30) classified into water-year types. These are familiar figures to many, but the purpose of including them up front is to emphasize two issues:

- Figure 1 shows the data sorted chronologically over the period from 1921 - 2015[2]. This view underlines the significant variability of the data emphasizing the fact that the City has no certainty about what the following year will bring, nor any certainty about how long any pattern may last. Average runoff during this period is about 93,000 acre-feet or 30 billion gallons[3]. The least amount of runoff, 9,500 ac-ft, occurred in the drought of 1977. The maximum recorded discharge was over 280,000 ac-ft in 1983, one of the wettest years on record in California. This natural variation in the level of runoff available in local streams and rivers, from which the City draws the majority of its supply, is the major factor that results in an inconsistent level of water supply from year to year.
- Figure 2 sorts the data into year types, showing the number of years that have historically fallen into each year type. As will be discussed later in this section, a plausible impact of climate change on Santa Cruz's water supply would be an increase, perhaps even a significant increase, in the fraction of dry and critically dry years that Santa Cruz will experience, thereby exacerbating the reliability issues the system currently faces.

[2] The actual period of record for the gage on the San Lorenzo River began in 1936, but synthesized flow records generated for earlier modeling studies were used to extend the period of record back to 1921.

[3] One ac-ft equals 325,851 gallons; 3.07 ac-ft equals one million gallons.

Figure 1 – Water Year Classification System Based on San Lorenzo River Runoff (by year)

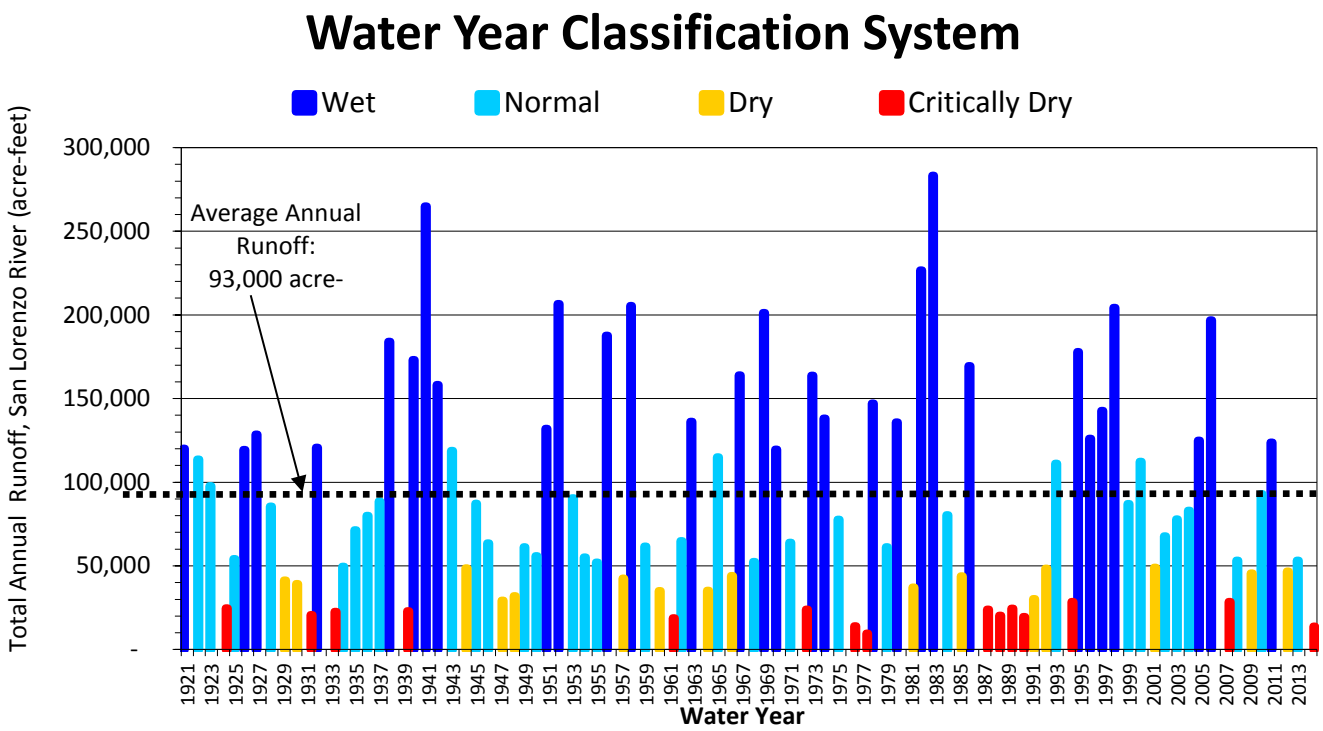
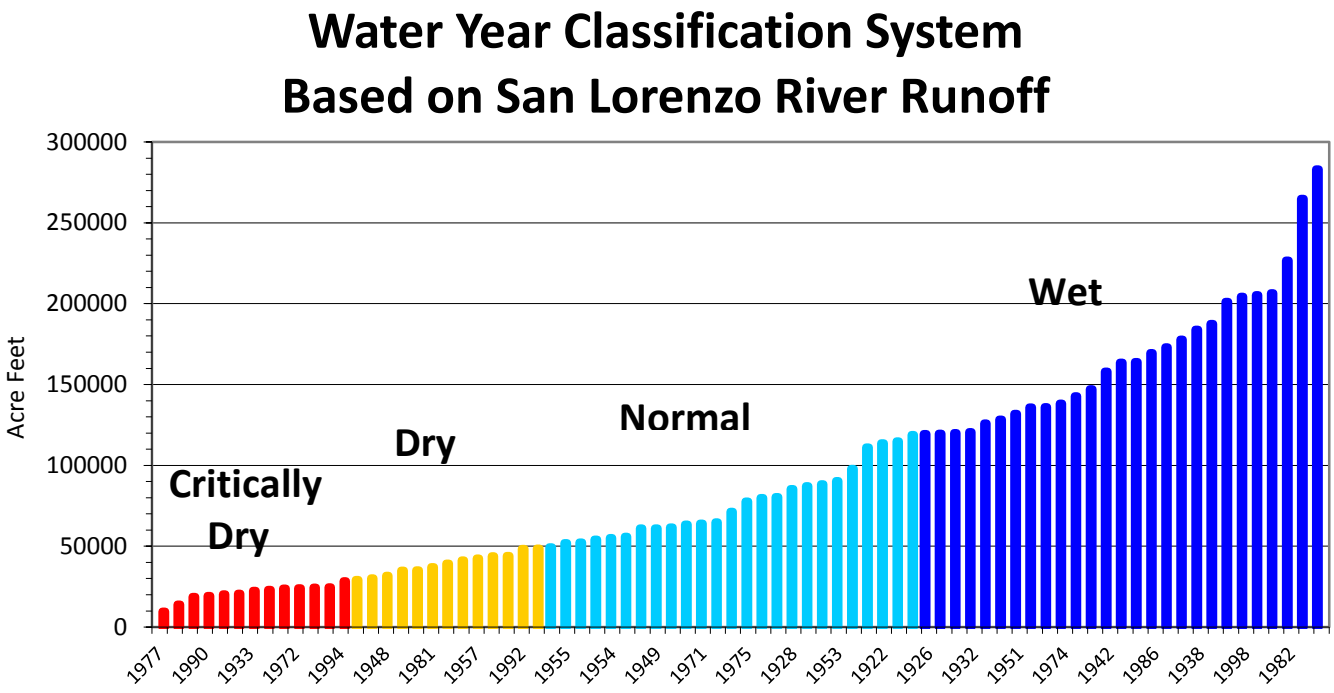


Figure 2 – Water Year Classification System Based on San Lorenzo River Runoff (by water year type)



Section 3.05 Forecast of Current and Future Water Demand

(a) Water Demand and Growth – the City General Plan

At its August 1, 2014 meeting, the Water Supply Advisory Committee agreed that using water scarcity to change the assumptions about the City's future growth and development, as laid out in the 2010 Council adopted General Plan, was not part of the Committee's charge from the Council. In making this agreement, the Committee recognized that there are several growth issues that are within the Committee's purview including, for example, the potential impacts of growth on water demand for the period after that covered by the General Plan.

The Committee also acknowledged the requirements in the California Urban Water Management Planning Act (Water Code Section 10631) requiring that "… The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available."

(b) Water Demand and Growth – UCSC Future Demands

Significant work has been done to update the water demand forecast used in the 2010 Urban Water Management Plan. This demand forecast incorporates the changes in population and development that were part of the City's General Plan update as well as whatever up to date information was available at the time for the Water Department's outside-city service area.

The University's estimated build-out demand is 349 mgy. The WSAC did not generate an independent estimate of UCSC demand. The 349 mgy figure for the University's build-out demand is based in part on its 2005 - 2020 Long Range Development Plan with added demand for the University's Marine Science and Delaware Street facilities. The only change made by City staff to the University water demand was to extend the previous forecast of 349 mgy in 2030 further out into the future to reflect a lower, more realistic, rate of growth, with two potential endpoints: 2035 and 2050. In the lower bound forecast, build-out occurs in 2050. In the upper bound forecast it occurs in 2035. The primary forecast is the midpoint between the lower and upper bound forecasts. The forecast of UCSC demand is given in Table 2. The primary forecast almost exactly replicates a forecast based on projected enrollment and average rates of water use per student.[4]

Table 2 – Primary, High and Low Projections for University Growth

	2013*	2020	2025	2030	2035
Low	182	186	213	240	268
Primary	182	196	234	271	308
High	182	207	254	302	349
Notes					
*Actual per Water Department billing records.					

[4] The enrollment-based approach yields a 2035 demand of 304 MG, which differs from the primary forecast by less than 2%.

(c) Interim Demand Forecast – February to April 2015

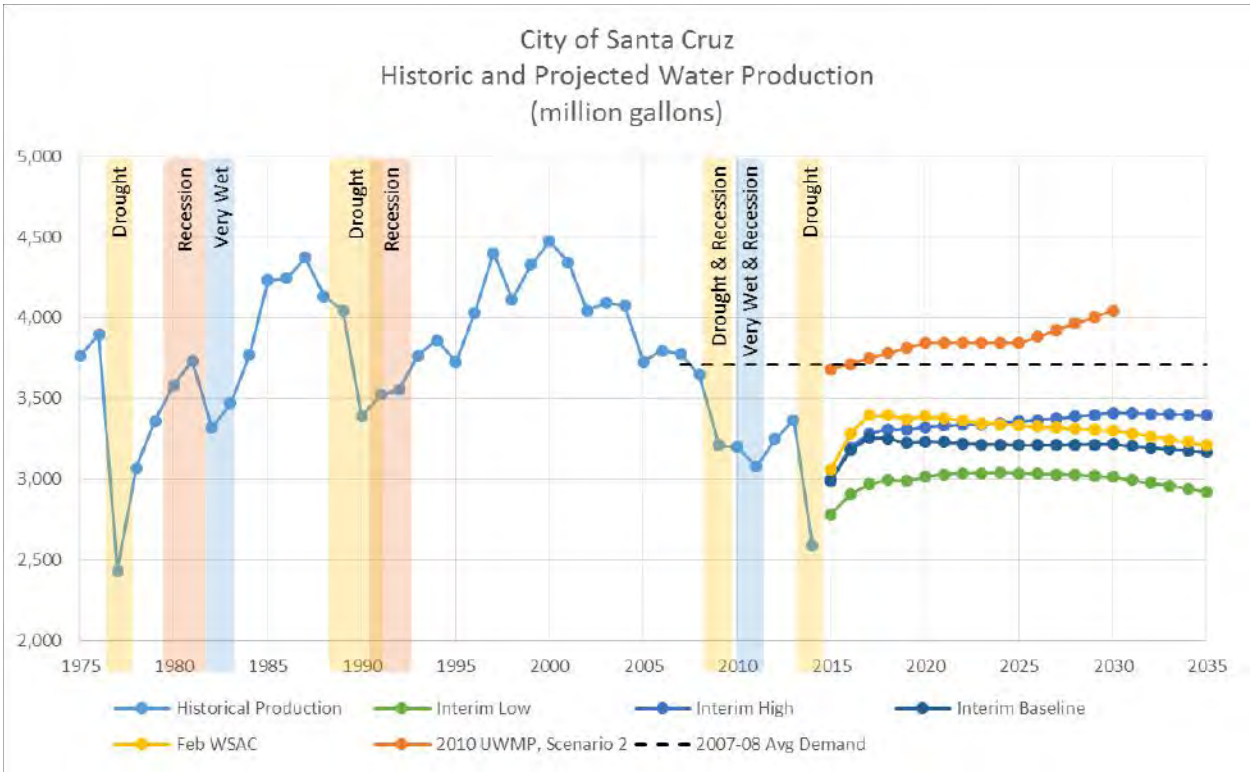
An interim demand forecast was developed by working from the demand forecast used in the 2010 Urban Water Management Plan. The 2010 Urban Water Management Plan demand forecast incorporates the changes in population and development that were part of the City's General Plan update as well as whatever up-to-date information was available at the time for the Water Department's outside-city service area at the time. Working from the 2010 forecast, the interim forecast incorporated a number of key changes including:

- Incorporating effects of existing, ongoing water conservation programs,
- Integrating the expected impacts of changes in the state's building and plumbing codes that will affect future water use in both existing and new construction,
- Adding into the forecast the effects of income changes and price increases on water use,
- Revising the projected growth of commercial services, and
- Using the university's projection of its ultimate build-out demand but extending its time for completion as described above.

The result was a forecast for current and future demand that looks substantially different from the 2010 Urban Water Management Plan forecast. Most notably, the revised forecast no longer shows an increase in water demand during the coming 20 years.

Figure 3 below portrays the interim demand forecast and incorporates the changes described above as well as the revisions to the University's growth projections described above.

Figure 3 – April 2015 Interim Demand Forecast with High and Low Forecasts



An explanation of how the high and low demand forecasts were developed can be found in the April 17, 2015 Technical Memo included in Appendix 1.[5]

At the April 30 – May 1, 2015 meeting the Committee agreed that this interim forecast would be used as the basis for the Committee's work until the results of the econometric forecast became available.

(d) Econometric Demand Forecast – July to September 2015

The forecast of future water demand is a foundational component to any water utility of its future needs for water supply. In recent years the historical patterns of water demand have been upended by a variety of factors, including the cumulative effects of tighter efficiency standards for appliances and plumbing fixtures, greater investment in conservation, a significant uptick in water rates, an equally significant downturn in economic activity during the Great Recession, and on-going drought. These events have resulted in even more uncertainty than usual regarding future water demand and have placed even greater importance on sorting out the effect each has had on demand in recent years as well as how they are likely to affect demand going forward.

One of the first requests made by the WSAC was for the Water Department to update the demand forecast to reflect current information on water usage and to account for effects of conservation, water rates, and other factors expected to impact the future demand for water.

i) Statistical Models of Average Demand

Econometric demand forecasting develops statistically-based models of average water use per service by customer class. A demand forecast was developed based on these models covering the period 2020-2035 and incorporating empirical relationships between water use and key explanatory variables, including season, weather, water rates, household income, employment, conservation, and drought restrictions. The approach builds on similar models of water demand developed for the California Urban Water Conservation Council (Western Policy Research, 2011), Bay Area Water Supply and Conservation Agency (Western Policy Research, 2014), California Water Service Company (A&N Technical Services, 2014, M.Cubed 2015), and Contra Costa Water District (M.Cubed 2014).

The statistical models of demand were estimated using historical data on customer class water use, weather, water price, household income, conservation, and other economic variables driving water demand. The monthly models of water demand were combined with service and housing growth forecasts to predict future water demands. The demand models explain 90 to 99% of the observed variation in historical average use over the 14-year estimation period.

The forecasts of average demand by customer class are summarized in Table 3. The forecasts include adjustments for future effects of water rates, plumbing codes and the City's baseline conservation program[6] and are predicated on average weather and normal (predicted) income and growth.

[5] Appendix 1 includes Technical Memos on Demand Forecasts authored by M.Cubed (D. Mitchell) and City Staff.

[6] The baseline conservation program level is Program A in the City's forthcoming water conservation master plan.

Table 3 – Forecasted Average Demand by Customer Class (CCF/Year)[7]

YEAR		2013	2020		2025		2030		2035	
	Per	Actual [1/]	Forecast	CI	Forecast	CI	Forecast	CI	Forecast	CI
Single Family	Housing Unit	87	86	± 3	83	± 3	80	± 4	78	± 4
Multi Family	Housing Unit	53	56	± 2	52	± 2	50	± 2	49	± 3
Business	Service	405	400	± 12	389	± 12	382	± 13	377	± 13
Municipal	Service	388	296	± 26	290	± 27	283	± 29	277	± 30
Irrigation	Service	365	286	± 28	271	± 28	257	± 28	244	± 28
Golf	Acre	990	671	± 130	641	± 134	606	± 137	593	± 144

1/ Actual use, unadjusted for weather or economy. Stage 1 drought water use restrictions in effect May - Dec.

CI = 95% confidence interval.

ii) Industrial Demand

Because of its unique characteristics, industrial demand was forecasted separately from the other customer categories. In the case of industrial demand, there is a strong relationship between Santa Cruz County manufacturing employment and aggregate industrial water use. This relationship is used to generate the industrial demand forecast shown in Table 4 below.

Table 4 – Industrial Demand Forecast

	2013 [1/]	2020	2025	2030	2035
Mfg Employment Forecast[2/]		5,900	6,200	6,400	6,500
Industrial Water Demand (MG)					
Low	56	56	58	59	60
Primary	56	57	59	61	62
High	56	57	60	63	64

Notes

1/ Actual per Water Department billing records.

2/ Caltrans Economic Forecast for Santa Cruz County.

iii) Population, Housing, and Non-Residential Connection Forecasts

Forecasts of population, housing units, and non-residential connections are anchored to AMBAG's 2014 Regional Growth Forecast (AMBAG 2014). Projected growth in single- and multi-family housing units are shown in Table 5 and projected growth in non-residential services (excluding industrial and UCSC) are summarized in Table 6.[8]

[7] Table 2 through Table 7 are from M.Cubed's August 2015 Draft Final Report on its work developing the econometric demand model, which can be found in Appendix 1.

[8] The decrease in forecasted golf acreage is due to the intention of Pasatiempo golf course to shift to non-City sources of irrigation water.

Table 5 – Forecast of Occupied Housing Units

	2014 [1/]	2020	2025	2030	2035
Inside-City					
Single Family	12,246	12,534	12,780	13,030	13,246
Multi-Family	9,583	10,958	11,398	12,106	12,679
Subtotal	21,829	23,492	24,177	25,136	25,925
Outside-City					
Single Family	6,743	6,922	7,074	7,230	7,390
Multi-Family	7,901	7,910	8,033	8,310	8,495
Subtotal	14,644	14,832	15,107	15,540	15,884
Service Area					
Single Family	18,989	19,456	19,854	20,260	20,636
Multi-Family	17,484	18,868	19,431	20,416	21,174
Total	36,473	38,324	39,284	40,676	41,809

Notes
1/ Actual per Water Department billing records.

Table 6 – Forecast of Non-Residential Services and City-Irrigated Golf Acreage

	2013 [1/]	2020	2025	2030	2035
Business [2/]	1,889	1,948	1,971	2,008	2,055
Municipal [3/]	218	218	218	218	218
Irrigation [4/]	452	651	723	845	951
Golf					
DeLaveaga	79	79	79	79	79
Pasatiempo	68	40	30	20	20
Total Golf	146	119	109	99	99

Notes
1/ Actual per Water Department billing records.
2/ Based on ratio of business to residential demand.
3/ No expected growth in number of municipal services.
4/ Based on historical rate of gain in irrigation services per gain in multi-family and business services.

iv) Demand Forecasts

The primary forecast of system demand is provided in Table 7. Under the primary forecast, total system demand is expected to remain stable at about 3,400 MGY over the forecast period, despite a 13 percent increase in population over the same period. Per capita water use is projected to go from 93 gallons per day in 2020 to 84 gallons per day in 2035, a decrease of approximately 10 percent.

Table 7 -- Primary Forecast of Class Demands and System Production

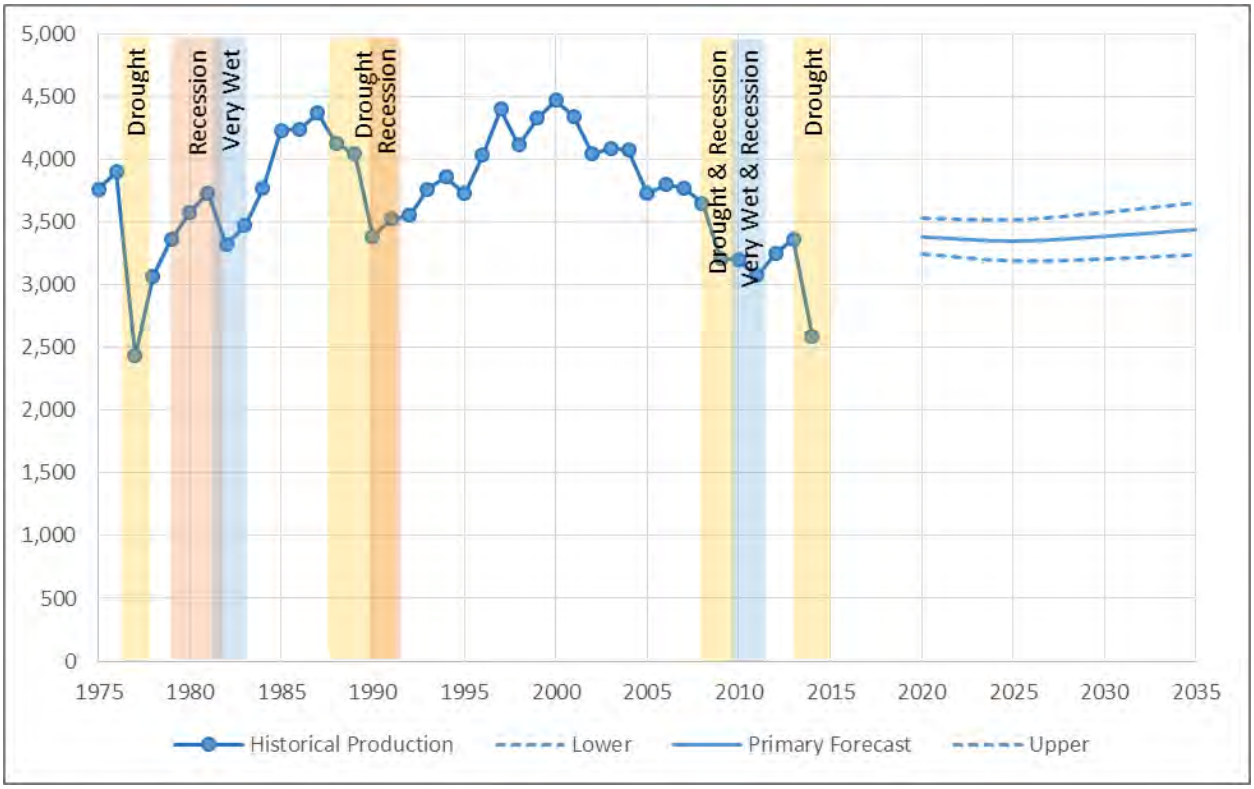
YEAR		**2020**	**2025**	**2030**	**2035**
		Forecast	Forecast	Forecast	Forecast
Service Units	**Units**				
SFR	Housing Units	19,456	19,854	20,260	20,636
MFR	Housing Units	18,867	19,430	20,416	21,174
BUS	Services	1,948	1,971	2,008	2,055
IND	NA	NA	NA	NA	NA
MUN	Services	218	218	218	218
IRR	Services	651	723	845	951
GOLF	Acres	119	109	99	99
UC	NA	NA	NA	NA	NA
Avg Demand	**Units**				
SFR	CCF	86	83	80	78
MFR	CCF	56	52	50	49
BUS	CCF	400	389	382	377
IND	NA	NA	NA	NA	NA
MUN	CCF	296	290	283	277
IRR	CCF	286	271	257	244
GOLF	CCF	671	641	606	593
UC	NA	NA	NA	NA	NA
Annual Demand	**Units**				
SFR	MG	1,256	1,228	1,208	1,196
MFR	MG	792	759	766	775
BUS	MG	583	573	575	580
IND	MG	57	59	61	62
MUN	MG	48	47	46	45
IRR	MG	139	147	163	174
GOLF	MG	60	52	45	44
UC	MG	196	234	271	308
Total Demand	**MG**	**3,131**	**3,099**	**3,134**	**3,184**
MISC/LOSS	MG	254	251	254	258
Total Production	**MG**	**3,385**	**3,351**	**3,388**	**3,442**
Rounded	**MG**	**3,400**	**3,400**	**3,400**	**3,400**

Forecasted demands are significantly lower than the 2010 UWMP forecast. The primary reasons for this are that the 2010 UWMP forecast

1. did not include adjustments for the future effects of passive and active conservation and higher water rates on future water use, and
2. assumed higher UCSC demand.

Figure 4 shows a comparison of historical production and the primary, lower, and upper bound forecasts from the econometric models. It is interesting to see how historical production has been influenced by weather and economic events. The forecast does not exhibit a similar degree of variability because it is based on average weather and normal economic conditions. In other words, it is a forecast of *expected future demand*. Realized future demand will certainly not be smooth like the forecast. It will vary about the expected value depending on year-to-year variation in future weather and economic conditions. The forecast, however, provides the baseline around which this variability is likely to occur.

Figure 4 – Historical and Forecast Production in Millions of Gallons[9]



[9] An explanation of how the high and low demand forecasts from the economic demand model were developed can be found in the August 2015 City of Santa Cruz Water Demand Forecast report included in Appendix 1.

(e) Committee Agreement(s)

At the Committee's April 30 – May 1, 2015 meeting they agreed that the interim forecast would be used as the basis for the Committee's work until the results of the econometric forecast became available.

At its July 23, 2015 meeting, the Water Supply Advisory Committee agreed to use the econometric demand forecast as presented by David Mitchell of M Cubed Consulting at this meeting.

On September 10, 2015, the Committee accepted a revised forecast that corrected an error in the way that future plumbing and building code changes were incorporated into the forecast. Figure 4 above, reflects the revised, corrected forecast.

(f) List of Key Assumptions for Econometric Demand Forecast

- Future growth rates for service area population, housing units, and service connections are based on AMBAG's 2014 Regional Growth Projections and the City's General Plan.
- UC demand at build-out is assumed to be 349 MGY. Upper- and lower-bound demand forecasts assume UC build-out occurs in 2035 and 2050, respectively. The primary forecast uses the midpoint of the upper- and lower-bound forecasts.
- Future demand is progressively adjusted for expected water savings from national appliance standards (clothes and dish washers), California plumbing codes (showerheads, faucets, toilets, and urinals), and continuation of the City's basic conservation programs. These adjustments total approximately 370 MGY by 2035.
- The Pasatiempo Golf Course is assumed to shift off of City water so that by 2030 no more than 20 acres of the course (29%) are irrigated with City water.
- Water rates are assumed to increase by an average of 10% per year for the next five years and by an average of 4.4% per year thereafter.
- Median household income is assumed to grow at its long-term historical rate of growth (based on 30 years of census data).
- Regional unemployment and housing vacancy rates are assumed to equal their long-term average rates.
- Monthly rainfall and average maximum daily air temperature are assumed to equal their 30-year normal values.
- No restrictions on water use due to drought or other reason are assumed to be in place. The forecast assumes unrestricted customer water demands.

Section 3.06 Analysis of Supply Available to Meet Current and Projected Future Water Demand[10]

The projected change in demand has had an immediate and important impact on the analysis of the adequacy of current supply to meet demand. Essentially the projected stabilization and longer term reduction in demand would allow the water system to fully meet customer demand, under natural

[10] Appendix 2 includes Technical Memos used in the analyses described in Sections 3.06 and 3.07.

(unconstrained) flow conditions, even in historically worst case conditions such as the 1976-1977 drought.

City staff and members of the technical team discussed this result and recognized that modeled results based on historic hydrological information underestimate the real-world likelihood of curtailments being implemented. This is because water managers making decisions in the late winter and spring of one water year may act more conservatively than the model to conserve storage in light of the uncertainty the coming months and the next water year will bring. In fact, this reality was behind City staff's recommendation for implementing Stage 3 water restrictions in the spring of 2015.

The key assumption of using natural (unconstrained) flow conditions is also an important one. Natural flows mean no externally driven constraints on the City's ability to withdraw water from its existing sources, except for those associated with the City's water rights. The likelihood of this condition being the case in the future is low. The more likely case is that the City's ability to withdraw water from its supply sources will be affected by both the need to release water for fish flows (to meet the federal and state requirements for the protection of threatened and endangered coho salmon and steelhead trout) and the impact climate change will have on available resources resulting in changed hydrology and increased likelihood of extended droughts. The implications of both of these factors on the City's future supply are discussed in more detail in the next sections.

(a) Future Challenges – Fish Flow Releases

The City has not yet finalized a flow agreement with state and federal fishery agencies. Two flow regimes have been identified and were used by the WSAC to assess water supply reliability. The lower bound flow regime is called "City Proposal" and the upper bound flow regime is called "DFG-5." Both result in less water available for diversion than the natural flows discussed above and both have different impacts on the long-term availability of water to meet City needs.

i) Potential implications of Fish Flow Releases on the Frequency and Severity of Water Shortages

Table 8 and Table 9 respectively show the forecasted peak-season shortage profiles in 2020 and 2035.

Table 8 – 2020 Shortage Profiles

2020 Shortage Profiles						Worst-Year Peak-Season Shortage
FLOWS	Likelihood of Peak-Season Shortages					
	0%	<15%	15%-25%	25%-50%	>50%	
	0	<300 mg	300-500 mg	500-1000 mg	>1000 mg	
Natural	100%	0%	0%	0%	0%	0%
City Prop	86%	12%	0%	1%	0%	34%
DFG-5	81%	10%	7%	1%	1%	68%

Table 9 – 2035 Shortage Profiles

2035 Shortage Profiles						Worst-Year Peak-Season Shortage
FLOWS	Likelihood of Peak-Season Shortages					
	0%	<15%	15%-25%	25%-50%	>50%	
	0	<305 mg	305-515 mg	515-1025 mg	>1025 mg	
Natural	100%	0%	0%	0%	0%	0%
City Prop	86%	12%	0%	1%	0%	34%
DFG-5	81%	10%	4%	4%	1%	69%

ii) Committee Conclusions on Fish Flow Releases

The Committee discussed this information and agreed that the following conclusions can be drawn from these profiles:

- With unconstrained natural flows, there are no shortages of any magnitude under any hydrologic condition. Since we saw above that there are no expected shortages under worst-year conditions, this is not surprising.
- As expected, the DFG-5 profile is worse (i.e., results in a higher likelihood of larger shortages) than the profile for City Proposed flows. For example, in both forecast years, there is about a 10% likelihood (7 out of 73 years) of a peak-season shortage larger than 15% under DFG-5. This compares to around 1% (1 out of 73 years) under the City Proposal.
- Even under the most stringent flow regime (DFG-5), there are no expected shortages in 80% of historic hydrologic conditions. Without taking into account the possible impacts of climate change, the City's supply reliability challenges have been and will continue to be in the driest years.
- The 2020 and 2035 profiles are similar since the forecast demands for those two years are similar.
- The key conclusion is that under baseline conditions, and assuming that future hydrology looks like the historic record, the City would have sufficient supply to serve its demands in the absence of any HCP flow restrictions. Under either of the habitat conservation plan flow proposals, the City faces peak-season shortages in the driest hydrologic conditions. In those driest years, those shortages can be significant, around 700 million gallons under City-Proposed flows and 1.2 billion gallons under DFG-5 flows.

iii) Key Assumptions about Fish Flow Releases

Fish flow assumptions used in the WSAC process are based on two key data sets:

- The City's July 2012 flow proposal to state and federal agencies for flow releases for the San Lorenzo River and Laguna and Majors creeks and Liddell Springs (City Proposal); and
- The September 2012 response received from the (then) California Department of Fish and Game suggesting modifications to the City Proposal (DFG-5).

Both fish flow regimes are designed to address flow requirements needed to maintain habitat for endangered coho salmon and threatened steelhead trout during their various fresh water life-stages. Both flow regimes are indexed to the amount of water available using a modified version of the year class types shown in Figure 1 and Figure 2, which divide years into five rather than four categories and specifically link flow releases for a coming month to the year class type for the amount of water in the system in the previous month.

The ultimate resolution of fish flow requirements for the City's sources of supply will be the result of the City's negotiations with state and federal fishery agencies. Negotiated flows will be the foundation of a habitat conservation plan for the City's water system. At the completion of the environmental review of the habitat conservation plan, the City will receive a long term permit, called an Incidental Take Permit (and a state version), that will give the City an ability to plan for and operate its water system with long term certainty.

iv) Committee Agreements on Fish Flow Releases

On April 30, 2015, the WSAC agreed that, for planning purposes, using the DFG-5 flows as an upper bound or the potential impacts of fish flow releases on Santa Cruz's water system made the most sense. If the ultimate negotiated flow releases are lower, then the supply demand gap will be smaller and those results can be incorporated into future planning for supply augmentation.

(b) Potential Impacts of Climate Change

The second potentially significant factor to impact the City's current water system is climate change. With California in the throes of a deep multi-year drought, the City's water system may already be experiencing the impacts of climate change. For example, with the exception of the summer of 2011, the City has imposed some form of water restrictions on its customers every year since 2009. And this year's second consecutive year of rationing is unprecedented.

The Water Supply Advisory Committee explored the impacts on future water supply reliability of two potential manifestations of climate change:

- Longer and more severe extended droughts; and
- Changes in ongoing hydrologic patterns.

i) Extended Droughts

As the Committee began to delve into the issue of climate change, the Technical Team conducted a brief literature search to frame the discussion. A summary of information related to drought is provided here.

Recent evaluations of paleoclimate records and future climate model projections indicate that longer droughts have occurred in the past and are likely to occur again within the next century. In this section we review paleoclimate and climate change projection studies relevant to drought planning in California and the Santa Cruz region. Several publications, including some very recent ones, compare modern climate observations to historical records and to future climate projections.

Fritts (1991) shows that droughts in the Santa Cruz region were frequently much longer than three to eight years. Paleoclimate reconstruction for the California valleys show that precipitation from the 17th century until the 20th century was consistently below average 20th-century values, with long periods of relative drought and short periods of high rainfall. These data show that cycles of below-average precipitation have commonly lasted from 30 to 75 years (Fritts, 1991)[11].

Other paleoclimate analyses, summarized in Fritts (1991), have concluded:

- "The variability of precipitation was reconstructed to have been higher in the past three centuries than in the present" (p. 7).
- "Lower variability occurred in twentieth-century precipitation. Reconstructions of this kind should be used to extend the baseline information on past climatic variations so that projections for the future include a more realistic estimate of natural climatic variability than is available from the short instrumental record" (p. 8).

A recent publication by Cook et al. (2015)[12] compares paleoclimate drought records with future predicted conditions based on climate change models. Using tree ring data and current climate models, the authors found that drought conditions in the coming century are likely to be as bad as or worse than the most severe historical droughts in the region, with severe dry periods lasting several decades (20–30 years). In some cases, winter precipitation may increase, but gains in water during that period will most likely be lost due to hotter, drier summers and greater evaporation.

Other recent studies linking climate change, precipitation changes, and drought conditions have found that warming temperatures greatly increase drought risks in California (Diffenbaugh et al., 2015)[13].

The historic hydrologic record on which all of the prior analyses of Santa Cruz water supplies are based only goes back to 1937. This record therefore cannot adequately capture the kind of historic variability found in these paleoclimate studies and by extension the conditions the City might face under future conditions of climate change. The WSAC technical team created an extended-drought planning scenario that represents a discrete plausible future event that can help guide water resource planning in Santa Cruz. Building on examples from utilities around the state, the Santa Cruz extended drought planning sequence combines and places back to back the City's two worst drought sequences: 1976-77 and 1987-92. This eight-year drought sequence is worse than anything in the historic hydrologic record, but is intended to represent what might be experienced under climate change. It was combined with each of the fish flow proposals discussed above and evaluated for the frequency and severity of the shortages that would be produced. Table 10 summarizes these results.

[11] Fritts, H.C. 1991. Reconstructing Large-Scale Climatic Patterns from Tree-Ring Data: A Diagnostic Analysis. University of Arizona Press, Tucson, AZ.
[12] Cook, B.I., T.R. Ault, and J.E. Smerdon. 2015. Unprecedented 21st century drought risk in the American southwest and central plains. Science Advances 1(1):e1400082. doi: 10.1126/sciadv.1400082
[13] Diffenbaugh, N.S., D.L. Swain, and D. Touma. 2015. Anthropogenic warming has increased drought risk in California. PNAS. doi: 10.1073/pnas.1422385112.

Table 10 – Extended drought peak-season shortage statistics (mg)

	City Proposal	DFG-5
Total 8-year (mg)	875	5,300
Average	5%	33%
Maximum	34%	69%
Minimum	0%	0%
Years > 20%	1	7

The key take-away message from Table 10 is that combining a multi-year drought with a significant commitment to fish flow releases would result in serious water shortages for Santa Cruz's water service customers. In the eight years modeled, customers would face curtailments of greater than 20% in seven out of the eight peak seasons. On average the shortage would be 33% and in the worst year the shortage would be nearly 70%.

To put these data in perspective, prior to the droughts occurring in water years 2014 and 2015 (October 1, 2013 through September 30, 2015) Santa Cruz's residential customers used on average about 60 gallons of water per person per day (gpcd). On average, during the extended drought modeled in this analysis, residential use would have to be reduced to 40 gpcd, and in the worst year, residential use would need to be reduced to 18 gpcd.

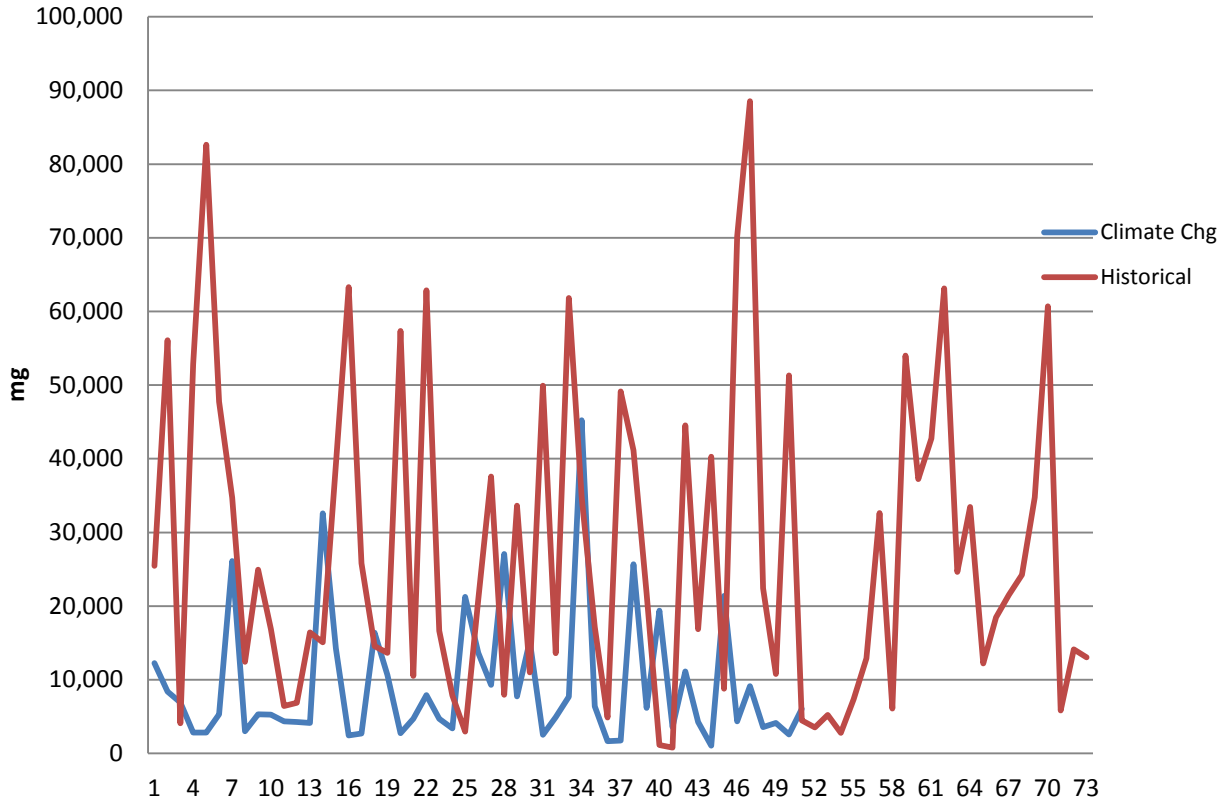
ii) Changes in Ongoing Hydrology

Across hundreds of modeling runs evaluating Santa Cruz water supplies, beginning with the 2003 Integrated Water Plan, the essential characteristics of the historic hydrologic flow record have remained constant. The worst drought event was 1976–1977. The 1987–1992 period represented another major drought. It was clear which years in the record were very wet and which were exceptionally dry.

This historical foundation on which to plan and operate water systems no longer applies when analyzing how the system will respond to potential changed hydrology driven by climate change. The essence of analyzing this type of climate change is the assumption that future weather and stream flows will not be the same as the past.

To analyze the plausible impact of climate change, a new 51 year flow record has been produced by working with hydrologic conditions that would occur in a selected global climate model and downscaling those conditions to Santa Cruz's sources and local conditions. In the resulting flow projection, there is no longer a 1976–1977 worst-case drought benchmark or a 1987–1992 sequence. As is illustrated in Figure 5 for City proposed HCP flows at Big Trees, a standard and long-term flow gauging station on the San Lorenzo River, the distribution of flows is completely different from that of the historic record.

Figure 5 – Comparison of annual flows at Big Trees: City proposal



While the worst years in the climate change scenario are no worse than the driest historic years, the overall pattern is a considerably drier one, which might be expected to result in a higher fraction of years in which there is insufficient water to meet the needs of both Santa Cruz water customers and fisheries.

iii) Committee Agreements on Climate Change

On April 30, 2015, the WSAC agreed that the Climate (hydrologic) Change and Extended Drought scenarios provide plausible parameters to use in its water system planning and that this analysis provides a useful point of depart for its scenario planning work. For planning purposes, the Committee agreed that the eight year drought sequence was useful as a design drought, and recognized that this drought sequence would be reviewed and revised as new information became available.

iv) Key Assumptions about Climate Change

Use of climate change projections to assess potential impacts to water supply carries the following major assumptions.

1. The utilized climate projections provide plausible climate trajectories, not predictions, for the future time period simulated.
2. The utilized climate projections provide reasonably bounded potential impacts/trends to water supply for the future time period simulated.

3. The physical character and nature of the watersheds utilized by the City for water supply will not change appreciably for the future time period simulated, specifically including:
    a. The physical characteristics which lead to development of surface runoff including types, spatial patterns and intensities of land use, and landscape scale vegetative communities and
    b. The physical expression of instream habitat conditions based on channel morphology types, occurrences, etc.
4. Historical hydrologic characteristics of supply source watersheds are a reasonable basis to simulate general hydrologic conditions under future climate trajectories, specifically including:
    a. The distribution of average daily flows for any month of the year over the historical period will not change appreciably during the future time period simulated and
    b. The relative timing and magnitude of average daily flows between supply source watersheds will not change appreciably during the future time period simulated.
5. Historical utilization or exercising of water rights within the supply source watersheds will not change appreciably during the future time period simulated, and includes water rights held by the City, other water purveyors, and others.
6. Summertime and late fall stream flows will be the primary limiting condition for water supply and instream habitat, as it has been during the historical time period, for the future time period simulated.

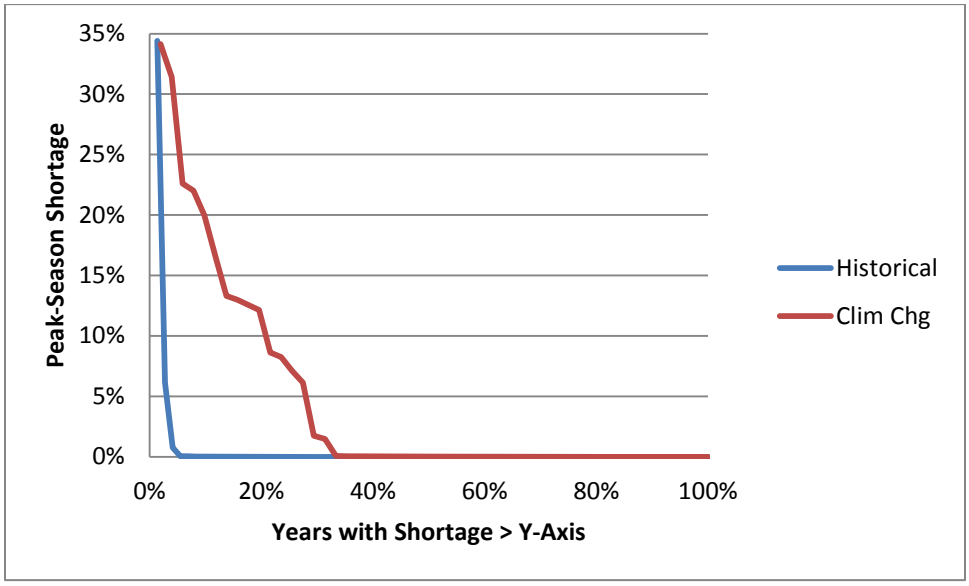
Section 3.07 How Climate Change Affects the System Modeling Results:

Combining potential fish flow releases and climate change impacts shows that climate change results in increasing both the frequency and the size of shortages. The discussion below summarizes and explores these results.

(a) City Proposed Flows

Figure 6 compares the peak-season shortage duration curves for City Proposed flows with and without climate change.

Figure 6 – Peak season shortage duration curves with and without climate change: City Proposed Flows

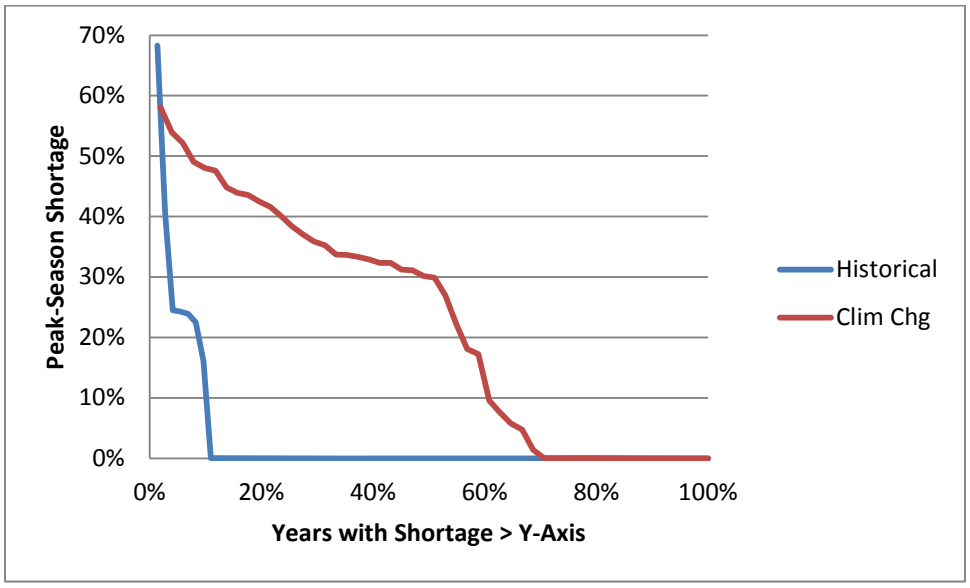


The differences between the two curves are immediately noticeable: Climate change shifts the curve upward and to the right, meaning there is an increased likelihood of larger shortages. Whereas with historic flows, there is a small chance (< 10%) of any shortage at all, this rises to more than 20% with climate change. The probability of a shortage greater than 20% increases from about 1% with historic flows to about 8% with climate change.

(b) DFG-5 Flows

Figure 7 shows the same system reliability comparisons for DFG-5 flows.

Figure 7 – Peak season shortage duration curves with and without climate change: DFG – 5 flows



While the types of impacts are similar, their magnitudes with DFG-5 are increased. For example, with DFG-5 flows and climate change there will be a peak-season shortage under nearly 70% of hydrologic conditions. In fact, a shortage exceeding 25% can be expected in just over half the years.

The foregoing results are consistent with the flow patterns of Figure 5, and highlight the importance of considering climate change as Santa Cruz plans for its water supply future. Even under the City's proposed HCP flows, which represent the potential lowest impact to Santa Cruz's water supply, water customers would have to contend with frequent shortages under this climate change scenario. If the outcome of the HCP negotiations are closer to the California Department of Fish and Wildlife's (CDFW's) DFG-5 proposal, the frequency and magnitude of shortages becomes much more onerous.

Thus with climate change, the City's water future will look qualitatively different. With historical flows, while there is a real possibility of large peak-season shortages, these are generally confined to the driest years with the large majority of conditions having no shortages. Clearly, that will not be the case with the impact of climate change. Instead, significant shortages can be expected in many years. With DFG-5 flows, large shortages can be expected in the majority of years. The pattern of water availability to customers will be markedly altered and water rationing will be both more frequent and more severe.

Section 3.08 Problem Statement

Based on the preceding analysis, the WSAC recommendations are designed to address the following revised problem statement:

> *Santa Cruz's water supply reliability issue is the result of having only a marginally adequate amount of storage to serve demand during dry and critically dry years when the system's reservoir doesn't fill completely. Both expected requirements for fish flow releases and anticipated impacts of climate change will turn a marginally adequate situation into a seriously inadequate one in the coming years.*
>
> *Santa Cruz's lack of storage makes it particularly vulnerable to multi-year droughts. The key management strategy currently available for dealing with this vulnerability is to very conservatively manage available storage. This strategy typically results in regular calls for annual curtailments of demand that may lead to modest, significant, or even critical requirements for reduction. In addition, the Santa Cruz supply lacks diversity, thereby further increasing the system's vulnerability to drought conditions and other risks.*
>
> *The projected worst-year gap between peak-season available supply and demand during an extended drought is about 1.2 billion gallons. While aggressive implementation of conservation programs will help reduce this gap, conservation alone cannot close this gap. The Committee's goal is to establish a reasonable level of reliability for Santa Cruz water customers by substantially decreasing this worst-year gap while also reducing the frequency of shortages in less extreme years.*

On September 11, 2015 meeting, the Committee adopted this formal problem statement. The basic understandings reflected in this problem statement underpin all the work the Committee did during

the Analysis Phase of its process to identify, evaluate and select strategies for improving the reliability of Santa Cruz's water supply.

The Committee also noted that the Water Department is already taking steps to address the supply-demand gap, including incorporating into its Capital Improvement Plan funding for replacement of the pipeline between Felton and Loch Lomond.

Section 3.09 Data Driven Decision Making

The Council asked the Committee to "… explore, through an iterative, fact-based process, the City's water profile, including supply, demand and future risks; analyze potential solutions to deliver a safe, adequate, reliable, affordable and environmentally sustainable water supply and develop recommendations for City Council consideration."

After defining the problem, the Committee worked hard to use a fact-based process in its work. Section 3.10 summarizes the work the Committee did to:

- Identify and evaluate alternatives, to
- Identify and apply committee's evaluation criteria, and
- Use scenario planning and portfolio building to explore risks and uncertainties.

Section 3.10 Evaluation Criteria

Criteria that enable one to distinguish among potential solutions are essential for effective problem solving. Understanding how various alternatives or portfolios of alternatives rate against those criteria is at the heart of the Committee's problem solving process. The development of the multi-criteria decision support (MCDS) model provided a focal point for the definition of criteria, subcriteria, and rating scales. Committee members also individually prioritized the criteria by applying weights to them. A key purpose of using this approach is to support data-driven decision-making.

The Council's charge to the Committee emphasizes the importance of data-driven decision making. The goal of developing and using a MCDS tool is not to produce an outcome by "pouring in the ingredients, turning the crank and having the answer come out."

No analytical tool can (or should) completely replace the judgment and careful weighing and balancing of values, uncertainties, and risks in this kind of decision-making. Rather the goal of using such a tool is to help develop information in a form that decision-makers can effectively and efficiently use as they make their decisions.

An additional benefit is that the careful thought that goes in to the creation of the MCDS tool creates many opportunities to talk about values and interests that are important to address as the collaborative problem solving process proceeds. Creating the MCDS model required the WSAC to identify important criteria and subcriteria, define what is meant by those criteria, establish individual weights for the criteria, and create rating scales for each criterion. When the model was applied to the alternatives or portfolios the Committee developed, it allowed Committee members to see how their evaluations of the options were similar and different, and how their values were reflected in the way they prioritized the criteria.

Table 11 lists the evaluation criteria used by the Committee in the MCDS evaluation it conducted in the spring of 2015. The questions articulated in the table reflect what was relevant at the time the Committee used these criteria in their work.

In addition to using these criteria in that formal evaluation, these criteria were used more informally through much of the Committee's work during the Spring and Summer of 2015 as they worked together to identify and evaluate portfolios of measures to improve the reliability of Santa Cruz's water supply.

Table 11– WSAC Evaluation Criteria

Criterion	Questions
Technical Feasibility	How likely is each Plan to be technically successful? For Plan B, consider the technical feasibility at the time the plan would actually start
Time Required to Demonstrate Technical Feasibility	How much time is required to demonstrate whether a Plan is technically feasible? When rating Plan B, start from the time Plan B actually begins.
Time Required to Full Scale Production	What is the time required to full scale production? For all Plans, start the clock when the Plan is permitted, has all needed rights and property ownership issues resolved and is ready to proceed.
Adaptive Flexibility (includes Scalability)	What benefits in terms of adaptive flexibility is each Plan likely to contribute in the face of external conditions such as climate change, demand levels or streamflow requirements?
Supply Reliability	How likely would each Plan be to improve the reliability of the Santa Cruz water system in the face of different operating conditions such as turbidity, low flows, etc.?
Supply Diversity (Portfolio Level Only)	How does the Portfolio affect the diversity of Santa Cruz water supply portfolio?
Energy Profile	How much energy does each Plan require? Units are megawatts of energy per million gallons produced, mw/mg expressed as weighted average by Plan.
Environmental Profile	What is the environmental profile of each Plan? Note: this criterion covers a range of issues and a diversity of Plans. This is a great place to provide details about your rating using the comment button.
Regulatory Feasibility	How easy or difficult would the regulatory approval process be for these Plans?
Legal Feasibility	How easily and within what time period are these Plans likely to obtain the necessary rights in the form needed? When considering a Plan B that would start after a trigger, start the clock at the point at which the trigger actually occurs.
Administrative Feasibility	To what degree do each of the Plans require cooperation, collaboration, financial participation, and/or intergovernmental agreements to succeed? How likely is it that these can be obtained?
Potential for Grants or Special Low Interest Loans for Engineering and/or Construction	What is the potential for these Plans to qualify for grants and/or special low interest loans?
Political Feasibility	What level of political support is each Plan approach likely to have? When rating Plan B, take into account the impacts of additional time and the (hypothetical) failure of Plan A would have on Santa Cruz's political landscape.
Cost Metrics	How much do each of these Plans cost? Metric is annualized unit cost in dollars per million gallons, $/mg.

Appendix 3 provides the detailed criteria the Committee used in its MCDS modeling and portfolio-building exercises conducted in the spring and summer of 2015.

(a) Identifying and Evaluating Solutions[14]

The WSAC used an iterative process to identify and evaluate alternative approaches to improving the reliability of the Santa Cruz water supply. Their efforts began with their work in the summer and fall of 2014 to identify a full range of demand management and water supply options for consideration. Since then, the WSAC, City staff and the technical team supporting the WSAC have invested considerable resources in developing and fleshing out demand management and supplemental water supply and infrastructure addition and operating change options to develop more specific planning level information for use in evaluating alternatives.

This section, describes the Committee's iterative process for identifying and evaluating alternatives to improve the reliability of the Santa Cruz water supply.

i) Alternatives Identification: Our Water, Our Future – The Santa Cruz Water Supply Convention

During the community discussions of the desalination Draft Environmental Impact Report (DEIR), a common criticism was that the City hadn't adequately evaluated other alternatives during the decades of water supply planning that preceded the selection of desalination in the Integrated Water Planning process in early 2000s. A key element of the Council's decision to convene the WSAC was to have a community based process to consider alternatives to solve the water supply problem. The goal was to look in more detail at alternatives to desalination while not excluding desalination from further consideration.

As the Committee got underway in the spring of 2014, it was clear that a handful of very engaged citizens had ideas they wanted to share with the Committee regarding how to improve the reliability of the Santa Cruz water system. The challenge was to make sure that all those who might have ideas to share would have the opportunity to do so.

In June, the WSAC decided to include in its Reconnaissance phase an event that would engage the broader public by inviting those with strategies, alternatives, or ideas for improving water supply reliability to submit their proposals. The goal was to ensure that citizen and community-based ideas, as well as those provided by the technical team and other outside experts, were considered as possible strategies to improve water supply reliability in the Santa Cruz water system.

By late July, the Committee was starting to receive submissions covering a wide range of topics including but not limited to:

- Enhancing conservation efforts
- Climate appropriate landscaping improvements
- Expanding rainwater catchments and grey water systems
- Incentivizing conservation through pricing structures

[14] See Appendix 4 – Identifying and Evaluating Alternatives for Committee work products and related Technical Memos.

- Revisiting old strategies such as exchanging highly treated wastewater for irrigation water used for north coast agriculture
- Developing recycled water facilities and systems
- More groundwater development
- Aquifer storage and recovery
- On-stream and off-stream storage projects
- Desalination using a variety of existing and new approaches and technologies for both the desalination process and the energy issues related to desalination.

In August those submitting ideas in the first round were invited to further develop their proposals for submission to the WSAC and for public review at an event called "*Our Water, Our Future – the Santa Cruz Water Supply Convention*."

The *Convention* was held from 11:00 a.m. to 9:00 p.m. on Thursday, October 16, 2014 at the Civic Auditorium. More than 40 ideas were presented in poster session presentations set up around the hall. Brief oral presentations by the submitters were provided at noon and at 6:00 p.m. and attendees were invited and encouraged to visit the poster presentations of strategies, ideas, and alternatives and to interact with the submitters.

Approximately 350 people attended the convention. Attendees included most of the members of the WSAC, members of the City Council, and many staff members of the Water Department. WSAC members practiced rating and ranking the proposals using four criteria: effectiveness, environmental impact, community impact, and practicability.

Following the conclusion of the *Convention*, the WSAC continued to accept ideas and alternatives for addressing the issues that have been identified. The most recent proposal, a project for storing water in Hanson Quarry, was received in early January 2015. The Committee's purpose in keeping the door open for submission of new proposals was to ensure that the arbitrary exercise of a deadline did not keep a great idea from being considered.

ii) Selected Alternatives

Between the Committee's October and November meetings, WSAC members provided their technical consultant, Stratus Consulting, with their input on the alternatives identified in the *Convention* that they were most interested in considering further. Stratus' job was to select a dozen or so alternatives that were representative of a broad range of approaches that the Committee would use in testing the decision model. Alternatives not selected as part of this effort were not eliminated from further consideration, just not selected for further evaluation in the Reconnaissance phase of the Committee's work.

Twelve alternatives were selected by Stratus and approved by the Committee at their November meeting. The alternatives selected were:

- WaterSmart Software Implementation
- Landscaping Revisions, Rainwater Capture and Grey Water Reuse
- Water Neutral Development

- North Coast Off Stream Storage
- The Lochquifer Alternative
- Expanded Treatment Capacity on San Lorenzo River
- Ranney Collectors on San Lorenzo River
- Reuse for Agriculture
- Aquifer Restoration
- Potable Water Reuse
- Reverse Osmosis Desalination
- Forward Osmosis Desalination

The varied and often incomplete nature of the information provided by those proposing many of the alternatives submitted in the Water Supply Convention proved to be a challenge for the Committee, City staff, and the technical team. Almost immediately following the November Committee meeting, information and assumptions about the selected alternatives were needed to support the Committee's use of the Reconnaissance MCDS model. To facilitate this timing, City staff made a variety of assumptions to fill in data gaps and used this information to provide default ratings for the alternatives and scenarios in the MCDS model. Still there is was a critical need to develop reasonably accurate technical details to support further analysis.

iii) Consolidated Alternatives

From the more than 80 initial suggestions and the more than 40 proposals presented by community interests, project proponents, and City staff during and after the October 16, 2014 Water Supply Convention, the technical team created 20 Consolidated Alternatives.

"Consolidated Alternatives" were created from groups of Water Convention Alternatives with similar concepts and attributes. Consolidated Alternatives were created for a range of options and approaches such as additional demand management activities, approaches to improving storage for available system flows in the winter, to developing supply augmentation sources such as using advanced treated recycled water.

Table 12 is a list of Consolidated Alternatives and the Water Convention Alternatives they were inspired by.

Table 12 – Consolidated Alternatives

#	Name/ Water Source	Description	#	Author and comments
CA-01	Peak Season Reduction/ Conservation (mandated)	Develop programs to decrease peak season demands through peak reduction or peak-demand shifting	WCA-69	SCWD: Peak season reductions – 10%, 25% and 50%
CA-02	Water-Neutral Development/ Conservation (mandated)	Implement a demand offset program required for new development to offset new demands	WCA-03	SCDA:Water-Neutral Development
CA-03	Water conservation measures/ Conservation (voluntary)	Implement Program C Recommended (Crec) -- Maddaus Water Management, September 30, 2014, Table 4)	WCA-20	McGilvray (9): Implement Conservation
			WCA-22	SCDA: Conservation Education
			WCA-65	zNano: Conservation rebate program
			WCA-68	SCWD: Program C from Long-Term Water Conservation Master Plan
CA-04	WaterSmart Home Water Reports/ Conservation (voluntary)	Use this software to promote conservation and efficient water use	WCA-04	WaterSmart: Home Water Reports
			WCA-16	Gratz: Maximize Conservation Behavior
CA-05	Home Water Recycling/ Decentralized (graywater)	Package automatic treatment system suitable for single family home or condo or multi-family development; recycles gray water for toilet flushing and landscape irrigation; requires dual plumbing.	WCA-39	Garges: Residential Gray-Water
			WCA-66	zNano: Onsite Water re-use
			WCA-70	Home Water Recycling
CA-06	Landscaping, Capture, Reuse/ Decentralized (rainwater, graywater)	Use gray water for irrigation; minimize irrigation for lawns; capture and use rainwater for domestic, non-potable	WCA-01	Markowitz: Landscaping, Capture, Re-use
			WCA-21	SCDA: Climate Appropriate Landscape

#	Name/ Water Source	Description	#	Author and comments
CA-07	Deepwater Desalination/ Seawater	In cooperation with Soquel Creek Water District, sign up for water delivered from the Deepwater Desalination Project at Moss Landing. Work with SqCWD to create the transfer facilities for potable water conveyance. Upgrade SCWD distribution system to accept water transferred through SqCWD.	WCA-19	McGilvray: (11) Seawater Desal
			WCA-36	Aqueous: Desalination (non-membrane)
			WCA-37	Brown: Zero-emission Wave energy
			WCA-67	Tanaka: Energy Efficient Desal
			WCA-72	Seawater desalination--Deepwater Desalination
CA-08	Water from Atmosphere/ Moist air	Extract water from the air to offset other demands	WCA-38	DewPoint : Atmospheric Water Generation
			WCA-77	SKYH2O
CA-09	Winter flows capture/ Winter flows	Capture winter flows for treatment and storage or infiltration	WCA-29	Malone: Stormwater capture
			WCA-60	SCDA: Watershed Restoration
			WCA-63	Smallman: Water Skate Parks
			WCA-71	SVWD: Quarry storage/GW recharge at Hanson Quarry
			WCA-74	McGilvray: Additional Pipeline--Felton Diversion to Loch Lomond
			WCA-76	Bixler: Olympia Quarry
			WCA-31	McGilvray: (3) Water Capture and Transfers
CA-10	Water Reuse for aquifer recharge/ Reclaimed water	Produce CAT water at City WWTP and pump to SVWD for aquifer recharge (IPR--Indirect Potable Reuse).	WCA-44	McGilvray: (8) Tertiary Treatment, Re-use
			WCA-62	Smallman: (17) Recycled Water
			WCA-64	Weisz: Water Recycling

#	Name/ Water Source	Description	#	Author and comments
CA-11	Water reuse for direct potable/ Reclaimed water	Produce CAT water at City WWTP and pump to GHWTP for treatment and distribution system addition, a Direct Potable Reuse (DPR) alternative.	WCA-11	SCWD: Water Reuse
			WCA-46	McKinney: Water Reuse
			WCA-64	Weisz: Water Recycling
CA-12	Water Reuse for indirect potable/ Reclaimed water	Produce CAT water at City WWTP and pump to Loch Lomond.	WCA-44	McGilvray: (8) Tertiary Treatment, Re-use
			WCA-52	Paul: (17) Detention Tub String
			WCA-62	Smallman: Recycled Water
			WCA-64	Weisz: Water Recycling
CA-13	Water Reuse for non-potable/ Reclaimed water or groundwater	The City would pump the Title 22 unrestricted effluent north through a new pipeline aligned along the railroad right of way, with turnouts to irrigate up to about 1,300 acres on private land and leased land. The City would use wells on ag land to produce water for treatment at GHWTP.	WCA-09	Ripley: Reuse for Agriculture
			WCA-40	Gratz: Recycled Water for Irrigation
			WCA-41	McGilvray: (1) Recycled Water for Irrigation
			WCA-45	McKinney: Additional Wells and WTPs
			WCA-43	McGilvray: (6,7) Pipelines Along RR Line
			WCA-64	Weisz: Water recycling
CA-14	Desal using Forward Osmosis/ Reclaimed water or seawater	Use seawater desalting through a Trevi forward osmosis (FO) system. This alternative's other components would match those for seawater desalting. The alternative has several outstanding issues, e.g., Trevi technology and other FO technologies are still in their infancy and being tested at a pilot scale. As described, Trevi would require a lower grade heat source for separately drawing the solution from the potable water but the alternative description did not designate a source for lower grade heat.	WCA-13	Trevi: Forward Osmosis Desalination (separate FAQs and technical memorandum summarize FO in its various incarnations and its implementation status around the world)

#	Name/ Water Source	Description	#	Author and comments
CA-15	Desalination using Reverse Osmosis/ Seawater	This alternative for initial comparison would use seawater desalting through a new reverse osmosis desalination facility to produce about 2.5 mgd for addition to the City potable water supply. This alternative's components and development would match those for the previously proposed scwd2 desalination facility. The City would own and operate the facility and would use the water produced year round. Excess water would allow the City either to idle the Live Oak wells for conjunctive-use aquifer recovery or to undertake Live Oak well operation in an ASR mode to restore the aquifer more rapidly. In wet years, the City could sell excess desalted to SqCWD and/or SVWD.	WCA-12 WCA-19 WCA-36 WCA-37 WCA-67	Sustainable Water Coalition: Desalination McGilvray: (11) Seawater Desal Aqueous: Desalination (non-membrane) Brown: Zero-emission Wave energy Tanaka: Energy Efficient Desal
CA-16	Aquifer restoration and storage/ Winter flows	The City would sell treated water to SqCWD during normal and wet years. SqCWD would use the transferred water for either groundwater recharge or demand reduction and conjunctive use. SqCWD would sell pumped groundwater water to City during droughts. The City also should have improved production from its Live Oak wells.	WCA-08 WCA-28 WCA-49 WCA-59 WCA-10	Paul: (13) The Lochquifer Alternatives Malone: Regional Water Exchanges (also possibly addressed through CA-11) Paul: (14) Upgrade Water Intertie SCDA: Enhance Existing Infrastructure SCDA: Regional Aquifer Restoration
CA-17	Expand Treatment Capacity/ Winter Flows	Add a new 14-mgd water treatment plant (WTP) (pretreatment for turbidity control and membrane filtration) near the Tait Street Diversion to produce treated water that would be piped directly into the distribution system. It would increase capacity to divert to Loch Lomond and produce additional water for aquifer recharge.	WCA-06 WCA-27	McKinney: Expanded Treatment Capacity Malone: Enhanced Storage and Recharge

#	Name/ Water Source	Description	#	Author and comments
CA-18	Off-stream water storage/ Winter Flows	Convert Liddell Quarry into 650 MG reservoir, filled with water from City North Coast diversions; use stored water to offset water demand during drought	WCA-05	Bevirt: North Coast Quarries (modified to include diversion of water from City existing sources)
			WCA-26	Fieberling: expand storage (addresses off stream storage)
			WCA-30	McGilvray (2): Quarries for Water Storage
			WCA-32	SCWD: Zayante Dam and Reservoir
			WCA-33	Smallman: Reservoirs
			WCA-34	Smallman: Storm Aquarries
CA-19	Ranney Collectors/ Winter flows	Use Ranney collectors with a 12.9-mgd capacity (maximum capacity allowed under the current City of Santa Cruz [City] diversion permit), installed near the City's Felton diversion to draw water allocated under the City's existing water rights. Water drawn through the collectors would have greatly reduced turbidity and allow continuous refilling of Loch Lomond while also operating the GHWTP. It would produce additional water for aquifer recharge.	WCA-07	McKinney: Ranney Collectors on SLR (requires a storage component to be a viable alternative)
			WCA-42	McGilvray: (4,5) Upgrade Water Treatment
			WCA-48	Paul: (12) Diversion Alternatives
			WCA-49	Paul: (14) Upgrade Water Intertie
			WCA-57	Paul: (23) Loch-Down Alternatives
CA-20	Interagency Cooperation - County Water Authority/ Institutional and Administrative	Establish Santa Cruz County Water Authority to manage water resources development and use for public agencies and private diverters and groundwater users	WCA-14	Gratz: Regional Water Authority
			WCA-15	Smallman: Regional Water Authority
			WCA-18	McGilvray: (10) Regional Collaboration

(b) Analytical Work on Alternatives

During the spring and early summer of 2015, the technical team developed and shared information with the Committee about each of the Consolidated Alternatives. The Committee worked with this material, which included information about capital, operating, and energy costs, yield, as well as

planning level information for each CA for each evaluation criteria. Based on questions raised and comments received from both Committee members and the public, the WSAC directed the technical team to do additional vetting of the CAs to understand the potential benefits and contributions to the water supply issues facing the City of Santa Cruz.

Committee members also developed and used the multi-criteria decision support (MCDS) model to individually rate CAs as well as portfolios of measures, including expressing their values by weighting the criteria. At their December 2014 and July 2015 meeting, the Committee discussed the results of their evaluations and used this information to both better understand their various interests and points of view as well as to focus the alternatives for further explanation.

Appendix 4 to this document includes some of the key technical memos and Committee reports that provide examples of the Committee's analysis of alternatives. In addition, an archive of all of the Committee's meeting materials is available on DVD and at www.santacruzwatersupply.com

(c) Alternatives Considered but Not Pursued at this Time

As the Committee explored the diverse range of CAs in some detail, some CAs emerged as being more feasible and better fitted to the WSAC's vision of how to approach improving water system reliability than others. As the technical team's research and analysis work continued, information became available about some of the alternatives that raised questions about their feasibility. For others, issues of potential scale or suitability created issues that took them out of the running. As the Committee moved into their portfolio building efforts during the summer of 2015, they directed staff and the technical team to put together a list of all the CAs and the status, including those that were no longer being considered. For each CA, information was provided about its current status, and the WCAs covered by that CA. Appendix 5 includes information about the CAs, WCA's and other submittals not selected for further consideration at this time. At its September 10, 2015 meeting the WSAC, the Committee approved the information in Appendix 5 as its conclusions about the alternatives it evaluated and its reasons for not further pursuing these alternatives at this time.

Section 3.11 Scenario Planning

Scenario planning is a tool often used to facilitate planning in the face of uncertainty. A goal of scenario planning is to explore a range of futures that are different from what would occur if current trends continue, but not so unlikely as to be a waste of time. One way to maximize the benefits of scenario planning is to create scenarios based on what are called "deep drivers of change." For Santa Cruz, the obvious deep drivers of change are climate change and fish flows.

Scenario planning isn't intended to result in the selection of a preferred scenario to pursue but to explore and get a better understanding of the degree to which key uncertainties such as climate change could affect the problem we need to solve or the outcomes we might be able to achieve. The "best" solutions are those that address conditions in multiple scenarios.

Throughout the Reconnaissance Phase of its work, the Committee used simple scenario planning to explore a range of potential water futures. For example, different scenarios were created to explore how the community's water supply needs would be affected by the need to release water for fish, the

implications of climate change, and potential changes to the local economy that would make Santa Cruz a place where people could both live and work.

During the first half of 2015, the technical team worked to develop consistent information about Consolidated Alternatives so that the Committee could use them as building blocks in the two rounds of scenario planning. Among the most important information emerging from this technical analysis was the result of system simulation modeling using the Confluence model.[15] These simulations concluded that two broad approaches have the potential to completely address the City's water supply challenges:

1. Harvesting and storing winter flows. This approach can work, even with current water rights, DFG-5 instream flows, and climate change. The analysis considered how the Santa Cruz water system would benefit if there were additional storage in the form of a "virtual reservoir." To achieve this benefit, the "virtual reservoir" used in the Confluence analysis would have to become real, i.e. suitable infrastructure improvements and institutional arrangements would have to be made to have a place to reliably store sufficient water and to be able to recover and use a sufficient portion of that water. The analysis indicated that the estimated quantity, about three billion gallons, would need to be banked and be recoverable at required daily volumes. This would require increasing the capacities of various current infrastructure components.
2. Developing a more drought-resistant supply (i.e. one that is insulated from year-to-year variability in weather and streamflow). Examples of such a supply include desalination and use of advanced treated recycled water. These alternatives would also require development and improvement of infrastructure.

The first round of scenario planning occurred during the March 2015 meeting. In this effort, Committee members broke into small groups, with each group working on one of three scenarios:

- Changed hydrology that results from City proposed flows;
- Changed hydrology that results from DFG-5 flows; and
- DFG-5 flows and a potential extended drought that is a plausible event under future climate change conditions.

Following several hours of work in their small groups, Committee members presented the demand management and water supply improvement measures they had created to address the conditions described in their scenario. These groups of measures were called portfolios.

Two key themes emerged from this work:

1. Committee members created water supply portfolios which included additional investments in demand management; and
2. Each of the groups gravitated to some form of winter flow capture and storage as a key strategy for meeting future water supply needs for Santa Cruz. One group acknowledged the potential need for a supplemental supply to help get the aquifer storage program going before it could

[15] See Appendix 2 for a description of the Confluence model and its use in the WSAC process.

be completely filled by available winter flows, and chose to fill that potential gap with recycled water.

Round two of scenario planning occurred at the Committee's April/May 2015 meeting and included two scenarios:

- DFG-5 flows with extended drought and
- DFG-5 flows with climate change.

Two working groups of Committee members were assigned to each scenario. Again, winter flow harvest was the centerpiece of each group's solution to the scenario they were given, and again, advanced treated recycled water played a role if and as needed as a back-up resource.

Section 3.12 Portfolio Development and Evaluation [16]

Starting in May 2015, the Committee began exploring and building portfolios of measures to close the supply-demand gap. Portfolios were typically made up of combinations of demand management and supply augmentation strategies that often included projects or approaches for improving the performance of the existing water system, particularly as it relates to its ability to capture and store winter flows.

One goal of portfolio building was to provide opportunities for Committee members to explore the risks and uncertainties associated with various combinations of measures. Another was for Committee members to work with each other to create portfolios that met their common interests using interest based bargaining techniques. And a third was to give Committee members a hands-on way to engage with the information about the technical aspects of various approaches.

Especially with respect to the last goal, Committee members have received, processed, and asked for clarification of and additional information about just about every aspect of water system operation, technical and financial assumptions, and have built a substantial base of knowledge upon which to create their recommendations. The diversity of Committee member backgrounds and interests has been a significant asset to the group as it has done this important work and they have learned from each other as well as from the Technical Team and City staff participating in their work. In addition, this hands-on approach has created an unparalleled opportunity for Committee members to learn about, and learn to respect their individual perspectives and interests, which is an invaluable asset to any collaborative problem solving process.

Section 3.13 Issues of Risks and Uncertainties

At the Committee's June 2015 meeting, Committee members worked with a set of four different staff-created water supply portfolios that have at their center some form of winter water harvest. In addition to a winter water harvest approach provided as a "Plan A," each portfolio contained a proposed "Plan B" and a "trigger" that would define the conditions for moving from Plan A to Plan B. The task was to consider the risks and uncertainties related to the various approaches, and the

[16] See Appendix 6 Portfolio Development and Evaluation for Committee materials related to work summarized in Sections 3.12 through 3.14

addition of a Plan B and a trigger was designed to get the Committee members thinking about and working with ideas related to "what ifs."

The four portfolios developed were:

1. **Plan A**: In lieu recharge of regional aquifers by providing system flows during the rainy season to Soquel Creek Water District and Scotts Valley Water District to meet their customer demand, thereby allowing them to rest their wells. Infrastructure or operating rule changes were added to extend the season during which in lieu recharge could be provided, thereby increasing the rate of recharge. The goal would be for groundwater to come back to Santa Cruz Water Department customers from water stored in regional aquifers when Santa Cruz needs it during drought years or other unusual events. **Plan B**: Advanced treated recycled water piped back to and mixed with Loch Lomond supplies (a technique called indirect potable reuse or IPR).
2. **Plan A**: Active recharge of regional aquifers using injection wells (a technique called Aquifer Storage and Recovery, or ASR) by providing excess flows to SVWD or SqCWD for injection into the aquifers to accelerate the rate of groundwater recharge. The goal would be for groundwater to come back to SCWD from regional aquifers when needed. **Plan B**: Advanced treated recycled water piped to and mixed with North Coast and San Lorenzo River supplies, retreated at Graham Hill Water Treatment Plant and delivered to customers (a technique called direct potable reuse, or DPR).
3. **Plan A**: ASR along with using advanced treated recycled water to create a seawater barrier along the coast to manage and impede salt water intrusion. The ultimate goal would be for groundwater to come back to Santa Cruz from regional aquifers when Santa Cruz needs it. Creating a salt water intrusion barrier would accelerate the timeline when this source would fully meet Santa Cruz's needs. Should the ASR program ultimately completely solve Santa Cruz's problem, the stranded assets in this plan would be an advanced water treatment plant for producing advanced treated recycled water and related infrastructure. **Plan B**: Converting the advanced treated recycled water plant producing water for the salt water intrusion barrier to a source of water for DPR use.
4. **Plan A**: ASR coupled with desalinated water from the proposed DeepWater Desalination plant at Moss Landing. The ultimate goal would be for groundwater to come back to Santa Cruz from regional aquifers when Santa Cruz needs it. Creating a supplemental source of potable water could result in a combined ASR and in lieu recharge strategy that would accelerate the restoration of regional aquifers, making the timeline when this source would fully meet Santa Cruz's needs shorter. Should the ASR program ultimately completely solve Santa Cruz's problem, the stranded assets in this plan would be a share of a regional desalination facility that might be sold to another party and a pipeline that might be repurposed for a different use. **Plan B**: DeepWater Desalination.

None of these portfolios was designed to be the best one. Rather, they were designed to be purposefully different from each other so that the Committee could explore the risks and uncertainties associated with different approaches. It was not part of the goal of the Committee's June meeting to select one of the portfolios as the preferred approach.

The focus on risks and uncertainties associated with the performance of these portfolios is an important one. At the level of analysis and information currently available, it is inevitable that there will be questions about actual performance of various approaches.

Section 3.14 Committee Member Portfolio Building

Between the July and August meetings (2015) Committee members worked independently or in teams to prepare portfolios that addressed the supply demand gap.

One portfolio was created by David Baskin, Peter Beckmann, Sue Holt, Charlie Keutmann and David Stearns. This proposal includes In Lieu and ASR along with direct potable reuse (a more drought resistant element to be implemented concurrently). This portfolio was designed to effectively cover the "gap" and, in the long term, would go further by providing the capacity to supply water even if events occurred such as a wildfire around Loch Lomond.

A second portfolio was created by Greg Pepping, Rick Longinotti, Mark Mesiti-Miller and Sid Slatter. This portfolio proposed a combination of In Lieu and aquifer storage and recovery (ASR) with direct potable reuse. This group reached consensus on the component parts and found that they disagreed as to whether, to ensure success, it would be necessary to implement the parts of the proposal sequentially or concurrently. This proposal provides for concurrent implementation, and Rick Longinotti developed a separate portfolio (described below) that proposed a sequential implementation.

A third portfolio was developed by Rick Longinotti in consultation with Erica Stanojevic and members of Santa Cruz Desalination Alternatives. As noted above, this proposal scales down the in lieu to operate initially within the capacity of the existing system, thus avoiding significant upgrade costs for modifications to the Graham Hill Water Treatment Plant. Ongoing monitoring of the response of the aquifer would provide the information needed to determine whether to maintain the level of effort or scale up as necessary.

A fourth portfolio was developed by Sarah Mansergh. This proposal shows an approach that portrays a lower level of urgency for moving forward than some of the other portfolios. The portfolio is also designed to seek and achieve multiple benefits through regional partnerships focused on restoring regional aquifers.

The fifth portfolio was developed by Erica Stanojevic. This proposal combines the storage capacity of Loch Lomond with the aquifer. By starting the project immediately and sorting out our water rights, security will be increased and we could achieve 3BG in storage by 2020.

All of these portfolios incorporated demand management.

In the discussion that followed the following agreements were articulated:

- The Committee developed consensus that the environmental benefits of fish habitat restoration is an important value and that the supply-demand gap should reflect a commitment to releasing flows to support restoration of threatened and endangered fish species. (The specifics of the DFG-5 flow proposal are not agreed to, as the Committee wants the City to work with the agencies to define the final flow proposal.)

- The Committee has developed consensus that there are substantial benefits from pursuing regional solutions for Santa Cruz's water supply issues and that reasonable regional solutions should be pursued if possible.
- The Committee developed consensus that energy requirements for any new water supply augmentation project should be met with power from renewable sources.
- The Committee reached agreement that groundwater storage strategies implemented by in lieu (passive recharge) and ASR (active recharge) are preferred.
- The Committee has developed consensus that their direction be focused on policy versus prescriptive level detail.
- The Committee has developed consensus that the plan they develop and recommend to the City Council will include an adaptation or Change Management Strategy.

Section 3.15 Alternatives that Emerged as Key Strategies to Consider

As the Committee worked through its first several meetings of the Analysis Phase, information developed by the WSAC Technical Team identified challenges with some of the alternatives. For example, it would be impractical to build surface water storage reservoirs in old quarries underlain by Karst formation geology. Other alternatives emerged as being more feasible and began to appear consistently as measures included in scenario planning results. By late spring 2015 the Committee had defined a set of alternatives and approaches that became their focus. Each area is described briefly below in Section 3.16 through Section 3.20.

Section 3.16 Demand Management

During much of the Committee's work a program known as "C recommended" (Crec) was a focus of the conversation around what additional demand management activities the City should pursue. Crec is a combination of water conservation measures identified during the development of the City's updated Water Conservation Master Plan in a process that began in 2013 but was still underway in the spring and summer of 2014.

As the Committee gained a better understanding of the nature of the reliability problem Santa Cruz faces, it began to look at whether and how well the measures combined into Program Crec focused on peak season demand. In the spring of 2015, the Committee formed a Peak Season Demand Management Working Group to look at strategies for improving the focus of the future Demand Management program on peak season reductions.

The Working Group developed and presented some strategies focusing on peak season demand management. When its results were received, the Working Group had proposed that the City set a goal of reducing peak season demand by an additional 150 mgy using a variety of strategies. This proposal raised a concern about the potential for double counting demand management savings due to the significant impact of price elasticity in reducing future demand. Double counting of demand reductions in a concern because of the possibility that an unknown number of customers will respond to higher rates by switching to water-conserving landscapes, for example, and will also participate in a water Department rebate program while doing so. If this occurs, their water savings would be counted

twice – once as a program participant and again as a response to higher rates. Double counting could lead to overestimating the potential for demand reductions from programmatic conservation.

Table 13 below, lays out the impact of price response on future water demand.

Table 13 – Peak Season Savings Due to Price Response[17]

Peak (May-Oct) Demand Without Price Response, MG

	SFR	MFR	BUS	MUN	IRR	GOLF	**TOTAL**
2020	750	386	372	39	123	58	**1,728**
2025	763	375	373	39	138	52	**1,739**
2030	778	383	381	39	162	46	**1,790**
2035	798	393	393	39	184	46	**1,854**

Peak (May-Oct) Demand With Price Response, MG

	SFR	MFR	BUS	MUN	IRR	GOLF	**TOTAL**
2020	705	364	348	35	93	52	**1,598**
2025	703	347	342	35	104	45	**1,575**
2030	702	347	341	34	111	37	**1,572**
2035	703	347	342	33	119	35	**1,580**

Peak (May-Oct) Savings from Price Response, MG

	SFR	MFR	BUS	MUN	IRR	GOLF	**TOTAL**	**% Savings**
2020	46	22	23	4	30	5	**131**	**8%**
2025	60	28	31	5	34	7	**164**	**9%**
2030	76	36	40	6	51	9	**218**	**12%**
2035	95	46	51	7	65	11	**274**	**15%**

The price elasticity used to produce these numbers was based on the measured impact of price on the demand of various customer groups in Santa Cruz between 2000 and 2013. These elasticities were integrated into the econometric demand forecast presented to the Committee in July of 2015.

During the development of the econometric forecast, considerable effort was expended to ensure water conservation savings were not counted twice. The forecast includes an estimated 274 mgy of peak season demand reduction due to price, an estimated 170 mgy due to continuing existing programs and 248 mgy in demand reductions due to the impacts of building and plumbing codes. An additional 170 mgy in demand reduction from Program Crec was included as a supply alternative in all the Confluence modeling analyses, including those analyses used to establish the 1.4 billion gallon worst year shortage.

As the Conservation Master Plan is finalized, the new conservation measures proposed by the Working Group will be more fully analyzed and the Committee agreed that until that analysis is completed, it

[17] From Presentation by David Mitchell (M. Cubed) to the Water Supply Advisory Committee, July 23, 2015.

was best to be cautious about including the full additional 150 mgy of demand reduction in the projections.

(a) Development of Recommendations on Demand Management[18]

At its July 24, 2015 meeting, the Committee members decided they wanted their recommendations on Demand Management to combine providing the Council with their recommendations on a package of demand management programs as well as with a results-oriented, policy level direction, including guidance about key criteria.

City staff worked with two members of the Demand Management Working Group to develop recommendations reflecting both the Committee's strong interest in pursuing conservation with the uncertainties regarding costs and water savings associated with the package of measures outlined by the working group. The recommendations developed included:

1. **Expressly acknowledge the conservation savings that have been embedded into the new econometric demand forecast.** The econometric forecast carefully factored in different estimates of conservation savings that together amount to over 700 million gallons of water per year saved by 2035. These include the savings representing the passive effects of plumbing codes (278 mgy), active water savings associated with measures currently being implemented, (also referred to "Program A", 170 mgy), and the peak season savings that is related to economic effects over the 20-year planning horizon (274 mgy). These three elements play a large role in keeping water demand relatively constant over the next 20 years, and represent a combined 17 percent savings that should be communicated and highlighted as a key part of the overall solution to balancing the City's future water supply and demand.
2. **Set a goal, expressed as a range, between 200 and 250 million gallons per year of additional water savings by 2035, with emphasis on implementing measures that focus on peak season demand reduction.** Although the exact number is yet to be finalized and needs to be revisited, modeling performed by Maddaus indicates another 168 mgy of water savings is potentially attainable by 2035 through new or expanded conservation measures (referred to as "Program C"). More savings may be possible by incorporating the working group's recommendations into the City's Water Conservation Master Plan. Various estimates have been put forward about the savings of its recommendations, ranging from 81 to 183 mgy. The proposed goal recognizes and agrees with the Working Group that more water savings is possible, especially in the peak season, but expresses it as a range to reflect the uncertainty involved at this time.
3. **Complete additional analysis** to finalize the package of programs to be implemented and to more specifically establish the savings goal. Earlier modeling performed by Maddaus Water Management indicates another 168 mgy of water savings is potentially attainable by 2035 through new or expanded conservation measures from Program Crec. Additional programmatic savings will be identified both due to changing the $2500 per million gallon threshold used in the Maddaus Water Management modeling work conducted in 2013 to a $10,000 per million gallon average program cost recommended by the WSAC and by identifying, developing and implementing more programs focused on peak season savings.

[18] See Appendix 7 for materials related to Demand Management Recommendations.

4. **Identify the water conservation measures listed in Program C and in the working group's report as the demand management package the Committee recommends.** Providing a list such as the one presented in Table 14 below would fulfill the Committee's desire to articulate a recommended suite of demand management measures.

Table 14 – Recommended Water Conservation Measures

No.	Water Conservation	Included in Working Groups	Comments
1	System Water Loss Reduction		Project Initiated July 2015
2	Advanced Metering Infrastructure		
3	Large Landscape Budget-Based Water Rates	Yes	Identified in Peak Season Report as "Shifting Landscape Budgets Toward Climate Appropriate Irrigation Levels"; lower water budgets over time
4	General Public Information		
5	Public Information (Home Water Use Report)	Yes	Assume 3-5% savings
6	Residential Leak Assistance		
7	Single Family Residential Surveys	Yes	Identified in Peak Season Report as "Personalized Outreach to Highest Users and Generic Landscape Budgets"; combine with water budgets
8	Plumbing Fixture Giveaway/Opt		
9	Residential UHET Rebates		
10	High Efficiency Clothes Washer Rebates B	Yes	Alternative delivery/financing mechanisms
11	High Efficiency Clothes Washer - New Development		
12	Hot Water On Demand - New Development		
13	Toilet Retrofit at Time of Sale		
14	CII MF Common Laundry Room High Efficiency Clothes Washer		
15	CII Incentives	Partially	
16	Pre-Rinse Spray Nozzle Installation		Project Completed 2014
17	CII Surveys		
18	HEU Program		
19	Public Restroom Faucet Retrofit - MUN		
20	Public Restroom Faucet Retrofit - COM		

No.	Water Conservation	Included in Working Groups	Comments
21	School Retrofit		
22	Water Efficient Landscape Ordinance		State mandated update due by end of 2015
23	Single Family Residential Turf Removal A	Yes, as part of "Climate Appropriate Landscaping and Rainwater infiltration	Recommend B (increased rebate amount)
24	Multifamily Residential/CII Turf Removal A		Recommend B (increased rebate amount)
25	Expand Large Landscape Survey/Water Budgets	Yes	
26	Sprinkler Nozzle Rebates		
27	Gray Water Retrofit		
28	Residential Rain Barrels		
29	Climate Appropriate Landscaping and Rainwater Infiltration		Includes requirement to convert spray to drip for shrub irrigation, prohibit spray irrigation in narrow areas. Rainwater infiltration component to be led by other City Department or agency
30	Conservation Pricing - Water and Sewer		Water rate project underway through separate contract with Raftelis Financial Consultants; conservation pricing for sewer service
31	Dishwashers		Not recommended by staff
32	Hot Water Recirculation Systems		Not included in Program C but worth reconsideration
33	Rewarding Businesses For Adopting Best Practices		Hotel laundry recycling one example; reduced curtailment level as reward
34	Additional Building Code Requirements for New Development		Some requirements already in place; urinals, dishwashers, graywater, pre-rinse spray nozzles
35	Innovation Incubator Program		Capitalize on local programs to support research and continue role as conservation innovators

5. **Acknowledge that a final estimate of conservation savings is subject to change pending completion of the Master Plan.** A contract amendment for a second phase of work on this project was approved by the City Council at its September 8, 2015 meeting. Work is scheduled to resume this fall and will include coordinating the consultant's DSS model with the latest demand forecast, adjusting model parameters based on input received from Committee members and the Water Commission, incorporating new measures with greater emphasis on peak season savings

forwarded by the working group, and rerunning modeling scenarios. This will ensure consistency in how water savings and costs are estimated and help avoid speculation and/or double counting. In addition, staff has identified the need to revisit the sequencing and scheduling of measures listed in the latest version of Program C, and this will affect estimated savings. The final plan will, of course, be subject to public review and stakeholder input prior to its final adoption by City Council.

(b) Committee Agreement about Demand Management

At the Committee's meeting of September 10, 2015, the Committee agreed to the recommendations described in Section 3.16(a) above.

(c) Key Assumptions about Demand Management

The following are key assumptions about the Demand Management Program being recommended by the WSAC:

- The Econometric Demand Forecast includes significant demand reductions associated with the implementation of existing plumbing and building codes, the continuation of existing demand management programs (as a baseline) and as a function of the effect on demand of expected increases in water rates.
- A focus of new demand management programs will be on peak season demand reduction, which is also a significant focus of the expected demand reduction associated with anticipated price increases.
- New and enhanced demand management programs will be developed to build on the Water Department's current program that has contributed to reducing per capita demand in Santa Cruz to one of the lowest levels in the state.
- The programs to be implemented in the coming decade are a mix of lower cost and some higher cost measures. Those higher cost measures are meant as small-scale experiments that may be broadened if they prove popular and their costs decline over time. Together these measures incur an average total program cost of no more than $10,000 per million gallons of water saved. This figure is lower than the expected cost of supply augmentation projects recommended to be pursued as a result of WSAC's work.

Section 3.17 Supply Development

As described earlier, the Committee considered a wide range of supply augmentation alternatives during its deliberations. Committee members focused on options that are local including demand management, capturing and storing surface water flows during the rainy season, or developing some form of either recycled water or desalinated water to augment existing supplies.

As the Committee worked through the process of defining the problem and evaluating potential solutions during the winter and spring of 2015, they consistently identified winter water capture and storage through passive and active recharge as an opportunity that made sense to pursue.

As previously described, the Committee's scenario planning and portfolio building efforts focused on selecting supply alternatives and then exploring the risks and uncertainties associated with the

portfolios they selected. During the Committee's work, the supply augmentation strategies that emerged included:

- Passive recharge of regional aquifers (in lieu);
- Active recharge of regional aquifers (aquifer storage and recovery – ASR);
- Some form of advanced treated recycled water (indirect potable reuse or direct potable reuse); and
- Some form of desalinated water (local desalination or a regional project called DeepWater Desalination).

To help the Committee consider the effectiveness of the supply augmentation options they were most interested in pursuing, all of the options were evaluated using the Confluence model. The estimated Confluence model yields are shown in Table 15. The yields indicated are defined as the reduction in peak-season shortages that are realized when each element is fully operational, i.e., when all technical and institutional (legal, regulatory, public acceptance) uncertainties have been successfully resolved.

Table 15 – Estimated Peak-Season Yields and Remaining Shortage

	Worst Year			Average		
Element	**Peak-Season Yield**	**Remaining Peak-Season Shortage**		**Peak-Season Yield**	**Remaining Peak-Season Shortage**	
	mg	**mg**	**%**	**mg**	**mg**	**%**
Base Case	--	*1230*	*63%*	--	*470*	*24%*
In Lieu	750	480	25%	350	120	6%
ASR	760	470	24%	380	90	5%
Combined In Lieu, ASR	760	470	24%	380	90	5%
Advanced treated RW/Desalination *	810	420	22%	440	30	2%
All Elements Combined	1230	0	0%	470	0	0%

* Either DPR, Deepwater Desalination, or Local Desalination.

The yield[19] estimates are necessarily based on a variety of infrastructure and operational assumptions, including but not limited to:

- For both in lieu storage and ASR, it is assumed that the maximum daily capacity to pump water from the aquifer and convey it to Santa Cruz is 4 million gallons per day (mgd). For ASR, it is assumed that the maximum ability to inject water is 5 mgd.
- For ASR, it is assumed that 80% of the injected water is recoverable. This is a function of assumed physical characteristics of the aquifers. For in lieu, it is assumed that 60% of the water conveyed to neighboring water districts is available to Santa Cruz, a function of both assumed aquifer characteristics and the outcome of discussions with the city's negotiating partners.
- For advanced treated recycled water/desalination, it is assumed that the maximum available supply on any day is 3 mgd, which is based on the estimated availability of local wastewater (i.e., excluding Soquel Creek wastewater).
- In all cases, the modeling of these supply elements makes particular assumptions about how they will be operated in conjunction with current supplies.

Given these assumptions, none of the elements on its own completely eliminates all projected water shortages though each substantially improves water supply reliability. However, since it is likely that some or all of these and other assumptions will change as better information is generated regarding physical, operational, and institutional parameters, these yields will also undoubtedly change.

During the Committee's scenario planning work, the idea of packaging various demand management and supply augmentation measures into a portfolio or integrated strategy emerged as an effective way to deal with the various uncertainties that are inevitably present in any long range planning work.

Ultimately the Committee selected two basic strategies to pursue, in addition to demand management (Element 0):

1. **Strategy One**: Development of groundwater storage using a combination of both passive and active recharge approaches and available surface water flows during the rainy season; and
2. **Strategy Two**: Development of advanced treated recycled water or desalinated water if and as needed to address any remaining supply-demand gap.

Strategy One includes the following Elements:

- **Element 1** – in lieu, passive recharge of the groundwater aquifers with either or both the Scotts Valley Water District and the Soquel Creek Water District; and

[19] "Yield is used to characterize the capacity of a water resource to serve as a long-term water supply. It is a fundamental water-supply planning concept, and an understanding of its attributes is critical for those who participate in water-supply issues. In the context of surface-water resources, yield is often synonymous with safe yield or firm yield. Safe yield or firm yield in the context of water reservoirs is defined as the maximum quantity of water which can be guaranteed during a critical dry period (Linsley and Franzini, 1979). The simplicity of this definition, however, belies two "complicating" factors. First, yield changes as watershed conditions, such as land use and ground-water-surface-water interactions, evolve. Second, yield is uncertain because of our inability to know the severity and duration of future drought periods."
From: http://www.kgs.ku.edu/Publications/Bulletins/239/Leib/
See also, page 3 of https://www.owasa.org/Data/Sites/1/media/whatwedo/appendix%20iii-a.pdf
Additional definitions of production and yield are provided in the Glossary and Appendix 8.

- **Element 2** – aquifer storage and recovery, active recharge of the groundwater aquifers, with or without regional partners in regional aquifers.

Strategy Two includes the following Elements:

- **Element 3** – advanced treated recycled water to be used in either an indirect potable reuse or a direct potable reuse application, as the initial focus of Strategy Two approaches. In the event advanced treated recycled water is eliminated from consideration, desalination would then become Element 3.

As the WSAC discussed the potential development of the potential for advanced treated recycled water to be developed if Element 3 were to be needed, it received numerous comments from members of the public who expressed the critical importance of ensuring that all supply options be safe to human health. Specifically, comments received included cautions related to recycled water, a desire for the SCWD to carefully analyze the latest research on potential human health risks from contaminants of emerging concern and the synergistic or compounding effects of mixtures of multiple constituents that may occur in advanced treated recycled water, a recommendation that the SCWD use the precautionary principle when evaluating advanced treated recycled water options, and also that the City learn from other communities using similar supplies.

Section 3.18 Rationale for the Committee's Preference for the Groundwater Storage and Retrieval Strategy

Throughout the Committee's work in the spring and summer of 2015, it consistently demonstrated a preference for developing available winter flows as a supplemental supply. As the list below shows, the Committee's reasons for this preference were numerous and diverse.

1. More fully utilizes winter water flows in the San Lorenzo River.
2. Can contribute water to storage in many years. Even in dry years winter water may be available to store in local aquifers.
3. May start returning water before the entire groundwater system is built out.
4. May help reduce the threat of seawater intrusion.
5. Groundwater strategies are regional solutions. Regional solutions may help the regional economy, and thus the local economy.
6. Even without agreements to return water to SCWD in the future, in lieu recharge strategies can start immediately with existing infrastructure (an agreement is already in place for winter 2015), and can grow over time.
7. Because each ASR injection well acts as an independent storage and recovery site, together the individual wells create a flexible, resilient and scalable system, not just for the groundwater strategy but for Santa Cruz's overall water supply portfolio.
8. Water stored underground is much less affected by evaporation.
9. As aquifers are restored, base flows from groundwater to local creeks and streams may be improved and may offset some fish flow requirements.

10. May eliminate future water use curtailments during extended droughts.
11. It is believed to be politically feasible.

Section 3.19 Infrastructure Constraints

As is the case with all water systems, the City of Santa Cruz water system's operation is limited by a number of infrastructure constraints. Chief among these is the inability of the Graham Hill Water Treatment Plant to efficiently treat waters with turbidities over about 15 Nephelometric turbidity units[20] (NTU). Additional infrastructure constraints involve the limited hydraulic capacity and pressure constraints of the existing pipeline between the Felton Booster Station and Loch Lomond Reservoir. Once the pipeline between Felton and Loch Lomond is replaced, the capacity of the existing Felton pumps could potentially be increased.

In the recently completed Conjunctive Use and Water Transfer Phase II study report,[21] the Graham Hill Water Treatment Plant turbidity constraint was identified as a potentially significant barrier to the idea of capturing and using winter flows for passive and active recharge of regional groundwater basins. That report laid out a phased implementation of in lieu (passive) recharge that would not require addressing the treatment plant constraints right away. The report also described various infrastructure improvements to both Graham Hill Water Treatment Plant and the Tait Street Diversion that could be required as winter water deliveries to Soquel Creek and Scotts Valley are increased.

During the Committee's scenario planning process, the technical team modified the Confluence model's operating parameters in order to assess how the water system would perform without infrastructure constraints. The Committee, City staff and the technical team gave the issue of infrastructure constraints considerable attention, and a range of possible approaches to addressing these problems was discussed.

In the "State of the Water System Report" provided to the Committee at its April/May 2015 meeting, City staff provided a high level overview of the deferred maintenance and major rehabilitation and replacement issues the system has and laid out a conceptual framework for a 15 year Capital Improvement Program (CIP) to tackle these issues. The CIP includes projects to address certain infrastructure constraints, such as the need for a replacement pipeline from Felton to Loch Lomond, but not others, like upgrades to the Graham Hill Water Treatment plant to allow it to treat higher turbidity water. The rationale for including the pipeline is that it is needed to improve system operation whether or not a winter harvest option is pursued. The need for other infrastructure improvements to address the higher turbidities of winter water, whether through the implementation of the treatment plant upgrades identified in the Conjunctive Use and Water Transfer report, or possibly the installation of Ranney collectors or other approaches, is dependent upon selection of a water supply augmentation strategy. Including such improvements in a long term CIP prior to the Committee having completed its work would not be appropriate.

[20] Nephelometric turbidity units (NTU) is a measure of water clarity that is used in drinking water treatment and safe drinking water regulations.
[21] Final Report, Conjunctive Use and Water Transfers – Phase II, May 2015
http://scceh.com/Portals/6/Env_Health/water_resources/Task%206%20Report%20051215%20clean.pdf

While current infrastructure does allow some initial regional cooperation efforts to get underway relatively soon, to fully utilize available winter water for in lieu and/or ASR will require substantial additional infrastructure. The minimum additional infrastructure requirements include creating an intertie with Scotts Valley, expansion of transmission capacity to Soquel Creek, and creating the infrastructure necessary to transfer water stored in aquifers back to Santa Cruz when needed during drought years.

Section 3.20 Operational Constraints

The Santa Cruz water system uses a variety of operating rules and practices to guide its daily operation. A utility's operating rules provide straightforward and reasonable parameters for both operating the system and for modeling system performance.

Most of the City's operating rules and practices have developed over time and are based on experience operating the system. A major influence underlying the operating rules is that avoiding problems is more effective than dealing with their consequences after the fact. Some of the key operating constraints have been incorporated into the Confluence Model to help insure that system modeling results reasonably represent reality.

The WSAC examined operating rules and constraints that limit the water system's ability to provide water. During the dry season, the key constraint is the existing operating rule curve for Loch Lomond drawdown. During the rainy season, the key constraints were related to taking first flush water and dealing with turbidity levels over 15 NTU, whether for treatment at the Graham Hill Water Treatment Plant or to send to Loch Lomond to store in years when winter precipitation is not expected to fill the reservoir.

The technical team explored modifying the operating parameters using the Confluence model to simulate different operating rules. A number of recommendations for change and further evaluation were developed. Of those, two particular operating constraints stand out: the rule curve used to operate Loch Lomond, and the first flush constraint for sending water from Felton to Loch Lomond.

The existing Loch Lomond rule curve is designed to keep about a billion gallons of water in the reservoir as drought supply for a potential third year of drought conditions. When modeling the system, the Confluence Model currently runs the system to ensure that on October 31st of the second year of a drought, the reservoir still has one billion gallons remaining in storage. This constraint could potentially be relaxed in the event the City develops additional storage. The first flush constraint is designed to allow a sufficient quantity of water to bypass the City's Felton Diversion on the San Lorenzo River to avoid introducing large quantities of nutrients and pathogens into Loch Lomond. In critically dry years the quantity of water needed to meet the first flush criterion, 48 hours at 100 cubic feet per second or greater, may never be achieved. If this criterion can be relaxed without threatening Loch Lomond's water quality or ecosystem health, the additional water diverted to Loch Lomond during dry years could have significant benefits in reducing the size of worst year shortages.

Bearing in mind the complexity of Loch Lomond's ecosystem and the need to avoid creating a problem that would likely be time-consuming and expensive to solve, the potential supply-enhancing benefits of changing any of these constraints make it worthwhile to seriously explore this matter over the coming

years. If it is feasible to modify this operating constraint, the fix may entail operational changes, infrastructure modifications, or both.

Section 3.21 Agreement on Elements of the Water Supply Augmentation Plan

As WSAC proceeded, it focused on both what the Plan should include and how it should be implemented. As had been the case during the Committee's scenario planning and portfolio building work during the spring and summer of 2015, the Committee found it relatively easy to coalesce around groundwater storage strategies, but more challenging to build agreement around whether or how it might make sense to include additional supply augmentation measures.

Beginning with the Committee's July 2015 meeting, the WSAC began developing an adaptive management plan that would be used to guide the implementation of the Plan. Through the August and early September 2015 meetings, the Committee continued to solidify its agreement about the elements of the Plan, while recognizing that final agreement would be based on both what the Plan Elements were as well as how the Plan would be implemented. At its September 11, 2015, the Committee agreed to the following Plan Elements, contingent on the Committee also reaching agreement on the implementation plan and adaptive management strategy.

Element 0: Demand Management, with a goal to generate an additional 200 to 250 million gallons of demand reduction by 2035 from expanded water conservation;

Element 1: In Lieu start quickly as a small program relying on existing infrastructure to provide potable water to the SqCWD. The program is intended to grow over time, if/as additional infrastructure is developed, additional agreements are reached with SqCWD and SVWD, and any needed changes to water rights are granted by the State of California. Details of sharing capital and operating costs would and how much water returns to Santa Cruz and when it would be available would be addressed in these agreements.

Element 2: Aquifer Storage and Recovery (ASR), involves development of a program to inject treated water from available winter flows into regional aquifers and recover a large portion of the stored water as a supplemental supply for Santa Cruz. This program would proceed through evaluation and piloting steps as detailed in technical reports (e.g., the May 2015 Pueblo Water Resources report) and, if successful, can be implemented on a scale sufficient to meet the yield goals of this Plan.

Element 3: Advanced Treated Recycled Water, is intended to supplement or replace Elements 1 and 2 to the extent they do not generate sufficient yield to fill the supply/demand gap in a cost-effective and timely manner, as stipulated in the Plan. In the event advanced treated recycled water is eliminated from consideration, desalination would then become Element 3.

In addition to developing Elements 0, 1, 2 and 3 above, the Committee suggests that the City should continuously review and take steps to address infrastructure and operating constraints that are keeping the existing system from performing as well as it could, within reason. Some specific suggestions are included in the recommendation section of this report.

Section 3.22 Implementation Strategy Options

Following the August 2015 Committee meeting, staff and the technical team worked to lay out a phased implementation plan for Strategies One and Two. The purpose of this task was to provide Committee members with a way to visualize how a staggered plan might actually be implemented, and to support a more thorough discussion of implementation strategy options.

As they mixed and matched supply augmentation strategies, the Committee also considered how measures in the portfolio would be implemented. The technical team provided the Committee with a useful model for thinking about both potential implementation options and adaptive management drawn from work done in the Netherlands (see https://www.deltares.nl/en/adaptive-pathways/).

As part of developing both the Committee's implementation and adaptive management strategies, the WSAC evaluated several implementation approaches, including sequential, staggered and parallel. Each approach is briefly described below.

- A sequential implementation plan would involve working on Strategy One approaches until they either succeeded or failed. Only if these approaches fail to meet the yield target would Priority Two approaches be pursued.
- A staggered implementation plan involves advancing work on Strategy One approaches to demonstrate their effectiveness, while simultaneously doing some work on Strategy Two approaches with a goal of shortening the time required to produce water from a Strategy Two approach should Strategy One approaches not prove successful.
- A parallel approach would involve moving forward on both Strategy One and Strategy Two strategies with a goal of pursuing both types of projects and significantly enhancing the City water system's reliability and robustness.

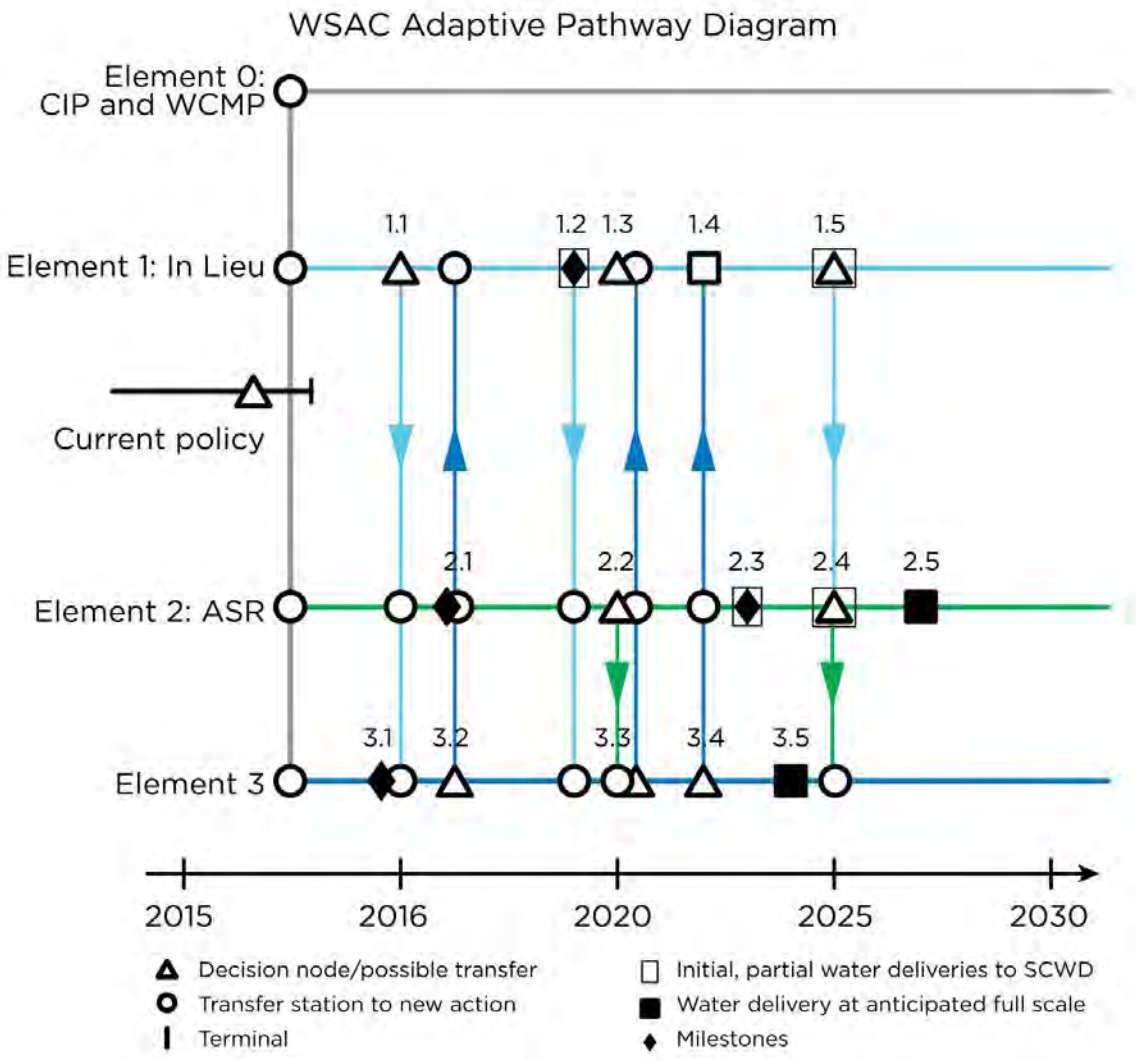
The idea behind an adaptive pathway is that you work down a path through the phases of a project or program and when you reach a decision node, you have an opportunity to decide whether to continue or change to a different approach. There are two types of decision nodes used in the adaptive pathways:

1. Open circles represent start points and possible change direction points and
2. Open triangles represent project transition points between one phase of work and the next.

Opportunities for initiating work or reviewing progress and making changes, either in the form of adjustments or as a result of assessments occur at these decision nodes. As an additional feature, the Committee decided to develop thresholds that would act as triggers for considering either adjustments or assessments. The Change Management Strategy, including further information on adjustments, assessments, and thresholds, is presented in more detail in Section 3.24.

Figure 8 shows the adaptive pathway chosen for implementation.

Figure 8 –Adaptive Pathway Map for Implementing the Water Supply Augmentation Plan



Section 3.23 Developing a Change Management Strategy

At the same time as the Committee members were developing the implementation strategy, they were also thinking about how to deal with decision-making and dealing with the new and changing information that will develop as the plan or project is implemented.

(a) Exploring Example Change Management Approaches

The Committee had explored several types of strategies used by others in setting up a policy and/or procedural framework to guide implementation of various kinds of plans over time. Included in this review were several specific examples of different approaches to developing policy or implementation frameworks. The most relevant examples are:

- Borrego Water Coalition Recommendations on the Groundwater Sustainability Plan being developed by the Borrego Water District.
  - Example of: Policy recommendations with phased in reduction in water production to improve groundwater sustainability and specific incremental performance targets http://www.borregospringschamber.com/bwc/documents/2014/BWC%20Policy%20Recs%20FINAL%2011-06-14.pdf
- Clackamas River Hydro Relicensing Settlement Agreement/Agreement in Principle – Fish Passage Provisions with performance based phased-in of fish passage measures:
  - Example of: Performance Benchmarks used in determining additional actions, in this case, additional measures to improve/enhance the success of fish passage at a hydroelectric dam facility.

    For details of the A, B, C and D measures called for as part of the performance based implementation of fish passage improvements, see Clackamas Agreement in Principle (AIP) document, Section II – Downstream Fish Passage Measures. This section begins on page 3 and goes to page 11 of the Agreement in Principle Fish Passage and Protection Plan that is embedded in the larger document. Using the pdf document page counter, typically found in the upper left hand area of the screen, this section starts on page 39 and goes to page 47.

    Additional Information: General information about Portland General Electric's Fish Protection Programs: https://www.portlandgeneral.com/community_environment/initiatives/protecting_fish/clackamas_river/default.aspx
- Owens Lake Dust Control – Section 5 – Framework for Resource Protection Protocols (RPP) including criteria, monitoring, indicators, triggers, and actions, significant impact thresholds, and mitigation measures.
  - Example of: Outcome oriented performance criteria; performance measurement; tiered (incremental) action oriented steps to take if performance metrics are not being met; and significant impact thresholds with required mitigation.

    https://owenslakebed.pubspsvr.com/masterproject/Master%20Project%20Document%20Library/Advisory%20Committee/April%202015/Owens%20Lake%20MP%20Advisory%20Committee%20Recommendations%20to%20LADWP.pdf (Section 5 starts on page 28 of the pdf that opens at this link.)

Two common themes of these examples are the idea that implementing plans is an inherently adaptive process and that, within reason, it is feasible to lay out an approach to making future decisions that maintains the integrity of the agreements on which the plans were based.

By the early summer of 2015, the WSAC understood that the planning level information available was only going to be adequate to allow them to make contingent recommendations. The City would need to be able to adjust or adapt them during implementation. The Committee acknowledged that questions would arise about how to proceed when new information became available and concluded that developing a Change Management Strategy, and especially guidelines and principles that reflected

their values and priorities, was as important as agreeing upon the portfolio of measures to recommend to the Santa Cruz City Council.

Section 3.24 WSAC's Change Management Strategy

A major goal of the WSAC's Change Management Strategy is to establish clearly defined mechanisms for dealing with changes that will need to be made to the Plan over time. The success of whatever is done to implement the proposed recommendations is dependent upon a high degree of both transparency and accountability. The Change Management Strategy the WSAC has developed is specifically designed to facilitate that success.

(a) The Plan-Do-Check-Act Cycle[22]

The basic premise of the WSAC's Change Management Strategy is that developing and implementing any Plan, and the projects within a plan, is a cyclic activity of continuous improvement that involves planning, doing, checking and acting (PDCA). Figure 9 shows this cycle and describes each part.

Figure 9 – Plan, Do, Check, Act Cycle

Plan–Do–Check–Act Procedure

1. Plan. Recognize an opportunity and plan a change.
2. Do. Test the change. Carry out a small-scale study.
3. Check. Review the test, analyze the results and identify what you've learned.
4. Act. Take action based on what you learned in the study step: If the change did not work, go through the cycle again with a different plan. If you were successful, incorporate what you learned from the test into wider changes. Use what you learned to plan new improvements, beginning the cycle again.

This cycle is designed to incorporate new information and well adapted to the circumstances involved in implementing the Water Supply Augmentation Plan (Plan).

The elements of the WSAC's Change Management Strategy include the following:

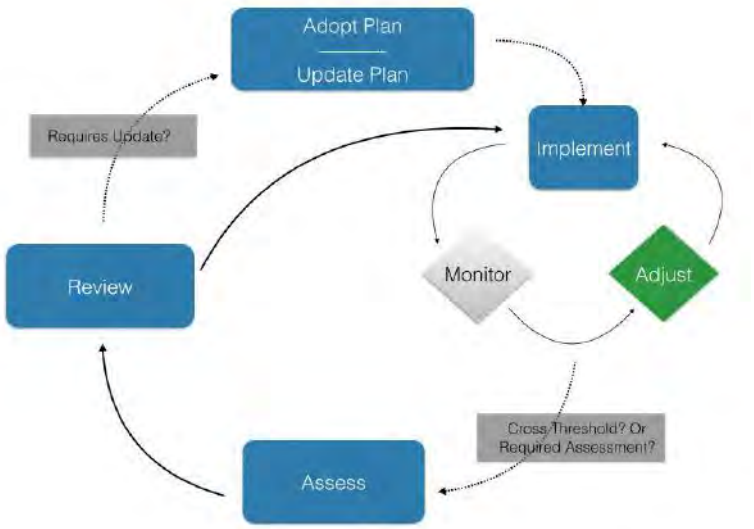
1. A Plan-Do-Check-Act model specifically adapted to the work being planned;
2. An Adaptive Pathway framework for implementing the three main supply augmentation elements;
3. Guiding Principles reflecting the WSAC's values and priorities;

[22] From: http://asq.org/learn-about-quality/project-planning-tools/overview/pdca-cycle.html

4. Procedures for implementing the strategy, including roles and responsibilities for Water Department staff and the Water Commission as they work with the Council on the issues and initiatives covered by the plan; and
5. Guidance for Decision-Making.

Figure 10 shows the Change Management Process WSAC developed:

Figure 10 – WSAC Change Management Process



This framework actually incorporates a smaller PDCA cycle within the larger PDCA cycle. The larger PDCA framework functions in concert with the adaptive pathways and mostly relates to adaptive decisions that would need to be made to switch from one path to another. The smaller PDCA cycle is shown on the upper right of the figure above as the "Implement, Monitor, Adjust" cycle and would be used to make needed adjustments while implementing the various Plan Elements that are part of the Plan. For example, as in lieu and ASR are being developed, their progress in meeting their project goals would be monitored. An adjustment would be needed if, for example, eight wells were needed to produce the desired yield instead of the six originally estimated. The sections below present the parameters and mechanisms the WSAC developed to guide the implementation of the Water Supply Augmentation Plan.

(b) Definitions and Context

The WSAC's Change Management Strategy was built around several specific definitions and application of concepts. This section provides the definitions and context used in the Change Management Strategy and the circumstances under which the various adaptation approaches would be used.

1. An **Adjustment** is a change in implementation that helps the Plan stay on track. In a continuous feedback loop, the Water Department will make adjustments to help achieve (or exceed) performance targets for the various Plan Elements.

2. A**n Adaptation** is a shift from an Element or a set of Elements to another Element or set of Elements within the Plan's Adaptive Pathway. An adaptation may be recommended when certain thresholds are reached.
3. **Guiding Principles** are qualitative policy and value-based provisions that are taken into account in decision-making along with quantitative information that will be available.
4. A T**hreshold** is the set of information that leads to an Assessment of the Plan and possible adaptation. The Committee identified thresholds for the key issues that need to be considered during decision-making about a possible Adaptation. The goal was to avoid trying to address each possible eventuality, and to focus on overall program goals rather than implementation specifics. Once a threshold issue has prompted an assessment, other considerations captured in the Guiding Principles, such as regional collaborations or the collateral benefits of an approach, may be taken into consideration. The thresholds are:
    - Cost
    - Yield
    - Timeliness
5. **Performance Metrics** are developed and used to assess how well individual Elements are tracking against their performance targets. As work on implementing the Plan Elements goes forward, tracking performance will generate information that will be used in several ways:
    a. Deliver greater understanding about the system from management activities, technical work, pilot testing and modeling results and other work.
    b. Ongoing cycles of monitoring and adjusting may help the Department keep the Elements moving forward to achieve their goals and determine when and how Adjustments might affect overall goals or when Adaptation may be appropriate.

    The Committee had a chance to learn about the potential Performance Metrics that would be used in assessing Element 2, ASR, through all of its developmental phases. Further work will be needed to develop Performance Metrics for other Plan Elements.
6. **Catastrophic Events** (or other exogenous events), such as earthquakes or wildfire could disrupt the plan. Catastrophic Events are low probability/high consequence events.

(c) Guiding Principles

The Committee recommends that the following Guiding Principles be taken into account in all applications of the Change Management Strategy:

- **Public Health** – public health protection is every water utility's most fundamental duty. The SCWD, as an organization, and as individual employees, work every day to produce and deliver an adequate and high quality supply of water that complies with numerous public health-based regulatory standards and is used for human consumption, sanitation, for other domestic and commercial use and for fire protection.

  WSAC recommends that, prior to reaching a decision on a potential preferred supply augmentation project; the City will consult with experts (recommended by the Water Department and approved by City Council) in public health, endocrinology and water chemistry

to evaluate and report on local water quality data and the public health implications of the preferred choice. This consultation would take place with ample opportunity for public review and input.

- **Public Acceptance** –The Committee was aware that the most important reason for convening the WSAC was to address the public's concerns about the proposed desalination plant. The Committee notes public acceptance issues were raised during the WSAC process about costs, including overall costs and costs to rate-payers, energy consumption, schedule for implementation and public health concerns.

  The WSAC has, throughout its process, created and applied criteria reflecting the community's values. Along with the yield, costs, timeliness and technical feasibility of various supply augmentation alternatives (including conservation), the Committee also considered energy use, and environmental impacts of the alternatives. Accordingly, these considerations and criteria should be taken into account in any future decision-making.
- **Regional Collaboration** – Where consistent with the goal of achieving a sufficient water supply, the City should promote regional collaboration to improve water supplies, reversing or slowing seawater intrusion, and support habitat restoration.
- **Plan Goal** – The Committee agrees that, to improve the sufficiency and reliability of Santa Cruz's supply using groundwater storage, an additional 2.4 billion gallons of water needs to be accessible from regional aquifers in a timely manner which will require storage of a larger volume. This additional storage, along with other key infrastructure modifications outlined in the Plan, would provide water needed to meet a worst year peak season shortage of 1.2 billion gallons under forecasted climate change and DFG5 flows.
- **Incremental Implementation** – An important premise of the Water Supply Augmentation Plan is incremental implementation. The Committee worked to develop a phased approach to develop the additional water supply needed and to integrate this approach into the Adaptive Pathway and Change Management Strategy. A significant benefit of this approach is that it will help the City avoid investing resources before they are needed and justified based on performance and other metrics.

(d) Change Management Strategy

As the Water Department implements this Plan, the Committee recommends that staff apply the following Committee agreements in making adjustments and recommending adaptations:

For Adjustments:

1. Diligently implement the groundwater storage strategy: when implementing Plan Elements related to groundwater storage, the City will take all reasonable and necessary steps to explore and demonstrate the technical feasibility of these approaches.
2. In addition, the City will adopt and implement communication practices that support the goals of transparency and accountability about Adjustments or Adaptations.

For Adaptations:

1. Prefer groundwater storage strategies: before making a choice to move away from groundwater storage, diligently pursue all reasonable measures to make the groundwater strategies work.
2. Should the choice need to be made between options available within Element 3, the Committee's preference is for advanced treated recycled water, rather than desalination, which is estimated to cost more and use more energy than advanced treated recycled water. The Committee viewed recycled water as more sustainable than desalinating seawater and therefore more aligned with the community's values. However, if the City determines that recycled water cannot provide sufficient yield then desalination should be pursued.
3. System robustness, resilience, redundancy, and adaptive flexibility are important values.

Thresholds are an important element of the overall Change Management Strategy. The Committee developed its agreements based on assumptions and information available to it at the time it did its work and recognized that new information would be developed as the Plan is implemented. Establishing thresholds (which could, themselves, be updated as new information is developed and analyzed) gave the Committee a way to provide parameters within which to continue developing an Element as well as clear sign posts for when the Plan or an Element might be failing to perform as anticipated. Exceeding a threshold value would not necessarily result in stopping work on an Element, but would trigger an Assessment. There are three key types of thresholds:

1. Cost
2. Yield
3. Timeliness

For several of these thresholds there is no fixed number or value. This is because for items such as cost and timeliness, the threshold value is necessarily relative to the other options available at the time the threshold is reached. The achievable schedule for implementing the Elements will become clearer as additional work is done. At a decision node, the most up-to-date information should be considered.

The Committee understood that new information would be developed as the Plan was implemented and therefore what was important was to set the threshold metric rather than the threshold value. And, in addition, the Committee understood that numbers produced by planning level analyses cannot be considered exact and thus applying an acceptable range around a threshold metric would be an appropriate way to express the Committee's values and provide flexibility in implementing the Plan.

While thresholds may operate as independent triggers for an assessment, once an assessment is undertaken it would look at each Plan Element's status as it relates to each of the thresholds as well as to the Guiding Principles. Taking this more comprehensive approach to the Assessment is intended to avoid unintended consequences that could result from applying a more narrow focus.

(i) Cost Metric

Cost-effectiveness is an important consideration in making pathway changes. Any decision on cost-effectiveness will require comparing the costs of available alternatives at the time a decision is made.

After considering the range of possible cost metrics to evaluate cost-effectiveness, the Committee recommends the threshold Cost Metric be the Annualized Cost per million gallons of Average Year Yield (ACAYY). This is the cost identified in Line k of the Project Elements Summary Table included in Appendix 8, Cost Data and Cost Analysis, which table is incorporated by reference.

This metric adds the amortized annual cost of capital investments and the annual operating and maintenance cost and divides it by the estimated project average year yield.

Amortized annual cost is preferred because it takes into account the amortized capital investment as well as operation and maintenance costs. *Average year yield* is preferred because *yield* focuses on benefits to the overall system and *the average year yield* allows comparison among options. While other costs may be considered in future decision-making, this Cost Metric was favored because it focuses on the cost of the yield produced in an average year.

(ii) Committee Preference Statement Related to Cost

Recognizing the cost differential between some of the strategies the Committee considered in developing its recommendations, the WSAC agreed to express its preference for Strategy One over Strategy Two, and has agreed that as long as the ACAYY for implementing Strategy One is not more than 130% of the ACAYY for Strategy Two, Strategy One should be pursued provided Strategy One meets other threshold metrics.

(iii) Yield Metric

The Yield Metric is the most straight-forward, the most quantifiable, and the least flexible of the thresholds. As described earlier in this document, the supply-demand gap has been established at 1.2 billion gallons per year (bgy) for the worst year, based on Confluence modeling of the frequency and severity of shortages. The analysis takes into account DFG-5 fish flows and a plausible estimate of climate change impacts.

Updating the supply-demand gap requires both new demand forecasts and the kinds of analyses described earlier in Section 3.05 and Section 3.06. This analysis will be refreshed every five years as part of the Urban Water Management Plan update.

(iv) Timeliness Metric

For the Timeliness Metric, the Committee has agreed that a 10-year window is a reasonable target for achieving water supply sufficiency, defined as having a fully functional water system able to meet the supply-demand gap forecasted during extended droughts. Assessments, Reviews and Update to Plan

1. Procedural Steps
    a. An **Assessment** is performed by the Water Department and includes updated information and a recommendation about whether a change to the Plan is needed.

b. The Water Department submits a report to the Water Commission for its **Review, including development of recommendations to the Council**. Following Water Commission action, the recommendation is forwarded to the Council for its consideration.

c. If the Council so chooses, the Plan will be **updated**.

2. Information Sharing

   a. The Water Department will report to the Water Commission and the City Council

      i. At all decision nodes identified in the Plan;

      ii. Informally, as part of the Water Director's Oral Report at each Water Commission meeting, providing specific information about work in progress, successes and failures, and challenges and opportunities;

      iii. Quarterly in the spring, summer and fall, as an agenda item with accompanying staff report on the Water Commission agenda for discussion, public comment, and action as needed; and

      iv. Formally and annually to the Water Commission and the City Council in the winter of each year during the budget cycle, including Plan performance and significant adjustments

   b. As part of the Water Commission's and City Council's review of an updated Urban Water Management Plan, including

      i. Performance

      ii. Significant adjustments

      iii. Updated Plan Goals and Assumptions (including demand, climate change, systems improvements etc.)

3. If the Water Department recommends an adaptation, such a report must contain a synthesis of each Strategy and/or Element's actual performance or most current projected performance against the most current Thresholds and an evaluation of whether the performance of individual Elements warrants making a change to the Plan as a whole, or to one or more Elements within the Plan.

(e) Staggered Adaptive Pathway and Decision Nodes

At its September 10, 2015 meeting, the Committee agreed to use a staggered implementation approach. Figure 11 shows the agreed-upon adaptive pathway map, and Table 16 lists the numbered decision nodes and provides descriptions about the expected information, decision, or result anticipated at that node.

Figure 11 – Agreed-Upon Adaptive Pathway Map

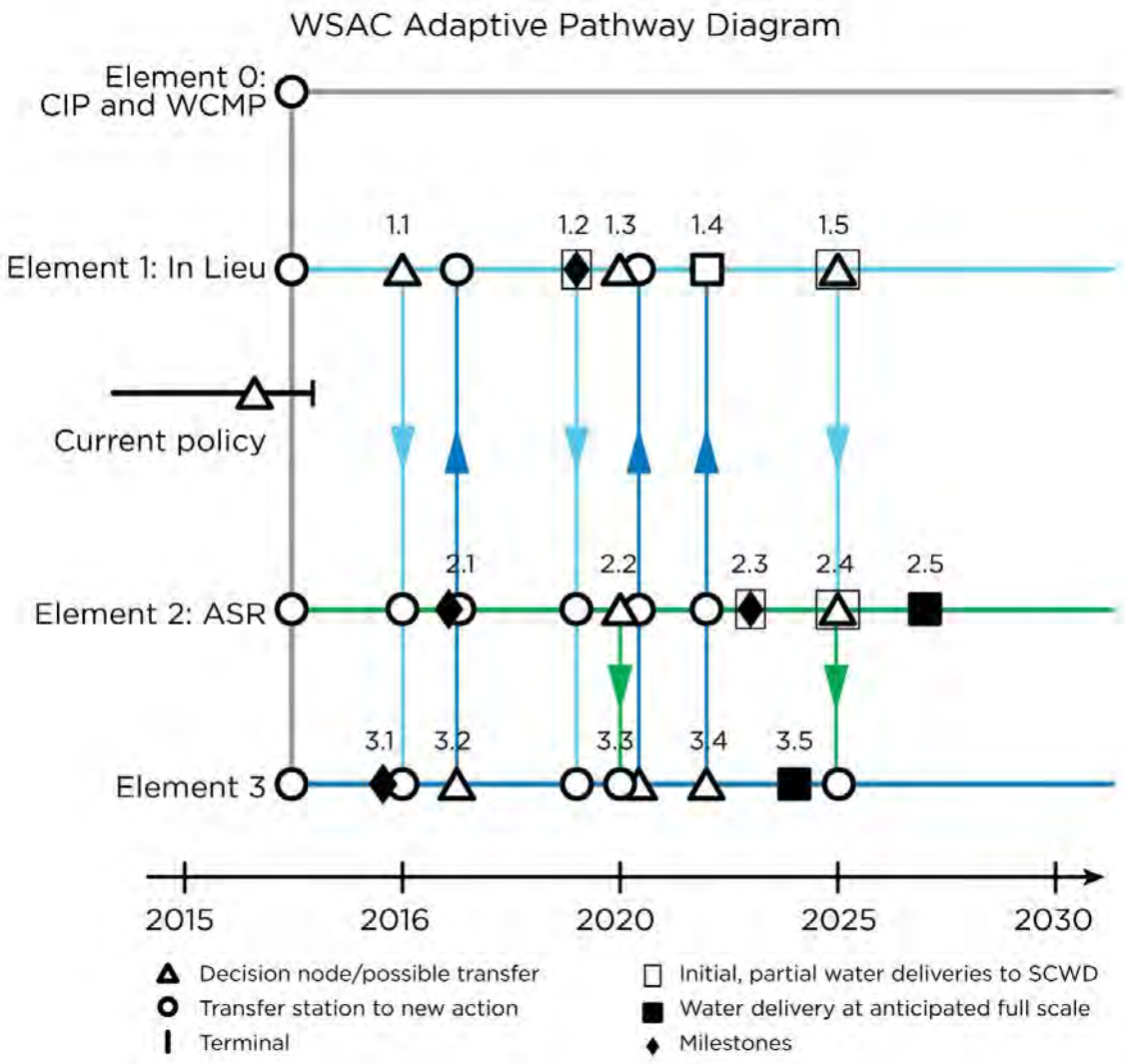


Table 16 – Table of Decision Nodes and Related Milestones

NODE	ABBREVIATED DESCRIPTION	ENDING YEAR
In Lieu (Element 1)		
1.1D △	Near Term: Initiation of near term water transfer/sale to SqCWD using North Coast water; agreements in place, and CEQA completed.	c. 2016
1.2M ◇	Larger Project: Understanding the feasibility of a potentially larger water transfer/exchange project with SqCWD and/or SVWD using North Coast and San Lorenzo River waters. Includes quantifying return water (using groundwater models) from SqCWD and/or SVWD to Santa Cruz as well as understanding of water rights and inter-agency collaboration.	c. 2018
1.3W/D □ △	Larger Project: Completion of agreements specifying terms of transfers to/from SqCWD and/or SVWD, water right modifications, planning/prelim design; complete assessments of cost, yield and schedule; and define CEQA. Decision point for proceeding on final design of associated infrastructure improvements.	c. 2019 c. 2020
1.4W □	Larger Project: Potential for return of water from SqCWD, and/or SVWD, to SCWD with the construction of infrastructure/treatment improvements.	c. 2022
1.5D/W △ ■	Assess in lieu performance: amount to SqCWD, SVWD, and SCWD; reduced groundwater pumping, groundwater elevations, etc.	c. 2025
Aquifer Storage and Recovery, ASR (Element 2) Includes evaluation of Purisima and Santa Margarita		
2.1M ◇	High level feasibility work: use of groundwater model; completion of site specific injection capacity and geochemical analyses; development of pilot program.	c. 2017
2.2D △	Completion of all administrative items to conduct pilot testing (e.g., CEQA/permits/agreements and well modifications), completion of pilot testing, and assessment of probable ASR system performance, cost and schedule to complete build out of ASR system.	c. 2020
2.3M/W ◇ □	Develop/construct ASR wells, ready to operate.	c. 2022
2.4D/W △ □	Assess ASR performance against projections and ability to meet project goals.	c. 2024
2.5W ■	Aquifer storage target attained (ability to sustain return flows to SCWD at desired levels).	c. 2027
Advanced Treated Recycled Water or Desalination (Element 3)		
3.1M ◇	Identify recycled water alternatives; increase understanding of recycled water (regulatory framework, feasibility, funding opportunities, public outreach and education)	c. 2016

3.2D △	Complete high level feasibility studies, as-needed demonstration testing, and conceptual level designs of alternatives;, define CEQA processes; and continue public outreach and education. Select preferred Element 3.	c. 2017
3.3D △	Preliminary design, CEQA (including preparation of draft EIR), and apply for approvals and permits (except building permit).	c. 2020
3.4M ◇	Complete property acquisition, final design, complete CEQA and all permits.	c. 2022
3.5W ■	Construction completed: plant start-up, water production begins	c. 2024

Abbreviations

ASR = Aquifer Storage and Recovery
CEQA = California Environmental Quality Act
DDW = Division of Drinking Water
DPR = Direct Potable Reuse
GHWTP = Graham Hill Water Treatment Plant
IPR = Indirect Potable Reuse
SCWD = Santa Cruz Water Department
SqCWD = Soquel Creek Water District
SVWD = Scotts Valley Water District

Notes

- This table is intended as a companion piece to the implementation Gantt chart and subway map. Gantt chart contains additional activity detail(s) for each node.
- Node types
  - D = decision node (triangle on subway chart)
  - M = milestone (diamond on the subway chart), furthering the understanding of feasibility.
  - W = water production potentially available (squares on the subway chart; open square indicates some water; solid square represents full goal being met).
- Node types have been assigned based on a set of assumptions as to how the implementation will proceed. However, if a threshold is being tripped, the node becomes a decision node regardless of its current designation.
- Ending Year refers to when all work associated with reaching node and/or achieving goal(s) will be accomplished. Dates shown are approximate based on current information and project understanding. Dates may adjust depending on: volumes of water available due to winter precipitation levels (which may limit amount of in lieu and ASR); ability to establish agreements, permits, etc.; and ability to implement workload.

As noted in earlier discussions, thresholds represent “special decision nodes” that can be reached by any Element, at any time.

(f) Guidance for Decision-Making at Decision Nodes

This section provides guidance for decision-making.

When a decision node on the adaptive pathway map is reached, or when the Plan or any Element appears it will fail to meet any threshold value at any time, the Committee’s Change Management Strategy recommends a “pause and assess” step. At this juncture, there are three basic kinds of decisions:

1. A decision to stay on the same path;
2. A decision to add another path or paths; or
3. A decision to switch to a different path or paths.

A decision to stay on the same path may include consideration of a range of actions. A decision to continue to the next phase in the Plan's development could involve, for example:

- Moving from preliminary engineering to design, or
- Expanding an element by deciding to make additional infrastructure investments, or
- Deciding not to put additional money into an element or approach that is struggling but to maintain the production already developed.

In general the possible decisions associated with the staying on the same pathway include:

- Start planning and/or pilot testing,
- Start preliminary engineering and/or regulatory and permitting processes,
- Start final design,
- Start construction,
- Build out or scale up,
- Stop further investment,
- Operate and maintain, and
- Stop pursuing altogether.

A decision to switch to a different path or paths may result from concluding that a particular task cannot be accomplished, for example not reaching agreement with other regional water providers for in lieu recharge, or from a failure to meet any threshold.

Recommended factors to be taken into account in decision-making about Plan implementation include the Guiding Principles as well as how well Plan Elements are performing relative to their Performance Metrics or Thresholds.

(i) Examples of Decision Guidance

This section provides several specific examples of decision guidance or special considerations for adjustments, adaptation or decision-making at specific decision nodes. Refer to Table 16 for details about decision nodes.

- **Element 1, Decision Node 1.3**
    - Build Out Element 1 – If agreements with one or more regional partners are reached, water rights issues have been resolved, assumptions about the availability of river flows are confirmed, and groundwater modeling indicates sufficient water will be returned to Santa Cruz in a cost-effective and timely manner, then proceed to build out water transfers up to the original design limits of Element 1, adding additional infrastructure as needed to optimize project effectiveness.

- Stop Element 1 – If no agencies choose to participate with the City in pursuing in lieu recharge, including return of sufficient stored water in a cost-effective and timely manner, the City will evaluate whether Element 1 should be pursued further or abandoned.

- **Element 2, Decision Node 2.2**
  - Build Out Element 2 – Use results of pilot testing and estimates of cost-effectiveness and schedule for final system build-out to decide whether to continue implementing ASR up to the original design limits of Element 2.
  - Stop Element 2 – Consider stopping Element 2 if the solution is not working within acceptable performance parameters, for example, something systemic to the aquifer appears to make too many test sites unsuccessful in effecting aquifer recharge, or costs greatly exceed budget, or the schedule for final build-out exceeds the target completion date, and other Elements can meet or exceed their performance parameters, such that the Plan can meet its goals without Element 2.
- **Element 3, Decision Node 3.2** – Select preferred approach for Element 3 (e.g., DPR, IPR, desalination), initiate high level feasibility studies, as needed demonstration testing, and conceptual designs, define CEQA process; continue public outreach and education, and select preferred alternative.
  - Start Preliminary Design Engineering and Regulatory Process for selected Element 3 – (start work outlined in 3.3). Initiate preliminary design, prepare a draft EIR, and continue public discussions about the selected Element 3. This effort involves activity up to, but not including, site acquisition, final design and EIR (Draft EIR only at this stage). A key goal of the work would be to have Element 3 ready to go into the final design stage at node 2.2.
  - Stopping Element 3 -- Decide to stop or pause Element 3 if other Elements can meet or exceed their performance parameters, such that the Plan can meet its goals without Element 3.

As each decision is made, thresholds, performance metrics developed for each Strategy and/or Element, including budget, schedule, and yield, objective results-oriented measures, would be reviewed and changes made either within the **Adjustment** framework by the Water Department, or within the **Adaptation** framework in collaboration with the Water Commission and under the direction of the City Council. In both cases, communication about progress, issues, and actions would be open, frequent and data-based.

Section 3.25 Article III Summary – listing of all Committee Agreements

As indicated in Section 2.02, the Committee chose to use a consensus based decision-making process during its work. All Agreements presented in this section and elsewhere in this document were reached using this consensus process.

(a) Committee Agreements on Demand Forecasts

At the Committee's April 30 – May 1, 2015 meeting they agreed that the interim forecast would be used as the basis for the Committee's work until the results of the econometric forecast became available.

At its July 23, 2015 meeting, the Water Supply Advisory Committee agreed to use the econometric demand forecast as presented by David Mitchell of M Cubed Consulting at this meeting.

On September 10, 2015, the Committee accepted a revised forecast that corrected an error in the way that future plumbing and building code changes were incorporated into the forecast. Figure 4 above, reflects the revised, corrected forecast.

(b) Committee Agreement on Fish Flow Releases

On April 30, 2015, the WSAC agreed that, for planning purposes, using the DFG-5 flows as an upper bound or the potential impacts of fish flow releases on Santa Cruz's water system made the most sense. If the ultimate negotiated flow releases are lower, then the supply demand gap will be smaller and those results can be incorporated into future planning for supply augmentation.

(c) Committee Agreement on Climate Change

On April 30, 2015, the WSAC agreed that the Climate (hydrologic) Change and Extended Drought scenarios provide plausible parameters to use in its water system planning and that this analysis provides a useful point of depart for its scenario planning work. For planning purposes, the Committee agreed that the eight-year drought sequence was useful as a design drought, and recognized that this drought sequence would be reviewed and revised as new information became available.

(d) Committee Agreement on Problem Statement

On September 11, 2015, the Committee Agreed to the following formal problem statement:

> *Santa Cruz's water supply reliability issue is the result of having only a marginally adequate amount of storage to serve demand during dry and critically dry years when the system's reservoir doesn't fill completely. Both expected requirements for fish flow releases and anticipated impacts of climate change will turn a marginally adequate situation into a seriously inadequate one in the coming years.*
>
> *Santa Cruz's lack of storage makes it particularly vulnerable to multi-year droughts. The key management strategy currently available for dealing with this vulnerability is to very conservatively manage available storage. This strategy typically results in regular calls for annual curtailments of demand that may lead to modest, significant, or even critical requirements for reduction. In addition, the Santa Cruz supply lacks diversity, thereby further increasing the system's vulnerability to drought conditions and other risks.*
>
> *The projected worst-year gap between peak-season available supply and demand during an extended drought is about 1.2 billion gallons. While aggressive implementation of conservation programs will help reduce this gap, conservation alone cannot close this gap. The Committee's goal is to establish a reasonable level of reliability for Santa Cruz water customers by substantially decreasing this worst-year gap while also reducing the frequency of shortages in less extreme years.*

(e) Committee Agreement on the List of Alternatives Considered but Not Being Pursued at this Time

At its September 10, 2015 meeting the WSAC, the Committee approved the information in Appendix 5 as its conclusions about the alternatives it evaluated and its reasons for not further pursuing these alternatives at this time.

(f) Committee Agreement about Demand Management (Conservation)

At the Committee's meeting of September 10, 2015, the Committee agreed to the recommendations related to demand management described in Section 3.16(a) of this report.

(g) Committee Agreement on Supply Augmentation Strategies

At its September 10-11, 2015 meeting, the Committee agreed to the following Supply Augmentation Strategies:

1. **Strategy One**: Development of groundwater storage using a combination of both passive and active recharge approaches and available surface water flows during the rainy season; and
2. **Strategy Two**: Development of advanced treated recycled water or desalinated water if and as needed to address any remaining supply-demand gap.

(h) Committee Agreement on Elements of the Water Supply Augmentation Plan

At its September 10-11, 2015 meeting, the Committee agreed to the following Elements of the Water Supply Augmentation Plan:

Element 0: Demand Management, with a goal to generate an additional 200 to 250 million gallons of demand reduction by 2035 from expanded water conservation;

Element 1: In Lieu, start quickly as a small program relying on existing infrastructure to provide potable water to the SqCWD. The program is intended to grow over time, if/as additional infrastructure is developed, additional agreements are reached with SqCWD and SVWD, and any needed changes to water rights are granted by the State of California. Details of sharing capital and operating costs would and how much water returns to Santa Cruz and when it would be available would be addressed in these agreements.

Element 2: Aquifer Storage and Recovery (ASR), involves development of a program to inject treated water from available winter flows into regional aquifers and recover a large portion of the stored water as a supplemental supply for Santa Cruz. This program would proceed through evaluation and piloting steps as detailed in technical reports (e.g., the May 2015 Pueblo Water Resources report) and, if successful, can be implemented on a scale sufficient to meet the yield goals of this Plan.

Element 3: Advanced Treated Recycled Water, is intended to supplement or replace Elements 1 and 2 to the extent they do not generate sufficient yield to fill the supply/demand gap in a cost-effective and timely manner, as stipulated in the Plan. In the event advanced treated recycled water could not meet the needs, desalination would then become Element 3.

In addition to developing Elements 0, 1, 2 and 3 above, the Committee suggests that the City should continuously review and take steps to address infrastructure and operating constraints that are keeping the existing system from performing as well as it could, within reason. Some specific suggestions are included in the recommendation section of this report.

(i) Committee Agreement on a Staggered Implementation Adaptive Pathway

At its September 30, 2015 meeting, the Committee agreed that implementation of the Water Supply Augmentation Plan should use a staggered approach that would include active pursuit of Strategy One at the same time as initial project planning and development work is occurring on Strategy Two. This approach is designed to ensure that should Strategy Two be needed as a water supply, enough work would have been done so that it will be feasible to achieve the yield goal within the original 10 to 12 year timeframe.

(j) Committee Agreement on a Change Management Strategy

At its October 2, 2015 meeting, the Committee agreed to the Change Management Plan presented in Section 3.24.

(k) Committee Agreement on Conveyance of Recommendations to the Santa Cruz City Council.

At its October 2, 2015 meeting, the Committee agreed to convey the Recommendations in Article IV of this report to the Santa Cruz City Council.

(l) Committee Agreement on the WSAC Agreement

Eleven of the 14 WSAC members were present at the October 2, 2015 meeting. By consensus (including proxies for two of the absent members) the Committee unanimously affirmed and approved the Agreements and Recommendations described in this report. The Committee's consensus reflects the strong commitment of the parties to move forward with addressing and ultimately resolving the community's long-standing water supply issues.

Article IV. Recommendations

Section 4.01 The Water Supply Augmentation Plan

The Committee has worked on developing a Plan that would eliminate future water shortages by 2025, give or take two years, while allowing for robust stream flows to support and enhance fish habitat.

The agreed-upon **Water Supply Augmentation Plan** (Plan) includes:

1. A **specific goal for Yield**, as well as the assumptions underlying this goal;
2. A **Timeframe** for improving the reliability of the Santa Cruz Water Supply;
3. The **Water Supply Augmentation Plan Elements**;
4. An **Adaptive Pathway** to provide a structure within which work on the Elements can be pursued and evaluated; and
5. A **Change Management Strategy** to guide adjustments and adaptations within the Plan, as described below.

Section 4.02 Yield Goal

The Committee recommends the City implement additional demand management and supply augmentation programs and projects and address key infrastructure and operating constraints to reliably make available an additional 1.2 bgy during modeled worst-year conditions.

Section 4.03 Timeframe for Improvement

The Committee recommends that the City adopt a goal of completing the improvements to Santa Cruz's water supply necessary to meet the specified yield goal by the end of 2025;

Section 4.04 Water Supply Augmentation Plan Portfolio Elements

The Water Supply Advisory Committee recommends that the City Council adopt a portfolio of measures for improving the reliability of the water supply. The recommended package includes the following Elements:

- **Element 0:** Additional water conservation with a goal of achieving an additional 200 to 250 million gallons of demand reduction by 2035 by expanding water conservation programs;
- **Element 1:** Passive recharge of regional aquifers by working to develop agreements for delivering surface water as an in lieu supply to the Soquel Creek Water District and/or the Scotts Valley Water Districts so they can rest their wells, help the aquifers recover, and effectively store water for use by SCWD in drought years;
- **Element 2:** Active recharge of regional aquifers by using existing infrastructure (wells, pipelines, and treatment capacity) and potential new infrastructure (wells, pipelines and treatment capacity) in the regionally shared Purisima aquifer in the Soquel-Aptos basin and/or in the Santa Margarita/Lompico/Butano aquifers in the Scotts Valley area to store water that can be available for use by Santa Cruz in drought years;

- **Element 3:** A potable water supply using advanced treated recycled water as its source, as a supplemental or replacement supply in the event the groundwater storage strategies described above prove insufficient to meet the Plan's goals of cost effectiveness, timeliness or yield. In the event advanced treated recycled water does not meet the needs, desalination would then become Element 3.

Section 4.05 WSAC Value Statement on Implementing Plan Elements

The recommended Water Supply Augmentation Plan reflects the Committee's preference for pursuing a groundwater storage and retrieval strategy provided the yield goal can be achieved in a cost-effective and timely manner. Before making a choice to move away from groundwater storage, the Committee recommends that the City diligently pursue all reasonable measures to make the groundwater strategies work.

Recognizing the cost differential between some of the strategies the Committee considered in developing its recommendations, the WSAC agreed to express its preference for the Strategy One, groundwater storage and retrieval, over Strategy Two, and has agreed that as long as the ACAYY for implementing Strategy One is not more than 130% of the ACAYY for Strategy Two, while still meeting other metrics, Strategy One should be pursued.

Section 4.06 Adaptive Pathway Implementation Strategy

The Committee recommends that the Council adopt a staggered Adaptive Pathway to guide implementation of the Plan and that decision-making at the various decision-nodes identified in this Adaptive Pathway be guided by the provisions of the Change Management Strategy.

Section 4.07 Change Management Strategy

The Committee recommends that the Council adopt the Change Management Strategy described in Section 3.24.

Section 4.08 Additional Recommendations Related to Infrastructure and Operating Constraints

(a) Infrastructure Constraints

The Committee also supports the Water Department's plans to address certain key infrastructure constraints that are keeping the City from fully utilizing available water, especially during the high flow season. These include, but are not limited to:

- Rehabilitation of the pipeline between the Felton Diversion and Loch Lomond that would allow the City to increase diversions to Loch Lomond during the high flow season;
- Evaluation of additional pumping capacity at Felton to push more water to Loch Lomond through the replacement pipeline; and
- If proven cost-effective, and needed for the implementation of Strategy One, complete improvements that will allow the Department to treat water with turbidities that are higher than can be effectively treated by the current Graham Hill Water Treatment Plant facilities and

processes. The specific method for how to address the water treatment constraint should include evaluating a range of potential options, including, but not limited to Ranney Collectors or satellite treatment plants, and choosing the most cost-effective approach.

(b) Operating Constraints

Another focus of the Committee's review relates to some system operational constraints. Operating constraints typically include both daily parameters for drawing water from the City's sources and operating constraint parameters that are used in modeling system performance.

The Committee recommends that the Water Department identify and regularly evaluate operating constraints to determine whether those constraints continue to be justified as necessary to protect the system and finished water quality and to support efficient and cost-effective operations. Early focus should be given to issues related to Loch Lomond year-end carry over storage requirements, particularly if/when in lieu and/or ASR have provided a sufficient drought supply, and to the "first flush" constraint impacting the City's ability to pump water from Felton to Loch Lomond under critically dry year conditions.

Section 4.09 Implementation Plan and Timeline

As part of the process for developing the WSAC Agreement, City Staff and the technical team developed a Gantt chart shown in Figure 12. This Gantt chart, together with the Decision Node Table (Table 16) and the Staggered Adaptive Pathways Map (Figure 11) comprise the Implementation Plan and Timeline.

Figure 12 – Gantt Chart: Implementation Plan and Timeline

Figure 12 Gantt Chart
Implementation Plan and Timeline

	Node	Activity	Duration (years)	2016 Year 1	2017 Year 2	2018 Year 3	2019 Year 4	2020 Year 5	2021 Year 6	2022 Year 7	2023 Year 8	2024 Year 9	2025 Year 10	2026 Year 11	2027 Year 12
				Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1/2 Q3/4	Q1/2 Q3/4	Q1/2 Q3/4
strategy 1	Element 1 - In lieu	Both near term with SqCWD using North Coast & lareger project with SqCWD & SVWD using SLR water													
	1.1D	Near term: Develop Agreements, Complete CEQA, Resolve any Infra. Issues	0.5	1.1											
	1.2M	Evaluate larger project(s) with other agencies; affirm return water volumes & water rights	3			1.2									
	1.3W/D	Completion of agreements, water rights, planning/prelim design, siting study & CEQA	1					1.3							
	1.4W	Infrastructure Improvements (see below for potential projects) & return water to SCWD	4							1.4					
	1.5D/W	Assess performance	NA										1.5		
	Element 2 - ASR (City, SqCWD and/or SVWD, i.e., Purisima & SM) + shared infrastructure (in lieu & ASR)														
	Phase 1 2.1M	Complete & use groundwater model	0.5-2												
	Higher-level Feasibility	Identify/select existing wells for potential pilot testing	0.25												
		Perform site specific injection capacity & geochemical analyses	0.5												
		Develop Pilot Program & identify potential sites for new ASR well(s)	0.75			2.1									
	Phase 2 2.2D	Retrofit existing wells	0.25												
	Pilot Testing	Perform injection well hydraulic testing	0.25												
		ISR cycle testing	1-2					2.2							
		Develop ASR program	1												
	Phase 3 2.3M/W	Procure properties	1												
	Implementation	Design Project (includes City Administration)	1												
		CEQA	0.5												
		Construct	1.5							2.3					
	2.4D/W	Assess performance	2									2.4			
	2.5W	Storage target achieved	NA												2.5
	Infrastructure Improvements for Long term in lieu and/or ASR														
		Design/build pipeline in Santa Cruz to Beltz Wells	1.5												
		Tait Street Diversion Improvements	3												
		Graham Hill WTP Improvements	4												
		Design & build Soquel Creek transfer (back), Scotts Valley transfer (to) infrastructure	2												
		Pump Station (Soquel to City)	1.5												
		Intertie No. 1 Pipeline (City to Scotts Valley)	2												
		Pump Station (City to Scotts Valley) Intertie No. 1	2												
strategy 2	Element 3 - Advanced Treated Recycled Water or Desalination														
	3.1M	Define Recycled Water project alternatives and status of DPR regulations	1	3.1											
	3.2D	Select preferred Element 3	1		3.2										
	3.3D	Prelim design, CEQA (prepare Draft EIR), permits	3					3.3							
	3.4M	Complete Design , CEQA, permits, property acquistion	2							3.4					
	3.5W	Complete construction/start up	2										3.5		

These items will be evaluated along with Elements 1 and 2 and implemented as needed.

Table Notes & Select Assumptions

This table approximates activities, costs, durations and sequencing of each element, all of which are subject to change.
Elements are shown to start in Q1 - 2016. This may or may not occur depending upon agreements, contracts, etc.
Rehab/replacement of the Newell Creek Pipeline is part of the existing CIP and not shown here.
Some infrastructure improvements may not be required if other pursuits are successful. E.g., evaluation of Ranney collectors may substitute GHWTP Improvements.
CEQA is used generically, implies compliance with Califorina Environmental Quality Act.
Pilot ASR work assumes major infrastructure not required. E.g., intertie to Scotts Valley or new well(s).
Element 2 includes 8 wells for in lieu plus 8 additional wells for ASR.

Legend

ASR = Aquifer Storage and Recovery
CEQA = California Environmental Quality Act
DDW = Division of Drinking Water
DPR = Direct Potable Reuse
EIR = Environmental Impact Report
GHWTP = Graham Hill Water Treatment Plant
IPR = Indirect Potable Reuse
ISR = Injection, Storage, Recovery
SCWD = Santa Cruz Water Department
SqCWD = Soquel Creek Water District
SVWD = Scotts Valley Water District

△ Decision Node
◇ Milestone Node
□ Some amount of water returned to SCWD
■ Full required amount of water returned to SCWD

Appendix 8
Cost Data and Cost Analyses

Overview

This Appendix describes key activities undertaken by City staff and the project technical team to support the Water Supply Advisory Committee (WSAC or Committee) as it evaluated alternatives and later defined the recommended water resources plan and associated costs (capital, operations and maintenance [O&M], and present value).

Progression: Ideas to Building Block Development to a Robust Adaptive Program

Figure A8-1 presents an overall flow schematic for the progressive development that moved from public and staff ideas offered at the Strategies and Ideas Convention (October 2014), through consolidated alternatives (CAs) to building blocks (BBs), portfolios, and final elements and strategies.

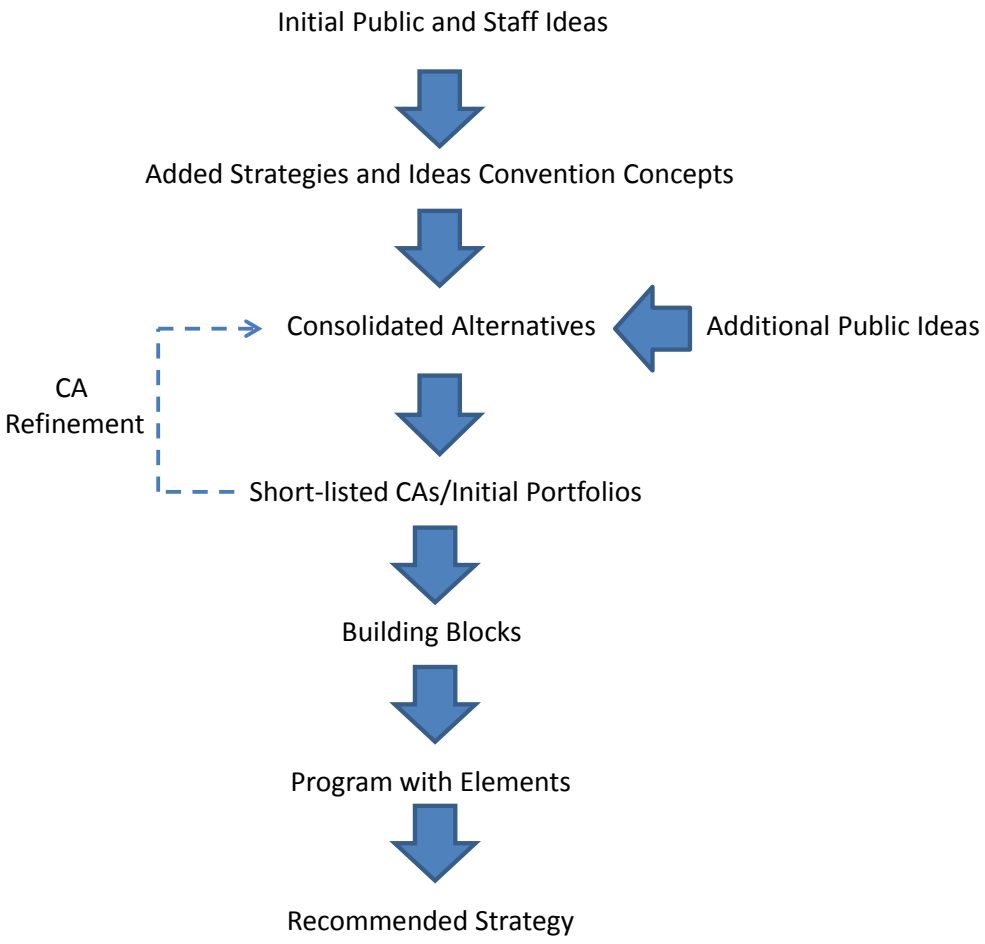


Figure A8-1 Overall flow schematic for the progressive development of the Proposed Water Supply Program

The April/May 2015 WSAC meeting marked the start of the modeling of the manner in which supply/ infrastructure alternatives address the reliability issues identified to that point. Analyses were performed on the following Consolidated Alternatives (CAs):

- Harvesting Winter Flows (CA-9, CA-16, CA-18)
- Ranney Collectors and Additional Storage (CA-19)
- North Coast Reclaimed Water Exchange (CA-13)
- Indirect Potable Reuse (CA-10)
- Additional Water Conservation (Program CRec) (CA-03)

By the June 2015 WSAC meeting, the Consolidated Alternatives considered above had evolved into several portfolios. All of the portfolios included the CRec conservation programs (CA-3). In addition, each portfolio included a Plan A and a Plan B. The initial supply/infrastructure additions represented by Plan A depended in whole or in part on storing excess winter flows in groundwater aquifers. The Plan B additions consisted of drought-proof supplies that did not vary with streamflow.

The portfolios were refined in several iterations, and the final set that was discussed at the June meeting was intended to enable the Committee to wrestle with different adaptive approaches to dealing with the uncertainties associated with all of the alternatives, particularly the abilities of the regional aquifers to store and allow recovery of significant volumes of water. Resolution of these uncertainties requires a robust program of groundwater modeling, analysis, and testing, and the portfolios recognized the significant risk of simply relying on the Plan A alternatives.

Based on WSAC discussions around these potential portfolios assembled from parts of the CAs, City staff and the Project Team developed BBs that WSAC combined into its preferred/recommended Elements. In this process, CAs were refined and consolidated into BB portfolios that could accomplish key water production, transfer and return goals. Elements from the BB portfolios were then extracted and further refined as separate potential projects. These elements were as follows:

1. In lieu recharge to Soquel Creek Water District (SqCWD) and Scotts Valley Water District (SVWD),
2. ASR as a supplement or in place of in lieu recharge to SqCWD and SVWD, and
3. Advanced Treated Recycled Water or Desalination.

The Elements form an adaptive program that the City, likely with cooperation with adjacent agencies, will implement and modify based on relative success of the Elements. Attachment 1 presents a summary of the recommended elements, including estimated capital costs, energy use, yield, etc., of the Elements in this Plan. Attachment 2 is a Gantt Chart timeline for

implementation. Attachment 3 is the companion piece describing the decision points and milestones. And Attachment 4 includes the three subway diagrams that can be used with the other attachments to understand in the implementation plan.

Key Physical Components

The City plans to use existing facilities wherever possible and build new facilities as needed to augment its existing supply. Key existing components include:

- The City's diversions (North Coast streams and San Lorenzo River via Tait Street and Felton),
- Beltz Wells,
- Loch Lomond Reservoir,
- Graham Hill Water Treatment Plant (GHWTP),
- Associated storage and conveyance infrastructure (raw water and treated water pipelines, pumping stations and distribution system reservoirs),
- The City's wastewater treatment plant (WWTP) and ocean effluent outfall.

Potential new facilities include:

- Upgrades to the GHWTP,
- Modifications to diversions (e.g., Ranney collectors and/or upgraded Felton and Tait Street facilities, and replacement of the pipeline from Felton Pump Station to the Newell Creek Dam/Loch Lomond),
- New wastewater effluent advanced purification facilities (likely at the WWTP),
- Replacement or addition of new infrastructure (both within the City and connecting to/within the Soquel Creek Water District and Scotts Valley Water District), and
- New wells within the City, Soquel Creek Water District (SqCWD), and/or Scotts Valley Water District (SVWD).

The diagrams in Figures A8-2, A8-3, and A8-4 show examples of how the pieces could fit together into functioning systems.

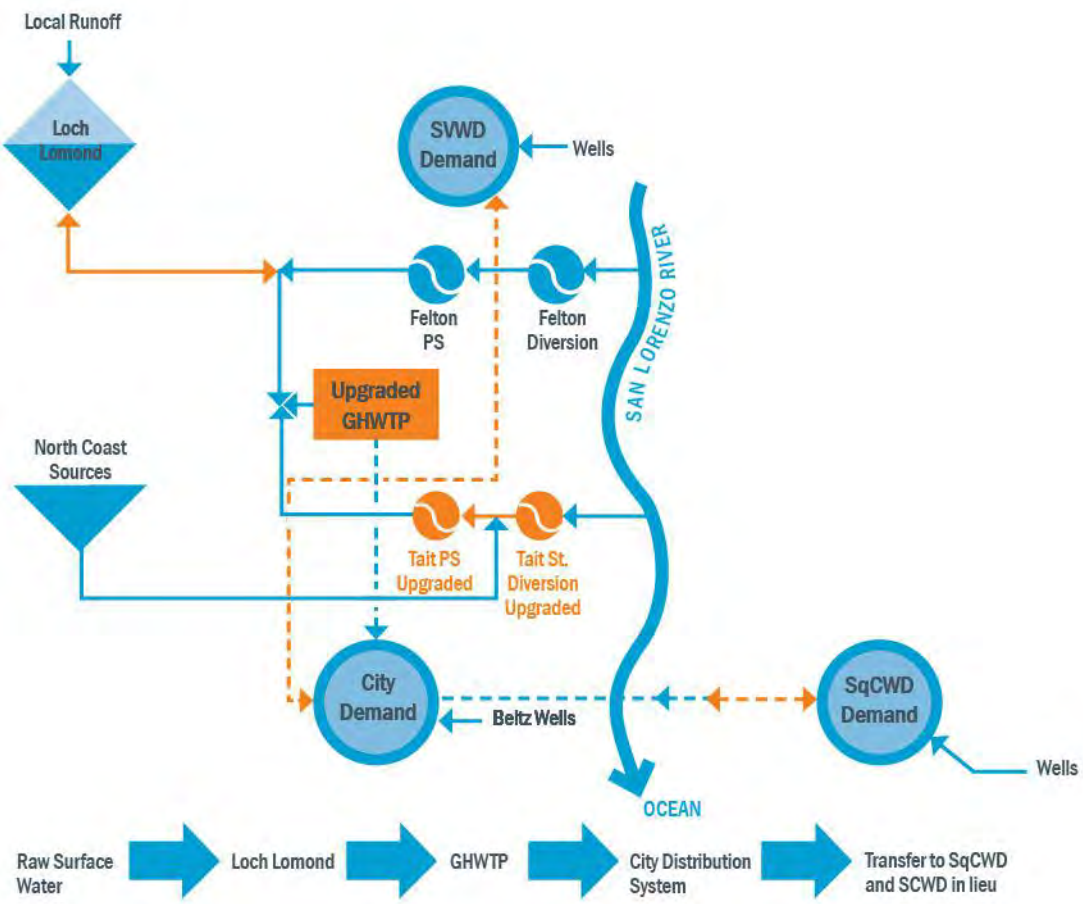


Figure A8-2. Illustration of the Conceptual Approach for Element 1, In lieu Recharge

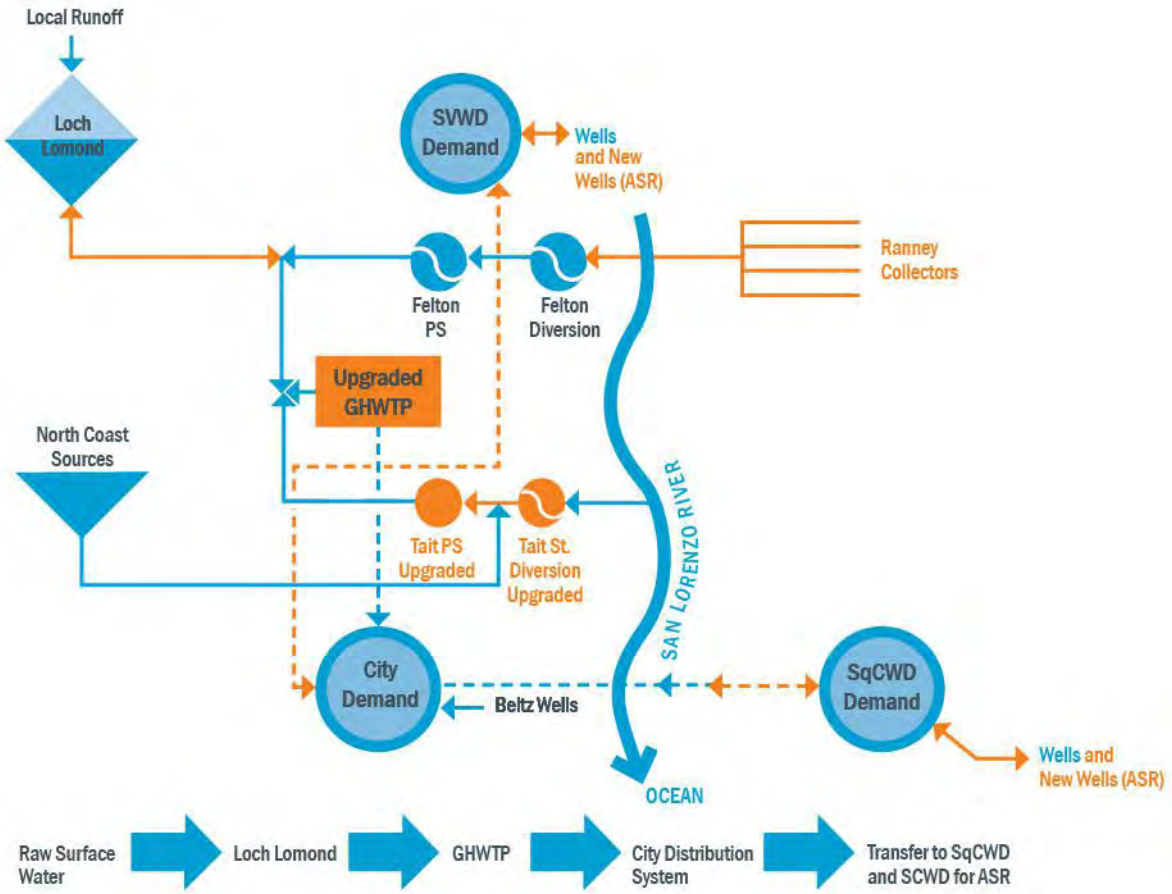


Figure A8-3. Illustration of the Conceptual Approach for Element 2, ASR.

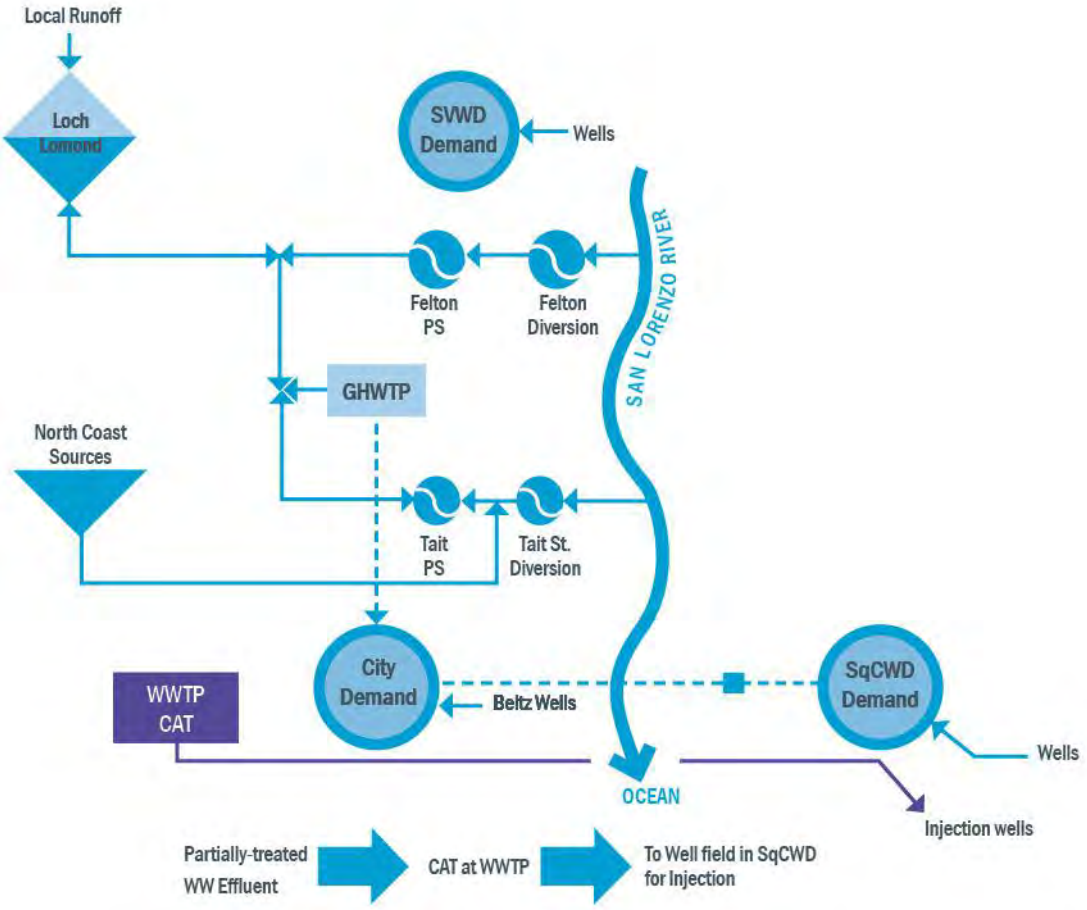


Figure A8-4. Illustration of the Conceptual Approach for Element 3a, Potable Reuse via Groundwater Recharge—i.e., Indirect Potable Reuse

Cost Estimating

The technical team developed costs (capital, operations and maintenance [O&M] and present value) at several stages of potential program component development**.** All costs, from the Portfolio stage through the original Building Block concepts (which were expanded on by committee members) to the final Recommended Project Elements were based on the conceptual-level construction and operating costs on project components like those shown in the schematics above. Information available in previous technical studies conducted by the City, Santa Cruz County, SVWD, and SqCWD and previous projects/studies by Brown and Caldwell (BC) were used to inform this work. For example, the 2015 Pueblo ASR report informed the development of the ASR well number and cost estimates; the new conveyance between Soquel Creek Water District and the City is based on the alignment for a potential intertie and pump station developed for the City by Kennedy Jenks; and the treatment train concept for this work was based on the most exhaustive complete advanced treatment (CAT) process being piloted in California as of Summer 2015: nitrification of the wastewater

effluent—ozone with biologically active carbon (O_3/BAC)—microfiltration (MF)—reverse osmosis (RO)—advanced oxidation ultraviolet light with peroxide (UV-AOP) conditioning of the product water, as illustrated in Figure A8-5. This process train is very robust since regulations for potable reuse via reservoir augmentation and direct reuse are still in flux and the City may wish to pursue one of these options. The more robust process train also responds to concerns expressed by citizens at WSAC meetings. The proposed train would ensure a greater removal of constituents such as emerging contaminants of concern (e.g., pharmaceuticals).

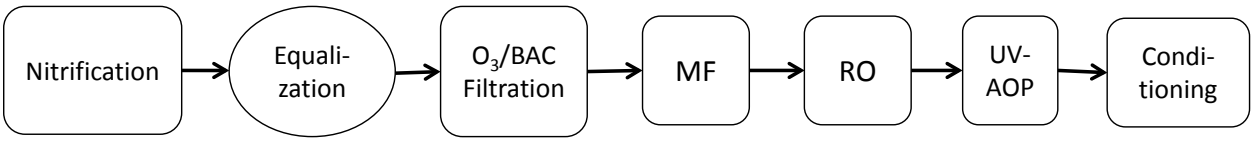


Figure A8-5. Illustration of the CAT Conceptual Approach for Element 3a, Potable Reuse

Table A8-1 below describes the final project elements. The cost estimates for Elements 1, 2 and 3 all contain a range of uncertainty. For example, while it is possible that the final cost for implementing Strategy 1 may be substantially less, it is also possible the costs may be more. Focusing only on Strategy 1, the factors that may lead to lower costs include the following:

1. It is beyond the scope of the WSAC to recommend the actual design of these Elements. For example, in lieu recharge (Element 1) might be implemented in many different ways, depending on the interests of neighboring districts, the constraints of water treatment, the constraints of existing distribution pipelines, etc. Similarly, direct injection (Element 2) may be conducted by the City alone, or in conjunction with neighboring districts, focused on one aquifer strata, or focused on several strata, etc. I.e., there are many unknowns that must be answered to define the final project.
2. The Project Elements Summary does not include the revenue from sale of water to neighboring districts, or other means of potential cost-sharing. It is premature to estimate that cost sharing contribution or possible revenues back to Santa Cruz.
3. The cost of upgrade of GHWTP, $62 million, is the largest single line item on the Gantt Chart. The purpose of this expenditure is to allow treatment of more winter water from the San Lorenzo River for the purpose of maximizing Elements 1 and 2. To be able to produce and deliver more water in the winter, we may need to deal with water with turbidity levels that are beyond that which can be effectively treated by the GHWTP. Lower cost options for addressing this purpose may be available and include: a) using existing GHWTP treatment capacity, b) constructing a Ranney Collector to reduce turbidity, and/or c) installation of a small-scale satellite treatment plant. The information needed to assess the feasibility of these alternatives is currently

unavailable. A principal piece of needed data is an understanding of the current GHWTP's ability to treat water at the quality and quantity needed for Elements 1 and 2, followed by an understanding of the most cost-effective way of meeting treatment goals associated with these elements where the GHWTP might fall short.

4. The cost of upgrading the Tait St. Diversion, $14 million, is included in the cost estimate and is a placeholder for achieving increased diversion capacity on the San Lorenzo River for the purposes of maximizing Elements 1 and 2. However, with the City adoption of the aquifer recharge strategy and the completion of a Habitat Conservation Plan, the expectation is that state and federal fisheries agencies will remove their long-standing protest of the City's water rights application to use Felton Diversion for direct pumping to Graham Hill Treatment Plant. State approval of this water rights revision may allow the City to use the Felton Diversion for additional winter water diversion, rather than expand the Tait St. Diversion.
5. Current calculations are based on a 30-year life-cycle and do not account for residual value in capital expenditures beyond 30 years. Longer-lived infrastructure, such as pipelines between Santa Cruz and neighboring districts, likely has value that is not included in the cost accounting.
6. Costs could be significantly greater in order to generate yield sufficient to meet the gap, e.g., final pipeline routes could be longer or geological conditions could require more injection wells.
7. Strategy 1 will be implemented in incremental fashion. Initial expenditures are intended to define the project(s) and its feasibility at meeting the Plan's goals in the most cost effective way possible. Subsequent expenditures would be made based on feasibility and cost effectiveness with little risk of creating stranded assets.

Table A8-1. Project Element Capital Cost Components and Assumptions

Element Number/Type	Capital Cost Components	Basis for Assumptions
1 – In lieu	<u>Existing Infrastructure Improvements</u> • Tait Street Diversion Improvements • Graham Hill WTP Improvements <u>Pumps and Pipelines</u> • 3,600 gpm Pump Station (City to Scotts Valley)at Intertie No. 1 • 16-inch Intertie 1 Pipeline (City to Scotts Valley), 3,600 linear feet (LF) • 3,600 gpm Pump Station (Soquel to City) at SqCWD Intertie • 16-inch Intertie Pipeline (City to Soquel Creek), 25,000 LF <u>Wells</u> • 4 350-gpm extraction wells in SVWD • 4 350-gpm extraction wells in SqCWD • Iron & manganese treatment, 8 wells • Land acquisition for wells, 4 sites in SqCWD and 4 sites in SVWD	• In lieu is based on winter demands for SqCWD and SVWD. • Water could be transferred to wells within the City, to SqCWD, and to SVWD. • Infrastructure is sized to accommodate 2.5-mgd (million gallons per day) peak flow between the City and SVWD and between the City and SqCWD. This sizing is to allow inclusion additional flows for ASR in the future. • The ultimate number and distribution of wells between agencies will be determined during project development. • The Tait Street and GHWTP improvements are based on current information that indicates that these facility upgrades are needed to treat a larger volume of higher turbidity water. This will be better defined moving forward. • It is assumed that the wells will all have a peak extraction flow rate of 350 gpm. • It is assumed that on-site iron and manganese treatment will be needed at each well. • Well footprints are estimated at 0.1 acre each. •
2 – ASR	<u>Pumps and Pipelines</u> • In-City pipeline to Beltz Wells, 4,000 LF <u>Wells</u> • 2 350-gpm Wells in SVWD)	• ASR is based on the assumption that there is adequate capacity in the basin to store and produce water as supplied from available winter flows. It is also assumed that early project activities will include field work to evaluate the validity of these initial assumptions (i.e., how well ASR is likely to work in terms of both storage capacity and future yield). • The project elements for the ASR program build on the project elements already developed in

	• 2 350-gpm Wells in SqCWD • 4 350-gpm Wells in Santa Cruz • Iron & manganese treatment, 4 wells • Land acquisition, 0.1 ac. each in SVWD and SqCWD	Element 1. • Water could be transferred to wells within the City, to SqCWD, and to SVWD. • Infrastructure is sized to accommodate 2.5-mgd peak flow between the City and SVWD and between the City and SqCWD. • The ultimate number and distribution of wells between agencies will be determined during project development. • It is assumed that the wells will all have a peak injection flow rate of 250 gpm and a peak extraction flow rate of 350 gpm. • It is assumed that on-site iron and manganese treatment will be needed at each well. • Well footprints are estimated at 0.1 acre each.
3 – Indirect potable reuse via groundwater recharge	CAT Process • Nitrification (3.9 mgd) • Ozone/BAC Filters (3.9 mgd) • Microfiltration (3.9 mgd) • Reverse Osmosis (3.5 mgd) • Advanced Oxidation (Peroxide + UV) (3.0 mgd) • Conditioning Facilities (3.0 mgd) • Effluent Diffuser Modification <u>Pumps and Pipelines</u> • 2,700 gpm Pumping System—WWTP to CAT • Pipeline Installation—WWTP to CAT, 200 LF • Equalization Basin, 0.5 million gallons • 2,100 gpm Pumping System—WWTP to Soquel Creek • 16-inch Pipeline to Wells, 20,100 LF • 16-inch Pipeline under San Lorenzo River, 350 LF • 16-inch Pipeline Under Woods Lagoon, 445 LF	• Potable reuse capacity is designed for 3-mgd product water 365 days a year based on treating only City of Santa Cruz flows. (I.e., conservatively assuming raw sewage and/or effluent from SqCWD and SVWD was unavailable.) • Infrastructure for potable reuse treatment is identical for all potable reuse alternatives. Treatment is on-site at the WWTP. Costs to treat blended water at GHWTP not included (~$2.7M/yr for 3 mgd daily flow) • Groundwater recharge is assumed to occur near the coast.

	• 16-inch Pipeline Installation—transmission line to well 1, 2,640 LF • 14-inch Pipeline Installation— well 1 to well 2, 2,640 LF • 12-inch Pipeline Installation— well 2 to well 3 to well 4, 5,280 LF • 10-inch Pipeline Installation (WWTP to wells 5-6, 10"), 5,280 LF • 8-inch Pipeline Installation—well 6 to well 7, 2,640 LF • 6-inch Pipeline Installation—well 7 to well 8, 2,640 LF <u>Wells</u> • 8 350-gpm Injection Wells at SqCWD	
4 – City desalination	• City Desalination Plant Capital Cost (from earlier Santa Cruz work) • Effluent Outfall Modifications	• The City desalination option capacity is 3 mgd product water 365 days a year. • Cost includes property rights acquisition. • Water from the facility would be added in at Bay Street has been added (instead of into the distribution system at a lower point).

Capital Costs.

The capital cost estimates represent an order-of-magnitude (AACEI Class 5) approach. For an order of magnitude estimate the planners, hydrogeologists and engineers have defined major project components (see examples above), estimated approximate required capacities, established preliminary design criteria, and selected rough locations for facilities and routings for connection infrastructure such as pipelines. BC used capital cost information from other similar projects (for example, City of San Diego Pure Water and Orange County Sanitation District/Orange County Water District Groundwater Replenishment Supply—GWRS) and many Northern California pumping stations and pipelines from previous BC planning and design assignments. Pueblo Water Resources supplied information about well construction costs. In terms of costs, Class 5 planning-level estimates, which include a 50 percent contingency factor, are also accompanied by an accuracy range of -30% to +50%. For example, a project presented with a $100M cost including contingency allowance ($66.7 million plus $33.3 million = $ 100 million) likely would have a final cost between $70 million and $150 million. Table A8-2 and Figure A8-6 below summarize the AACE Estimate Classification System.

Table A8-2 AACE Estimate Classification System, adapted from AACE RP No. 18R-97, *Cost Estimate Classification System – As Applied in Engineering, Procurement and Construction for the Process Industries* (1998)

Estimate Class	**Primary Characteristic**	**Secondary Characteristic**			
	Level of Project Definition (% complete)	**End Use**	**Methodology**	**Expected Accuracy Range** (Typical variation in low and high ranges)	**Preparation Effort** (Typical degree of effort relative to least cost index of 1)
Class 5	0-2%	Concept Screening	Capacity factored, parametric models, judgement or analogy	L: -20% to -50% H: +30% to 100%	1
Class 4	1-15%	Study or Feasibility	Equipment factored or parametric models	L: -15% to -30% H: +20% to +50%	2 – 4
Class 3	10-40%	Budget Authorization or Control	Semi-detailed unit costs with assembly-level line items	L: -10% to -20% H: +10% to +30%	3 – 10
Class 2	30-70%	Control or Bid/Tender	Detailed unit cost with forced detailed take-off	L: -5% to – 15% H: +5% to 20%	4 – 20
Class 1	50-100%	Check Estimate or Bid/Tender	Detailed unit cost with detailed take-off	L: -3% to – 10% H: +3% to 15%	5 - 100

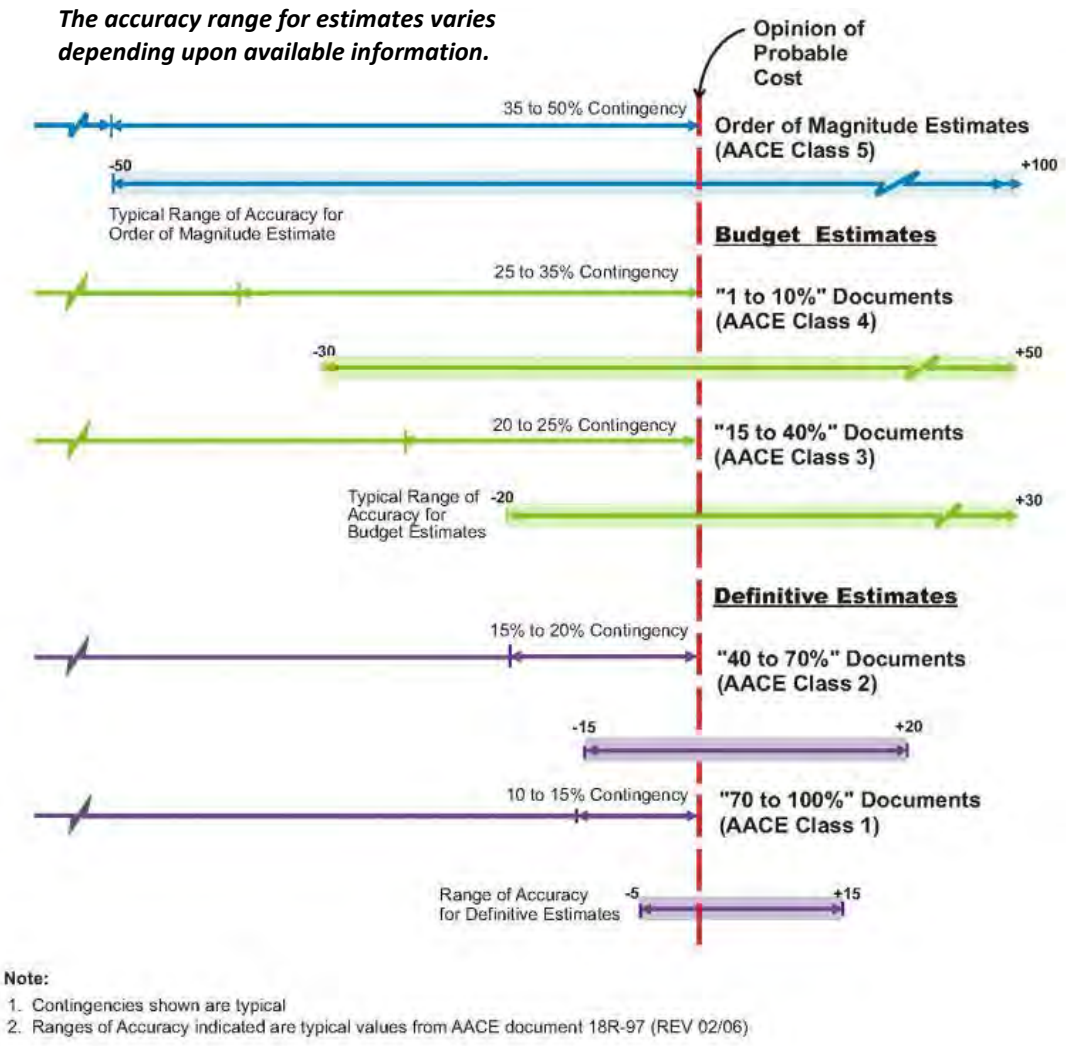


Figure A8-6 Opinions of Probable Cost Typical Contingencies and Ranges of Accuracy

The standard cost multipliers used on the construction subtotal (1.5X the base capital materials cost) in the capital estimates included:

- Engineering and Administration 20%
- Legal 5%
- Geotechnical Investigation 1%
- Permitting - CEQA/NEPA 5%

Project sizing, e.g., flow rate for a pumping station or pipeline, came from a combination of Confluence® model runs (for available raw water from the City's current sources) and assessment of available resources such as raw wastewater flows and estimated recovery of

recycled water after allowing for production losses. For this project, the reader should note that each estimated construction cost includes a contingency allowance for both "known unknowns" and "unknown unknowns." Known unknowns include items such as site geotechnical conditions (at most sites no investigations have occurred yet but some sites such as the WWTP are built over originally swampy ground) and existing potential utility interferences. Unknown unknowns could be things such as endangered species habitat that requires rerouting/relocation of facilities or potential well site exploration that would show unsuitable underlying geology. The contingency allowance was set at 50 percent to reflect the very early conceptual level for the work.

Capital costs also recognize that the City will expend considerable funds in its planning, design, and facilities permitting.

O&M Costs

O&M costs include a wide variety of ongoing project costs. CAT-specific treatment O&M costs were based on South District WWTP (Miami-Dade Sanitation District Miami, FL) costs prepared by BC. Basic O&M cost elements included:

- Electricity to run equipment and to pump (based on elevation lift and frictional losses) at $0.013/kW-hr,
- Infrastructure and mechanical spare parts, equipment repairs and replacement:
  - Pumping Systems: Pump replacement every 15 years + pumping system replacement every 30 years.
  - Pipelines: Annual O&M 1.5% of capital cost + 60-year replacement.
  - Storage Tank: Annual O&M at 0.5% of capital cost + painting every 20 years + 60-year replacement.
  - Treatment Processes Nitrification, Ozone/BAC, Conditioning Facilities – Annual O&M 1.5% of capital cost + 60-year replacement for full unit.
  - Treatment Processes MF, RO, and UV-AOP: Microfiltration and RO based on expected average membrane life and company warranty, UV and Ballast based on average life and company warranty. This also includes 60-year replacement for full unit.
- Treatment chemicals (e.g., greensand and chlorine for the wellhead treatment systems, anti-scalant for the RO system, caustic for pH adjustment post-RO), and
- Cost of treating water through the GHWTP (if the City would choose direct potable reuse later in project implementation).

The O&M costs have similar uncertainty to capital costs.

Unit Costs

BC based unit costs on those prepared by BC for North City Water Reclamation Plant (NCWRP), Harbor Drive Advanced Water Purification Facility (HD AWPF), and North City Water Reclamation Plant, NCWRP Upgrades/Improvements. BC used the sizing criteria from San Diego's Pure Water program for unit processes with a general assumption that the City could modify the existing highly under-loaded SC TF/SC WWTP to achieve nitrification. BC knows the effluent flow rates available and general water quality. The cost curves and the six-tenth rule served as the basis for adjusting estimated capital costs for facility scale changes. For final analysis, a 3-mgd output facility was considered that would treat only City wastewater.

Why was "yield" selected as the basis of the cost comparison?

An important metric for evaluating different water supply (and conservation) enhancement options can be developed by examining the cost per some unit of water-related benefit provided. Two water-related benefit measures that might be applied in this context are:

1. ***Yield*** is defined within the WSAC context as the amount by which a water option, or a portfolio of options, decreases the gap between peak season demand and the supply of water available in that peak season. Yield is typically measured in terms of the estimated millions of gallons (mg) by which the gap is reduced over the peak season. Yield may also be portrayed in terms of the size of the remaining peak season gap in a given projected water year (measured in MG, and/or in terms of the percent of peak season demand remaining unmet). Yield estimates reflect how the water supply components operate together as part of the overall SCWD *system*, and yield estimates are generated through application of the *Confluence* model.
2. ***Production*** is the volume of water potentially generated when operating at full design capacity by a water supply option, and is typically described in terms of volume produced in a typical day (e.g., 3 mgd). Production also may be described as how much water would likely be produced over a year (e.g., a 3 mgd facility producing water at that rate for 365 days would produce almost 1,100 MG per year). Production can be a somewhat hypothetical measure of the actual amount of water generated, as many options do not operate at full scale every day of the year (e.g., they may be constrained by the amount of river flows, and/or limited by other components of the overall water system). Production estimates do not account for how components of the overall system interact, but they are useful for scaling the size of the necessary infrastructure and estimating annual operation and maintenance costs.

Either of these water measures can be applied in a "unit cost" metric – i.e., one can use a cost per yield metric and/or a cost per production metric or both.

Of these two possible metrics, the "cost per yield" version was selected by the WSAC as the most informative and relevant during the evaluation phase. This is because "yield" reflects the true value to the community of the water generated by an alternative–it reflects how much an option (or portfolio of options) helps address water shortages in the times of year when shortages otherwise would arise and result in curtailments being imposed on the Water Department's customers.

In contrast, water "production" reflects how much water might theoretically be generated in total, but not necessarily how much water would be truly generated, nor how much of the water shortage problem it might help address.

- **How will "Annualized Cost per Average Year Yield" be used with other metrics in comparing projects?**

A metric selected by WSAC for evaluating options is the Annualized Cost per Average Year Yield (ACAYY). This metric applies the estimated total annualized cost of an option (the annualized capital expense, such as would be incurred through bond repayments, plus the annual operation and maintenance costs), divided by the estimated average year yield (AYY).

The total annualized costs portion of the metric provides a useful approximation of how much the community will pay each year for the alternative. The AYY portion of the metric reflects the estimated value realized by the community (in terms of yield–the amount by which water shortage problems are resolved) averaged across projected future water year outcomes. This metric thus provides an indication of costs borne relative to the benefit received by rate payers.

This metric will be used to help guide deliberations about how the preferred water plan elements may be adjusted over time, as more information becomes available through the initial stages of investigation and implementation. For example, if technical or institutional complications (or simplifications) arise that render the expected cost of a preferred alternative considerably higher (or lower) than initially estimated, and/or result in lower (or higher) anticipated water yields, then the expected ACAYY cost per yield metric for that element will increase (or decrease). If the increase (or decrease) in ACAYY is sufficiently large, then the unit cost information will be considered—along with other factors—with respect to whether there should be some change in the portfolio moving forward (e.g., to enlarge or reduce the scale of one element as compared to another).

It is important to note that there is <u>not</u> a hard cut-off value for ACAYY for when an alternative may be modified or dropped from further consideration. WSAC opted for a benchmark of a 130% difference in the ACAYY unit cost metric, for comparing one portfolio element against another, as a basis for whether or not an adaptive change in strategy should be *considered*.

However, WSAC also clearly indicated that an ACAYY beyond the 130% level should not necessarily result in a change in strategy. WSAC also noted that some options provide ancillary benefits that are not necessarily reflected in the ACAYY metric (e.g., aquifer restoration may enhance instream flows), and such additional benefits may justify a higher unit cost compared to the ACAYY of other options.

List of Attachments

Attachment 1 Project Element Summary

Attachment 2 Gantt Chart, Implementation Plan and Timeline

Attachment 3 Table of Decision Nodes and Related Milestones

Attachment 4 Subway Diagrams

Project Elements Summary

	Element	1	2	3a	3b	3c	3d
	Building Block Approach	In-Lieu	ASR and In-Lieu Combined*	DPR Small (3 mgd)	IPR-Loch (3 mgd)	IPR-GW (3 mgd)	Local Desal (3mgd)
a	Capital Cost ($ M)	131	159	89	132	119	147
b	Annual O&M cost ($ M/yr)	2.6	3.7	3.5	5.2	4.2	3.9
c	Total Annualized Cost ($ M/yr)	11.6	14.6	9.6	14.3	12.4	14.0
d	Present Value Costs ($M)	185	237	162	241	207	229
h	Worst Year Yield (MG)	750	760	810	660	740	810
i	Average Year Yield (MG)	350	380	440	430	380	440
j	Worst year yield unit cost (Total Ann Cost/Wst Yr Yield)	15,500	19,300	11,900	21,600	16,700	17,300
k	ACAYY** (Total Ann Cost/Ave Yr Yield)	33,200	38,500	21,900	33,200	32,600	31,800
l	Worst Year Peak Season Shortage (MG)	480	470	420	570	490	420
m	Worst Year Peak Season Shortage (%)	25%	24%	22%	29%	25%	22%
n	Average Year Peak Season Shortage (MG)	120	90	30	40	90	30
o	Average Year Peak Season Shortage (%)	6%	5%	2%	2%	5%	2%

* Both the costs and yields in this column reflect the combined costs of implementing both in-lieu and ASR.

**ACAYY = Annualized Cost per million gallons of Average Year Yield

NOTES:

1 All estimates are preliminary, rounded, and subject to revision and refinement as more detailed analysis is developed.

2 Total annualized costs based on amortizing capital outlays using a capital recovery factor of 0.0688 (reflecting a 30-year bond term at a 5.5% rate of interest to estimate the annual payment), and adding annual O&M costs.

3 Present Value Costs calculated based on capital outlays occuring in first year, followed by 30 years of annual O&M expense, discounted to present worth using a 2.5% real discount rate. No inflation escalation included.

4 ASR costs and yields reflect the *combined* cost and yields associated with adding ASR to the In-lieu program. Energy use for the combined ASR and In-Lieu elements reflect a volume-weighted average across the two elements.

5 Potential for revenues from water sales, cost sharing, and grant funding are not reflected.

6 All Element 3 options scaled at 3 mgd, reflecting potential reuse production based soley on City of Santa Cruz effluent flows.

7 See additional notes on following page.

C = Averaged Costs (All BBs)

	-30%	Mean	+30%
Worst Yr	11,935	17,050	22,165
Avg Yr	22,307	31,867	41,427
	median	32,900	1.03

C' = Averaged Costs (Element 3 BBs)

	-30%	Mean	+30%
Worst Yr	11,813	16,875	21,938
Avg Yr	20,912	29,875	38,837
	median	32,200	1.08

C'' = Averaged Costs (Element 1 & 2 BBs)

	-30%	Mean	+30%
Worst Yr	12,180	17,400	22,620
Avg Yr	25,095	35,850	46,605
	median	35,850	1

ADDITIONAL NOTES

Elements 1&2: In lieu/ASR: Capital Costs

1. Infrastructure is sized to accommodate In-lieu plus ASR (to allow peak flow for recharge of 5 mgd -- 2.5 mgd out to Soquel Creek and 2.5 mgd to Scotts Valley).
2. All infrastructure costs needed for the in lieu program are included in the in lieu option. The ASR capital costs added to the in-lieu costs for the combined option include only additional elements that would be needed for doing recharge and recovery: pipeline to Beltz wells, upgrade of in lieu extraction wells to allow for injection, and additional wells and treatment of the extracted water.
3. In a departure from previous Building Blocks, in the ASR option, a pipeline to the Beltz Wells and 4 wells in Santa Cruz are included. This addition is to allow flexibility in where the water is moved.
4. The capital costs associated with in lieu and ASR include $62M for upgrading the GHWTP and $14M to upgrade the San Lorenzo River Tait Street Diversion. Feasibility studies will evaluate whether there are alternative(s) to these two large projects to meet the same goals at a lower cost. One alternative, as it relates to ASR & in lieu combined, may be installing Ranney Collectors at Felton Diversion. Together with a modified water right to allow for direct diversion from Felton Diversion to GHWTP. This change could lower the cost of this strategy by as much as ~$60M. This would result in an Average year yield unit cost of $27,700.

O&M Costs

1. Operations for recharge and for recovery are set at 180 days each for both in lieu and ASR. That means moving water out for 180 days and moving water back for 180 days. Real-world costs will vary over time.
2. Flow rates are similar to previous building block scenarios. Cost includes both sending water out to SqCWD and SVWD and later sending water back to SCWD.
3. Average flow rate for costing in lieu returns = 4 mgd, split evenly between Soquel Creek and Scotts Valley.
4. Average flow rate for costing ASR = 5 mgd out (same volume would be available for transfer whether it was in lieu or ASR, and this also maintains consistency), split evenly between SqCWD and SVWD. Flow back would be 80% of that volume, or 4 mgd split evenly between SqCWD and SVWD. Real-world recovery will vary from well-to-well.
5. Well extraction pumping in SVWD or SqCWD is ***not*** included - it is roughly balanced out by the energy savings of not running wells in SqCWD and in SVWD when in lieu water is being sent.
6. Cost and energy use estimates for combined In-lieu and ASR would be higher if less water were directed to in-lieu and instead directed to ASR (e.g., more water injected if more goes to ASR).

Element 3

General assumptions

1. Potable reuse capacity is designed for 3-mgd *product water 365 days a year* based on treating only City of Santa Cruz flows. (I.e., conservatively assuming effluent from SqCWD and SVWD are unavailable.)
2. Infrastructure for potable reuse treatment is identical for all potable reuse alternatives. Treatment is on-site at the WWTP. Costs to treat blended water at GHWTP not included (~$2.7M/yr).

Element 3a: DPR

1. DPR water blends with raw water near Bay Street Reservoir. Energy calculation uses very conservative estimate that existing pressure pipe will not be changed.(A pipeline improvement would decrease energy needs.)
2. It is reasonable to assume that the City would investigate pipeline improvements and a lower-pressure operating scenario might be found. This change could significantly reduce the energy cost per MG.

Element 3b: IPR to Loch Lomond

1. A very significant portion of energy use is embedded in the pumping costs to move water ~800 vertical feet up to Loch Lomond.

Element 3c: IPR for Groundwater Recharge

1. Groundwater recharge is assumed to occur near the coast.
2. Eight wells included for 3 mgd capacity scenario used here.

Element 3d: Local Desal

1. The City desalination option capacity is 3 mgd product water 365 days a year.
2. Cost now includes property rights acquisition.
3. An O&M cost element for lifting the water to Bay Street has been added (instead of into the distribution system at a lower point).

	Item	Units	Quantity	Cost, dollars	
				Cost per unit	Cost
Treatment Processes					
1	Nitrification (6.1 mgd)	LS	1	1,500,000	1,500,000
2	Ozone/BAC Filters (6.1 mgd)	LS	1	9,000,000	9,000,000
3	Microfiltration (6.1 mgd)	LS	1	14,000,000	14,000,000
4	Reverse Osmosis (5.5 mgd)	LS	1	20,000,000	20,000,000
5	Advanced Oxidation (Peroxide + UV) (4.7 mgd)	LS	1	3,250,000	3,250,000
6	Conditioning Facilities (4.7 mgd)	LS	1	1,432,500	1,432,500
7	Effluent Diffuser Modification	LS	1	1,000,000	1,000,000
				Site Work Subtotal	**50,182,500**
Pumps and Pipes					
8	Pumping System (WWTP to CAT)	GPM	4,300	400	1,720,000
9	Pipeline Installation (WWTP to CAT)	LF	200	600	120,000
10	Pumping System (CAT to Bay St. Reservoir)	GPM	3,200	400	1,280,000
11	Pipeline Installation (CAT to Bay St. Reservoir)	LF	6,000	440	2,640,000
12	Equalization Basin	LS	1		500,000
				Pipeline, Pumps, Dam, Appurtenances Subtotal	**6,260,000**
				Construction Subtotal	**56,442,500**
	Contingency	percent	50	---	28,221,250
				Subtotal	**84,663,750**
	Engineering and Administration	percent	20	---	16,932,750
	Legal	percent	5	---	4,233,188
	Geotechnical Investigation	percent	1	---	846,638
	Permitting - CEQA/NEPA	percent	5	---	4,233,188
	Other	percent	0	---	0
				Subtotal	**26,245,763**
	Line Maintenance Facility Relocation				**5,200,000**
				Total Project Cost	**116,200,000**

Operation and Maintenance Cost for Building Block 3	
Parameter	**Value**
Nitrification Tower Rework & Pipeline capital cost ($)	$2,947,500
Nitrification Tower electricity cost ($/year)	$28,470
Nitrification Tower O&M Cost	1.5%
Annual O&M cost ($/year)	$44,212.50
Nitrification Tower Replacement	60
Nitrification Tower Replacement Cost ($/year)	$49,125
Total Nitrification Tower electricity, O&M and replacement cost ($/year)	**$121,808**
Ozone/BAC Filters	
Ozone/BAC Filter capital cost ($)	$17,685,000
Ozone/BAC electricity cost ($/year)	$48,916
Ozone/BAC O&M Cost	1.5%
Ozone/BAC Filter annual cost ($/year)	$265,275
Ozone/BAC Filter replacement	60
Ozone/BAC Filter replacement cost ($/year)	$294,750
Total Ozone/BAC Filter O&M and replacement cost ($/year)	**$608,941**
Microfiltration	
Microfiltration system installation cost ($)	$27,510,000
Electricity consumption cost ($/year)	$250,536
Microfiltration maintenance cost ($/year)	$51,429
Chemical/Cleaning Cost	$207,386
Microfiltration system replacement	60
Microfiltration system replacement cost ($/year)	$458,500
Total Microfiltration system O&M and replacement cost ($/year)	**$967,851**
Reverse Osmosis	
RO system installation cost ($)	$39,300,000
Electricity Consumption Cost ($/year)	$740,220
RO System maintenance cost ($/year)	$136,080
Chemical/cleaning cost	$193,389
RO system replacement	60
RO system replacement cost ($/year)	655,000
Total RO system O&M and replacement cost ($/year)	**$1,724,689**
Peroxide/UV Disinfection	
UV system installation cost ($)	$6,386,250
Electricity Consumption Cost ($/year)	$182,208
Maintenance/Replacement UV & Ballast cost ($/year)	$73,234
Hydrogen Peroxide	$67,634
UV system replacement	30
UV system replacement cost ($/year)	$212,875
Total UV system replacement cost ($/year)	**$535,951**

Conditioning Facilities	
Conditioning facilities installation cost ($)	$2,814,863
Electricity Consumption Cost ($/year)	$28,470
Maintenance cost ($/year)	1.5%
Maintenance cost ($/year)	$42,223
Conditioning facility replacement	30
Conditioning facility replacement cost ($/year)	$93,829
Total Conditioning facility O&M and replacement cost ($/year)	**$164,522**
Pumping System (WWTP to CAT)	
Pumping System	$3,379,800
Electricity Consumption Cost ($/year)	$64,912
Pump replacement interval	15
Pump replacement cost ($)	$250,000
Pump replacement cost ($/year)	$16,667
Pumping System Replacement	30
Pumping System Replacement cost ($/year)	$112,660
Total Pump and Pumping System O&M and Replacement cost ($/year)	**$194,238**
Pipeline (WWTP to CAT)	
Pipeline capital cost ($)	235,800
Pipeline O&M Cost	1.5%
Pipeline annual cost ($/year)	$3,537
Pipeline replacement	60
Pipeline replacement cost ($/year)	$3,930
Total Pipeline O&M and replacement cost ($/year)	**7,467**
Pumping System (CAT to Bay St. Reservoir)	
Pumping System	$2,515,200
Electricity Consumption Cost ($/year)	$580,788
Pump replacement interval	15
Pump replacement cost ($)	$250,000
Pump replacement cost ($/year)	$16,667
Pumping System Replacement	30
Pumping System Replacement cost ($/year)	$83,840
Total Pump and Pumping System O&M and Replacement cost ($/year)	**$681,295**
Pipeline (CAT to Bay St. Reservoir)	
Pipeline capital cost ($)	5,187,600
Pipeline O&M Cost	1.5%
Pipeline annual cost ($/year)	$77,814
Pipeline replacement	60
Pipeline replacement cost ($/year)	$86,460
Total Pipeline O&M and replacement cost ($/year)	**164,274**
Equalization Basin	
Steel Equalization Tank	$982,500

Operation and Maintenance	$4,913
Painting Cost ($)	$150,000
Painting interval	20
Painting Cost ($/year)	$7,500
Tank replacement	60
Tank replacement cost ($/year)	$16,375
Total tank painting, O&M, and replacement cost ($/year)	**$28,788**
Sampling/Water Quality Analysis	
Sampling/Water Quality Analysis	**$25,999.12**
Total Annual O&M Cost	**$5,200,000**

Figure 12 Gantt Chart
Implementation Plan and Timeline

	Node	Activity	Duration (years)	2016 Year 1	2017 Year 2	2018 Year 3	2019 Year 4	2020 Year 5	2021 Year 6	2022 Year 7	2023 Year 8	2024 Year 9	2025 Year 10	2026 Year 11	2027 Year 12
				Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1/2 Q3/4	Q1/2 Q3/4	Q1/2 Q3/4
strategy 1		**Element 1 - In lieu**		**Both near term with SqCWD using North Coast & lareger project with SqCWD & SVWD using SLR water**											
	1.1D	Near term: Develop Agreements, Complete CEQA, Resolve any Infra. Issues	0.5	1.1											
	1.2M	Evaluate larger project(s) with other agencies; affirm return water volumes & water rights	3			1.2									
	1.3W/D	Completion of agreements, water rights, planning/prelim design, siting study & CEQA.	1					1.3							
	1.4W	Infrastructure Improvements (see below for potential projects) & return water to SCWD	4							1.4					
	1.5D/W	Assess performance	NA										1.5		
		Element 2 - ASR (City, SqCWD and/or SVWD; i.e., Purisima & SM) + shared infrastructure (in lieu & ASR)													
	Phase 1 2.1M	Complete & use groundwater model	0.5-2												
	Higher-level Feasibility	Identify/select existing wells for potential pilot testing	0.25												
		Perform site specific injection capacity & geochemical analyses	0.5												
		Develop Pilot Program & identify potential sites for new ASR well(s)	0.75			2.1									
	Phase 2 2.2D	Retrofit existing wells	0.25												
	Pilot Testing	Perform injection well hydraulic testing	0.25												
		ISR cycle testing	1-2					2.2							
		Develop ASR program	1												
	Phase 3 2.3M/W	Procure properties	1												
	Implementation	Design Project (includes City Administration)	1												
		CEQA	0.5												
		Construct	1.5							2.3					
	2.4D/W	Assess performance	2									2.4			
	2.5W	Storage target achieved	NA												2.5
		Infrastructure Improvements for Long term in lieu and/or ASR													
		Design/build pipeline in Santa Cruz to Beltz Wells	1.5												
		Tait Street Diversion Improvements	3												
		Graham Hill WTP Improvements	4												
		Design & build Soquel Creek transfer (back), Scotts Valley transfer (to) infrastructure	2												
		Pump Station (Soquel to City)	1.5												
		Intertie No. 1 Pipeline (City to Scotts Valley)	2												
		Pump Station (City to Scotts Valley) Intertie No. 1	2												
strategy 2		**Element 3 - Advanced Treated Recycled Water or Desalination**													
	3.1M	Define Recycled Water project alternatives and status of DPR regulations	1	3.1											
	3.2D	Select preferred Element 3	1		3.2										
	3.3D	Prelim design, CEQA (prepare Draft EIR), permits	3					3.3							
	3.4M	Complete Design , CEQA, permits, property acquistion	2							3.4					
	3.5W	Complete construction/start up	2										3.5		

These items will be evaluated along with Elements 1 and 2 and implemented as needed.

Table Notes & Select Assumptions

This table approximates activities, costs, durations and sequencing of each element, all of which are subject to change.
Elements are shown to start in Q1 - 2016. This may or may not occur depending upon agreements, contracts, etc.
Rehab/replacement of the Newell Creek Pipeline is part of the existing CIP and not shown here.
Some infrastructure improvements may not be required if other pursuits are successful. E.g., evaluation of Ranney collectors may substitute GHWTP Improvements.
CEQA is used generically; implies compliance with Califorina Environmental Quality Act.
Pilot ASR work assumes major infrastructure not required. E.g., intertie to Scotts Valley or new well(s).
Element 2 includes 8 wells for in lieu plus 8 additional wells for ASR.

Legend

ASR = Aquifer Storage and Recovery
CEQA = California Environmental Quality Act
DDW = Division of Drinking Water
DPR = Direct Potable Reuse
EIR = Environmental Impact Report
GHWTP = Graham Hill Water Treatment Plant
IPR = Indirect Potable Reuse
ISR = Injection, Storage, Recovery
SCWD = Santa Cruz Water Department
SqCWD = Soquel Creek Water District
SVWD = Scotts Valley Water District

Decision Node
Milestone Node
Some amount of water returned to SCWD
Full required amount of water returned to SCWD

Overview of Decision Nodes and Related Milestones along Adaptive Pathway Diagram

NODE	ABBREVIATED DESCRIPTION	ENDING YEAR
In-Lieu (Element 1)		
1.1D △	Near Term: Initiation of near term water transfer/sale to SqCWD using North Coast water; agreements in place, and CEQA completed.	c. 2016
1.2M ◇	Larger Project: Understanding the feasibility of a potentially larger water transfer/exchange project with SqCWD and/or SVWD using North Coast and San Lorenzo River waters. Includes quantifying return water (using groundwater models) from SqCWD and/or SVWD to Santa Cruz as well as understanding of water rights and inter-agency collaboration.	c. 2018
1.3W/D □ △	Larger Project: Completion of agreements specifying terms of transfers to/from SqCWD and/or SVWD, water right modifications, planning/prelim design; complete assessments of cost, yield and schedule; and define CEQA. Decision point for proceeding on final design of associated infrastructure improvements.	c. 2019 c. 2020
1.4W □	Larger Project: Potential for return of water from SqCWD, and/or SVWD, to SCWD with the construction of infrastructure/treatment improvements.	c. 2022
1.5D/W △ ■	Assess in-lieu performance: amount to SqCWD, SVWD, and SCWD; reduced groundwater pumping, groundwater elevations, etc.	c. 2025
Aquifer Storage and Recovery, ASR (Element 2) Includes evaluation of Purisima and Santa Margarita		
2.1M ◇	High level feasibility work: use of groundwater model; completion of site specific injection capacity and geochemical analyses; development of pilot program.	c. 2017
2.2D △	Completion of all administrative items to conduct pilot testing (e.g., CEQA/permits/agreements and well modifications), completion of pilot testing, and assessment of probable ASR system performance, cost and schedule to complete build out of ASR system.	c. 2020
2.3M/W ◇ □	Develop/construct ASR wells, ready to operate.	c. 2022
2.4D/W △ □	Assess ASR performance against projections and ability to meet project goals.	c. 2024
2.5W ■	Aquifer storage target attained (ability to sustain return flows to SCWD at desired levels).	c. 2027
Advanced Treated Recycled Water or Desalination (Element 3)		
3.1M ◇	Identify recycled water alternatives; increase understanding of recycled water (regulatory framework, feasibility, funding opportunities, public outreach and education)	c. 2016
3.2D △	Complete high level feasibility studies, as-needed demonstration testing, and conceptual level designs of alternatives;, define CEQA processes; and continue public outreach and education. Select preferred Element 3.	c. 2017
3.3D △	Preliminary design, CEQA (including preparation of draft EIR), and apply for approvals and permits (except building permit).	c. 2020
3.4M ◇	Complete property acquisition, final design, complete CEQA and all permits.	c. 2022

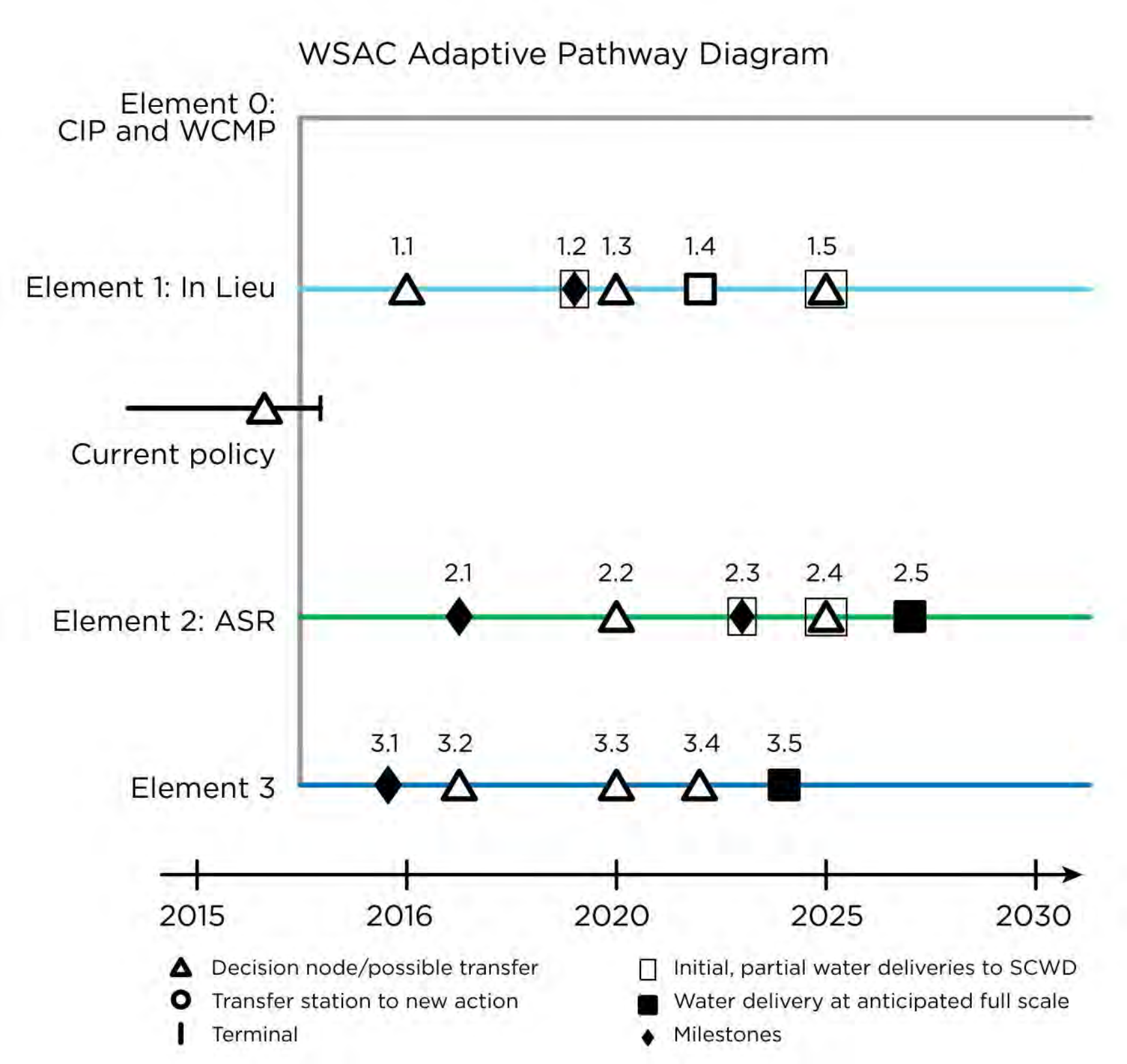
3.5W	Construction completed: plant start-up, water production begins	c. 2024

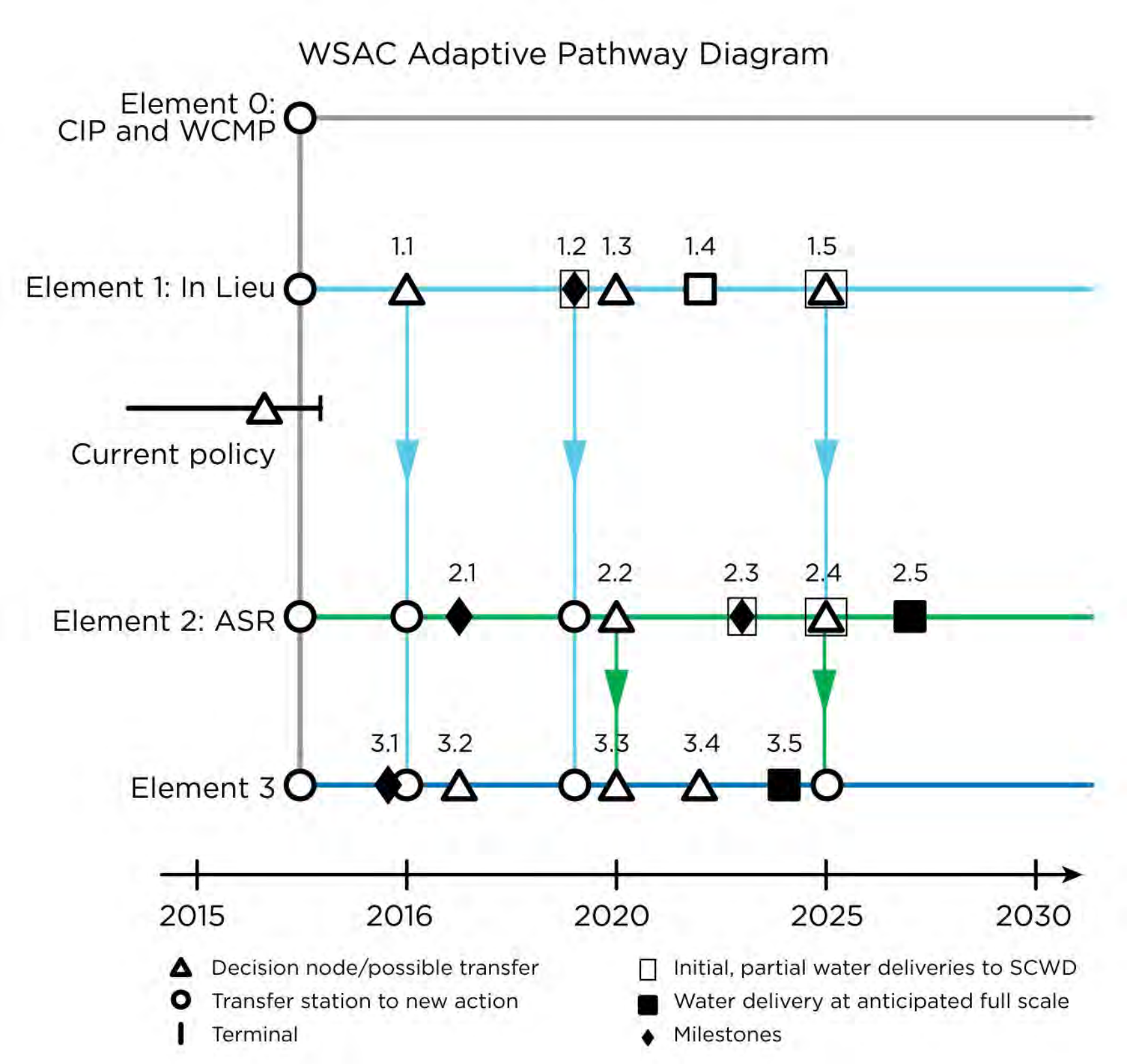
Abbreviations

ASR = Aquifer Storage and Recovery
CEQA = California Environmental Quality Act
DDW = Division of Drinking Water
DPR = Direct Potable Reuse
GHWTP = Graham Hill Water Treatment Plant
IPR = Indirect Potable Reuse
SCWD = Santa Cruz Water Department
SqCWD = Soquel Creek Water District
SVWD = Scotts Valley Water District

Notes

- This table is intended as a companion piece to the implementation Gantt chart and subway map. Gantt chart contains additional activity detail(s) for each node.
- Node types
  D = decision node (triangle on subway chart)
  M = milestone (diamond on the subway chart), furthering the understanding of feasibility.
  W = water production potentially available (squares on the subway chart; open square indicates some water; solid square represents full goal being met).
- Node types have been assigned based on a set of assumptions as to how the implementation will proceed. However, if a threshold is being tripped, the node becomes a decision node regardless of its current designation.
- Ending Year refers to when all work associated with reaching node and/or achieving goal(s) will be accomplished. Dates shown are approximate based on current information and project understanding. Dates may adjust depending on: volumes of water available due to winter precipitation levels (which may limit amount of in-lieu and ASR); ability to establish agreements, permits, etc.; and ability to implement workload.


WSAC Adaptive Pathway Diagram
Element 0:
CIP and WCMP
Element 1: In Lieu
1.1
1.2
1.3
1.4
1.5
Current policy
Element 2: ASR
2.1
2.2
2.3
2.4
2.5
Element 3
3.1
3.2
3.3
3.4
3.5
2015
2016
2020
2025
2030
Decision node/possible transfer
Transfer station to new action
Terminal
Initial, partial water deliveries to SCWD
Water delivery at anticipated full scale
Milestones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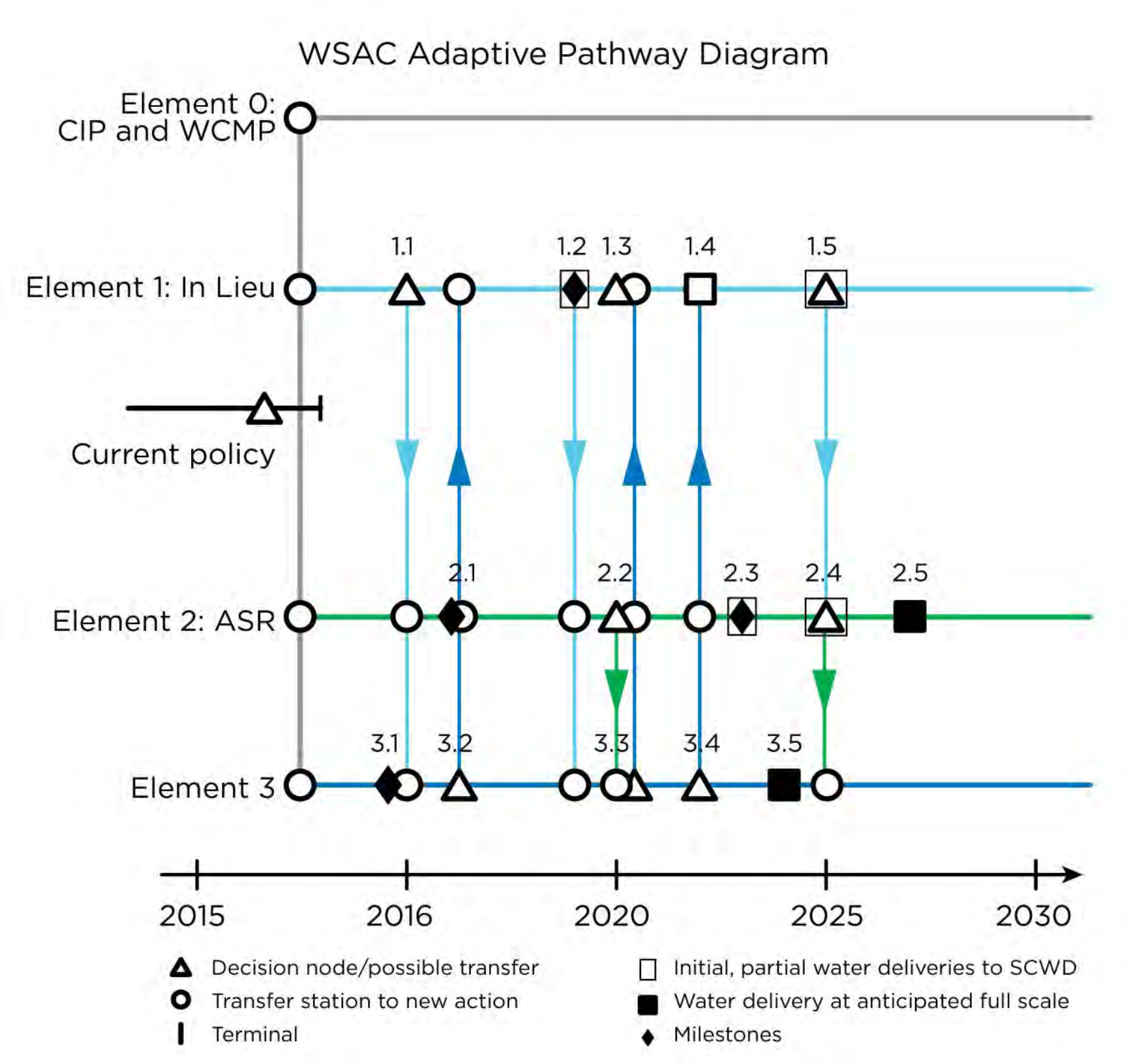
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Water Shortage Contingency Plan

Prepared by:

City of Santa Cruz Water Department

March 2009

City of Santa Cruz Water Department

Water Shortage Contingency Plan

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Katherine Beiers
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Cover graphic courtesy of the California Department of Water Resources

Executive Summary

This report constitutes the first comprehensive review and update of the City's Water Shortage Contingency Plan since the early 1990's. The project is an outgrowth of the City's 2005 Urban Water Management Plan, which recognized the many changes in regional conditions and local water supply planning that had taken place over the previous decade, and identified the need to better prepare for the possibility of future water shortages in advance of the next major drought.

Introduction

This section provides background information about the City water system and the City's Integrated Water Plan, explains the purposes and goals of this plan, summarizes state regulations that pertain to water shortage contingency planning, and describes the process and principles that were used to guide the preparation of this document.

The last time the Santa Cruz area was confronted with a serious water shortage was during a statewide drought that lasted from 1987 through 1992. The exceptional drought of 1976-77, however, remains the most severe event on record. In 2003, the City adopted a long range planning document known as the "Integrated Water Plan", the goal of which was to reduce near term drought shortages and provide a more reliable public water supply through the year 2030. One component of this plan deliberately involves cutting back or "curtailing" system water demand by 15 percent in dry years when water is in short supply.

This plan was developed to fulfill two fundamental purposes:

1. To establish the procedures and actions necessary to achieve the up to 15 percent cutback in system-wide demand established in the City's Integrated Water Plan, and

2. To describe how the City would respond if faced with much larger shortages in water supply ranging as high as 50 percent (not only because, as a public water supplier, the City is required to do so by state law, but also because the City remains vulnerable in the near term to a critical water shortage of this magnitude until it secures a new source of supply for drought protection).

Whatever magnitude of shortfall the City may experience, the overarching goals of this plan are as follows:

1. To conserve the water supply of the City for the greatest public benefit,

2. To mitigate the effects of a water supply shortage on public health and safety, economic activity, and customer lifestyle, and

3. To budget water use so that supply will be available for the most essential purposes for the entire duration of the water shortage.

Development of this plan was a collaborative effort among the City Water Department staff, the City's Water Commission, City Council, and the public. The process included reviewing the City's existing ordinance and water shortage plans from many other water agencies, addressing various planning and policy issues, and taking into account state regulations. The Water Commission provided its input and recommendations throughout the entire process. The final step will be to prepare an ordinance that incorporates the structure and policy recommendations embodied in this plan. This ordinance would then be adopted and go into effect only if necessary in an actual water shortage following appropriate public notification and public hearing before City Council.

Assessing Water Supply and Demand

This section describes the key hydrologic factors affecting the City's water supply and discusses the process staff uses to determine whether a water shortage is expected in the year ahead.

The City of Santa Cruz relies on surface flows in coastal streams and the San Lorenzo River for most of its annual water supply needs. The yield of these sources in any given year is directly related to the amount of rainfall received and runoff generated during the winter season.

After an unusually dry winter or period of consecutive dry years, when a lack of supply appears possible, the Water Department undertakes an analysis to determine whether water supplies will be deficient relative to estimated water needs for the coming dry season. This analysis involves first comparing projected water supply and demand on a monthly basis, assuming no restriction on water

use, to forecast the end of season water level and storage volume in Loch Lomond Reservoir. The Department then evaluates whether the amount of carryover storage in Loch Lomond at the end of the year will be sufficient to meet essential health and safety needs in case the dry weather pattern continues into the following year. If this analysis shows that Loch Lomond Reservoir would be depleted to a dangerously low level, then a decision is made regarding how much reservoir water is available to use in the current year and how much should be banked as a safeguard against the possibility of another dry year. The amount of cutback in demand needed to reduce the rate of reservoir depletion and end the year at a safer level of storage is then determined. If necessary, cutbacks would go into effect in late April or early May and span the entire dry season through the end of October.

The degree of shortage is normally defined as the supply deficiency in relation to normal water use over a given period of time, and expressed as a percentage. For example, a 25 percent shortage means the City has one-quarter less water supply available than what is normally used during the seven month long dry season.

Demand Reduction Program

This section describes the five-stage approach and overall strategy for dealing with water shortages, explains how available water would be allocated among various customer categories according to priority of use, and presents the recommended menu of actions for cutting back water demand during a declared water shortage. This section also covers policies and recommendations regarding enforcement methods, exceptions, and appeals.

Table ES-1. Five Stage Structure to Water Shortage Contingency Plan

Stage	Magnitude of Water Shortage	Stage Title
1	0-5%	Water Shortage Alert
2	5-15%	Water Shortage Warning
3	15-25%	Water Shortage Emergency
4	25-35%	Severe Water Shortage Emergency
5	35-50%	Critical Water Shortage Emergency

The updated Water Shortage Contingency Plan uses a staged approach that classifies a shortage event into one of five levels spanning a range from less than 5 percent up to 50 percent. The overall concept is that water shortages of different magnitudes require different measures to overcome the deficiency. Because there is so little the City can do in the short run to increase the supply of water, the focus of this plan is primarily on measures that reduce demand. Each stage includes a set of demand reduction measures that become progressively more stringent as the shortage condition escalates. Normally, only one of these five stages would be put into effect early in the year at the recommendation of the Water Director and remain in force for the entire dry season.

There is an important distinction between Stages 1 and 2, designated above in shades of yellow, and the upper three stages. The lower two stages represent a level of curtailment that is envisioned as being necessary to balance water supply and demand from time to time under the City's Integrated Water Plan. Shortages of 15 percent or less, while inconvenient, do not directly threaten public safety or pose undue economic impact. The upper three stages (3-5) are characterized as emergency water shortages since they result in more widespread hardships being felt throughout the community, may threaten public health and welfare, and cause more economic harm. The intent of the City's Integrated Water Plan, however, is to limit future water shortages to no more than more than 15 percent.

Customer reduction goals for all but the first stage were derived by evaluating the composition of demand for each major group and dividing it into three usage priorities. These priorities are, from highest to lowest, 1) health/safety, i.e., all domestic and sanitary uses, 2) business and industrial uses and, 3) irrigation and other outdoor uses). Normal demands were then scaled back in accordance with the schedule below. The recommended allocation is presented in Table ES-3.

Table ES-2. Reduction in Water Delivery by Usage Priority
(percent of normal deliveries)

Stage	Magnitude of Water Shortage:	Health/Safety	Business	Irrigation
2	15%	95	95	64
3	25%	95	90	34
4	35%	90	85	12
5	50%	75	67	0

Table ES-3. Water Supply Allocation and Customer Reduction Goals

Normal Peak Season Demand = 2,473 mil gal	No Deficiency		Stage 2 15% Deficiency		Stage 3 25% Deficiency		Stage 4 35% Deficiency		Stage 5 50% Deficiency	
	Delivery		Delivery		Delivery		Delivery		Delivery	
	%	Volume (mil gal)	%	Volume (mil gal)	%	Volume (mil gal)	%	Volume (mil gal)	%	Volume (mil gal)
Single Family Residential	100	1,031	84%	864	73%	753	62%	639	48%	495
Multiple Residential	100	524	87%	454	78%	411	69%	361	55%	287
Business	100	438	95%	416	92%	402	87%	381	70%	307
UC Santa Cruz	100	132	85%	113	76%	100	66%	87	52%	68
Other Industrial	100	23	95%	22	90%	21	85%	20	67%	15
Municipal	100	48	76%	36	57%	27	41%	20	28%	14
Irrigation	100	110	64%	70	34%	37	12%	13	0%	0
Golf Course Irrigation	100	106	73%	78	51%	54	34%	36	20%	21
Coast Agriculture	100	59	95%	56	90%	53	85%	50	67%	40
Other	100	2	95%	2	90%	2	50%	1	50%	1
Total	**100**	**2,473**	**85%**	**2,111**	**75%**	**1,861**	**65%**	**1,607**	**50%**	**1,247**
Demand Reduction %, Million gallons	**0**	**0**	**15%**	**-362**	**25%**	**-612**	**35%**	**-866**	**50%**	**-1,226**

In essence, this allocation system strives to balance available supplies in times of drought as much as possible through cutbacks in outdoor water use. At each level of shortfall, public health and sanitation usage is afforded the highest priority by cutting back on interior usage the least. The importance of water in protecting the City's employment base is also acknowledged through proportionately modest cutbacks to the commercial sector as compared to the overall system shortfall. Irrigation and other outdoor uses in all cases is cut back the most. The larger the water shortage, the greater the cutbacks, but this system of priorities is maintained throughout the range of potential shortages. The heavy reliance on outdoor use reductions makes sense, both from a water system perspective because it reduces peak demands, which is important to preserving storage in Loch Lomond Reservoir, and from a public health and welfare perspective, because irrigation and other outdoor uses are the most discretionary of all uses when drinking water is in short supply.

The remainder of this section discusses the demand reduction measures, communications, publicity, and operational activities that apply to each stage.

The primary demand reduction measures used in **Stage 1** are to restrict all landscape irrigation to certain hours of the day and to prohibit various uses deemed to be non-essential.

The recommended approach to reducing water use **Stage 2** involves expanding mandatory water restrictions and limiting landscape irrigation to specified days and times. Large landscape users would be required to adhere to water budgets.

A **Stage 3** water shortage constitutes an emergency situation. The three primary measures being recommended to meet this emergency reduction goal are 1) residential water rationing, 2) mandatory water shortage signage in all commercial buildings, and 3) reduced water budgets for large landscapes.

A **Stage 4** water shortage requires expanding water rationing to cover all water customers, including business, and reducing residential allocations. At this severe level of shortage, only minimal water is available for outdoor purposes.

Stage 5 represents an extraordinary crisis threatening health, safety, and security of the community. It would involve reduced rationing levels for all customers and a ban on outdoor uses to cut back normal water use by half.

Table ES-4. Summary of Demand Reduction Actions and Measures

Water Shortage Condition	Key Water Department Communication and Operating Actions	Customer Demand Reduction Measures
Stage 1: Water Shortage Alert (0-5%)	• Initiate public information and advertising campaign • Publicize suggestions and requirements to reduce water use • Adopt water shortage ordinance prohibiting nonessential uses • Step up enforcement of water waste • Coordinate conservation actions with other City Departments, green industry	• Voluntary water conservation requested of all customers • Adhere to water waste ordinance • Landscape irrigation restricted to early morning and evening • Non-essential water uses banned • Shutoff nozzles on all hoses used for any purpose • Encourage conversion to drip, low volume irrigation
Stage 2: Water Shortage Warning (5-15%)	• Intensify public information campaign • Send direct notices to all customers • Establish conservation hotline • Conduct workshops on large landscape requirements • Optimize existing water sources; intensify system leak detection and repair; suspend flushing • Increase water waste patrol • Convene and staff appeals board	• Continue all Stage 1 measures • Landscape irrigation restricted to designated watering days and times • Require large landscapes to adhere to water budgets • Prohibit exterior washing of structures • Require large users to audit premises and repair leaks • Encourage regular household meter reading and leak detection
Stage 3: Emergency Water Shortage (15-25%)	• Expand, intensify public information campaign • Provide regular media briefings; publish weekly consumption reports • Modify utility billing system and bill format to accommodate residential rationing, add penalty rates • Convert outside-City customers to monthly billing • Hire additional temporary staff in customer service, conservation, and water distribution • Give advance notice of possible moratorium on new connections if shortage continues	• Institute water rationing for residential customers • Reduce water budgets for large landscapes • Require all commercial customers to prominently display “save water” signage and develop conservation plans • Maintain restrictions on exterior washing • Continue to promote regular household meter reading and leak detection
Stage 4: Severe Water Shortage Emergency (25-35%)	• Contract with advertising agency to carry out major publicity campaign • Continue to provide regular media briefings • Open centralized drought information center • Promote gray water use to save landscaping • Scale up appeals staff and frequency of hearings • Expand water waste enforcement to 24/7 • Develop strategy to mitigate revenue losses and plan for continuing/escalating shortage	• Reduce residential water allocations • Institute water rationing for commercial customers • Minimal water budgets for large landscape customers • Prohibit turf irrigation, installation in new development • Prohibition on on-site vehicle washing • Rescind hydrant and bulk water permits
Stage 5: Critical Water Shortage Emergency (35-50%)	• Continue all previous actions • Implement crisis communications plan and campaign • Activate emergency notification lists • Coordinate with CA Department of Public Health regarding water quality, public health issues and with law enforcement and other emergency response agencies to address enforcement challenges • Continue water waster enforcement 24/7	• Further reduce residential water allocations • Reduce commercial water allocations • Prohibit outdoor irrigation • No water for recreational purposes, close pools • Continue all measures initiated in prior stages as appropriate

The City's existing water shortage emergency ordinance contains several provisions for enforcing water use rules and regulations, and a process for issuing exceptions and hearing appeals. These provisions were reviewed by staff and the Water Commission, which put forth several recommendations to be incorporated into the updated water shortage ordinance. Recommendations include revised penalty fees and excess use fees, adding specified findings for authorizing exceptions, and adding an alternative enforcement approach to reduce the likely caseload of appeals.

Implementation

This section describes the essential elements of implementing the updated Water Shortage Contingency Plan, discusses the approximate lead time needed to prepare for and activate a demand reduction program, outlines the process for declaring a water shortage, and identifies areas where additional ongoing efforts are necessary to address critical gaps.

Although the Water Department closely monitors rainfall, runoff and reservoir storage all winter, it is not usually until the end of March that the water supply outlook for the year ahead becomes certain. This leaves very little lead time to prepare for implementing the water shortage contingency plan.

Formal action declaring a water shortage is taken by City Council. The legal requirements for such action are covered in Section 350 et.seq. of the California Water Code. The code requires the following process be followed:

- That City Council hold a public hearing on the matter;
- That the public hearing be properly noticed (minimum of publishing once in newspaper at least seven days prior to the date of the hearing);
- Upon determining and declaring the existence of a water shortage, City Council may then adopt regulations and restrictions governing the use and delivery of water.

By municipal code, rules adopted by the City Council establishing water use regulations become effective immediately after their publication in the newspaper.

Effective communication is essential to the success of any water shortage contingency plan in achieving the desired water use reductions. All customers need to be adequately informed about water supply conditions, understand the need to conserve, and know what actions they are being requested or required to take to mitigate the shortage. Even before formal declaration of a water shortage, a public information/media program should be activated to provide customers with as much advance notice as possible. Following Council action, all residents and businesses, not just customers of record, would need to be provided notice of water shortage rules and regulations via a variety of media and communications methods, including print and television media, internet, utility newsletter, and other methods. Public notification and communication will be provided in Spanish language for non-English speakers.

The additional staff needed to carry out this contingency plan and personnel costs are estimated according to stage. These may consist of existing staff reassigned from regular duties in the Water or other City departments, new part-time temporary employees, interns, or some combination of the above. Additional office space and equipment needs are also addressed.

The financial impact of short-term demand reduction was estimated to range from just under $0.6 million in a Stage 1 water shortage alert situation to almost $5.8 million in a Stage 5 critical water shortage emergency. Compared to 2007 revenues of just over $22 million, the Department's net revenue would be reduced to approximately $21.5 million in Stage 1 to less than $16.4 million in Stage 5. Options to lessen or overcome the revenue shortfall include the following:

- Tapping into the Department's Rate Stabilization Fund (currently $2.2 million)
- Deferring planned capital improvements
- Considering possible rate adjustments or surcharges

Implementing this Water Shortage Contingency Plan will require utility billing system software that provides the necessary capabilities and flexibility to quickly shift from normal billing practices to water rationing mode. The newly installed EDEN utility billing module appears to be able to handle the type of computations needed to implement the recommended method for rationing residential customers. It does not, however, have the capability or flexibility to handle large landscape water budgets, or commercial water rationing which is based on some

percentage of past use. This capability will have to be custom developed over time.

Another key challenge involves implementing large landscape water budgets. This is the next major work priority scheduled for the City's Water Conservation Office. These programs have a long development time (1-2 years) due to the need to measure landscape areas, differentiate among plant materials, and integrate water budget data into the billing system. This latter task requires changing the bill design and layout to show water budget information and tying performance relative to the water budget to water pricing. If the City were confronted with a water shortage before large landscape water budgets and budget-based pricing could be implemented, alternative methods to curtail water in the large landscape sector would have to be considered.

The final tasks in updating the City's Water Shortage Contingency Plan include the following steps:

- Involving the community and soliciting public review and input on this document;
- Finalizing and presenting the plan to City Council for adoption;
- Preparing an updated water shortage ordinance;
- Preparing and mailing a Proposition 218 notice about proposed changes to penalty and excess use fees.

As far as critical gaps that require ongoing work, the most important recommendations are to:

1. Continue to work on the new utility billing system so that the database is able to meet the City's requirements for use in water rationing if it becomes necessary, and

2. Focus on developing the large landscape program so that water budgets described above can be used to professionally manage large irrigation accounts the next time a water shortage arises.

3. As much as possible, prepare water shortage notices, announcements, materials, and mailing lists in advance, including bilingual materials for non-English speakers.

Section 1 INTRODUCTION

This report constitutes the first comprehensive review and update of the City's Water Shortage Contingency Plan since the early 1990's. The project is an outgrowth of the City's 2005 Urban Water Management Plan, which recognized the many changes in regional conditions and local water supply planning that had taken place over the previous decade, and identified the need to better prepare for the possibility of future water shortages in advance of the next major drought.

1.1 Background

The City of Santa Cruz water system serves a geographic area that includes the entire City of Santa Cruz, adjoining unincorporated areas of Santa Cruz County, a small part of the City of Capitola, and coastal agricultural lands north of the City. The water service area includes about 90,000 people, some 35,000 households, and an employment base of 45,000 jobs.

The City water system draws almost exclusively on local surface water sources, whose yield varies from year to year depending on the amount of rainfall received and runoff generated during the winter season. In normal and wet years, when rainfall and runoff are abundant, the water system is capable of meeting the community's current total annual water requirements. The system is highly vulnerable to shortage, however, in extended dry periods or critically dry years, when the flow in local streams and river sources runs low. Moreover, like other communities on California's central coast, the Santa Cruz water system is physically and geographically isolated. There are no interconnections with other water suppliers in place to transfer water among adjacent water districts or import emergency supplies from outside the region.

The last time the Santa Cruz area was confronted with a serious water shortage was during a statewide drought that lasted from 1987 through 1992. While this event was notable for its extended duration, the most severe event on record was the critical drought of 1976-77. Both situations were considered to be emergencies whose magnitude or duration had been unanticipated prior to their occurrence and for which little preparation had been made. Operations modeling shows **if an event similar to one in 1976-77 were to recur now, the system would barely be able to meet half the community's normal water requirements in the second year of that drought.**

In 2003, the City adopted a long range document known as the “Integrated Water Plan”, the goal of which was to reduce near term drought shortages and provide a more reliable public water supply through the year 2030. The preferred water supply strategy that evolved from that process consists of 3 components:

1. Reduce water demand in all years through water conservation measures,

2. Increase the water supply through seawater desalination, and

3. Cut back water demand temporarily in drought years

This approach, of cutting back on demand in dry years when water is in short supply, is becoming more commonplace in virtually every region of the country that is faced at times with emergency shortages of deliverable water. Rather than strive to meet 100 percent of customer water demand during periods of extreme drought, more and more urban water utilities are beginning to anticipate and plan for a certain degree of water shortage from time to time, and respond with programs that temporarily reduce water use. Whether for financial, political, or environmental reasons, or simply the recognition that public water systems can never be totally drought-proof, water agencies are deliberately incorporating short-term demand management or “use curtailment” as part of their overall water management strategy.

The City’s Integrated Water Plan envisions satisfying 85 percent of normal water needs during a worst-case scenario like the 1976-77 event, thereby reducing the potential shortfall from the current almost 50 percent to no more than 15 percent. This reliability goal was considered to be the best overall balance between ensuring public health and safety, cost, and impact on the environment, given the many public policy tradeoffs involved. Now, instead of treating any shortage as a water supply emergency situation and responding reactively, the City has effectively accepted the risk of incurring relatively modest shortages every so often, which drives the need for having a fully developed contingency plan and well-defined, measured responses in place.

1.2 Purpose and Goals

This Water Shortage Contingency Plan describes the conditions which constitute a water shortage and provides guidelines, actions, and procedures for managing

water supply and demands during a declared water shortage. The primary focus of the plan is on measures that reduce customer demand for water, but it also covers actions that can be implemented to stretch or increase the water supply.

This plan was developed to fulfill two fundamental purposes:

1. To establish the procedures and actions necessary to achieve the up to 15 percent cutback in system-wide demand established in the City's Integrated Water Plan, and

2. To describe how the City would respond if faced with much larger shortages in water supply ranging as high as 50 percent.

There are several reasons why it is necessary to consider and plan for shortfalls larger than 15 percent. First, the City remains vulnerable in the near term to a critical water shortage of that scale until it secures an additional source of supply for drought protection. The City is currently implementing a broad set of water conservation programs and is testing the feasibility of seawater desalination before proceeding with the design, permitting, and construction of a full scale plant. Commissioning of a new water source, though, remains years away and is by no means a certainty. Much planning remains to be done and project approvals have yet to be secured. In the meantime, the City is potentially at risk of experiencing a major water shortage, as demonstrated by the exceptionally dry conditions experienced during the 2007 water year and by the Governor's declaration of a statewide drought in 2008. Second, state law requires all public water suppliers to develop contingency plans for situations of up to a 50 percent shortage in water supply. Finally, the City's long range water supply planning is predicated on past hydrologic records which focused on the two year, 1976-77 event as a worst case scenario. No one can predict how the future will unfold, especially in light of the emerging science of global climate change, which some predict could bring more frequent, longer, or more intense water shortages across the state, and which compounds the uncertainty and risk going forward at the local government level.

Whatever magnitude of shortfall the City may experience, the overarching goals of this plan are as follows:

1. to conserve the water supply of the City for the greatest public benefit,

2. to mitigate the effects of a water supply shortage on public health and safety, economic activity, and customer lifestyle, and

3. to budget water use so that supply will be available for the most essential purposes for the entire duration of the water shortage.

1.3 State Regulations and Planning Requirements

For California water agencies, there are two main provisions of the California Water Code that pertain to water shortage contingency planning.

Sections 350-359 provide the authority for the governing body of a water agency to declare a water shortage emergency. Once having done so, the local agency is provided with broad powers to implement and enforce regulations and restrictions for managing a water shortage. Water needed for domestic, sanitation and fire protection purposes is given priority and discrimination between consumers using water for the same purpose or purposes is not allowed.

Section 10632 requires water agencies to provide a water shortage contingency analysis as part of their Urban Water Management Plans. The code requires agencies plan for shortages up to a 50 percent reduction in water supply, and to describe the actions and consumption reduction methods that apply to each stage of the plan.

The full text of these two code sections is included in Appendix A.

1.4 Planning Process and Water Shortage Management Principles

Development of this plan was a collaborative effort among the City Water Department staff, the City's Water Commission, City Council, and the public.

The project was initiated in 2006 with a work plan that organized the job into 12 individual tasks covering specific topics or issues (Table 1-1). For each task, staff prepared a written report for review and input by the Water Commission at its regularly scheduled meetings. These reports reviewed one or more aspects of the City's existing water shortage emergency ordinance, described alternative methods or approaches used by other water agencies, analyzed the different

Table 1-1. Water Shortage Contingency Plan Update Work Plan

Task	Description
Task 1	Identify Laws, Goals, and Principles
Task 2	Determining Water Supply Availability
Task 3	Declaration of Water Shortage Emergency
Task 4	Review Stages and Associated Terms
Task 5	Allocation of Water
Task 6	Review Allotment Methods
Task 7	Consumption Reduction Methods
Task 8	Water Department Actions
Task 9	Enforcement and Appeals Procedures
Task 10	Draft New Water Shortage Contingency Plan
Task 11	Present Recommended Plan to Water Commission and City Council
Task 12	Draft, Review New Ordinance

options, and presented a recommendation on the topic for inclusion in this plan. The Water Commission provided its input and recommendations throughout the process. Helpful guidance was obtained from the California Department of Water Resources' recently updated Urban Drought Guidebook. In addition, research involved reviewing the water shortage plans of 21 other urban water utilities from throughout California, and from selected cities in the western United States and across the country (Appendix B).

The subject that generated the most public interest, input, and debate was how to allocate the available water when supplies run short. The issue was discussed before City Council and negotiated with several large customers before reaching a final recommendation.

This document synthesizes the results of that process into a single report. It was presented to the Water Commission for review in January 2009, revised, distributed throughout the community, presented again at a public hearing before City Council, and adopted on March 10, 2009. The final plan was then redrafted in the form of an ordinance that was adopted in May 2009 and revised in June 2010. The final, approved water shortage contingency ordinance would then

become effective only as necessary in an actual water shortage following appropriate public notification and public hearing before City Council.

The plan is based on lessons learned here and from other water agencies during past droughts. Nevertheless, it is important to note that every drought will evolve differently and that it is not practical to develop a set of hard and fast rules that apply to all situations. The plan should be thought of as a general framework that will need to be adjusted and refined based on actual conditions.

Early in the planning process, staff and the Water Commission developed a set of principles to guide this planning process. These principles are as follows:

- **Shared contribution.** All customers will be asked to save their share in order to meet necessary reduction goals during water shortages.

- **Reduce non-essential uses first.** The plan concentrates on the elimination of non-essential water uses and on outdoor reductions, and gives the highest priority to essential health and safety uses.

- **Preserve jobs and protect the local economy.** The plan minimizes actions that would have substantial impact on the community's economy and provides large users the flexibility to determine their own reduction strategies within a water budget.

- **Existing conservation measures recognized.** Customers that have already implemented water conservation measures are acknowledged to have less potential for reduction and should not be penalized for conserving.

- **Communication at every stage.** A public information campaign at every level of shortage is essential for customer preparation and will encourage confidence in the City's ability to respond to water shortages.

- **Public participation.** Public participation in the development and implementation of the plan will help to ensure fairness, encourage cooperation, and facilitate implementation and with demand reduction measures in times of shortage.

1.5 Relationship Between This Document and Other Plans

This Water Shortage Contingency Plan, as described above, represents one of the three components in the City's Integrated Water Plan. It also constitutes one of several elements in the City's Urban Water Management Plan, as required by State law.

Water supply interruptions and shortages may result from a variety of causes, including facility failure, such as a major pipeline break, earthquake, flood, or other natural disaster. This plan specifically addresses longer-term water shortages that occur as a result of drought conditions that may extend several months or span several years in duration. For shorter term emergency incidents or disasters, the Water Department maintains a separate General Emergency Plan, which is subordinate to and complements the Citywide Emergency Operations Plan, to guide emergency operations response and recovery for shorter term water supply interruptions and outages.

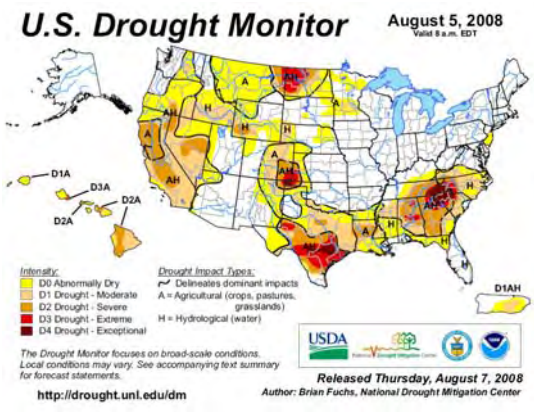
Section 2 ASSESSING WATER SUPPLY AND DEMAND

Rainfall, runoff, and reservoir storage are the key hydrologic indicators used by the City to evaluate water conditions. This section describes these factors affecting the City's water supply and discusses the forecasting process and management considerations used in dry years to determine whether a water shortage is expected for the year ahead and how much water use must be cut back systemwide in response. As a preface, this section includes a brief discussion on the distinction between the terms drought and water shortage.

2.1 Drought vs. Water Shortage

Drought is a normal, naturally occurring but unpredictable climatic phenomenon of varying frequency, duration and severity. Droughts differ from other natural hazards in that they are not distinct weather events, like floods, hurricanes, or tornados. They may have a slow onset, persist and evolve over a period of years, affect a large spatial region, but cause little structural damage. The most difficult aspect of a drought is that no one can tell how long it will last.

Figure 2-1. National Drought Map



Five degrees of drought intensity are recognized nationally, including abnormally dry, moderate, severe, extreme, and exceptional.

The California Department of Water Resources describes drought as:

> *"A deficiency of precipitation over an extended period of time resulting in a water shortage for some activity, group, or environmental sector."*

A water shortage, on the other hand, occurs when a particular utility's water supply is insufficient to meet its customers' ordinary drinking water needs.

Besides weather conditions, there are a number of factors that affect water supply availability, including:

- Source yield and reliability
- Infrastructure capacity and operating constraints
- Access to alternative sources
- System demand characteristics

In Santa Cruz, a water shortage occurs when the combination of low surface flows in the coast and river sources and depleted surface water storage in Loch Lomond Reservoir reduces the available supply to a level that cannot support existing demand.

Ordinarily, one abnormally dry year does not create a water shortage in Santa Cruz. Usually there is sufficient storage in Loch Lomond Reservoir, even after one dry winter, to carry the system though the following summer. Based on past experience, however, a shortage is likely to occur when the central coast region experiences **two or more** dry winter seasons in a row.

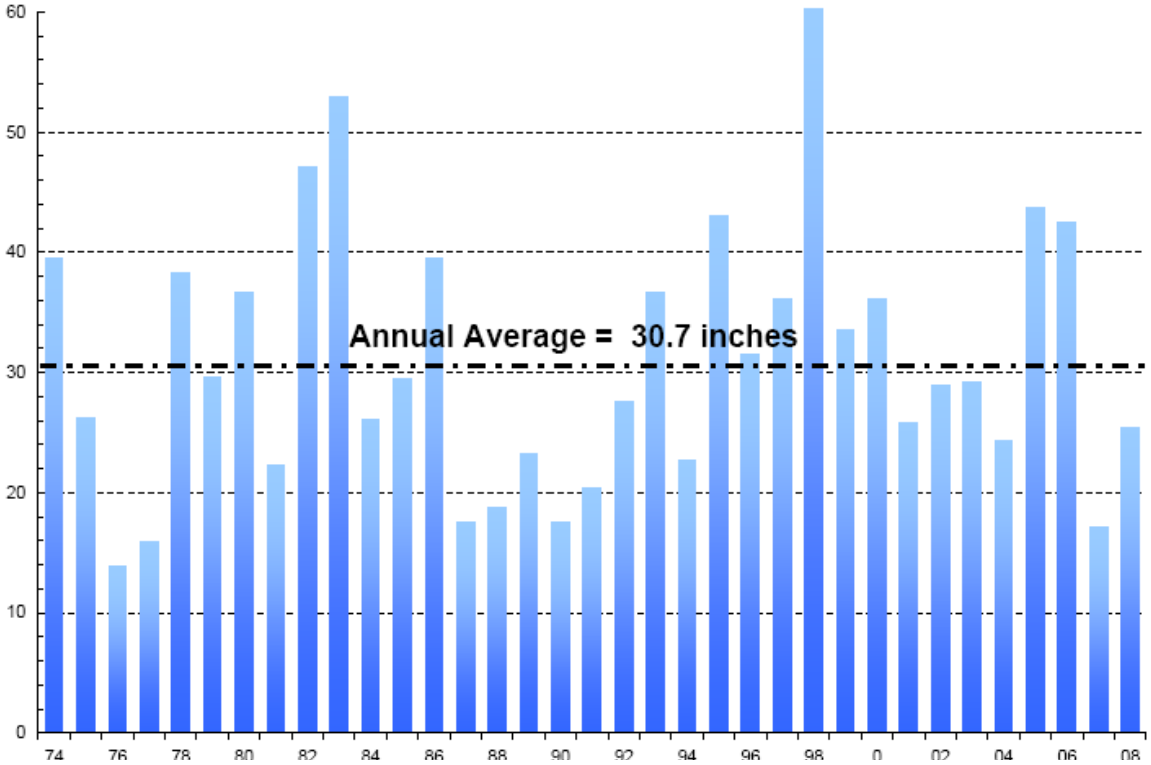
2.2 Precipitation

The water supply of the City of Santa Cruz all originates from precipitation that falls in the form of rain on the Pacific Ocean side of the Santa Cruz Mountains during the fall, winter, and early spring. The majority of rainfall normally occurs in a five-month period between November and March. The amount of precipitation that falls is one basic indicator of whether the city is experiencing a wet or dry year. Rainfall amounts on the central coast vary widely from year to year.

Daily rainfall data is collected for water supply purposes at various sites in the Newell Creek watershed, at Ben Lomond, and in the City of Santa Cruz. The Ben Lomond and Santa Cruz sites are both official National Oceanographic and Atmospheric Administration (NOAA) weather observation stations with extended rainfall records.

Annual variation in rainfall at Santa Cruz is illustrated below in Figure 2-2. Long-term average rainfall in the Santa Cruz area is about 30 inches. In the 1987-92 drought, annual rainfall ranged from 17 to 23 inches, and in the 1976-77 drought, annual rainfall amounts in the City measured 14 to 16 inches.

Figure 2-2. Annual Rainfall at Santa Cruz, 1974-2008 (inches)



In Ben Lomond, rainfall averages about 49 inches per year. In the 1987-92 drought, annual rainfall ranged from 25 to 32 inches, and in the 1976-77 drought, annual rainfall amounts measured 19 to 21 inches.

The pattern in both timing and distribution of rainfall can be as important in determining water supply availability as the total amount of rainfall received. Years in which the majority of rainfall occurs early in the rainy season or is concentrated in a short time frame tend to produce lower river and stream flows during the peak summer season. Conditions where storms are spread out through the winter season or occur late into spring help sustain higher base flows in the coastal streams and the San Lorenzo River later into the year.

2.3 Runoff

Under normal operating conditions, the north coast and San Lorenzo River flows provide about 80 percent of the City's total annual water supply. Accordingly, runoff is a key parameter used to assess the City's water supply condition.

Stream flow in the San Lorenzo River is monitored at two locations using the U.S. Geological Survey (USGS) gauges located at Henry Cowell Redwoods State Park near Felton and downstream next to the Tait Street intake. The gauge in Felton is particularly important for assessing water supply conditions because the river is the City's single largest source and because of the long historic record that exists for the site. Real time flow records are available on the USGS website, http://waterdata.usgs.gov/ca/nwis/uv?11160500. The USGS also prepares printed reports that provide a record of average daily and monthly flows, in cubic feet per second (cfs), and stream discharge, expressed in acre-feet (ac-ft). Monthly flows are charted by the Water Department and compared with the long-term averages and the previous year's flow to assess trends.

On the north coast sources, there were no stream gauges until a few years ago. Flow records are now being gathered for these sources, which will become valuable in future years for assessing water conditions on the north coast.

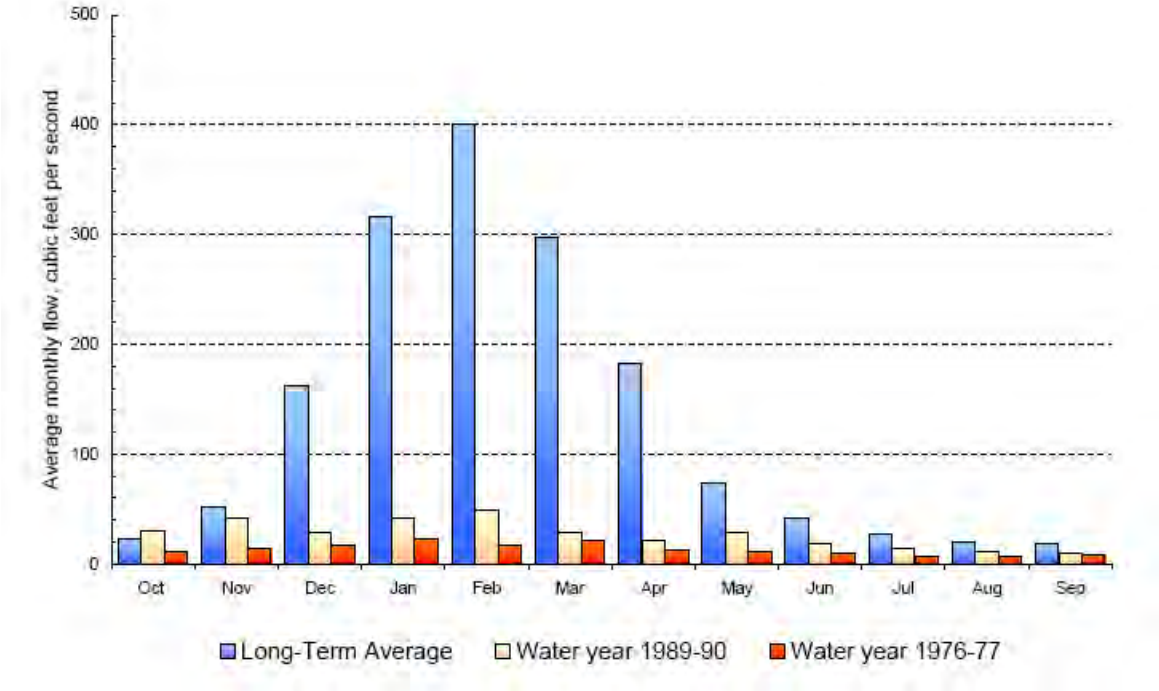
In the San Lorenzo River, runoff fluctuates annually and seasonally, depending on the amount and timing of rainfall. The majority of runoff typically occurs over a three month period from January through March, once the watershed becomes saturated. After the rainy season ends, stream flow in the San Lorenzo River gradually declines over the course of the summer dry season.

In normal years, average monthly runoff ranges from 300 to 400 cfs in winter, and then drops from 70 cfs to 18 cfs over the course of the dry season. As long as the flow in the channel continuously exceeds 12 - 14 cfs, which it typically does in normal years, the water system is capable of making full production within its water rights from the San Lorenzo River all season long.

In dry years, runoff is substantially lower. Figure 2-3 below illustrates the difference between average monthly flow and the flow in the San Lorenzo River during two drought years. Under these conditions, when stream flow in summer declines below 12-14 cfs, production from the river must be scaled back to avoid damaging pumps. In the 1977 drought, the flow in the river dropped to a historic low of about 6 cfs, significantly reducing water production.

The same is true, even more so, for the north coast sources. The stream flow in Laguna and Majors creeks dwindles to extremely low levels in dry years. Liddell Spring is a steadier, more reliable source in dry years than either Laguna or

Figure 2-3. Monthly Stream Flow in the San Lorenzo River at Felton



Majors Creek, but does exhibit some decline in flow during dry periods. As such, the spring is a crucial component of the City's water supply in drought years.

2.4 Water Year Type

The City uses a water year classification system as a primary index of its water supply conditions. Under this classification system, the water year, which runs from October 1 to September 30, is designated as one of four types, depending on the total annual stream discharge of the San Lorenzo River, measured at Felton, and expressed in acre-feet[1].

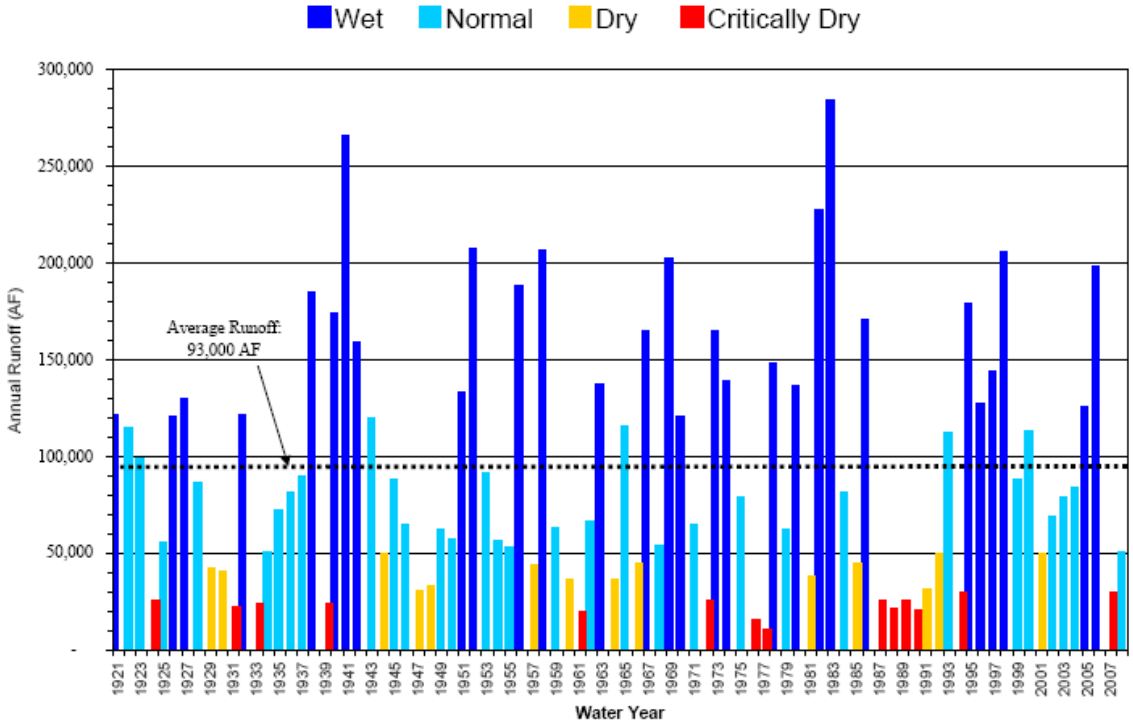
Table 2-1. Water Year Classification System

Classification	Total annual discharge (ac-ft)
Wet	> 119,000
Normal	49,000 - 119,000
Dry	29,000 – 49,000
Critically Dry	< 29,000

[1] An acre-foot of water is equal to 325,851 gallons. One million gallons equals 3.07 acre-feet.

Figure 2-4 below shows the total annual discharge for the San Lorenzo River over the 87 year period from 1921 to 2008, and the classification for each water year. The graph illustrates the dramatic variation in discharge from year to year. Long-term average annual discharge for the San Lorenzo River at Felton is 93,000 acre-feet or almost 30 billion gallons per year. In the long 1987-92 drought, total annual discharge measured between 20,000 and 30,000 acre-feet, and in the 1976-77 drought - the most critical on record - the total annual discharge in the San Lorenzo River dropped to between 10,000 and 14,000 acre-feet.

Figure 2-4. Total Annual Stream Discharge from San Lorenzo River



While the current water year type is of primary consideration in assessing water conditions, the previous water year type also has some influence on summer water supply availability. An antecedent year that is classified as wet will help sustain river base flows longer into the year, whereas a previous dry year can cause river flows to decline sooner and lower than would otherwise be expected.

2.5 Reservoir Storage

Loch Lomond Reservoir is the City's only source of stored water and has a total storage capacity of 2.8 billion gallons. In normal and wet years, reservoir storage

Figure 2-5. Loch Lomond Reservoir

refills naturally to full capacity with runoff from the Newell Creek watershed, usually by February or March. Storage can also be supplemented in dry years with water pumped up to the reservoir from the San Lorenzo River via the Felton booster station when natural runoff is low.

In a normal year, the reservoir will start the dry season full with 2.8 billion gallons in storage. In the 1987-92 drought, reservoir storage at the beginning of April ranged from 1.5 to 1.7 billion gallons (53 to 61 percent of capacity). In the 1976-77 drought, reservoir storage at the beginning of April 1976 measured 1.6 billion gallons or 57 percent of capacity. In April 1977, beginning season storage was only 1.0 billion gallons or 36 percent of capacity.

2.6 Determining If a Water Shortage is Imminent

In normal or wet years when the water supply outlook is favorable, there is generally a surplus of water available from the various sources to meet existing demand. A general rule of thumb is that if Loch Lomond Reservoir is at full capacity by spring, it is not necessary for the City to institute any short-term demand reduction measures the following summer.

After an unusually dry winter or period of consecutive dry years, though, when a lack of supply appears possible, the Water Department undertakes an analysis to forecast whether water supplies will be deficient relative to estimated water needs for the coming dry season. This calculation must be made before the end of rainy season in time to decide on appropriate actions and to provide adequate notice to the public. There is always the chance that late winter rains will change the water supply outlook. Thus, the situation remains dynamic through the end of April.

The peak season from roughly May 1 through October 31 is considered the critical period for the purpose of defining the degree of water supply shortfall, and for selecting the appropriate demand reduction goal. This is the period when water availability in the City's flowing sources is generally lowest and water demand normally would be at its highest, creating a summer water supply "crunch".

Past experience indicates that, even in water short years, there is generally adequate water in the City's flowing sources to meet system demands during the off-peak months between November and April, and that there is little if any need to reduce water demand this time of year when consumption is low.

There is no one single criterion, trigger, or definition that is used to determine if a water shortage exists. The determination of a shortfall involves consideration of all the parameters mentioned previously, as well as expected system demand. To determine the degree of shortfall, the Department follows a three-step process, described below:

1. Develop a monthly forecast of supply available from flowing sources and wells.

2. Compare the supply available from flowing sources and wells to the expected water demand and estimate production needed from Loch Lomond. Calculate the monthly and seasonal drawdown on Loch Lomond Reservoir.

3. Evaluate whether the amount of water in Loch Lomond Reservoir is adequate to meet expected demand for the coming dry season and for the following year in case the dry weather pattern continues through the next winter.

2.6.1 Forecasting Water Production from Flowing Sources and Wells

Of primary importance to the system operation is the ability to know at the end of a winter season how the San Lorenzo River, the City's most important source, will flow through the coming summer and into the dry fall season. In wet and normal years, the river flows at the Tait Street diversion are sustained consistently above the 12.2 cfs level that the City is authorized to divert under the City's water rights. The three river pumps normally make a steady 7.5 million

gallons per day from this source, or between 225 and 232 million gallons per month, all season long.

In dry and critically dry years, natural flows can drop below the 12 cfs level at the intake during summer, requiring pumping from the San Lorenzo River to be scaled back. Once the water year type has been established, statistical tables are used to forecast the mean monthly flow in the San Lorenzo River through the remainder of the dry season (Appendix C). This technique helps to identify at what point in the year river production will be reduced and by how much.

Forecasting supplies available from coastal sources involves less certainty due to the lack of historic stream flow information. The technique used to forecast supplies on the north coast is to find historic water years with a similar pattern in rainfall amount and timing. The production records from those years are examined to assess the likely yield of those sources for the coming season, while taking into account any operational rules, capacity constraints, or in-stream flow releases that may have changed from those previous years. Water production from the City's Live Oak well field is projected as a function of the production capacity for any wells in operation and duration that the wells will be operated.

The Department necessarily uses a conservative estimate of yield to ensure the supply forecast for flowing sources and groundwater production is reliable.

2.6.2 Calculating Drawdown on Loch Lomond Reservoir

Once the forecast of supply available from surface diversions and wells is made, supplies are compared with expected water demand to determine how much lake water would be needed to meet unrestricted system demand. The amount of water lost from the reservoir to evaporation and released for downstream fisheries preservation is then factored in. From this analysis, a projection can be made about:

- the expected rate of drawdown of the reservoir over the dry season;
- the lake level at the end of October; and
- the expected carryover storage for the following year.

Table 2-2 below presents an example with the City's current sources of supply to illustrate the forecast technique. This situation represents a hypothetical year in

which the lake does not refill over winter and begins the season on April 1 with 2.1 billion gallons in storage, or 73 percent of capacity. Flow in the San Lorenzo River is projected to drop below 12 cfs during the month of July, reducing river production. Without any constraint on water demand, a total of 680 million gallons of water would be needed from the lake to meet normal system demand over the dry season, which, along with other losses and outfows, would result in an end of season reservoir volume of about 1.2 billion gallons, or just under 42 percent of capacity.

Table 2-2. Example of Water Storage Forecast with Unrestricted Water Demand

SCWD Production Forecast (million gallons)	April	May	June	July	Aug	Sep	Oct	Total
North Coast (gross production) [2]	82	74	64	50	50	49	35	404
North Coast (net production)	61	55	48	38	38	37	26	303
San Lorenzo River	207	232	225	212	200	175	160	1,411
Live Oak Wells	24	24	24	24	24	24	24	168
Total Production without Lake	293	311	297	274	262	236	210	1,882
Projected System Demand	295	344	388	410	415	365	345	2,562
Lake Production Needed to Meet Demand	**2**	**33**	**91**	**136**	**153**	**129**	**135**	**680**
Evaporation (feet)	0.2	0.3	0.3	0.4	0.4	0.3	0.2	2.1
Evaporation (mil gal)	11	14	14	18	16	11	6	90
Fish Release (mil gal)	21	21	21	21	21	21	21	147
Beginning Lake Volume	**2,100**	**2,066**	**1,998**	**1,872**	**1,696**	**1,506**	**1,345**	
End of Month Lake Volume	**2,066**	**1,998**	**1,872**	**1,696**	**1,506**	**1,345**	**1,183**	
End of Month Lake Elevation (ft above msl)	**562.8**	**561.2**	**558.5**	**554.3**	**549.3**	**544.6**	**539.6**	
Monthly change in elevation	-0.8	-1.6	-2.7	-4.2	-5.0	-4.7	-5.0	
Cumulative change in elevation	-0.8	-2.4	-5.1	-9.3	-14.3	-19.0	-24.0	
Percent of capacity of Loch Lomond (%)	73.0	70.6	66.1	59.9	53.2	47.5	**41.8**	

2.6.3 Evaluating Adequacy of Supply

The determination of whether a shortage exists essentially boils down to a risk assessment regarding the predicted end of season lake level and carryover storage needed in Loch Lomond Reservoir. The Water Department's main considerations in undertaking this assessment include the following:

- Would allowing unrestricted water use in the current year leave insufficient reserves if drought conditions continue into next year?

[2] Gross production refers to the amount of water entering the system at the source, while net production is the amount reaching the City's water treatment plant. The difference is due to coast irrigation sales, leakage, and maintenance.

- Knowing that another dry year could mean the City's flowing sources would drop even lower, how much water should be withheld in the reservoir for the following year to be prudent?

The key decision thus revolves around how much Loch Lomond water to allocate in spring for the current year, whose tradeoffs are summarized in Table 2.3 below.

Table 2.3 Tradeoffs of Alternative Allocations from Loch Lomond Reservoir

Allocation	Frequency	Revenue Impact	Consequence
Large	Shortages occur less frequently	Less impact on water sales and revenue	Would require a smaller cutback in the current year, but would draw down the reservoir faster and potentially would require much more draconian cutbacks if the drought persisted into the following year
Small	Shortages occur more frequently	Lower sales and reduced revenue	Would mean customers would be required to cut back more in the current year, but would preserve storage enabling the City to withstand more prolonged drought before running out of stored water

There is no set formula to determine the optimal allocation. Rule curves were developed for operations modeling purposes as part of the City's Integrated Water Plan to mimic how lake resources theoretically would be allocated under various water conditions. Under these rule curves, no shortage is indicated if lake storage is above 2.4 billion gallons (85 percent of capacity) on April 1 and as long as the lake is forecast to remain above 1.8 billion gallons (64 percent of capacity) though the end of September. Below these levels, a shortage is assumed to occur. The lower the lake level, the greater the shortage. One important rule regarding utilization of lake storage established during the development of the Integrated Water Plan was to always regard the bottom 1.0 billion gallons (35 percent of capacity) in the reservoir as unusable, so there is always some limited amount of supply preserved in storage for the following year.

In the real world, though, with imperfect information about both supply and demand, and no ability to tell when the drought will end, prudent management dictates that the long-term welfare of the City and its residents outweighs the short-term benefit to the community and higher revenues that would be realized by setting a higher allocation. This means generally favoring a smaller allocation and

calling for larger cutbacks than may actually be necessary in retrospect to avoid the possibility of experiencing more critical water shortages if drought conditions continue to worsen. **Ideally, the carryover storage amount will be enough, along with other sources, to meet essential health and safety needs if the subsequent winter is as dry as the driest year on record.** According to the literature, the main lesson from other utilities that have been through droughts is that they would have acted earlier to save more water, in retrospect, in order lessen the impact of implementing more severe cutbacks later on.

Going back to the example in Table 2-2, it is logical to assume that a season-end level of less than 1.2 billion gallons (42 percent of capacity) would be regarded as unsafe and leaving the system vulnerable in case of another dry year. In this example, it is not unreasonable to assume that a decision would be made to curtail water use with the goal of retaining somewhere between 1.5 and 1.6 billion gallons of water in storage (55 percent of capacity) at the end of the season as a hedge against a subsequent dry year. To achieve that target storage, lake withdrawals would need to be reduced from 680 to less than 300 million gallons and customers would be required to cut back by 15 percent or 387 million gallons compared to the normal demand of 2,562 million gallons. Table 2-4 shows the effect a 15 percent cutback would have in terms of increasing carryover storage and lake level at the end of the dry season.

Table 2-4. Example of Water Storage Forecast with 15 Percent Demand Reduction

SCWD Production Forecast (million gallons)	April	May	June	July	Aug	Sep	Oct	Total
North Coast (gross production)	82	74	64	50	50	49	35	404
North Coast (net production)	61	55	48	38	38	37	26	303
San Lorenzo River	207	232	225	212	200	175	160	1,411
Live Oak Wells	24	24	24	24	24	24	24	168
Total Production without Lake	293	311	297	274	262	236	210	1,882
Reduced System Demand	295	315	320	330	320	300	295	2,175
Allowable Lake Production	**2**	**4**	**23**	**56**	**58**	**64**	**85**	**293**
Evaporation (feet)	0.2	0.3	0.3	0.4	0.4	0.3	0.2	2.1
Evaporation (mil gal)	11	14	14	18	16	11	6	90
Fish Release (mil gal)	21	21	21	21	21	21	21	147
Beginning Lake Volume	**2,100**	**2,066**	**2,027**	**1,969**	**1,873**	**1,778**	**1,682**	
End of Month Lake Volume Goal	**2,066**	**2,027**	**1,969**	**1,873**	**1,778**	**1,682**	**1,570**	
End of Month Lake Elevation (ft above msl)	**562.8**	**561.9**	**560.6**	**558.5**	**556.3**	**553.9**	**551.1**	
Monthly change in elevation	-0.8	-0.9	-1.3	-2.1	-2.2	-2.4	-2.8	
Cumulative change in elevation	-0.8	-1.7	-3.0	-5.1	-7.3	-9.7	-12.5	
Percent of capacity of Loch Lomond (%)	73.0	71.6	69.6	66.2	62.8	59.4	**55.5**	

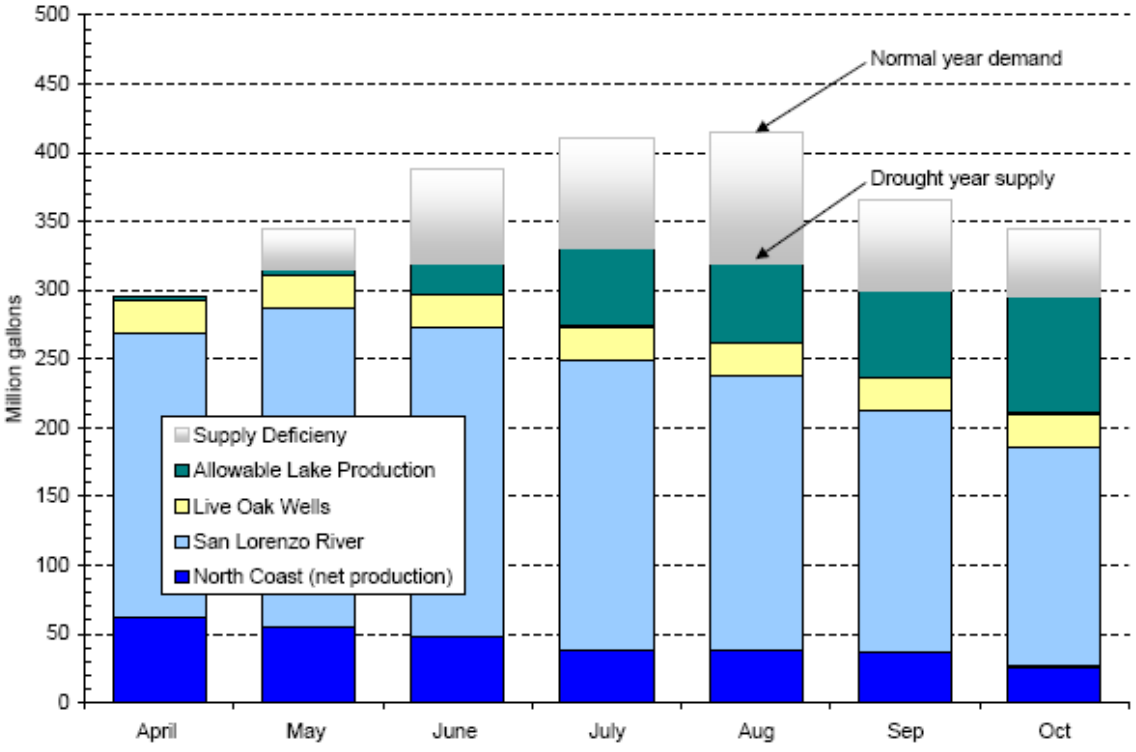
In this case, the reservoir at the end of the dry season stays over half full and 13 feet higher than it would have without any reduction in demand.

The overall water shortage is calculated simply by dividing the supply deficiency for the seven month period from April to October (387 million gallons), by the total unrestricted demand during the same period, expressed as a percentage:

Supply deficiency (mg):	387
Unrestricted demand (mg):	÷ 2,562
Water shortage:	= 0.15 or **15%**

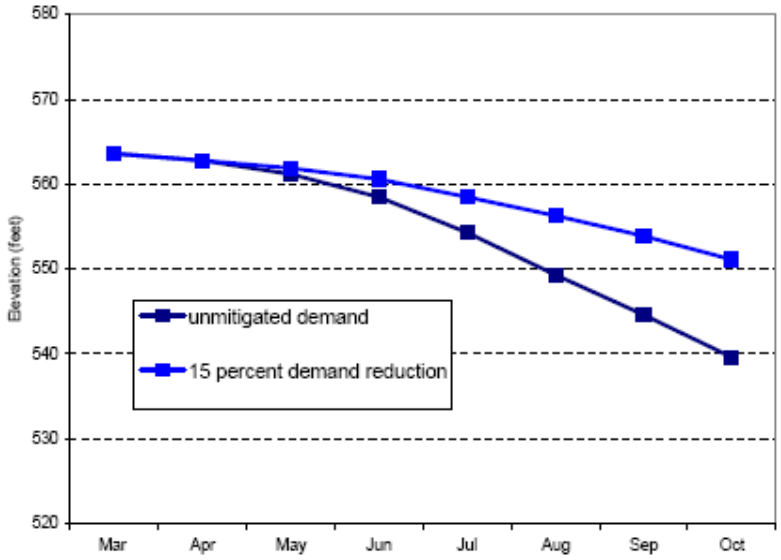
Figure 2-6 below illustrates the 15 percent supply deficiency relative to available supplies on a month to month basis.

Figure 2-6. Example of a 15 Percent Water Shortage



The difference in the drawdown rate between the two scenarios is illustrated in Figure 2-7. This chart shows the effect reducing water demand has on slowing the depletion rate of the City's stored water supply.

Figure 2- 7. Reservoir Drawdown



The ultimate decision about whether supplies are adequate in Santa Cruz for a given dry year are thus dependent not just how much water is available in that year from the City's sources of supply, but also on the level of demand exerted by customers over the coming season and management's comfort level with predicted carry over storage. In the last few years, systemwide water demands have experienced a noticeable downturn which means the City can better withstand dry conditions like the current 2008 water year and have a lower seasonal impact on lake levels than in the past. The one caveat, though, is that because at present use is so conservative, there is a declining ability for "belt tightening" when the next shortage arises.

2.7 New Water Sources and Potential Changes to Existing Supplies

There are several major projects currently under way that are intended to improve the City water system reliability in drought years.

The City and Soquel Creek Water District are jointly pursuing seawater desalination as a supplemental water source, which is expected to become available sometime around 2015. As currently envisioned, this facility would add 2.5 mgd capacity to the City water system, which could provide upwards of 500 million gallons over the dry season as a backup supply in times of drought. The operation of such a facility between the two agencies is yet to be determined, but

the process of evaluating the City's dry year supply and demonstration of need by the City for use of the plant would be similar to the example shown above.

The other major capital improvement project affecting the City's water supply is the renovation of the Live Oak well system, which includes upgrades to wells, treatment plant, and the distribution system to restore production capacity back to its full 2 mgd level that it was in operation during the 1987-92 drought. This assumes the entire groundwater basin is not compromised by continued regional over-pumping of the Purisima aquifer.

Another possible long-term project currently being pursued that may have some minor beneficial effect on City water supplies by reducing summertime peak demand is an exchange of water with the Scotts Valley Water District. The District is exploring ways to provide recycled water from the City of Scotts Valley to the Pasatiempo golf course, which now uses water obtained from the City of from Santa Cruz. The District would receive in exchange surplus water from the City during winter to reduce its groundwater pumping and restore groundwater levels in the Scotts Valley area. While net water production by the City would remain unchanged, the project would shift demands from the peak to off-peak season and shift production away from the lake toward the City's flowing supplies.

In addition to these projects, there are also several uncertainties facing the City's existing sources, particularly along the north coast, that have the very real potential to reduce water supply in dry years.

The City is pursuing an Endangered Species Act Section 10 permit and habitat conservation plan. Long-term requirements for in-stream flow releases affecting the City's surface water diversions have yet to be determined and are pending the outcome of further data collection, analysis, and negotiations with federal and state regulatory authorities. However, preliminary voluntary releases are now being made an all three North Coast sources (Laguna and Majors Creeks, and Liddell Spring) and expectation is that the City will lose more water as a result of regulatory actions at the state or federal level for the protection of listed species. The City is also involved in two water rights matters pending before the State Water Resources Control Board that could affect future operations of the Felton diversion and Loch Lomond Reservoir.

The net effect of all these projects and issues is unclear at this time, but the likelihood is that the City stands to lose some portion of its existing supply before it gains any new source. Those changes will have to be factored into the assessment of supply and demand the next time the City is confronted with a potential water shortage.

Section 3 DEMAND REDUCTION PROGRAM

This section describes how the City will respond to future water shortages and discusses the various actions it would take to reduce water demand under different shortage scenarios.

3.1 Staged Demand Reduction Approach

The recommended Water Shortage Contingency Plan uses a staged approach that classifies a shortage event into one of five levels spanning a range from less than 5 percent up to 50 percent. Each stage has been ascribed a specific title to describe and convey the severity of the water shortage to the public.

Table 3-1. Five Stage Structure to Water Shortage Contingency Plan

Stage	Magnitude of Water Shortage	Stage Title
1	0-5%	Water Shortage Alert
2	5-15%	Water Shortage Warning
3	15-25%	Water Shortage Emergency
4	25-35%	Severe Water Shortage Emergency
5	35-50%	Critical Water Shortage Emergency

To put these different levels into context, the City water system normally produces a total of about 2.5 to 2.6 billion gallons of water from April through October. This is the time period when water production is typically the most constrained by shortages and when consumption would need to be reduced. Normal daily usage during this period varies seasonally from 10 to 14 mgd and averages about 12 mgd. Table 3-2 below shows the amount of reduction in demand that would need to be achieved system-wide, on both a seasonal and a daily basis, which corresponds with the upper end of each stage.

The overall concept of this approach is that water shortages of different magnitudes require different measures to overcome the deficiency. As explained in further detail below, each stage includes a set of demand reduction actions and measures which become progressively more stringent as the shortage condition escalates.

Table 3-2. System-wide Demand Reduction Volumes

Stage	Magnitude of Water Shortage	Seasonal Demand Reduction (million gallons)	Average Daily Demand Reduction (mgd)
1	5%	125	0.6
2	15%	375	1.8
3	25%	625	3.0
4	35%	875	4.2
5	50%	1,250	6.0

Normally, only one of these five stages would be put into effect early in the year at the recommendation of the Water Director and remain in force for the entire dry season. Which one would depend on the water supply outlook at the beginning of the dry season. However, conditions and circumstances will vary with each shortage event. Although it would not be desirable to do so for sake of consistency, the City might be forced to transition to the next higher stage mid-season if the reduction efforts at the initial stage do not achieve the needed result.

There is an important distinction between the lower two stages (1 and 2), designated above in shades of yellow, and the upper three stages (3, 4, and 5) designated in shades of red, with the break point occurring at the 15 percent shortage level. The lower two stages (1 and 2) represent the **anticipated curtailment** that is envisioned as being necessary to balance water supply and demand from time to time under the City's Integrated Water Plan. Shortages of 15 percent or less, while inconvenient, do not directly threaten public safety or pose undue economic impact.

The upper three stages (3, 4 and 5), conversely, are all characterized as **emergency water shortages** since they result in more widespread hardships being felt throughout the community, may threaten public health and welfare, and cause considerably more economic harm. For these reasons, the City is making considerable effort and investing substantial capital to avoid shortages of this magnitude in the future. Nevertheless, as a public water supplier, the City must still prepare and plan for the possibility of experiencing such large deficits under state law.

3.2 Overview of Demand Reduction Strategy

The City's strategy for dealing with water shortages of all levels involves the following four interrelated components:

- An allocation system to establish reduction goals for different customer groups
- Demand reduction measures
- Publicity and communications
- Operating actions

These four components are summarized below.

3.2.1 Allocation System

A fundamental issue any water supplier faces in managing a water shortage involves the allocation of water and how to distribute the available supply among customer categories when supplies fall short. In the process of updating this plan, staff and the City Water Commission examined various options and alternatives and selected a priority-based system. This allocation system produces specific demand reduction goals for each major customer category at various levels of shortfall based on the unique usage characteristics of each customer category. It is one of the key mechanisms to ensure that the overarching goals of: 1) conserving the water supply of the City for the greatest public benefit and 2) mitigating the effects of a water shortage on public health, safety, and economic activity, are achieved. It also provides the means for determining whether demand reduction goals are being met or, if not, making needed adjustments. The allocation system is described in more detail below.

3.2.2 Demand Reduction Measures

There are a variety of demand reduction techniques that can be used to curtail customer water use during a supply shortfall. These techniques fall into the following general categories:

Voluntary Water Use Reductions This approach would include issuing guidelines and suggestions to conserve water, encouraging installation or active distribution of conservation devices, stepping up financial incentives for fixtures and

appliances that reduce per capita water use, discouraging installation of new landscape, or encouraging replanting with low water materials. Offering technical assistance in the form of water audits for various types of customers would fall into this category.

Prohibitions on Certain Uses This technique includes banning nonessential uses not required for protection of public health and safety that are not normally prohibited by definition under the city's water waste ordinance. Examples include prohibition on the use of potable water for washing sidewalks and paved surfaces, dust control, or the draining and refilling of private swimming pools. Included in this category would be serving of water in restaurants or other places where food is served unless expressly requested by the customer.

Limits on Certain Uses This approach involves placing mandatory restrictions such as watering only between certain hours or on specific days, watering of landscape only by certain methods (sprinkler ban), or restricting the manner in which vehicles or buildings may be washed.

Mandatory Requirements This technique includes adopting regulations mandating that certain measures be taken by selected customers ranging from the posting of signage in various establishments to save water to requiring the preparation and filing of site-specific conservation plan or requiring an audit of company water use demonstrating conservation efforts.

Rationing This approach involves establishing a fixed volume or allocation for individual customers or for groups of customers that is intended to reduce water use to a certain level commensurate with the seriousness of the situation. Possible methods that can be used to assign customer allotments include setting a uniform or flat amount, applying a percentage reduction from past use (or other benchmark), establishing a ration on a unit basis (per capita, per dwelling unit, per connection) or using a hybrid approach that is based on a combination of factors.

In updating this plan, staff and the City's Water Commission identified and reviewed available options for application to various customer groups and inclusion at different stages, and took into consideration the following factors:

- Water savings
- Seasonality
- Time frame and procedural requirements to implement the measure
- Administrative burden
- Applicable sector (residential, commercial, irrigation)
- Measures used by other water agencies

3.2.3 Publicity and Communications

Effective communication is essential to the success of any water shortage contingency plan in achieving the desired water use reductions. All customers need to be adequately informed about water supply conditions, understand the need to conserve, and know what actions they are being requested or required to take to mitigate the shortage. The Water Department naturally assumes a central role in publicizing the extent of the water shortage problem and in advising and assisting customers to conserve. The more severe the shortage, the more vigorous the public information campaign will need to be. No matter what the situation though, any public communications strategy undertaken in connection with water shortage ideally should contain the following fundamental attributes:

Timely – information should be disseminated well in advance of voluntary and mandatory actions that are to take effect, repeated often, and updated at regular intervals.

Credible – public information efforts should strive to be clear, professional, consistent, straightforward, reasoned, and honest to build trust and community support.

Multimodal – information should be made available to the public using a variety of methods, including the internet, newsletters and newspapers, radio, television, special events, visual displays, public meetings, speaking engagements, and other techniques to maximize reach.

Open – the Department will actively listen to, engage, and involve its customers, solicit feedback, address identified concerns, and respond to public input in a manner that is respectful, appreciative, welcome to creative solutions, and acknowledges each individual's sacrifice, inconvenience, and contribution to the situation.

Coordinated – the Department should collaborate with other City departments, affected public agencies and organizations, its own employees, interest groups, and the news media to ensure that everyone is on the same page and working together.

Action Oriented – information should always contain positive action steps people can take to help foster a spirit of cooperation and create an overall atmosphere that encourages the public to save water for the common good.

There are a number of **key groups** to whom water shortage communications will need to be aimed. These include, but are not limited to the following:

City Council and other local elected officials The Council authorizes the use of emergency powers and funds, adopts water shortage regulations, and makes appointments to a special appeals board. As the City's governing body, it will have to deal with frequent inquiries from the media and constituents. It will need to know about possible impacts on citizens and the City's own municipal water use. The City Council will be provided in-depth information for its decision-making. The Water Commission, which advises City Council, is a primary forum where policy issues are discussed and the public is able to make its voice heard. The County Board of Supervisors, Capitola City Council, and governing bodies of adjoining water districts also will need to be kept informed.

City Departments and other governmental bodies All City departments, including Parks, Fire, Public Works, as well as other public institutions will be asked to provide leadership and present a good example to the community by reducing their own water demand. The Water Department will need to work closely to promote and ensure such interdepartmental and government cooperation.

News media The media has a key role to play in helping communicate timely and accurate information to the public, especially when water restrictions or regulations are initially announced. The Water Director or Water Conservation Manager (as alternate) serve as official spokespersons to television and print media, answering questions and explaining reasons for certain actions. Because the news media is such a powerful force, care always must be given to deliver accurate and consistent messages and to maintain good relationships with the media. Feature reporters and editors can also be instrumental in writing about personal interest stories and alternative approaches to help people deal with water shortage in a positive way.

Large water users and groups most affected by water shortage The local landscaping and hospitality industries, along with other high water using businesses, University, and special needs customers (hospitals, nursing care facilities, etc) will need additional information about water shortage restrictions or regulations that affect their business or clients more than average.

City water customers/general public All 90,000 City water users, regardless of whether they are the customer of record, will need to be properly notified so that everyone understands the reasons for voluntary or mandatory cutbacks, what is expected in terms of usage restrictions, and the consequences of failing to abide by any adopted regulations. The Department will need to step up distribution of conservation tips and water saving ideas and respond to an increasing number of individual customer contacts. Special efforts also will need to be made to translate copies of all public notices, regulations, and outreach materials into Spanish and other appropriate languages for non-English speakers.

There are various methods the Department could employ to carry out added communications and public outreach responsibilities that become necessary in a water shortage situation. The menu of possible techniques is listed in Table 3-3.

Table 3.3 Communications and Public Outreach Methods

- Press releases
- Press conferences
- Opinion page coverage
- Paid advertising (print, radio, television)
- Community television
- Radio interviews
- Public service announcements
- Internet
- Bill inserts
- Utility bill messages
- Revisions to utility bill layout
- Direct mail
- Printed material (posters, banners, signage)
- E-mail
- Utility newsletter
- Public meetings, forums
- Publish figures and charts of actual water supply and demand on graph, comparing system use against daily, weekly, or monthly water budgets
- Presentations at neighborhood, homeowner's associations, service, and community meetings
- Telephone hotline
- Fliers at schools, churches, libraries, grocery markets, and other social gathering places
- Outdoor signs for visitors
- Conservation events, contests, booths
- Lead or participate in regional drought awareness media campaigns

In reviewing other agency's contingency plans, one feature that was considered valuable to have prepared in advance was a concise public message for each

stage of the Water Shortage Contingency Plan. These statements, set forth below, are intended to help communications stay on message and set the tone for subsequent communications through the duration of the incident.

A working list of contacts for major public agencies, media contacts, business organizations, landscape interests, and large customers is provided in Appendix D for reference.

3.2.4 Operating Actions

The Water Department must be flexible in the use of its own workforce and adaptable in realigning its priorities when a water shortage arises. The added responsibilities change what must be done in both field and office operations on a daily basis compared to usual duties under normal water supply conditions. These actions begin early in the water year with monitoring and forecasting water supply conditions and quickly ramp up in spring as the likelihood of a shortage increases. Many will represent increased costs to the Department for additional personnel, services, and supplies.

An important initial step is to designate a working group consisting of the Water Director and senior staff to lead and manage the Department's internal and external water shortage response. The size and composition of the group and frequency of meetings (monthly, weekly, daily) would vary depending on the severity of the shortage.

The Water Department must then mobilize the necessary personnel, resources, and equipment to undertake the various activities that are critical to implementing an effective response. These initial actions may include, among other things:

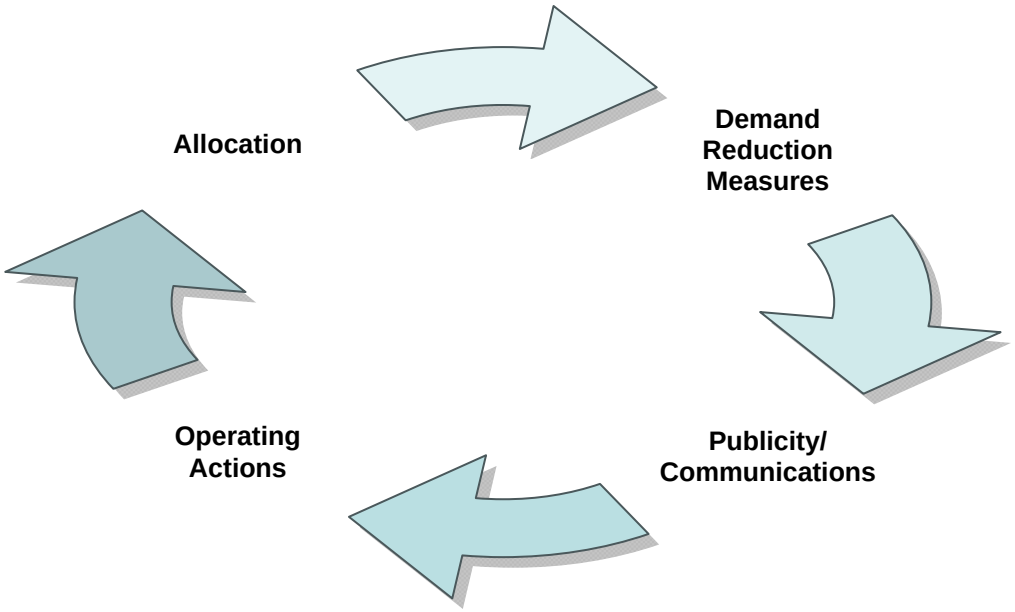
- Establishing water production budgets
- Coordinating with other city departments and affected public agencies
- Establishing a public communications program to publicize use restrictions and to engage and involve the community and key water-using sectors in curtailing their demand
- Ensuring adequate staff and training to effectively respond to customer inquiries and enforce water shortage regulations
- Adapting utility billing format and database capabilities
- Expanding water conservation assistance, outreach, and education

- Instituting a system for processing exception requests and appeals
- Addressing policy issues and updating status with decision makers
- Implementing monitoring mechanisms to track actual usage and measure performance

These and other operating actions are described further below and in Section 4 covering plan implementation.

Together, these four demand reduction strategy components can be thought of as a system whose parts function together to accomplish change; change in customer understanding and awareness, change in their behavior and actions, and fundamentally change in how much water residents, businesses, and visitors use in times of water shortage. As illustrated in Figure 3-1, these interrelated components provide the standards and feedback mechanism to ensure that water consumption is reduced to the level that the system can safely support.

Figure 3-1. Demand Reduction Strategy



3.3 Priority-Based Water Shortage Allocation

The recommended allocation system is based on the premise that, when water is in short supply, certain end uses should have a higher priority than others. Using a priority-based approach, the normal water demands of each major customer category are first classified into three basic priorities, as follows:

1. **Health and safety.** This is the highest priority use, which includes residential and non-residential interior domestic and sanitary uses.

2. **Business.** This category is the second highest priority and includes all non-sanitary usage related to commercial and industrial activity.

3. **Irrigation.** This is the lowest priority and includes all irrigation and outdoor usage in the single family, multiple residential, UC and irrigation categories.

Table 3-4 shows the normal water use for each of the City's major customer groups during the April to October peak season and the composition of that demand according to usage priority. These figures are based on an analysis of actual consumption records for the three-year period from 2002 through 2004, which was selected as being representative of typical water consumption patterns in a stable period marked by normal weather and water conditions.

Table 3-4. Composition of Peak Season Water Use, by Usage Priority
(Million gallons)

Customer Class:	Usage Priority: 1 Health/ Safety	2 Business	3 Irrigation	Total	Percent of Total
Single Family Residential	660		371	1,031	42%
Multiple Residential	382		142	524	21%
Business	165	273		438	18%
University of California	91		41	132	5%
Other Industrial		23		23	1%
Municipal	18		30	48	2%
Irrigation			110	110	4%
Golf Course Irrigation		32	74	106	4%
Coast Agriculture		59		59	2%
Other		2		2	0%
SUBTOTAL	1,316	389	768	2,473	100%
Percent of Total	**53%**	**16%**	**31%**	**100%**	
System uses/losses				168	
TOTAL SYSTEM PRODUCTION (million gallons)				2,641	

Metered water use by all customers during this 7-month period averages 2,473 million gallons, or roughly 2.5 billion gallons. In terms of the breakdown by usage priority, water used for health and safety purposes amounts to 1.3 billion gallons or just over half (53%) of the total demand during the peak season. Water used for business-related purposes amounts to less than 400 million gallons (16%) and the volume of water used for irrigation and associated outdoor purposes totals 768 million gallons (31%). Expressed on a daily basis, this breakdown equates to an average of 6.3 mgd for to satisfy heath and safety needs, 1.9 mgd for business activities, and 3.7 mgd for irrigation/outdoor purposes.

To arrive at demand reduction goals for each customer group, the normal year demands shown in Table 3-4 are scaled back by usage priority in accordance with the schedule shown in Table 3-5.

Table 3-5. Reduction in Water Delivery by Usage Priority
(percent of normal deliveries)

Stage	Overall System Shortfall:	Health/Safety	Business	Irrigation
2	15%	95	95	64
3	25%	95	90	34
4	35%	90	85	12
5	50%	75	67	0

In essence, this allocation system strives to balance available supplies in times of drought as much as possible through cutbacks in outdoor water use. At each level of shortfall, public health and sanitation usage is afforded the highest priority by cutting back on interior usage the least[1]. The importance of water in protecting the City's employment base is also acknowledged through proportionately modest cutbacks to the commercial sector as compared to the overall system shortfall. Irrigation and other outdoor uses in all cases is cutback the most. The larger the water shortage, the greater the cutbacks, but this system of priorities is maintained throughout the range of potential shortages. The heavy reliance on outdoor use reductions makes sense, both from a water system perspective because it reduces peak demands, which is important to preserving storage in Loch Lomond Reservoir, and from a public health and

[1] No separate allocation was developed for Stage 1 shortfall due to the minimal level of demand reduction needed, voluntary nature of conservation measures requested, and regulations that affect all customer groups equally.

welfare perspective, because irrigation and other outdoor use are the most discretionary of all uses when drinking water is in short supply.

Under this system, a systemwide water shortage of 15 percent - the maximum unserved demand envisioned in the Integrated Water Plan - can be addressed through modest cutbacks (5%) in both indoor and business water uses, combined with an approximately one-third reduction in outdoor water use. Emergency water shortages would involve far deeper cutbacks. A 25 percent systemwide shortage requires slightly greater reduction in business water use combined with a harsher two-thirds reduction in outdoor watering. A 35 percent systemwide shortage requires reducing health/safety and business uses somewhat more, combined with drastic reductions, amounting to almost 90 percent, in outdoor water use. To achieve a 50 percent reduction would take nothing less than a significant reduction in both health/safety and business usage, combined with the elimination of all outdoor water use.

The resulting water supply allocation is shown in Table 3-6. The figures are expressed as a percent of normal delivery and by volume in million gallons for each sector. For example, an allocation of 80 percent means a 20 percent cutback from normal use. Single family residential customers are cut back in all stages slightly more than the overall system shortfall and more than the multifamily customers due to their relatively higher proportion of outdoor to indoor use. Business and industrial customers are also cut back, but by less than the system deficit. The University’s cutback would be equal or close to system shortfall, while municipal facilities would be cut back substantially greater due to the high percentage of water use that goes to outdoor purposes. Dedicated landscape/irrigation customers suffer the deepest cutbacks of any single group.

The contribution of each customer category to the overall demand reduction goal is shown in Table 3-7. Approximately two-thirds of the total cutback would be realized through reductions at single and multifamily residential accounts, which is roughly proportional to their overall percentage of normal system demand.

This allocation system is the one recommended by the City’s Water Commission after considering several options, and is based on current patterns and composition of water consumption. As demand level changes over time, it should be reviewed and possibly revised. In addition, alternative allocations may always be considered at the time a given stage is implemented.

Table 3-6. Water Supply Allocation and Customer Reduction Goals

	No Deficiency		Stage 2 15% Deficiency		Stage 3 25% Deficiency		Stage 4 35% Deficiency		Stage 5 50% Deficiency	
	Delivery		Delivery		Delivery		Delivery		Delivery	
Normal Peak Season Demand = 2,473 mg	%	Volume (mil gal)	%	Volume (mil gal)	%	Volume (mil gal)	%	Volume (mil gal)	%	Volume (mil gal)
Single Family Residential	100	1,031	84%	864	73%	753	62%	639	48%	495
Multiple Residential	100	524	87%	454	78%	411	69%	361	55%	287
Business	100	438	95%	416	92%	402	87%	381	70%	307
UC Santa Cruz	100	132	85%	113	76%	100	66%	87	52%	68
Other Industrial	100	23	95%	22	90%	21	85%	20	67%	15
Municipal	100	48	76%	36	57%	27	41%	20	28%	14
Irrigation	100	110	64%	70	34%	37	12%	13	0%	0
Golf Course Irrigation	100	106	73%	78	51%	54	34%	36	20%	21
Coast Irrigation	100	59	95%	56	90%	53	85%	50	67%	40
Other	100	2	95%	2	90%	2	50%	1	50%	1
Total	**100**	**2,473**	**85%**	**2,111**	**75%**	**1,861**	**65%**	**1,607**	**50%**	**1,247**
Demand Reduction %, Million gallons	**0**	**0**	**15%**	**-362**	**25%**	**-612**	**35%**	**-866**	**50%**	**-1,226**

Table 3-7. Contribution of Each Customer Category to Toward Overall Cutback Goal

	Stage 2 15% Deficiency		Stage 3 25% Deficiency		Stage 4 35% Deficiency		Stage 5 50% Deficiency	
Demand Reduction:	Million gallons	Percent of total	Million gallons	Percent of total	Million gallons	Percent of total	Million gallons	Percent of total
Single Family Residential	167	46%	278	45%	392	45%	536	44%
Multiple Residential	70	19%	113	18%	163	19%	238	19%
Business	22	6%	36	6%	57	7%	131	11%
UC Santa Cruz	19	5%	32	5%	45	5%	64	5%
Other Industrial	1	0%	2	0%	3	0%	8	1%
Municipal	12	3%	21	3%	28	3%	35	3%
Irrigation	40	11%	73	12%	97	11%	110	9%
Golf Course Irrigation	28	8%	52	9%	70	8%	85	7%
Coast Irrigation	3	1%	6	1%	9	1%	19	2%
Other	0	0%	0	0%	1	0%	1	0%
Total Demand Reduction	**362**	**100%**	**612**	**100%**	**866**	**100%**	**1,226**	**100%**

A prime concern of any water shortage contingency plan is maintaining sufficient water for public health and sanitation. Table 3-8 below presents the health and safety allocation for residential customers in terms of gallons per person per day under the four deficit conditions. Current indoor water use averages 58 gallons per person per day for single residential accounts and about 50 gallons per person per day for multifamily accounts. In all but the most extreme case, there is enough water to meet essential health and safety needs, which is considered to be between 45 and 50 gallons per person per day for single family homes, assuming they have been fitted with water conserving fixtures and leakage is minimized. At a 50 percent deficiency, even highly water-efficient households would have to take additional actions to get their usage down to the upper 30 or low 40 gallons per person per day.

Table 3-8. Health & Safety Indoor Residential Use

Deficiency condition	Health / Safety Allocation	Single Residential (gal/person/day)	Multiple Residential (gal/person/day)
No deficiency	100%	58	50
15%, 25%	95%	55	47
35%	90%	52	45
50%	75%	43	37

3.4 Water Shortage Response Actions

The allocation system described above serves to establish demand reduction goals for each of the City's major customer groups. The challenge in crafting this contingency plan is to select the most appropriate set of measures that logically correlate with these targets for each sector and stage of shortfall, acknowledging the inherent uncertainties involved and difficulty in predicting their effectiveness in advance.

The recommended menu of actions to cut water use is presented below. It is meant primarily to help inform the public and decision-makers about the types of measures the Water Department would take under various water shortage scenarios and to aid in structuring an updated water shortage ordinance, but should not be construed as limiting other possible options. Specific circumstances will vary with each shortage and decisions about the most appropriate response should be based on the water supply and demand

conditions at the time, and the collective judgment of staff, Water Commission, and City Council, with ample public input. These actions are thus intended as a list of probable measures for advance preparation purposes rather than a set script to be strictly followed, recognizing that as supply and demand change over time, or as a shortage evolves, the ultimate choice of options and actions to best address the shortage also may change.

It is also important to recognize that flexibility in selecting the most appropriate stage may be needed. In the case of a borderline situation, for instance, where there is reasonable likelihood that system demand could be curtailed sufficiently with the lesser restrictions, it may be advantageous to initially choose the lower stage, conditioned with a well publicized caveat that, if water use exceeds targets, the more restrictive regulations would kick in.

Each section that follows includes:

- an overview of the response,
- a discussion of any key issues involved in that stage,
- the prepared public message, and
- a list of the recommended demand reduction measures, communications actions, and operating actions applicable to that stage

3.4.1 Stage 1 – Water Shortage Alert

Stage 1 applies to relatively minor water shortages that can be accommodated with a combination of voluntary conservation measures and minimal usage restrictions, combined with enhanced enforcement of the City's ongoing ordinance prohibiting water waste. Except for a few instances, all demand reduction measures apply uniformly to nearly all customers, therefore no specific allocation is proposed during this stage.

A Stage 1 response may also be appropriate in other situations. It may be prudent as a precautionary measure during an unusually dry year in advance of a declared water shortage to help preserve reservoir storage, or during the winter season following an actual shortage event if needed to maintain a continuing level of awareness among customers until normal water conditions are restored.

The Stage 1 public message is as follows:

"Due to abnormally dry conditions this winter, we're asking all customers to voluntarily cut back water use this summer by 5 percent to stretch the available water supply. City water users should stop using water for non-essential purposes and conserve where possible in case the dry period experienced this past winter continues into next year. If everyone cooperates, we may avoid imposing more stringent watering restrictions. As always, wasting water is prohibited by law"

Table 3-9. Stage 1 Water Shortage Alert Response Measures

System-wide Reduction Goal: 0-5% 0.6 mgd or less

Demand Reduction Measures:
• Request voluntary water conservation by all customers
• Step up enforcement of water waste
• Restrict the time of landscape irrigation to early morning and evening
• Prohibit non-essential water use:
  - serving drinking water by restaurant or food service establishments except upon request
  - use of potable water for washing driveways, patios, parking lots or other paved surfaces
  - require hotel, motel, and other commercial lodging establishments to offer option of not laundering towels and linen daily
  - draining and refilling of swimming pools
• Require hoses used for any purpose to have shut off nozzles
• Encourage use of drip and other low volume irrigation systems
 	
Publicity/Communications
• Conduct press conference to announce water conditions, request cooperation
• Initiate public information campaign through media, utility newsletter, website
• Develop regular advertising campaign to remind consumers of the need to conserve water
• Prepare and disseminate suggestions/requirements to reduce water use
• Inform large landscape/property managers/green industry of irrigation restrictions
• Implement customer meter reading program
 	
Operating Actions
• Coordinate water conservation actions with other City Departments and public agencies
• Adopt water shortage ordinance prohibiting non-essential water use
• Eliminate system water uses deemed non-essential
• Delegate water waste patrol duties to all field personnel
• Institute regular monitoring and reporting of water production and consumption
• Undertake contingency planning for continuing/escalating shortage

3.4.2 Stage 2 – Water Shortage Warning

Stage 2 applies to moderate water shortages. This condition requires more vigorous public information and outreach and an expansion of mandatory water restrictions and prohibitions, particularly on outdoor water uses. The primary methods to meet target consumption levels are to limit irrigation to specified days of the week and to institute water budgets for large landscapes and parks.

The recommended approach to reducing outdoor water use in this stage would be to restrict watering of all lawns and established landscapes to twice weekly during specified hours and to disallow any watering with automatic sprinkler systems on certain days to maximize reduction. Exact schedules would be developed with public input.

Large landscape users, including parks, residential and commercial landscapes, and golf courses with separate irrigation accounts would be required to complete on-site water audits, adhere to monthly water budgets based on their irrigated area and plant materials, and modify their irrigation schedules to achieve the equivalent of a one-third reduction in site water use. The lead time to develop landscape water budgets is long due to the need to collect site specific information, implement billing system changes, and to educate people and transform standard irrigation practices. However, development of water budgets for large users is the next major priority for the City's long-term conservation program, and once they become implemented as an ongoing program, they may be quickly adapted as a shortage management tool. Professional water budgets for dedicated irrigation accounts are typically tied to real-time weather data and tiered pricing systems or surcharges to be effective.

Other measures that would be imposed under Stage 2 would include mandatory leak inspection and repair for large customers and to expand restrictions on exterior washing to dwellings, buildings, and structures.

The Stage 2 public message is as follows:

"It is necessary to impose mandatory restrictions on water use to ensure that throughout the duration of this water shortage an adequate supply of water is maintained for public health and safety purposes. Our overall goal is to reduce water use by 15 percent, which can be achieved if everyone cuts back their

outdoor watering by one-third the normal amount. We are relying on cooperation and support of all water users to abide by all restrictions and to reach this goal. Otherwise, the shortage could deteriorate into a more serious emergency that requires rationing household water use to avoid depleting the available water supply."

Table 3-10. Stage 2 Water Shortage Warning Response Measures

System-wide Reduction Goal: 5-15% 0.6 to 1.8 mgd
Demand Reduction Measures: • Continue all measures initiated at Stage 1 • Restrict landscape irrigation to designated watering days and times • Require large landscapes to adhere to water budgets • Prohibit exterior washing of dwellings, buildings, or structures (with exceptions for window washing or in preparation for painting) • Reduce time allowed to resolve water waste • Require large users audit premises and repair leaks • Continue to promote meter reading and regular leak detection by all customers **Publicity/Communications** • Intensify public information campaign with regular media updates, direct notices to all customers, paid advertising, billing inserts. • Generate publicity about individuals and businesses demonstrating leadership to save water • Consult with major customers to develop conservation plans • Publish weekly consumption graph in daily newspaper • Inform large landscape/property managers/green industry of additional irrigation restrictions • Conduct workshops on large landscape requirements for property owners, contractors, maintenance personnel **Operating Actions** • Coordinate with all City Departments and public agencies to reduce water use • Optimize existing sources (increase groundwater production, reduce transmission losses) • Suspend main flushing except as required for emergency and essential operations • Intensify distribution system leak detection and repair • Hire, train, dispatch water waste patrol • Establish water conservation "hot line" to respond to questions and reports of waste • Expand home water survey program and offer large landscape water audits • If necessary, use City Water Commission to process requests for exceptions • Continue regular monitoring and reporting of water production and consumption • Undertake contingency planning for continuing/escalating shortage • Develop strategy to mitigate revenue losses

3.4.3 Stage 3 – Water Shortage Emergency

This level of water shortage constitutes an emergency situation requiring significant actions by the public to achieve up to a 25 percent reduction in normal water use to avoid depleting limited water storage. It requires the equivalent of 5 to 10 percent reduction in all indoor use and a drastic two-thirds reduction in outdoor use systemwide. The three primary measures being recommended to meet this emergency reduction goal are:

1. Residential water rationing
2. Required water shortage signage in all nonresidential establishments
3. Reduced landscape water budgets for large landscapes

The basic concept of water rationing is that each utility customer is given a certain allocation of water, expressed in billing units, to use in a billing period[2]. If they use the amount they are allocated or less, charges for water are calculated at the normal rate. If they exceed their allocation, the portion in excess of their allocation is charged a penalty rate. The penalty rate may be broken into multiple tiers so the more the excess usage, the higher the penalty price per CCF used. The purpose is not to generate revenue but rather to use water pricing as a way to motivate the customer to modify their usage to stay within their allocation and avoid being penalized, which most customers do. Those that don't reduce are charged for their overuse at the penalty rates.

The method to allocate water when rationing is instituted varies according to customer type. It may be based on the number of people in a home, the number of dwelling units in a multifamily complex, or set as a percentage of past use during some prior year. Staff and the Water Commission reviewed the water shortage contingency plans of many other water agencies to identify the methods used elsewhere to ration water and considered the advantages and disadvantages of various methods.

For single family residential customers, the **per capita approach** is probably the fairest practical method, easiest to communicate, would be best understood and accepted by the general public, and is effective in achieving cutbacks where they are needed most, in outdoor water use. In addition, past experience

[2] One billing unit equals one hundred cubic feet (CCF) or 748 gallons.

demonstrates that this method was very successful in reducing outdoor water demand for the single residential category when rationing was last instituted in 1990 and in 1977.

One of the key challenges to implementing water rationing using a pure per capita approach is the need to perform a census of household size at over 18,000 single family accounts and to maintain information on household size as number of residents changes over time. In lieu of performing a census, Staff and the Water Commission recommend using a modified per capita rationing system developed by the Goleta Water District. Under this system, all households are given a default allocation sufficient for a family of 4 persons. Households that have more than four persons would be required to contact the Water Department and verify household size in order to be granted an increased allocation, which would depend on the actual number of persons living at the residence.

Recent census data for the City of Santa Cruz indicate that only 17 percent of all occupied households within the City have four or more persons per household. Assuming this figure is similar for the unincorporated part of the City's water service area, establishing a default allocation for a family of four would more than satisfy the 83 percent majority of households that have three or fewer persons per household. This method is similar to that last used by the City to ration water in 1990, which provided a baseline allocation for households of three or less, except that a census was undertaken then to survey the actual number of persons living at each household.

The Goleta rationing model is considered to be preferable because it eliminates the significant work associated with carrying out an occupancy census and alleviates concerns about potential for inaccurate responses. The principle drawback is the problem of equity, since there will be less "cushion" in the allocation for households with four residents than there is for homes with fewer number of residents, and an increased possibility of exceeding their allocation. Whatever method is selected, allocation disagreements are to be expected and procedures need to be put in place to handle valid appeals and exceptions.

Table 3-11 below shows a typical rationing calculation for a single family residence in Stage 3.

Table 3-11. Water Rationing Schedule: Single Family Residential Account

	Ccf/month	Gallons per day:
Up to four persons:	11	265
Each additional person:	2	50
Example monthly allocation for a 6-person household:		
Base allocation:	11 ccf	
2 additional persons x 2 ccf per person	+ 4 ccf	
Monthly Allocation	= 15 ccf	= 374 or 62 gpcd [3]

What makes multifamily customers more challenging for developing a water rationing system are the large differences in housing types, the presence or absence of irrigation meters at a complex, and the fact that many larger accounts are handled by an independent property management firm on behalf of the homeowner's association. These companies typically do not track how many people reside in each unit or in the complex as a whole.

It is recommended that multiple-residential accounts be rationed based on the **number of dwelling units** associated with the water service account. The number of dwelling units is the best starting point since that data is available on the utility billing system and, in the absence of information about the number of people living on the property, it is the next best driver for indoor water demand. It is further recommended that multiple-residential accounts be allowed alternative rationing options that reflect the heterogeneous nature of building types on multifamily properties and the fact that some of these properties have separate irrigation accounts while others don't. These wide differences in user characteristics cause inequities in allocation based solely on the number of dwelling units. Offering alternatives allows the customer choose for themselves the option that works best in their particular case. These options include:

- an allocation based on the number of persons residing at the property
- an allocation based partly on the number of persons residing at the property and partly on landscape water needs at the property that reflect the same cutback to irrigation that other customers would experience (for properties without irrigation accounts)

[3] gpcd = gallons per capita per day

- the same allocation per dwelling unit as single family accounts would receive for certain properties that resemble single family lots in terms of lot coverage

Recommended rationing allotments for single and multiple residential accounts are presented in Appendix E.

If water rationing becomes necessary, it is also recommended that all outside city customers be converted from bimonthly to monthly billing. This change will enhance the customer's ability to monitor their water usage, enable them to detect and repair leaks quicker, and help them stay within their allocation.

The main obstacle in implementing water rationing at this time is the uncertainly about the capability of the new EDEN utility billing system. The system has been in use only since September 2008 and its ability to calculate rationing allocations and excess use charges is unknown. In the event rationing becomes necessary before the billing system can be adequately programmed and tested, other options could be considered to achieve substantial outdoor use reductions in the residential sector in lieu of water rationing. Although not ideal, these include:

- Restricting watering to once weekly, or
- Banning sprinkler irrigation

This problem is discussed further in Section 4.

It should be reiterated that **water rationing is a situation that the City is seeking to avoid** through long-term conservation efforts and the development of an additional water supply. It is, however, necessary to have a contingency plan in place should the need arise.

Commercial customers would be exempted from individual water rationing in Stage 3. Instead they would be expected to meet their collective 8 percent reduction goal by adhering to continuing water restrictions, and by being required to prominently post **"SAVE WATER – REPORT LEAKS AND WATER WASTE"** signs at the entrance and in every bathroom of commercial, industrial and institutional buildings, including:

- Hotels, motels, lodging
- Restaurants, cafeterias, cafes, and all food service establishments

- Offices and government buildings
- Hospitals and health care centers
- Schools

Large landscape customers would be held to water budgets as described in Stage 2, reduced in accordance with the allocation for irrigation customers in Stage 3.

One charged policy issue that often arises in connection with a water shortage emergency is the question of whether or not to continue allowing new connections on the system. In the past, it has been the City's policy to continue allowing new connections mainly because the demand they add in any one year is so negligible. The water that would be made available to existing customers by banning new water connections, therefore, would not make any real difference in terms of increasing the existing customers' allocation. This issue is typically driven by customers who are called on to make sacrifices and feel that water agencies should concentrate on fulfilling present obligations rather than accepting new customers. A number of agencies, however, do have provision for a temporary ban or place a low priority on new connections in later stages of their drought plans.

The Water Commission considered this issue carefully and recommended giving the public a one-year advance notice, beginning in Stage 3, stating that a temporary water service connection ban would be strongly considered if the shortage emergency continues or escalates into the following year. This notice would allow those people with plans and projects already underway time to complete work or make arrangements, and those considering future construction projects to make timely decisions about proceeding with the knowledge that they risk not being able to secure a water service connection until the shortage is over.

The Stage 3 public message is as follows:

"The City faces a serious water shortage emergency due to prolonged drought. To conserve the available water supply for the greatest public benefit while minimizing impacts on our local economy, it has become necessary to institute a water rationing program for all residential customers. Our goal is to reduce system water demand by ___%. While rationing amounts are adequate for

normal domestic needs, significant cuts to outdoor water use may be necessary to remain within set allocations. All customers are urgently asked to make every effort to conserve water and abide by watering restrictions or face further reductions in water allotments."

Table 3-12. Stage 3 Water Shortage Emergency Response Measures

System-wide Reduction Goal: 15-25% 1.8 to 3.0 mgd
Demand Reduction Measures: • Institute water rationing for residential customers • Continue landscape irrigation restrictions to designated watering days and times • Require large landscapes to adhere to reduced water budgets • Require all commercial customers to prominently display "save water" signage with specified language at specified locations • Maintain restrictions on exterior washing of surfaces and structures • Continue to promote meter reading and regular leak detection by all customers **Publicity/Communications** • Expand, intensify public information campaign focused on 2/3 reduction in outdoor use • Provide regular media briefings, manage media coverage • Provide regular information reports to Water Commission, City Council and other agencies • Consult with major customers to develop conservation plans • Publish weekly consumption graph in daily newspaper • Enlist support of business groups: chamber, CVC, lodging association, etc. • Inform large landscape/property managers/green industry of reduced allocations • Conduct workshops on large landscape requirements for property owners, contractors, maintenance personnel • Prepare public notice regarding possible future service connection moratorium **Operating Actions** • Modify utility billing system and bill format to compare actual use with customer allocation • Adopt penalty rates • Increase customer service training to address high bills, irate customers • Convene and staff appeals board to process requests for exceptions and appeals of penalties • Expand size and coverage of water waste patrol • Expand, strengthen water conservation education, activities, and program • Continue all operating actions listed under Stage 2 • Increase frequency of monitoring and reporting of water production and consumption • Convert outside City customers from bimonthly to monthly billing • Undertake contingency planning for continuing/escalating shortage • Develop strategy to mitigate revenue losses

3.4.4 Stage 4 – Severe Water Shortage Emergency

The water supply conditions that would trigger Stage 4 parallel the difficult situation the City experienced in the drought of late 1970s. Under this scenario, virtually all available water must be reserved either for health and safety purposes or to sustain local business.

Achieving a 35 percent systemwide reduction would require expanding water rationing to cover all water customers, including business. Residential customers would continue to be rationed as described in Stage 3, but with reduced monthly allotments.

Unfortunately, there is no practical way to assign a commercial water budget based on variables like the number of employees, square footage, etc. given the variety of usage characteristics in this sector. Every business (or group of businesses sharing a single water account, as is often the case in shopping centers) is unique. They include laundries, restaurants, health care facilities, retail outlets, hotels, car washes, and office buildings. We see no choice other than to ration business customers individually based on a **percent of prior use in a normal year** that is consistent with the overall allocation for Stage 4. Where essential water use at a business establishment involves a public health service, including hospitals, doctor's offices, medical laboratories, and skilled nursing facilities, or where a business can demonstrate it has already achieved maximum practical water conservation, provision for additional water could be made on a case by case basis through an exceptions process.

Other actions/restrictions that likely would be necessary in a severe water shortage emergency, in addition to those previously described, include the following:

- Prohibition on lawn/turf irrigation and on installation of new landscaping in new development
- Prohibition on potable water in fountains and ornamental water features
- Prohibition on on-site vehicle washing, including dealer lots, company fleets
- Rescinding hydrant and bulk water permits
- Suspending water main replacement program

Gray water use can be allowed and should be promoted for saving valuable landscape trees and shrubs. It includes drain water from showers, bathtubs,

bathroom sinks, and clothes washers. It does not include water that has come in contact with toilet waste, water from kitchen sinks and dishwashers, or laundry water used for washing diapers. There are no restrictions on the use of gray water if it is carried in a bucket. Plumbed gray water systems can also be built to convey drain water and provide subsurface irrigation to trees and shrubs.

The Stage 4 public message is as follows:

"Due to continuing deterioration in storage and overall scarcity of available supply, all customers, residential and business alike, are now unavoidably subject to water rationing. The current water shortage is among the most severe ever faced in modern times. We must all continue to conserve water to the maximum extent possible and strive to maintain water use within our established rationing limits as long as the drought endures in order to avert a water crisis."

Table 3-13. Stage 4 Severe Water Shortage Emergency Response Measures

System-wide Reduction Goal: 25-35% 3.0 to 4.2 mgd
Demand Reduction Measures: • Reduce residential water allocations • Institute water rationing for commercial customers • Minimize water use by large landscape customers – only for most valuable plant and tree survival • Prohibition on lawn/turf irrigation and on installation of new landscaping in new development • Prohibition on on-site vehicle washing, including dealer lots, company fleets • Rescind hydrant and bulk water permits, prohibit use except by special permission **Publicity/Communications** • Contract with outside advertising agency to carry out major publicity campaign • Continue to provide regular media briefings, manage media coverage • Provide regular information reports to Water Commission, City Council and other agencies • Publish daily consumption graph in all local newspapers • Prepare public notice regarding possible service connection moratorium • Publish information on ways to minimize most valuable landscape damage and loss, including promote appropriate use of gray water **Operating Actions** • Scale up administrative appeals staff and increase frequency of hearings • Expand water waste enforcement to 24/7

- Delegate field staff to assist in enforcement (shut offs, flow restrictors)
- Open separate, centralized drought information center
- Hire temporary staff to conduct conservation training
- Continue all applicable operating actions listed under Stage 3
- Increase frequency of monitoring and reporting of water production and consumption
- Undertake contingency planning for continuing/escalating shortage
- Revise Department operating budget to address revenue shortfall
- Defer portions of capital improvement program
- Consider surcharges, rate changes

3.4.5 Stage 5 – Critical Water Shortage Emergency

Stage 5 represents an imminent and extraordinary crisis threatening health, safety, and security of the entire community. Under this dire situation, extreme measures are necessary to cut back water use by up to half the normal amount. Not enough water would exist even to meet the community's full health and safety needs, the top priority. All water should be reserved for human consumption, sanitation, and fire protection purposes and any remaining amount allocated to minimize economic harm. A shortage of this severity could be expected to generate stress, confusion, and chaos much the same as any major emergency and at some point could transform into a full blown natural disaster that can no longer be governed by local ordinance and may need to be managed by the same basic principles and command structure under the state Standardized Emergency Management System that other natural disasters are. The City has experienced water shortages in the past but never one of such large proportion.

This fifth stage would involve nothing less than rationing all customer groups and instituting a prohibition on residential outdoor use for any reason (e.g., garden, car-washing, cleaning, maintenance, etc.) It may also require shutting down or severely restricting use at certain public facilities, like local parks and school play fields. Some businesses may be forced or required to either partially or completely close.

The planned response for a shortage of this magnitude would involve reducing rationing allocations for residential customers to minimal levels and reducing commercial rationing amounts in accordance with their overall allocation. All

outdoor irrigation would be prohibited (other than by hand-held container and what has been captured or collected from another non-prohibited use). No water would be available for public showers or private, community, or public pools and hot tubs. These facilities likely would be forced to close.

A shortage of this magnitude could affect other local water suppliers as people substitute normal activities, such as laundry, showers, etc. from their home to other locations not so affected. The City's response would therefore involve greater coordination at a regional and perhaps even statewide level.

The Stage 5 public message is as follows:

"The City of Santa Cruz is confronted with a critical water shortage emergency of unprecedented proportions. At this time, there exists barely enough drinking water for the most essential human health, sanitation, and safety needs. As a result, all outdoor watering is now prohibited. We understand the hardship this extraordinary condition poses to every resident and business in the City and appreciate the sacrifices people are making to ensure that water system does not run dry. Everyone is urgently requested to do whatever necessary to maintain water use within or below their allotted amount."

Table 3-14. Stage 5 Critical Water Shortage Emergency Response Measures

System-wide Reduction Goal: 35-50% 4.2 to 6.0 mgd
Demand Reduction Measures: • Further reduce residential water allocations • Reduce commercial water allocation • Prohibit all outdoor irrigation • No water for outdoor washing or recreational purposes; close pools, public showers • Continue all measures initiated in prior stages as appropriate **Publicity/Communications** • Contract with crisis/emergency communications consultant to develop crisis communications plan and major publicity campaign • Assign Public Information Officer to communicate with media • Set up emergency notification lists for medical/dental facilities, public facilities, large users, food and beverage facilities, and critical businesses • Promote appropriate use of gray water for reuse

Operating Actions

- Consider shifting to EOC model of command management for overall policy guidance and coordination
- Coordinate with CA Dept of Public Health, District Engineer and other emergency response agencies regarding water quality, public health issues
- Coordinate with law enforcement agencies to address enforcement challenges
- Continue water waste enforcement 24/7
- Delegate field staff to assist in enforcement (shut offs, flow restrictors)
- Continue all applicable operating actions listed under Stage 4
- Coordinate with local sanitation agencies regarding sewer line maintenance
- Continue close monitoring and reporting of water production and consumption
- Investigate potential for reduced in-stream release
- Procure resources to utilize dead storage, if needed
- Undertake emergency planning for continuing/escalating shortage

3.5 Enforcement, Exceptions, and Appeals

An important part of a water shortage plan is to have the appropriate authority and a combination of methods to enforce mandatory measures such as water restrictions or rationing in order to protect public health and safety. General authority and powers of the City to enforce ordinances is contained in Chapter 4 of the Santa Cruz Municipal Code. In addition, the City's water shortage ordinance contains specific language regarding enforcement of water use rules and regulations and includes provisions for issuing exceptions and hearing appeals. These provisions were reviewed by staff and the Water Commission, which put forth several recommendations to be incorporated into the updated water shortage ordinance.

3.5.1 Enforcement Methods

Enforcement is carried out in a number of ways during a water shortage. In cases such as a report of water waste, the first step is to communicate with the customer by telephone, letter, door tag, or by making personal contact in the field to educate them about regulations. Many times this contact is all that is required to get the problem resolved. If not, enforcement progresses to a written notice of violation. Beyond this, there are several methods in the City's existing water conservation and water shortage ordinances that can be used to enforce water restrictions and rationing regulations. These methods are described below.

Penalty fees This method would apply in situations involving violation of water restrictions, if, after multiple warnings had been given, a violation continued to occur at an account. The fee would be added to a customer's utility bill along with a written notice sent to the customer in advance. The penalty fee would increase with subsequent violations, as follows:

1st Violation $100
2nd Violation $250
3rd Violation $500
4th Violation $1,000

The Water Commission recommended that additional, higher penalty fees also be established and applied to large users that willfully violate water restrictions.

Excess use fees Excess use fees are the primary method for enforcing water rationing and are imposed on customers whose water use exceeds their allocation when rationing is in effect. The purpose of the excess use fee is to make the consequences of exceeding one's rationing allocation so severe that the customer is induced to keep their water use within their allocation and avoid being fined. Like water rates, there are two components to setting excess use fees: 1) the way they are structured, and 2) the dollar amount.

Staff and the Water Commission looked at several models from other agencies and recommend maintaining the same excess use fee structure as in the existing water shortage ordinance, for billing reasons and for clarity in communicating penalties to the public. It is, however, recommended that the penalty amount be increased to bring it more in line with current rates, as shown below:

Table 3-15. Proposed Excess Use Fees

Excess Use Range	Percent of water used in Excess of Allotment	Excess Use Charge per 100 Cubic Feet for all Water Used in Excess of Allotment (in addition to ordinary water consumption charges)
A	0% to 10% over allotment	$25.00
B	More than 10% over allotment	$50.00

For example, in Table 3-11 above, a 4-person household is provided an allocation of 11 CCF per month in Stage 3. At 2008 rates, the normal water charges for an inside city customer using 11 CCF would total $51.37, including the $16.58 readiness-to-serve charge for a 5/8" meter. Under water rationing, if that same customer used 18 CCF, their normal water charges would amount to $92.88, and excess use fees would cost $325 (1 ccf @$25 and 6 ccf @ $50), for a total of $417.88.

The purpose of a two-tier excess use structure is to avoid very large penalties for households that make a good faith effort to stay within their allocation but wind up going over a little. If a customer's water use exceeds one's allocation by a large amount, though, the penalty should be very steep.

Flow restriction Some customers will continue to exceed their allotment regardless of the amount of their water bill. In such instances, the Water Department is authorized to install a flow restricting device to provide minimal water flow, just enough for health and safety purposes. In these cases the customer is charged a fee to cover the staff time needed to install the flow restrictor and another fee for its removal. The Water Department would not use this method where fire suppression sprinklers are on the same supply line as domestic water.

Disconnection/reconnection fees Water suppliers have the legal authority to enforce water shortage regulations by terminating service for egregious violations. In such cases, the customer would be charged for both disconnection and reconnection.

Citation Finally, the City's water shortage ordinance authorizes staff to issue citations that would have to be paid or challenged in court. This method could be used in cases like a multifamily property where terminating service or restricting flow to all households may not be an option.

3.5.2 Exceptions

No water shortage plan can account for all situations. The exception procedure allows the Water Department to provide for special or exceptional circumstances that otherwise would create undue hardship for an individual customer or class of customers.

An exception allows a customer to be relieved of a particular regulation or receive an increased allocation for the duration of the shortage. Therefore, it should be granted only when justified on specific grounds that warrant allocating more water than other similarly situated customers and when consistent with the intent of the water shortage regulations, while providing equal treatment of all customers.

The City's existing ordinance includes an exception process. Some of its features are as follows:

- Under water restrictions, an exception application is not accepted unless the customer alleges unfair treatment.
- Under water rationing, an exception application is not accepted unless an excess use fee has been assessed.
- Leaks do not qualify for an exception.
- It allows a resident who is not an account holder to force the customer of record to appeal.
- The process is administered by the Water Director.

This policy is to make the customer first demonstrate the demand reduction efforts taken to meet the restriction or allocation, and places responsibility for managing and monitoring water use on the customer, where it belongs. It also serves to minimize the number of exception applications from those merely seeking more water without having gone to the effort to try to live within their given allocation.

Recommendations Regarding Exceptions

It is recommended that the updated water shortage contingency ordinance be amended to include a process that requires the Director make a formal finding to authorize an exception. This change is proposed to better articulate the standard that must be met in order to receive relief. The suggested language for such findings is as follows:

- Failure to do so would cause a condition affecting the health, sanitation, fire protection, or safety of the applicant or the public;

- Strict application of the allotment provisions imposes a severe or undue hardship on a particular business, or render it infeasible for a business or class of business to remain in operation;

- Alternative restrictions which achieve the same level of demand reduction as the restrictions from which an exception is being sought are available and are binding and enforceable;

- The customer has demonstrated to the Director's satisfaction that circumstances have changed warranting a change in the customer's allocation.

- Hospitals and health care facilities using industry best management practices are eligible for an exception.

- Demonstration by a business of actions already taken to increase environmental sustainability that have reduced water consumption to the maximum extent feasible, as determined by the Water Director.

Additional recommendations regarding the exception process are as follows:

- That the denial of an exception may be appealed to an Appeals Board;

- The Department adopt administrative procedures similar to those used by the City of Tampa Bay for including appropriate information on an exception application, including the requirement that the applicant must demonstrate maximum practical reduction in water consumption;

- That a policy be added allowing the Director to impose conditions requiring long-term water efficiency changes from customers as part of the exception process.

3.5.3 Appeals

The City's existing ordinance allows any water service customer who considers an enforcement action to have been erroneously undertaken to appeal their case before a City Council appointed ad hoc Drought Appeals Board. The Appeals

Board considers the evidence presented by the customer and decides whether to uphold the enforcement action or to provide relief.

The difference between an exception and an appeal is that an appeal gives an individual the opportunity to challenge an official decision about an enforcement action. It is not the primary means to secure a larger allocation or get an exception to a water use regulation. However, as mentioned above, customers should be able to appeal a denial by the Water Director of such an exception request to the Appeals Board.

From past experience, the most common reason for filing an appeal was to contest large excess use fees that were levied while under water rationing, often due to a leak in the customers' plumbing fixture or system. This resulted in a large and difficult backlog of cases for the Appeals Board. The Water Department would continue to follow its existing water leak rebate policy that provides administrative relief, including forgiveness of excess use fees, for certain types of leaks that are considered to be beyond the customer's control, such as a leak that develops in an underground pipeline serving a property. Common maintenance items, such as a leaking toilet or failing automatic irrigation valve, that are considered to be customer's responsibility to control, are not eligible for such forgiveness.

One feature of the existing ordinance was to allow a resident who is not a customer of record to force the account customer to appeal the excess water use fee. The ordinance also allowed a customer to request to use a portion of the excess use fee, on a one-time only basis, toward the installation of water conservation equipment in lieu of paying it to the Water Department.

Recommendations Regarding Appeals

It is recommended that the provisions included in the existing ordinance regarding appeals be continued. The Water Commission felt that a formal Appeals Board would not need to be convened until Stage 3, and felt it could serve in that capacity instead during the early stages (1 and 2), if necessary. Furthermore, as an alternative enforcement approach, we recommend adding a new process that would provide one-time forgiveness of excess use charges while under water rationing. To be considered for such forgiveness, the customer would be required to sign up and complete a short weekend or evening course

covering basic meter reading, leak detection, and other topics relevant to the water restrictions in place at the time. This approach (like traffic school) would help reduce the number cases heard by the Appeals Board, provide financial relief to customer receiving the high bill, and most importantly, would give them the opportunity, education, and tools they need to achieve ongoing compliance with water use rules and regulations for the remainder of the shortage.

3.6 Water Shortage Recovery and Plan Termination

A water shortage ends when local rainfall, runoff, and reservoir storage levels improve to the point where the water system is once again capable of supporting unrestricted water demand. Any water use rules and regulations in effect at the time are officially rescinded by City Council and public notice is given that the water shortage is over. The Water Director would then oversee any remaining termination and plan review activities. These activities could include:

- Publicize gratitude for the community's cooperation
- Restore water utility operations, organization, and services to pre-event levels
- Document the event and response and compile applicable records for future reference
- Continue to maintain liaison as needed with external agencies
- Collect cost accounting information, assess revenue losses and financial impact, and review deferred projects or programs
- Debrief staff to review effectiveness of actions, to identify the lessons learned, and to enhance response and recovery efforts in the future
- Complete a detailed evaluation of affected facilities and services to prepare an "after action" report
- Update the water shortage contingency plan as needed.

Section 4 IMPLEMENTATION

This section describes the essential elements of implementing the updated Water Shortage Contingency Plan and discusses the approximate lead time needed to prepare for and activate a demand reduction program. The elements discussed below differ in the amount of staff time, effort, priority, and funding that is required for implementation; some steps can be taken relatively quickly and inexpensively while others will require substantial ongoing work and expense before they are able to be set up and applied as shortage management tools. The primary purpose of this section is to map out the major tasks and timelines required to implement the demand reduction program described in Section 3 and to identify where additional ongoing efforts are necessary to address critical gaps.

4.1 Timeline for Declaring Water Shortage

The table below indicates the approximate times of the year when the City evaluates water supply conditions and, if necessary, declares a water shortage. Planning for a water shortage may begin earlier in winter, and should commence early if conditions that winter are unusually dry or are preceded by a dry year, but it is not usually until the end of March that the water supply outlook for the year ahead becomes certain. This leaves very little lead time to prepare for implementing the water shortage contingency plan.

Table 4-1. Calendar for Declaring Water Shortage

Target Date	Action
Months of Oct -Dec	Monitor rainfall, reservoir level, and runoff amounts
Late January	Prepare written status report on water supply conditions
Early February	Present initial estimate of water supply availability for year ahead
Early March	Present revised estimate of water supply availability for year ahead
Mid-March	SCWD announces existence of water shortage (if applicable)
Mid to late March	SCWD determines monthly water production budget and need for voluntary or mandatory response.
Early April	Present shortage response recommendation to Water Commission; notice of public hearing published
Mid-April	City Council formally declares water supply shortage, adopts emergency ordinance
Mid to late April	Water shortage regulations become effective

Long-range weather forecasting has not yet advanced to the point where it is possible to know in advance with certainty whether the City will experience a water shortage. Therefore, it is not practical to plan more than one season at a time, other than to prepare possible scenarios using multiple dry years for modeling purposes.

4.2 Process for Declaring Water Shortage

Once the water shortage condition has been defined (as soon as reasonably certain), recommendations regarding water shortage rules and regulations consistent with this contingency plan are discussed with the City Water Commission. Monthly Water Commission meetings serve as a public forum for discussing water conditions and for hearing issues associated with implementation of the water shortage ordinance throughout the entire duration of the water shortage event.

Following consideration by the Water Commission, formal action declaring a water shortage is taken by City Council. The legal requirements for such action are covered in Section 350 et.seq. of the California Water Code. The code requires the following process be followed:

- That City Council hold a public hearing on the matter;
- That the public hearing be properly noticed (minimum of publishing once in newspaper at least seven days prior to the date of the hearing);
- Upon determining and declaring the existence of a water shortage, City Council may then adopt regulations and restrictions governing the use and delivery of water.

In accordance with Municipal Code section 16.04.480, rules adopted by the City Council establishing water use regulations become effective immediately after their publication in a newspaper of general circulation published in the City of Santa Cruz.

4.3 Public Notification and Coordination

Even before formal declaration of a water shortage, a public information/media program should be activated to provide customers with as much advance notice as possible. Following Council action, all residents and businesses, not just

customers of record, would need to be provided notice of water shortage rules and regulations via a variety of media and communications methods, including print and television media, internet, and other methods. The timeline for getting information out to the public on television, radio, and through newspaper articles is very short. Additional notification would occur though the City's utility newsletter, which requires a longer lead time of six to eight weeks to produce and mail. It is also recommended that a separate website be designed in advance if rationing becomes necessary to provide basic information about the program, conservation information, forms related to the program, contact information, etc., which then can be modified and expanded as necessary. Large water users and those businesses that are most likely to be seriously affected should be contacted directly in writing. Public notification will be provided in Spanish language for non-English speakers.

Coordination with other City departments and other public agencies can begin prior to formal declaration of a water shortage and can be accomplished through regular meetings, e-mail group updates, and presentations.

Getting the public involved and keeping them informed will require a significant expansion of existing water conservation public information and outreach efforts. Contracting with an advertising agency to assist with a communications campaign and mass media advertising is one way to expand outreach efforts quickly. A substantial amount of printed information on how to conserve water during a water shortage has already been developed and tailored to various types of water customers and is available for immediate use.

4.4 Personnel, Office Space, and Equipment

The estimated additional staff needed to carry out this contingency plan is shown below in Table 4-2. Program staff may consist of existing staff reassigned from regular duties in the Water or other City departments, new limited-term employees, interns, or some combination of the above.

The role of the administrative and office assistants would be to help with the processing of customer appeal and exception requests, administration of the appeals board meetings, and related correspondence. The field utility representatives would be responsible for patrolling the service area for violations of watering rules and restrictions and public contact, while the office utility

representatives would deal with the greatly increased customer contact (in person and by telephone) and would help with utility billing issues. The meter technician's role would be to support the additional customer service workload related to verifying meter reads, data-logging, and other field activities. The water conservation representative's role would be to assist customers with on-site water audits, provide conservation education, and publicity. Distribution personnel (or possible contractor) would provide leak detection and repair services as well as functions related to meters and flow restriction. The programmer analyst position would provide utility billing system software services when water rationing is in effect.

Table 4-2. Potential Additional Staff Positions

Section/Position	Water Shortage Stage:			
	2	3	4	5
Water Administration:				
105 Administrative Assistant I		1	1	2
Customer Services:				
199 Utility Service Representative (field)	1	2	4	6
199 Utility Service Representative (office)	1	2	3	4
212 Water Meter Technician		1	1	1
333 Utility Supervisor				1
Water Conservation:				
208 Water Conservation Representative	1	2	2	3
Water Distribution:				
209 Water Distribution Worker	1	2	2	2
Other Temporary:				
229 Programmer Analyst II		1	1	1
914 Office Assistant			1	2
Total Positions	4	11	15	22
Estimated personnel costs* ($000)	$113	$324	$425	$622

**assuming seven months, including overhead*

The timeline associated with recruiting and hiring new or additional staff varies from several weeks to several months depending on the type of employment

opportunity, whether there is an existing recruitment list to draw from, or whether a new job announcement would need to be advertised.

Any newly hired staff would need to be quickly integrated into the organization with basic training in the following areas:

- Water Department functions, organization, facilities, and service area boundary,
- Customer service standards, City policies, and safety responsibilities,
- Computer equipment and the utility billing system,
- Water rates and charges and meter reading,
- Water shortage regulations and enforcement processes.

In addition, all existing Water Department personnel would need to understand water shortage rules and regulations in effect at the time to be able to respond to customer questions wherever they may come into contact with the public on the job.

Additional staff, particularly during stages when rationing is in effect, means expanded office space and additional equipment also would be needed to carry out office and field functions. Even though the Water Department recently moved to a new, larger office, the Customer Service section of the office is currently unable to accommodate any additional office personnel. The Water Department office would need to be reconfigured or new temporary workspace acquired, or vacant storefront property rented. In addition, the Water Department would need to purchase or lease the following equipment:

Office personnel:

- Furniture
- Telephones
- Computers

Field personnel:

- Automobiles
- Cell phones
- Digital cameras

4.5 Effect of Water Shortages on Revenue

One of the negative consequences of using demand reduction to deal with water shortages is the corresponding reduction in revenue that occurs to the City's Water Fund as a result of reduced water sales. To better understand the magnitude of revenue losses that the Water Fund might experience, a

spreadsheet model was developed based on 2007 calendar year revenues, the most recent year for which complete revenue data is available. The model assumes the "ready-to-serve" or fixed monthly service charge that is based on meter size would remain unaffected while the volumetric portion of the Department's revenue derived from water sales would vary by customer class in accordance with the allocation presented in Table 3-6 over the seven month period in which water shortage regulations are likely to be in effect. Results are summarized in Table 4-3.

Table 4-3. Revenue Losses Associated with Various Water Shortages

	2007 Revenue ($000)			Revenue Losses due to Reduced Water Sales ($000):				
Customer Category:	From service charges	From water sales	Total	Stage 1 (5%)	Stage 2 (15%)	Stage 3 (25%)	Stage 4 (35%)	Stage 5 (50%)
Single Family Residential	3,770	6,027	9,797	-229	-687	-1,236	-1,740	-2,381
Multi-Family Residential	1,069	3,742	4,810	-126	-329	-556	-784	-1,137
Business	917	3,207	4,124	-111	-111	-177	-288	-665
UC Santa Cruz	99	1,022	1,121	-33	-99	-158	-224	-317
Other Industry	44	130	174	-4	-4	-8	-13	-28
Municipal	149	301	450	-13	-62	-112	-153	-187
Irrigation	234	682	916	-29	-207	-379	-505	-574
Golf	32	581	614	-27	-148	-268	-361	-437
Coast	34	36	70	-1	-1	-3	-4	-9
Other	19	43	62	-1	-1	-3	-13	-13
Total 2007 Revenue	**$6,366**	**$15,770**	**$22,137**					
Total Revenue Losses				-$575	-$1,649	-$2,900	-$4,085	-$5,749
Estimated Net Revenue				**$21,562**	**$20,488**	**$19,236**	**$18,051**	**$16,388**

Table 4-3 shows revenue losses ranging from just under $0.6 million in a 5 percent water shortage situation to almost $5.8 million in a critical 50 percent water shortage. Compared to 2007 revenues of just over $22 million, the Department's net revenue would be reduced to approximately $21.5 million in Stage 1 to less than $16.4 million in Stage 5. These estimates of losses are ballpark figures only and probably underestimate the problem. Actual losses would be different for the following reasons:

- The spreadsheet did not model the effect of tiered pricing in the single family residential category, which would exacerbate revenue losses from this group;

- It is unlikely that system water use would immediately recover to normal levels in the months following a period of curtailment as modeled, thereby further depressing income;

- The table above does not include added operating costs of staff, equipment, and materials related to the water shortage response.

On the other hand, the time of year in which regulations would take effect includes parts of two fiscal years, so the full effect of revenue losses would not impact the Department's annual budget to such a large degree. In addition, there would be relatively minor cost savings associated with reduced power and chemical usage at the Graham Hill water treatment plant, ranging from <$0.1 million in Stage 1 to about $0.4 million in Stage 5. Finally, some of the revenue loss would be offset by penalty and/or excess use fees.

Whatever the situation, one element of implementing this Water Shortage Contingency plan involves examining the Water Department's proposed budget for the coming year and recommending action(s) to lessen or overcome the revenue shortfall. Options include the following:

- Tapping into the Department's Rate Stabilization Fund (currently $2.2 million)
- Deferring planned capital improvements
- Considering possible rate adjustments or surcharges

As a matter of policy, since the City's Integrated Water Plan anticipates occasional water shortages of up to 15 percent, it is recommended that the Rate Stabilization Fund be maintained at least at a level that would fully mitigate expected revenue losses associated with that level of shortfall. The Rate Stabilization Fund would now fully cover the losses of a 15 percent shortfall lasting one year, but may need to be increased in the future, either to keep pace with expected revenue losses, or to mitigate revenue losses from water shortages lasting more than a single year.

Another implementation issue associated with pricing is the Proposition 218 procedure for increasing water rates, fees, and charges. It is assumed that the

proposed changes to both penalty fees and excess use fees discussed in Section 3 would require written notice to all customers, a public hearing, and consideration of written protests and comments before implementing the new fees. Given the minimum 45 day protest period, the entire Prop 218 process can take several months to complete.

4.6 Household Survey

To implement water rationing for single residential customers in Stages 3 through 5, it is recommended that the City of Santa Cruz use the system developed by Goleta Water District in lieu of performing a household census or survey. The advantages are that it is simpler, easy to understand, more likely to be feasible with the new utility billing system, avoids having to perform a household survey or census, allows adjustments for larger households, and achieves the fundamental goal of reducing peak season water use, particularly outdoor use . Goleta also required that, for households larger than four, certain efficiency steps be taken before authorizing a larger allocation.

For the majority of households that have fewer than four residents, little opposition to this approach is expected. However, the one downside to this approach is that it does afford somewhat unequal amounts of water on a per person basis to households of different sizes, and so some may object to the City adopting this system. If, based on public input, a true per capita rationing system becomes the preferred approach to ration water instead of the Goleta model, the following describes the work involved to update the number of people residing at each account on the billing system. In the past this survey has been done by mail and is based fundamentally on the honor system. There are currently over 18,700 accounts classified as single residential customers on the water system. This task would involve data processing personnel to prepare data files for mailing, a mailing service vendor to provide printing and mailing services and to provide return envelopes, and two additional temporary staff to handle data input. The task would also involve maintaining census data on a daily basis as household sizes change and new utility accounts are established. The estimated cost for postage and services related to performing such a survey is about $20,000, not counting data entry. The lead time necessary to conduct the survey and enter data is approximately 3 months.

The other major work item involved in a census-based approach to rationing involves configuring the utility billing system to calculate allotments based on household size, discussed below.

4.7 Utility Billing/Data Processing Capabilities

Implementing this Water Shortage Contingency Plan will require utility billing system software that provides the necessary capabilities and flexibility to quickly shift from normal billing practices to water rationing mode. To manage a water shortage as outlined in this plan, the billing system must eventually be able, at a minimum, to do the following:

- Integrate penalty fees into the utility bill,
- Change billing frequency, as needed, to monthly from bimonthly for outside City customers,
- Calculate rationing allocations, whether determined by per capita, per dwelling unit, or percentage of past use method,
- Maintain long-term water usage history,
- Calculate excess use fees,
- Address special needs customers (overwrite default allocation to handle rationing exceptions),
- Handle special cases, such as multiple meters serving a single property,
- Calculate seasonally varying landscape water budgets.

In addition, the utility bill format and the data files that are generated to create the utility bills must be modified to incorporate water restrictions, water budgets, and rationing requirements.

The newly installed EDEN utility billing module appears to be able to handle the type of computations needed to implement both the Goleta rationing model for single family residential customers and the per dwelling unit method for multi-family accounts. It currently does not have the capability or flexibility to handle a census-based approach to rationing, large landscape water budgets, or commercial water rationing which is based on some percentage of past use. Acquiring this capability is a top priority but it will have to be custom developed over time. The Customer Service Manager indicates that such programming would likely take in excess of one year to complete. The Department's FY 09 budget includes $25,000 for utility billing software development expenses.

4.8 Customer Exceptions and Appeals

One of the actions that is triggered when City Council adopts the water shortage ordinance is the establishment of an Appeals Board. Part of implementing this plan involves providing administrative support to the Appeals Board, including processing requests, preparing recommendations, posting agendas, attending meetings, preparing meeting minutes, and handling correspondence. After the Board's membership has been established and approved by City Council, the Appeals Board function can be implemented quickly, but depending on the stage of water shortage and number of appeals filed, may require substantial staff time over the course of the water shortage to address the resulting caseload.

4.9 Large Landscape Water Budgets

The next major work priority scheduled for the City's Water Conservation Office involves implementing a large landscape program. The program will consist of developing water budgets for over 400 large landscape sites served by dedicated irrigation meters, offering water audits, and supporting activities (financial incentives, education, and possible separation of large landscapes currently on mixed use meters). These programs have a long development time (1-2 years) due to the need to measure landscape areas, differentiate among plant materials, and integrate water budget data into the billing system. This latter task requires changing the bill design and layout to show water budget information and tying performance relative to the water budget to water pricing. The project will be designed so that water budgets can be quickly adapted for use as a water shortage management tool in Stages 2-5. If the City were confronted with a water shortage before large landscape water budgets and budget based pricing could be implemented, however, alternative methods to curtail water in the large landscape sector would have to considered.

4.10 Monitoring Water Supply and Demand

Under normal water supply conditions, water production and gross consumption are recorded daily and monthly by treatment plant operators and reported to the Production Superintendent. Metered water consumption is reported on a monthly basis through automated sales reports generated by the utility billing system.

During a water shortage, a monthly production forecast and budget are developed for each source of supply. Actual production and the lake level are closely monitored on a daily and weekly basis to verify that the budgeted goals are being met. Consumption by large users is monitored on a frequent basis. In severe stages of a water shortage, production and consumption data would be evaluated daily and the status reported to the Water Director's office. If the trend in consumption is such that the rate of drawdown at Loch Lomond is greater than anticipated, the City Manager and Council are notified so that corrective action (such as increased publicity and enforcement or consideration of declaring the next higher stage) can be taken.

An example of a monthly water supply and demand monitoring report is presented in Appendix F.

4.11 Ongoing Implementation Steps

The final tasks in updating the City's Water Shortage Contingency Plan include the following steps:

- Involving the community and soliciting public review and input on this document;
- Finalizing and presenting the plan to City Council for adoption;
- Preparing an updated water shortage ordinance;
- Preparing and mailing a Proposition 218 notice about proposed changes to penalty and excess use fees.

As far as critical gaps that require ongoing work, the most important recommendations are to:

1. Continue to work on the new utility billing system so that the database is able to meet the City's requirements for use in water rationing if it becomes necessary, and

2. Focus on developing the large landscape program so that water budgets described above can be used to professionally manage large irrigation accounts the next time a water shortage arises.

3. As much as possible, prepare water shortage notices, announcements, materials, and mailing lists in advance, including bilingual materials for non-English speakers.

Appendices

A California Water Code, Sections 350-359 and 10632 ..... A-1

B Cities and Water Agencies whose Water Shortage Contingency Plans or Ordinances were Reviewed B-1

C Exceedance Probabilities for San Lorenzo River at Felton C-1

D List of Major Public Agency Contacts D-1

E Residential Water Rationing Allotments E-1

F Example Monthly Water Supply and Demand Monitoring Report F-1

G Resolution of the City Council of the City of Santa Cruz Adopting the 2009 Water Shortage Contingency Plan. G-1

H Ordinance 2010-12 Chapter 16.01 Water Shortage Regulations & Restrictions H-1

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Appendix A

California Water Code Sections 350-359 and 10632

Water Code Section 350-359

350. The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, may declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

351. Excepting in event of a breakage or failure of a dam, pump, pipe line or conduit causing an immediate emergency, the declaration shall be made only after a public hearing at which consumers of such water supply shall have an opportunity to be heard to protest against the declaration and to present their respective needs to said governing board.

352. Notice of the time and place of hearing shall be published pursuant to Section 6061 of the Government Code at least seven days prior to the date of hearing in a newspaper printed, published, and circulated within the area in which the water supply is distributed, or if there is no such newspaper, in any newspaper printed, published, and circulated in the county in which the area is located.

353. When the governing body has so determined and declared the existence of an emergency condition of water shortage within its service area, it shall thereupon adopt such regulations and restrictions on the delivery of water and the consumption within said area of water supplied for public use as will in the sound discretion of such governing body conserve the water supply for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection.

354. After allocating and setting aside the amount of water which in the opinion of the governing body will be necessary to supply water needed for domestic use, sanitation, and fire protection, the regulations may establish priorities in the use of water for other purposes and provide for the allocation, distribution, and delivery of water for such other purposes, without discrimination between consumers using water for the same purpose or purposes.

355. The regulations and restrictions shall thereafter be and remain in full force and effect during the period of the emergency and until the supply of water available for distribution within such area has been replenished or augmented.

356. The regulations and restrictions may include the right to deny applications for new or additional service connections, and provision for their enforcement by discontinuing service to consumers willfully violating the regulations and restrictions.

357. If the regulations and restrictions on delivery and consumption of water adopted pursuant to this chapter conflict with any law establishing the rights of individual consumers to receive either specific or proportionate amounts of the water supply available for distribution within such service area, the regulations and restrictions adopted pursuant to this chapter shall prevail over the provisions of such laws relating to water rights for the duration of the period of emergency; provided, however, that any distributor of water which is subject to regulation by the State Public Utilities Commission shall before making such regulations and restrictions effective secure the approval thereof by the Public Utilities Commission.

358. Nothing in this chapter shall be construed to prohibit or prevent review by any court of competent jurisdiction of any finding or determination by a governing board of the existence of an emergency or of regulations or restrictions adopted by such board, pursuant to this chapter, on the ground that any such action is fraudulent, arbitrary, or capricious.

359. (a) Notwithstanding any other provision of law that requires an election for the purpose of authorizing a contract with the United States, or for incurring the obligation to repay loans from the United States, and except as otherwise limited or prohibited by the California Constitution, a public water agency, as an alternative procedure to submitting the proposal to an election, upon affirmative vote of four-fifths of the members of the governing body thereof, may apply for, accept, provide for the repayment together with interest thereon, and use funds made available by the federal government pursuant to Public Law 95-18, pursuant to any other federal act subsequently enacted during 1977 that specifically provides emergency drought relief financing, or pursuant to existing federal relief programs receiving budget augmentations in 1977 for drought assistance, and may enter into contracts that are required to obtain those federal funds pursuant to the provisions of those federal acts if the following conditions exist:

(1) The project is undertaken by a state, regional, or local governmental agency.
(2) As a result of the severe drought now existing in many parts of the state, the agency has insufficient water supply needed to meet necessary agricultural, domestic, industrial, recreational, and fish and wildlife needs within the service area or area of jurisdiction of the agency.

(3) The project will develop or conserve water before October 31, 1978, and will assist in mitigating the impacts of the drought.
(4) The agency affirms that it will comply, if applicable, with Sections 1602, 1603, and 1605 of the Fish and Game Code
(5) The project will be completed on or before the completion date, if any, required under the federal act providing the funding, but not later than March 1, 1978.

(b) Any obligation to repay loans shall be expressly limited to revenues of the system improved by the proceeds of the contract.

(c) No application for federal funds pursuant to this section shall be made on or after March 1, 1978.

(d) Notwithstanding the provisions of this section, a public agency shall not be exempt from any provision of law that requires the submission of a proposal to an election if a petition requesting such an election signed by 10 percent of the registered voters within the public agency is presented to the governing board within 30 days following the submission of an application for federal funds.

(e) Notwithstanding the provisions of this section, a public water agency that applied for federal funds for a project before January 1, 1978, may make application to the Director of the Drought Emergency Task Force for extension of the required completion date specified in paragraph (5) of subdivision (b). Following receipt of an application for extension, the Director of the Drought Emergency Task Force may extend the required completion date specified in paragraph (5) of subdivision (b) to a date not later than September 30, 1978, if the director finds that the project has been delayed by factors not controllable by the public water agency. If the Drought Emergency Task Force is dissolved, the Director of Water Resources shall exercise the authority vested in the Director of the Drought Emergency Task Force pursuant to this section.

(f) For the purposes of this section, "public water agency" means a city, district, agency, authority, or any other political subdivision of the state, except the state, that distributes water to the inhabitants thereof, is otherwise authorized by law to enter into contracts or agreements with the federal government for a water supply or for financing facilities for a water supply, and is otherwise required by law to submit those agreements or contracts or any other project involving long-term debt to an election within that public water agency.

Water Code Section 10632

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

Appendix B

Cities and Agencies whose Water Shortage Contingency Plans or Ordinances were Reviewed

Alameda County Water District

Contra Costa Water District

Denver Water, Colorado

East Bay Municipal Utilities District (EBMUD)

El Paso Water Utilities, Texas

Marin Municipal Water District

Monterey Peninsula Water Management District

New York City, New York

Salt Lake City Department of Public Works, Utah

San Diego County Water Authority

San Francisco Public Utilities Commission (SFPUC)

San Luis Obispo, City of

Santa Barbara, City of

Santa Monica, City of

Santa Rosa, City of

Seattle Public Utilities, Washington

Sonoma County Water Agency

Southern Nevada Water Authority, Nevada

St. Helena, City of

Tampa, Florida, City of

Yuba City, City of

Appendix C

Exceedance Probabilities for San Lorenzo River at Felton

Month	Exceedence Probability	Wet	Normal	Dry	Critically Dry
Jan.	100	120	34.2	13.8	20.5
	90	244	56.4	28.6	22.4
	75	386	92.2	35.2	30.6
	50	656	181	57.3	35.9
	25	831	271	108	43.3
	10	1153	600	139	57.5
Mar.	100	113	70.1	54.9	21.4
	90	237	87.7	58.5	22.3
	75	308	99.9	71.1	28.3
	50	462	219	126	37.1
	25	705	303	197	75.9
	10	842	494	229	93.1
May	100	43.9	34.5	21.9	11.6
	90	65.9	40.2	27.2	15.7
	75	82.1	45.1	27.9	19.9
	50	105	58.5	31.7	21.3
	25	154	72.0	44.3	22.7
	10	185	87.2	77.5	29.4
July	100	24.1	16.5	10.6	6.7
	90	25.9	18.2	12.9	8.7
	75	33.2	20.1	13.4	9.8
	50	40.1	24.1	15.5	10.5
	25	46.6	28.8	20.6	12.1
	10	56.7	33.2	23.9	13.2
Sept.	100	16.9	13.6	8.3	8.3
	90	19.1	14.1	8.9	8.8
	75	21.1	14.6	10.8	9.3
	50	23.3	16.1	12.5	10.2
	25	26.1	20.0	14.9	10.9
	10	32.9	22.7	16.8	11.5
Nov.	100	12.8	11.8	11.4	14.5
	90	22.6	15.2	15.0	18.2
	75	27.0	24.1	20.3	20.9
	50	32.9	36.4	28.1	23.7
	25	65.7	53.0	67.6	25.3
	10	173	73.5	110	34.5

Month	Exceedence Probability	Wet	Normal	Dry	Critically Dry
Feb.	100	126	75.7	20.9	16.6
	90	218	102	34.9	21.6
	75	337	123	63.2	25.3
	50	637	301	141	47.3
	25	1177	466	220	77.5
	10	1318	573	256	124.0
April	100	67.9	58.0	36.7	12.3
	90	106	63.3	42.7	20.6
	75	140	77.6	43.3	25.5
	50	246	112	60.3	28.9
	25	459	149	70.0	32.8
	10	849	170	75.4	35.5
June	100	33.6	23.1	15.4	9.4
	90	42.5	26.1	17.3	11.6
	75	49.0	29.7	19.4	13.3
	50	60.5	36.1	22.7	14.7
	25	77.2	44.8	28.5	17.2
	10	93.0	51.6	34.8	17.8
Aug.	100	18.5	12.7	8.4	6.5
	90	21.3	15.4	10.1	8.3
	75	23.0	16.2	11.0	9.2
	50	27.4	18.7	12.0	10.1
	25	34.2	22.3	15.6	10.8
	10	40.2	25.3	18.7	11.5
Oct.	100	8.3	9.8	10.1	9.3
	90	12.0	14.4	15.3	11.3
	75	15.7	16.1	17.5	12.7
	50	21.1	21.0	25.4	15.8
	25	28.0	24.6	27.3	23.2
	10	32.1	29.0	28.4	30.0
Dec.	100	15.3	24.4	14.7	16.4
	90	52.4	26.7	21.8	22.4
	75	77.3	31.0	28.3	25.4
	50	168	65.1	36.3	33.7
	25	272	238	43.1	53.3
	10	501	376	85.5	82.4

Table 1: Exceedence probabilities for San Lorenzo River at Big Trees from 1936-2002 (USGS Gage ID #11160500). Wet, average, dry and drought years are classified by the total flow for the water year (Method A)

Appendix D

Public Agency and Major Customer Contact List

FACILITY	CONTACT NAME(S)	TELEPHONE	Email
Water Districts:			
CA Dept of Public Health	Jan Sweigert	831-655-6939	After hours/emergency 831-236-4311
Soquel Creek Water District	Laura Brown	831-475-8500	
Scotts Valley Water District	Charlie McNeish	831-438-2363	contact@svwd.org
San Lorenzo Valley Water District	Jim Mueller	831-338-2153	jmueller@slvwd.com
County of Santa Cruz/City of Capitola:			
County CAO	Dinah Phillips	831-454-2100	dinah.phillips@co.santa-cruz.ca.us
County Public Health Officer	Poki Namkung	831-454-4000	poki.namkung@co.santa-cruz.ca.us
County Director of Environmental Health	Bob Kennedy	831-454-2022	bob.kennedy@co.santa-cruz.ca.us
County OES	Paul Horvat	831-458-7109	oes014@co.santa-cruz.ca.us
Santa Cruz County Public Works	John Presleigh	831-454-2160	dpwweb@co.santa-cruz.ca.us
Emergency/General Services	Nancy Carr-Gordon	831-454-2714	nancy.gordon@co.santa-cruz.ca.us
NETCOMM	Scotty Douglas	831-471-1000	scotty@sccecc.org
County Safety Officer	Josh Riley	831-454-4820	josh.reilly@co.santa-cruz.ca.us
County Parks	Gretchen Iliff Maintenance Supt.	831-454-7908 Office 831-247-2615 Cell	prc043@scparks.com
County Redevelopment Agency	Anita Kane	831 454-2776	red017@co.santa-cruz.ca.us
City of Capitola	Richard Hill	831-475-7300	rhill@ci.capitola.ca.us
Capitola Public Works	Steve Jesberg	831-475-7300 x217	sjesberg@ci.capitola.ca.us

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Public Agency and Major Customer Contact List

FACILITY	CONTACT NAME(S)	TELEPHONE	Email
Medical Facilities:			
Dominican Hospital Main phone: 462-7700	Tom Bruce	831-462-7550	tbruce@chw.edu
Sutter Main phone: 477-2200	Facilities Office	831-477-2299	
Santa Cruz Medical Clinic Main phone: 423-4111	Brian Crispell Facilities Director	831-227-7110	
University of California, Santa Cruz:			
Campus Dispatch		831-459-4856	
Physical Plant (Non-Emergency)	Jim Dunne	831-459-4444	jfdunne@ucsc.edu
Physical Planning and Construction	Dean Fitch	831-459-4936	drfitch@ucsc.edu
University Relations	Donna Blitzer	831-459-3938	dblitzer@ucsc.edu
School Districts:			
City Schools Main phone: 429-3837	John Bramlett	831-429-3968 Office 831-251-6803 Cell	bram@sccs.santacruz.k12.ca.us
Live Oak School Dist. Main phone: 475-6333	Keith Houchen Director of Maint.	831-475-6095 Office 831-212-4862 Cell	khoutchen@santacruz.k12.ca.us
Other:			
PG&E	Phil Furnas	831-479-5892 831-915-8168	24 Hour emergency service: 1(800) PGE-5000
Pasatiempo Golf Course Corporate Office: 459-9169	Paul Chojnacky	831-459-9713 Office 415-336-5099 Cell	paul@pasatiempo.com
DeLaveaga Golf Course	Miles Hicks Alt. Contact: Steve Pacheco 831-236-0700	831-420-6121 Office 831-212-8699 Cell	mhicks@cityofsantacruz.com

Appendix D

Public Agency and Major Customer Contact List

FACILITY	CONTACT NAME(S)	TELEPHONE	Email
Santa Cruz Memorial, Oakwood Cemeteries	Randy Krassow	831-426-1601	rkrassow@scmemorial.com
Chaminade Main phone: 831-475-5600	Al Hittle Facilities Director	831-465-3451 Office 831-212-1616 Cell	
SC Beach Boardwalk Main phone: 423-5590	Security Head of Maint.	831-345-5590 Supv. 831-818-3336 Cell	Also: Ted Whiting: 460-1610 Carl Henn, Facility Manager 460-3364
City Parks	Steve Hammack	831-420-5366 Office 831-212-5687 Cell	shammack@cityofsantacruz.com
Port District	Rick Smith	831-475-6161	scpd@santacruzharbor.org
IT Main phone: 420-5555 Operators for SCADA systems: 420-5457, 24 hrs	Carlos Silva Network Administrator	831-420-5093 Office 831-227-0635 Cell	csilva@cityofsantacruz.com
Capitola Mall	Steve Bettencourt	831-901-8618	SMS1257@smsclean.com

Appendix E

Residential Water Rationing Allotments

(Monthly allotment, in ccf or billing units)

<table>
<tr><th></th><th colspan="2">Stage 3
15–25% Deficiency</th><th>Stage 4
25-35% Deficiency</th><th>Stage 5
35-50% Deficiency</th></tr>
<tr><td>Single Residential Accounts
Up to 4 persons:
Each Additional person:</td><td colspan="2">11
2</td><td>9
2</td><td>7
2</td></tr>
<tr><td rowspan="2">Multiple Residential Accounts
Allotment is <u>per dwelling unit</u> based on number of dwelling units on account:</td><td colspan="2">Separate irrigation meter serving property?
No Yes</td><td colspan="2">All multiple residential accounts, regardless of whether there is a separate irrigation meter serving the property or not:</td></tr>
<tr><td>2-4:
5-20:
Over 20:</td><td>7
6
5</td><td>6
5
4</td><td>6
5
4</td><td>5
4
3</td></tr>
<tr><td>Multiple Residential Accounts Alternative A
Allotment is in gallons per person per day (gpcd) based on the number of permanent residents at the account:</td><td colspan="2">47 gpcd</td><td>45 gpcd</td><td>37 gpcd</td></tr>
<tr><td>Multiple Residential Accounts Alternative B
(not applicable to 2-unit accounts)

Where lot coverage, by dwelling units is <35% of entire property</td><td colspan="4">Same allotment as single residential accounts</td></tr>
</table>

Appendix F

Example of Monthly Water Supply and Demand Monitoring Report

SCWD Production Forecast	April			May				Sep			Oct			Total		
(million gallons)	Projected	Actual	Variance	Projected	Actual	Variance		Projected	Actual	Variance	Projected	Actual	Variance			
North Coast (gross production)																
North Coast (net production)																
San Lorenzo River																
Live Oak Wells																
Total Production without Lake																
Projected System Demand																
Lake Production Needed to Meet Demand																
Evaporation (feet)																
Evaporation (mil gal)																
Fish Release (mil gal)																
Beginning Lake Volume (mil gal)																
End of Month Lake Volume (mil gal)																
End of Month Lake Elevation (ft above msl)																
Monthly change in elevation (ft)																
Cumulative change in elevation (ft)																
Percent of capacity (%)																

Previous Year Water Consumption	
Current Year Water Consumption	
Difference	

Notes:

North Coast gross production based on …

North Coast net production assumed to be …

San Lorenzo River forecast assumes ___ year type, ___ percent exceedance probability

Projected system demand based on …

Assumptions for Loch Lomond Reservoir include: starting elev: ____ no additional pumping from Felton Diversion, & no natural inflow.

Appendix G

RESOLUTION NO. NS-28,024

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SANTA CRUZ
ADOPTING THE 2009 WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the City Council of the City of Santa Cruz in 2003 adopted a long range planning document known as the Integrated Water Plan, which was intended to provide a flexible, phased approach for reducing near-term drought year shortages and to provide a reliable supply that meets long-term needs while ensuring protection of public health and safety; and

WHEREAS, in addition to implementing water conservation programs to reduce average daily water use and pursuing a cooperative desalination project to increase the supply of water, the Integrated Water Plan includes a curtailment component calling for temporary cutbacks of water use by up to 15 percent to help balance available water supply against demand in drought years; and

WHEREAS, the need to better prepare for the possibility of future water shortages in advance of the next major drought was identified as a top priority in the city's 2005 Urban Water Management Plan; and

WHEREAS, California Water Code section 10632 requires water agencies to plan for water shortages of up to 50 percent as part of their Urban Water Management Plan; and,

WHEREAS, development of the Water Shortage Contingency Plan was a collaborative, open, and public process among the City Water Department staff, the City's Water Commission, City Council and the public; and

WHEREAS, the Water Commission has reviewed the Water Shortage Contingency Plan and unanimously recommended that City Council adopt it to provide a framework for guiding the City's response to future droughts; and

WHEREAS, the State of California is now in its third consecutive year of drought and despite the recent rain, water conditions in Santa Cruz remain below normal; and

WHEREAS, because stream flows that constitute the City's primary drinking water source of supply are projected to run lower than usual this year, voluntary and mandatory actions to temporarily reduce water demand will likely be needed this summer to help preserve valuable reservoir storage in case dry conditions continue beyond 2009.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Santa Cruz that it hereby adopts the 2009 Water Shortage Contingency Plan, authorizes the Water Director to file a copy with the California Department of Water Resources as an amendment to the City's 2005 Urban Water Management Plan, and directs staff to develop a water shortage ordinance that is consistent with the recommendations outlined in the plan.

RESOLUTION NO. NS-28,024

PASSED AND ADOPTED this 10th day of March, 2009, by the following vote:

AYES:	Councilmembers Coonerty, Robinson, Lane, Madrigal, Beiers, Vice Mayor Rotkin; Mayor Mathews.
NOES:	None.
ABSENT:	None.
DISQUALIFIED:	None.

APPROVED: _____
Mayor

ATTEST: _____
City Clerk

Appendix H

ORDINANCE NO. 2010-12

AN ORDINANCE OF THE CITY OF SANTA CRUZ REPEALING ORDINANCE 2009-14 AND ADDING A NEW CHAPTER 16.01 OF THE MUNICIPAL CODE PROHIBITING AND REGULATING CERTAIN USES OF WATER FROM THE CITY WATER SUPPLY SYSTEM NOT ESSENTIAL TO THE PUBLIC HEALTH AND SAFETY FOR WATER CONSERVATION PURPOSES, PRESCRIBING PENALTIES FOR VIOLATIONS, AND ESTABLISHING A WATER SHORTAGE APPEAL BOARD

BE IT ORDAINED by the City Council of the City of Santa Cruz as follows:

SECTION 1: Ordinance 2009-14 is hereby repealed.

SECTION 2: Chapter 16.01 of the Santa Cruz Municipal Code is hereby enacted to read as follows:

"Chapter 16.01

Water Shortage Regulations and Restrictions

Sections:

16.01.010 Findings.
16.01.020 Declaration of Water Shortage.
16.01.030 Application of Regulations.
16.01.040 Precedence of Regulations.
16.01.050 Definitions.
16.01.060 Water Waste Prohibitions.
16.01.070 Stage 1: Water Shortage Alert.
16.01.080 Stage 2: Water Shortage Warning.
16.01.090 Stage 3: Water Shortage Emergency.
16.01.100 Stage 4: Severe Water Shortage Emergency.
16.01.110 Stage 5: Critical Water Shortage Emergency.
16.01.120 Exceptions.
16.01.130 Water Shortage Appeal Board.
16.01.140 Administrative Enforcement.
16.01.150 Additional Enforcement Authority.
16.01.160 Severability.

16.01.010 FINDINGS.

WHEREAS, the City of Santa Cruz water system draws almost exclusively on local surface water sources, whose yield varies from year to year depending on the amount of rainfall received and runoff generated during the winter season; and

WHEREAS, the City water system is susceptible to water shortages in dry and critically dry years or in periods of prolonged regional drought when water conditions characterized by low surface flows in the north coast streams and San Lorenzo River sources, depleted storage in Newell Creek Reservoir, or both, reduce the available supply to a level that cannot support seasonal water demand; and

WHEREAS, on March 10, 2009, the City Council of the City of Santa Cruz adopted an updated Water Shortage Contingency Plan that describes how the City will respond to future water shortages and lists the various actions the City would take to reduce water demand under different water shortage scenarios ranging from 5 percent or less up to and including a 50 percent seasonal water supply deficiency; and

WHEREAS California Water Code sections 350 et seq. authorize water suppliers, after holding a properly noticed public hearing and after making certain findings, to declare a water shortage (emergency) and to adopt such regulations and restrictions to conserve the water supply for the greatest public benefit with particular regard for domestic use, sanitation, and fire protection; and

WHEREAS, the voluntary and mandatory water conservation measures and progressive restrictions on water use and method of use set forth herein provide an effective and immediately available means of conserving water which is essential during periods of water shortage to ensure a reliable and sustainable minimum supply of water for the public health, safety, and welfare and to preserve valuable limited reservoir storage, avoid depleting water storage to an unacceptably low level, and thereby lessen the possibility of experiencing more critical shortages if dry conditions continue or worsen; and

WHEREAS, the usage allotments hereinafter established will equitably spread the burden of restricted and prohibited usage in a manner prescribed by the City's Water Shortage Contingency Plan over all City Water Department customers and other consumers of City water; and

WHEREAS, the purposes of this chapter are to conserve the water supply of the City of Santa Cruz for the greatest public benefit, to mitigate the effects of a water supply shortage on public health and safety and economic activity, and to budget water use so that a reliable and sustainable minimum supply of water will be available for the most essential purposes for the entire duration of the water shortage.

16.01.020 DECLARATION OF WATER SHORTAGE.

The provisions of this chapter shall take effect whenever the Director, upon engineering analysis of City water supplies, finds and determines that a water shortage exists or is imminent within the City of Santa Cruz water service area and a declaration of a water shortage is made by a resolution of the City Council, and they shall remain in effect for the duration of the water shortage set forth in the resolution.

16.01.030 APPLICATION OF REGULATIONS.

The provisions of this chapter shall apply to all persons using or consuming water both inside and outside the City and within the City water service area, and regardless of whether any person using water shall have a contract for water service with the City.

16.01.040 PRECEDENCE OF REGULATIONS.

Where other provisions of the Municipal Code, whether enacted prior or subsequent to this chapter, are inconsistent with this the provisions of this chapter, the provisions of this chapter shall supersede and control for the duration of the water shortage set forth in the resolution of the City Council.

16.01.050 DEFINITIONS.

(a) "Director" refers to the Director of the City of Santa Cruz Water Department.

(b) "Water" refers to water produced and served by the City of Santa Cruz Water Department.

(c) "City" refers to the City of Santa Cruz.

(d) "Water Department" refers to the City of Santa Cruz Water Department.

(e) "Seasonal water demand" refers to the demand, measured in gallons, placed by customers on the City water supply between April 1 and October 31 each calendar year.

(f) "Issue"/"Declare". Whenever this chapter references the Director's issuance or declaration of an alert, warning, emergency, or regulation, said alert, warning, emergency or regulation shall be put into effect by the placement of a legal advertisement in a newspaper of general circulation, by a posting on the City's internet website and by a posting in the following public places: Santa Cruz City Hall, 809 Center Street, Santa Cruz; Santa Cruz Water Department Office, 212 Locust Street, Santa Cruz; Capitola City Hall, 420 Capitola Avenue, Capitola, and the Santa Cruz County Governmental Center, 701 Ocean Street, Santa Cruz. Any such alert, warning, emergency or regulation shall take effect upon the date of its publication in the Santa Cruz Sentinel.

(g) "Customer" shall refer to any account customer of the City of Santa Cruz Water Department as well as to any consumer of City water who may not be City of Santa Cruz Water Department account customer.

(h) "Dry Year" refers to the type of water year under the City's water year classification system, which begins October 1 and ends September 30, in which the total annual discharge of the San Lorenzo River at Felton measures between 29,000 and 49,000 acre-feet.

(i) "Critically Dry Year" refers to the type of water year under the City's water year classification system, which begins October 1 and ends September 30, in which the total annual discharge of the San Lorenzo River at Felton measures less than 29,000 acre-feet.

16.01.060 WATER WASTE PROHIBITIONS.

It shall be unlawful during any water shortage stage for any person, firm, partnership, association, corporation, political entity (including the City) or any other Water Department customer to use water for any of the following:

(a) Fire Hydrants. Use of water from any fire hydrant unless specifically authorized by permit from the City, except by regularly constituted fire protection agencies for fire suppression purposes, or for other authorized uses, including distribution system flushing, fire flow testing, and filling of approved vehicles for sewer system flushing, storm drain maintenance, and street sweeping purposes.

(b) Watering/Irrigation. The watering of grass, lawn, groundcover, shrubbery, open ground, crops and trees, including agricultural irrigation, in a manner or to an extent that causes

or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, gutter or ditch.

(c) Plumbing Leaks. The escape of water through leaks, breaks, or other malfunctions within the water user's plumbing or distribution system for any period of time after such break or leak should have reasonably been discovered and corrected. It shall be presumed that a period of twenty-four hours after the water user discovers such break, leak or malfunction, or receives notice from the City of such condition, whichever occurs first, is a reasonable time within which to correct such condition or to make arrangements for correction.

(d) Washing of Exterior Surfaces. The washing of sidewalks, walkways, driveways, parking lots, patios, or other exterior surfaces unless the hose is equipped with an automatic shutoff nozzle.

(e) Cleaning of Structures and Vehicles. The cleaning of building exteriors, mobile homes, cars, boats, and recreational vehicles unless the hose is equipped with an automatic shutoff nozzle.

(f) Fountains and Decorative Water Features. The operation of a water fountain or other decorative water feature that does not use re-circulated water.

(g) Commercial Car Washes. The washing of vehicles at a commercial car wash unless the facility utilizes water recycling equipment, or operates on a timer for a limited time period and shuts off automatically at the expiration of the time period.

(h) Construction. The use of potable water for dust control or soil compaction purposes in construction activities where there is a reasonably available source of reclaimed water appropriate for such use.

(i) The indiscriminate running of water or washing with water not otherwise prohibited in this section, which is wasteful, and without reasonable purpose.

16.01.070 STAGE 1: WATER SHORTAGE ALERT.

(a) The Director is empowered to issue a Water Shortage Alert and to enforce the water shortage restrictions in this Section upon finding that the magnitude of an anticipated water shortage, per the criteria delineated in the City's adopted Water Shortage Contingency Plan, will be five percent (5%) and a minimal consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water supply conditions. In a Stage 1 water shortage, the City will enforce the following water shortage restrictions with the objective of realizing a seasonal water demand reduction of 125 million gallons or an average daily water demand reduction of 600,000 gallons.

(b) During Stage 1, it shall be unlawful for any person, firm, partnership, association, corporation, political entity (including the City) or any other Water Department customer:

1. to water or irrigate lawn, landscape, or other vegetated area between the hours of 10:00 a.m. and 5:00 p.m., except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low-volume, non-spray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system;

2. to use a hose that is not equipped with a shut off nozzle;

3. to use potable water to wash down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking lots, tennis courts, patios, or other paved surfaces, except when it is necessary to alleviate safety or sanitation hazards or to prepare paved surfaces for sealing;

4. to initially fill or to drain and refill residential swimming pools;

5. to serve water in a restaurant or other commercial food service establishment except upon the request of a patron; and/or

6. to operate a hotel, motel or other commercial lodging establishment without offering patrons the option to forego the daily laundering of towels, sheets and linens.

16.01.080 STAGE 2: WATER SHORTAGE WARNING.

(a) The Director is empowered to issue a Water Shortage Warning and to enforce the water shortage restrictions in this Section upon finding that the magnitude of an anticipated water shortage, per the criteria delineated in the City's adopted Water Shortage Contingency Plan, will be between five percent (5%) and fifteen percent (15%) and a moderate consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water supply conditions. In a Stage 2 water shortage, the City will enforce the following water shortage restrictions with the objective of realizing a seasonal water demand reduction of up to 375 million gallons and an average daily water demand reduction of up to 1.8 million gallons.

(b) During Stage 2, it shall be unlawful for any person, firm, partnership, association, corporation, political body (including the City) or other Water Department customer:

1. to water or irrigate lawn, landscape, or other vegetated area between the hours of 10:00 a.m. and 5:00 p.m., except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low-volume, non-spray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system;

2. to use a hose that is not equipped with a shut off nozzle;

3. to use potable water to wash down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking lots, tennis courts, patios, or other paved surfaces, except when it is necessary to alleviate safety or sanitation hazards or to prepare paved surfaces for sealing;

4. to initially fill or to drain and refill residential swimming pools;

5. to serve water in a restaurant or other commercial food service establishment except upon the request of a patron;

6. to operate a hotel, motel or other commercial lodging establishment without offering patrons the option to forego the daily laundering of towels, sheets and linens;

7. to water or irrigate lawn, landscape, or other vegetated area on days of the week other than the two days of the week authorized and publicized by the Director, except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low-volume, non-spray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system. Hourly restrictions set forth in subsection (1) above continue to apply on authorized watering days. This provision shall not apply to commercial growers/nurseries or to residential vegetable gardens/edible plantings watered with a hose equipped with a shut off nozzle;

8. to water or irrigate lawn, landscape, or other vegetated area using an automatic irrigation system for more than fifteen minutes per watering station per assigned day. This provision shall not apply to automatic irrigation systems exclusively using low output sprinkler equipment, including rotors, stream rotors, or micro-spray systems;

9. to wash the exterior of dwellings, buildings or structures (with the exception of window washing and preparation of property for painting or for sale);

10. to irrigate or water landscapes in a manner that conflicts with a customer's landscape irrigation water budget when such a budget is required by the Director per the criteria delineated in the City's adopted Water Shortage Contingency Plan; and/or

11. to disobey Water Department direction to large commercial, industrial or irrigation customers using 1,337 or more billing units (one million gallons) per year to conduct water use audits, to prepare water conservation plans and to submit progress reports, or to immediately repair water system leaks, including leaks attributable to faulty pipes or fixtures.

16.01.090 STAGE 3: WATER SHORTAGE EMERGENCY.

(a) The Director is empowered to declare a Water Shortage Emergency and to enforce the water shortage restrictions in this Section upon finding that the magnitude of an anticipated water shortage, per the criteria delineated in the City's adopted Water Shortage Contingency Plan, will be between fifteen percent (15%) and twenty five percent (25%) and a significant consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water supply conditions. In a Stage 3 water shortage, the City will enforce the following water shortage restrictions with the objective of realizing a seasonal water demand reduction of up to 625 million gallons and an average daily water demand reduction of up to 3.0 million gallons.

(b) During Stage 3, it shall be unlawful for any person, firm, partnership, association, corporation, political body (including the City) or other Water Department customer:

1. to water or irrigate lawn, landscape, or other vegetated area between the hours of 10:00 a.m. and 5:00 p.m., except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low-volume, non-spray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system;

2. to use a hose that is not equipped with a shut off nozzle;

3. to use potable water to wash down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking lots, tennis courts, patios, or other paved surfaces, except when it is necessary to alleviate safety or sanitation hazards or to prepare paved surfaces for sealing;

4. to initially fill or to drain and refill any swimming pools, outdoor spas, wading pools, and ornamental water features;

5. to serve water in a restaurant or other commercial food service establishment except upon the request of a patron;

6. to operate a hotel, motel or other commercial lodging establishment without offering patrons the option to forego the daily laundering of towels, sheets and linens;

7. to water or irrigate lawn, landscape, or other vegetated area on days of the week other than the specified day(s) of the week authorized and publicized by the Director, except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low-volume, non-spray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system. Hourly restrictions set forth in subsection (1) above continue to apply on authorized watering days. This provision shall not apply to commercial growers/nurseries or to residential vegetable gardens/edible plantings watered with a hose equipped with a shut off nozzle;

8. to water or irrigate lawn, landscape, or other vegetated area using an automatic irrigation system for more than ten minutes per watering station per assigned day. This

provision shall not apply to automatic irrigation systems exclusively using low output sprinkler equipment, including rotors, stream rotors, or micro-spray systems;

9. to wash the exterior of dwellings, buildings or structures (with the exception of window washing and preparation of property for painting or for sale);

10. to irrigate or water landscapes in a manner that conflicts with a customer's landscape irrigation water budget when such a budget is required by the Director per the criteria delineated in the City's adopted Water Shortage Contingency Plan; and/or

11. to disobey Water Department direction to large commercial, industrial or irrigation customers using 1,337 or more billing units (one million gallons) per year to conduct water use audits, to prepare water conservation plans and to submit progress reports, or to immediately repair water system leaks, including leaks attributable to faulty pipes or fixtures;

12. to violate residential customer water rationing regulations, including regulations intended to preclude excessive water usage and specifying maximum water usage limitations, issued by the Director in accordance with guidelines set forth in the City's' adopted Water Shortage Contingency Plan; and/or

13. to disobey Water Department directives issued to commercial customers requiring the prominent placement of "Save Water" signage at specified locations at the customer's premises.

16.01.100 STAGE 4: SEVERE WATER SHORTAGE EMERGENCY.

(a) The Director is empowered to declare a Severe Water Shortage Emergency and to enforce the water shortage restrictions in this Section upon finding that the magnitude of an anticipated water shortage, per the criteria delineated in the City's adopted Water Shortage Contingency Plan, will be between twenty five percent (25%) and thirty five percent (35%) and an extraordinary consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water supply conditions. In a Stage 4 water shortage, the City will enforce the following water shortage restrictions with the objective of realizing a seasonal water demand reduction of up to 875 million gallons and an average daily water demand reduction of up to 4.2 million gallons.

(b) During Stage 4, it shall be unlawful for any person, firm, partnership, association, corporation, political body (including the City) or other Water Department customer:

1. to water or irrigate landscape or other vegetated area between the hours of 10:00 a.m. and 5:00 p.m., except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low-volume, non-spray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system;

2. to use a hose that is not equipped with a shut off nozzle;

3. to use potable water to wash down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking lots, tennis courts, patios, or other paved surfaces, except when it is necessary to alleviate safety or sanitation hazards or to prepare paved surfaces for sealing;

4. to fill or to top off any swimming pools, outdoor spas, wading pools, and ornamental water features;

5. to serve water in a restaurant or other commercial food service establishment except upon the request of a patron;

6. to operate a hotel, motel or other commercial lodging establishment without offering patrons the option to forego the daily laundering of towels, sheets and linens;

7. to water or irrigate landscape or other vegetated area on days of the week other than the specified day(s) of the week authorized and publicized by the Director, except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low-volume, non-spray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system. Hourly restrictions set forth in subsection (1) above continue to apply on authorized watering days. This provision shall not apply to commercial growers/nurseries or to residential vegetable gardens/edible plantings watered with a hose equipped with a shut off nozzle;

8. to water landscapes using automatic irrigation systems for more than ten minutes per watering station per assigned day. This provision does not apply to automatic irrigation systems using water efficient devices, including but not limited to weather-based controllers, drip/micro-irrigation systems and stream rotor sprinklers.

9. to wash the exterior of dwellings, buildings or structures (with the exception of window washing and preparation of property for painting or for sale);

10. to irrigate or water landscapes in a manner that conflicts with a customer's landscape irrigation water budget when such a budget is required by the Director per the criteria delineated in the City's adopted Water Shortage Contingency Plan; and/or

11. to disobey Water Department direction to large commercial, industrial or irrigation customers using 1,337 or more billing units (one million gallons) per year to conduct water use audits, to prepare water conservation plans and to submit progress reports, or to immediately repair water system leaks, including leaks attributable to faulty pipes or fixtures;

12. to violate residential customer water rationing regulations, including regulations intended to preclude excessive water usage and specifying maximum water usage limitations, issued by the Director in accordance with guidelines set forth in the City's' adopted Water Shortage Contingency Plan;

13. to disobey Water Department directives issued to commercial customers requiring the prominent placement of "Save Water" signage at specified locations at the customer's premises;

14. to violate commercial customer water rationing regulations, including regulations intended to preclude excessive water usage and specifying maximum water usage limitations, issued by the Director in accordance with guidelines set forth in the City's adopted Water Shortage Contingency Plan;

15. to disobey a Water Department order to customers identified as "dedicated irrigation accounts" directing those customers to further limit their landscape irrigation and watering activity so as to preserve only the customers' most valuable trees and plants;

16. to water lawns or turf, unless such watering is authorized by the Director in accordance with a landscape irrigation water budget and is consistent with the guidelines set forth in the City's adopted Water Shortage Contingency Plan;

17. to install new landscaping which requires any irrigation or watering;

18. to wash or clean vehicles, including but not limited to automobile, truck, van, bus, motorcycle, boat, or trailer including the washing of fleet vehicles and the washing of vehicles on dealer lots. This restriction will not apply to commercial car wash businesses which use recycled water; and/or

19. to exercise any rights conferred by hydrant and bulk water permits that were issued prior to the Severe Water Shortage Emergency declaration absent special permission

granted by the Director. Said special permission may be granted only for projects necessary to protect the public health, safety and welfare where no alternative to potable water exists and for emergency response purposes.

16.01.110 STAGE 5: CRITICAL WATER SHORTAGE EMERGENCY.

(a) The Director is empowered to declare a Critical Water Shortage Emergency and to enforce the water shortage restrictions in this Section upon finding that the magnitude of an anticipated water shortage, per the criteria delineated in the City's adopted Water Shortage Contingency Plan, shall be between thirty five percent (35%) and fifty percent (50%) and an extreme consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water supply conditions. In a Stage 5 water shortage, the City will enforce the following water shortage restrictions with the objective of realizing a seasonal water demand reduction of up to 1,250 million gallons and an average daily water demand reduction of up to 6.0 million gallons.

(b) During Stage 5, it is unlawful for any person, firm, partnership, association, corporation, political body (including the City) or other Water Department customer:

1. to water or irrigate any outdoor landscaping, unless such watering is authorized by the Director and is consistent with the guidelines set forth in the City's adopted Water Shortage Contingency Plan;
2. to use a hose that is not equipped with a shut off nozzle;
3. to use water for any outdoor washing purpose including commercial car washing, window washing, and paint preparation;
4. to fill or to top off any swimming pools, outdoor spas, wading pools, and ornamental water features;
5. to serve water in a restaurant or other commercial food service establishment except upon the request of a patron;
6. to operate a hotel, motel or other commercial lodging establishment without offering patrons the option to forego the daily laundering of towels, sheets and linens;
7. to use water for recreational purposes;
8. to operate public swimming pools;
9. to operate public showers;
10. to disobey Water Department direction to large commercial, industrial or irrigation customers using 1,337 or more billing units (one million gallons) per year to conduct water use audits, to prepare water conservation plans and to submit progress reports, or to immediately repair water system leaks, including leaks attributable to faulty pipes or fixtures;
11. to violate residential customer water rationing regulations, including regulations intended to preclude excessive water usage and specifying maximum water usage limitations, issued by the Director in accordance with guidelines set forth in the City's adopted Water Shortage Contingency Plan;
12. to violate commercial customer water rationing regulations, including regulations intended to preclude excessive water usage and specifying maximum water usage limitations, issued by the Director in accordance with guidelines set forth in the City's December 2008 Water Shortage Contingency Plan;
13. to disobey Water Department directives issued to commercial customers requiring the prominent placement of "Save Water" signage at specified locations at the customer's premises;

14. to install new landscaping which requires any irrigation or watering; and/or

15. to exercise any rights conferred by hydrant and bulk water permits that were issued prior to the Critical Water Shortage Emergency declaration absent special permission granted by the Director. Said special permission may be granted only for projects necessary to protect the public health, safety and welfare where no alternative to potable water exists and for emergency response purposes.

16.01.120 EXCEPTIONS.

(a) The Director, upon application made in writing by a customer on a form promulgated by the Water Department and accompanied by supporting documentation, shall be authorized to issue an exception from the strict application of any restriction, regulation or prohibition enforced pursuant to this chapter, upon the customer's production of substantial evidence demonstrating the existence of one or more of the following circumstances that are particular to that customer and which are not generally shared by other Water Department customers:

1. Failure to approve the requested exception would cause a condition having an adverse effect on the health, sanitation, fire protection, or safety of the customer or members of the public served by the customer;

2. Strict application of the subject restriction, regulation or prohibition would impose a severe or undue hardship on a particular business customer or render it infeasible for a particular business customer or class of business customers to remain in operation;

3. Alternative restrictions to which the customer is willing to adhere are available that would achieve the same level of demand reduction as the restriction for which an exception is being sought and such alternative restrictions are enforceable by the Water Department;

4. Circumstances concerning the customer's property or business have changed since the implementation of the subject restriction warranting a change in the customer's water usage allocation; or

5. A hospital or health care facility customer using industry best management practices is eligible for an exception upon demonstrating that the subject restriction, regulation or prohibition is interfering with or preventing it from providing health care service to its customers in accordance with industry hygiene, sanitation and health care standards.

6. A business customer has already implemented environmental sustainability measures that have reduced water consumption to the maximum extent feasible. As used in this subsection the term "environmental sustainability measures" refers to installation of high efficiency plumbing fixtures, devices, equipment, and appliances, recycled water systems, and landscaping consisting exclusively of low water using plant materials using drip or similar high efficiency, non-spray irrigation systems, or to buildings that are designed, built, and continuously operated according to Leadership in Energy and Environmental Design (LEED) certification standards.

(b) In order to qualify for an exception, a customer must first complete a self water audit pursuant to standards and procedures promulgated by the Water Department. This audit shall be made part of the customer's exception application and water conservation measures indicated by the audit may be incorporated as conditions of approval to an exception in addition

to any other conditions of approval imposed by the Director in connection with the Director's approval of the customer's exception application.

16.01.130 WATER SHORTAGE APPEAL BOARD.

(a) A Water Shortage Appeal Board is hereby established and shall be eligible to convene upon the Director's issuance of any water shortage declaration and the implementation of water shortage restrictions pursuant to Sections 16.010.070 though 16.01.110. Thereafter the Water Shortage Appeal Board will remain available to convene for as long as the water shortage remains in effect.

(b) Under water shortage Stages 1 and 2, the Water Shortage Appeal Board will be comprised of members of the City Water Commission. Under water shortage Stages 3, 4, and 5, the Water Shortage Appeal Board will be appointed by City Council and will be comprised of one member of the Water Commission, one business customer, one landscape industry customer, one residential customer, and two at-large members who reside within the City's water service area.

(c) Any customer who considers an action taken by the Director or an enforcement official under the provisions of this chapter, including actions on exception applications and the assessment of administrative penalties, to have been erroneously taken or issued, may appeal that action or penalty to the Water Shortage Appeal Board in the following manner:

1. The appeal shall be made in writing, shall state the nature of the appeal specifying the action or penalty that is being appealed and the basis upon which the action or penalty is alleged to be in error. Penalty appeals shall include a copy of the Notice of Violation;

2. An appeal, to be effective, must be received by the Director not later than ten (10) business days following the date of the Notice of Violation or the date that the Director took the action which is the subject to the appeal;

(A) A water service resident who is not an account customer may notify the Water Department of his or her intention to file a petition to force the resident's account customer to appeal an excess water use penalty within ten (10) business days following the penalty;

(B) If the Water Department has been given a notice of intention to file a petition per subsection 2(A) by a water service area resident who is not an account customer, the appeal from the account customer must be received within fifteen (15) business days after the account customer has been petitioned by the resident.

3. The Director shall schedule the appeal for consideration by the Water Shortage Appeal Board at a Water Shortage Appeal Board meeting. The Water Shortage Appeal Board shall hear the appeal within 90 days of the date of the appeal and issue its decision within 30 days of the date of the hearing.

4. The decision of the Water Shortage Appeal Board shall be final. In ruling on appeals, the Water Shortage Appeal Board shall strictly apply the provisions of this chapter, and shall not impose or grant terms and conditions not authorized by this chapter.

(d) The Chair of the Water Shortage Appeal Board shall have the discretion to divide the Board into two-three member hearing panels. Each hearing panel shall have the same authority to hear and rule upon appeals as the entire Water Shortage Appeal Board. A hearing panel shall have no more than one at-large appointee as a member. The decision of any hearing panel shall be final.

16.01.140 ADMINISTRATIVE ENFORCEMENT.

(a) Any person firm, partnership, association, corporation, political entity or other Water Department customer violating any provision of this chapter may be assessed an administrative penalty.

(b) Each and every day a violation of this chapter exists constitutes a separate and distinct offense for which an administrative penalty may be assessed.

(c) Penalties. The purpose of the administrative penalties assessed pursuant to this Section is to assure future chapter compliance by the cited customer through the imposition of increasingly significant penalties so as to create a meaningful disincentive to commit future chapter violations. In acknowledgment of the fact that the City's water is a scarce and irreplaceable commodity and that this chapter is intended to equitably distribute that commodity among Water Department customers and to assure that, to the extent feasible, City water is conserved and used only for purposes deemed necessary for public health and safety, the penalty schedule herein prescribed is not to be construed as creating a "water pricing" structure pursuant to which customers may elect to pay for additional water at significantly higher rates. To this end, a customer's repeated violation of the chapter shall result in either the installation of a flow restriction device or disconnection of the customer's property from the City's water service system at the customer's cost.

(d) Administrative penalties for failure to comply with water waste prohibitions requirements in Section 16.01.060 or mandatory water use restrictions and regulations commencing with Stage 1 in Section 6 are as follows:

1. First Offense: Written notice of violation and opportunity to correct violation.

2. Second Offense: A second violation within the preceding twelve (12) calendar months is punishable by a fine not to exceed one hundred dollars ($100).

3. Third Offense: A third violation within the preceding twelve (12) calendar months is punishable by a fine not to exceed two hundred fifty dollars ($250).

4. Fourth Offense: A fourth violation within the preceding twelve (12) calendar months is punishable by a fine not to exceed five hundred dollars ($500). In addition to any fines, the Director may order a water flow restrictor device be installed.

5. Large customers. Administrative penalties for customers that use an average of 1,337 billing units (one million gallons) or more per calendar year shall be triple the amounts listed above.

6. Discontinuing Service. In addition to any fines and the installation of a water flow restrictor, the Director may disconnect a customer's water service for willful violations of mandatory restrictions and regulations in this chapter. Upon disconnection of water service, a written notice shall be served upon the customer which shall state the time, place, and general description of the prohibited or restricted activity and the method by which reconnection can be made.

(e) Excessive Water Use Penalties. An excessive use penalty shall be assessed where the customer, during any given billing cycle, uses more than the customer's water allotment per the Director's water rationing regulations issued pursuant to this chapter commencing with Stage 3 in Section 16.01.090. Excess use penalties shall be in addition to ordinary water consumption charges, as follows:

1. 1% to 10% over customer rationing allotment: $25.00/CCF
2. More than 10% over customer rationing allotment: $50.00/CCF

3. In addition to any excess use penalties, the Director may order a water flow restrictor device be installed and/or may disconnect a customer's water service for willful violations of the water rationing regulations in this chapter. Upon disconnection of water service, a written notice shall be served upon the customer which shall state the time, place, and general description the prohibited or restricted activity and the method by which reconnection can be made.

(f) Cost of Flow Restrictor and Disconnecting Service: A person or entity that violates this chapter is responsible for payment of charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service in accordance with the City's Miscellaneous Water Service Fee Resolution then in effect. The charge for installing and/or removing any flow restricting device must be paid before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

(g) Notice and Hearing. The Director will issue a Notice of Violation by mail or personal delivery at least ten (10) business days before taking any enforcement action described in subsection 13D. Such notice must describe the violation and the date by which corrective action must be taken. A customer may appeal the Notice of Violation by filing a written notice of appeal with the City no later than the close of business day before the date scheduled for enforcement action accompanied by a $25 appeal fee. Any Notice of Violation not timely appealed will be final. Upon receipt of a timely appeal, a hearing on the appeal will be scheduled, and the City will mail written notice of the hearing date to the customer at least ten (10) days before the date of the hearing. Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the Director may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violation and the current declared water shortage condition.

16.01.150 ADDITIONAL ENFORCEMENT AUTHORITY.

In addition to the remedies referenced above, the Director is empowered to pursue any additional remedies necessary, including criminal, civil and administrative remedies listed in Title 4 of the Santa Cruz Municipal Code, to correct a violation of this chapter.

16.01.160 SEVERABILITY.

If any portion of this chapter is held to be unconstitutional, it is the intent of the City Council that such portion of the chapter be severable from the remainder and that the remainder be given full force and effect."

SECTION 3: This ordinance shall take effect 30 days after final adoption.

ORDINANCE NO. 2010-12

PASSED FOR PUBLICATION this 25th day of May, 2010, by the following vote:

AYES: Councilmembers Lane, Beiers, Madrigal, Robinson; Mayor Rotkin.

NOES: None.

ABSENT: Councilmember Mathews, Vice Mayor Coonerty.

DISQUALIFIED: None.

APPROVED: _____
Mayor

ATTEST: _____
City Clerk

PASSED FOR FINAL ADOPTION on this 8th day of June, 2010, by the following vote:

AYES: Councilmembers Lane, Beiers, Robinson; Vice Mayor Coonerty; Mayor Rotkin.

NOES: None.

ABSENT: Councilmembers Mathews, Madrigal.

DISQUALIFIED: None.

APPROVED: _____
Mayor

ATTEST: _____
City Clerk

This is to certify that the above and foregoing document is the original of Ordinance No. 2010-12 and that it has been published or posted in accordance with the Charter of the City of Santa Cruz.

_____
City Clerk

Chapter 16.01
WATER SHORTAGE REGULATIONS AND RESTRICTIONS

Sections:

16.01.010 Findings.
16.01.020 Declaration of water shortage.
16.01.030 Application of regulations.
16.01.040 Precedence of regulations.
16.01.050 Definitions.
16.01.055 Water department customer classifications/allocations.
16.01.060 Water waste prohibitions.
16.01.070 Stage 1: Water shortage alert.
16.01.080 Stage 2: Water shortage warning.
16.01.090 Stage 3: Water shortage emergency.
16.01.100 Stage 4: Severe water shortage emergency.
16.01.110 Stage 5: Critical water shortage emergency.
16.01.120 Exceptions.
16.01.130 Water shortage appeals.
16.01.140 Administrative enforcement.
16.01.150 Additional enforcement authority.
16.01.160 Severability.

16.01.010 FINDINGS.

Whereas, the city of Santa Cruz water system draws almost exclusively on local surface water sources, whose yield varies from year to year depending on the amount of rainfall received and runoff generated during the winter season; and

Whereas, the city water system is susceptible to water shortages in dry and critically dry years or in periods of prolonged regional drought when water conditions characterized by low surface flows in the north coast streams and San Lorenzo River sources, depleted storage in Newell Creek Reservoir, or both, reduce the available supply to a level that cannot support seasonal water demand; and

Whereas, on March 10, 2009, the city council of the city of Santa Cruz adopted an updated water shortage contingency plan that describes how the city will respond to future water shortages and lists the various actions the city would take to reduce water demand under different water shortage scenarios ranging from five percent or less up to and including a fifty percent seasonal water supply deficiency; and

Whereas California Water Code Sections 350 et seq. authorize water suppliers, after holding a properly noticed public hearing and after making certain findings, to declare a water shortage (emergency) and to adopt such regulations and restrictions to conserve the water supply for the greatest public benefit with particular regard for domestic use, sanitation, and fire protection; and

Whereas, the voluntary and mandatory water conservation measures and progressive restrictions on water use and method of use set forth herein provide an effective and immediately available means of

conserving water which is essential during periods of water shortage to ensure a reliable and sustainable minimum supply of water for the public health, safety, and welfare and to preserve valuable limited reservoir storage, avoid depleting water storage to an unacceptably low level, and thereby lessen the possibility of experiencing more critical shortages if dry conditions continue or worsen; and

Whereas, the usage allotments hereinafter established will equitably spread the burden of restricted and prohibited usage in a manner prescribed by the city's water shortage contingency plan over all city water department customers and other consumers of city water; and

Whereas, the purposes of this chapter are to conserve the water supply of the city of Santa Cruz for the greatest public benefit, to mitigate the effects of a water supply shortage on public health and safety and economic activity, and to budget water use so that a reliable and sustainable minimum supply of water will be available for the most essential purposes for the entire duration of the water shortage.

(Ord. 2010-12 § 2 (part), 2010).

16.01.020 DECLARATION OF WATER SHORTAGE.

The provisions of this chapter shall take effect whenever the director, upon engineering analysis of city water supplies, finds and determines that a water shortage exists or is imminent within the city of Santa Cruz water service area and a declaration of a water shortage is made by a resolution of the city council, and they shall remain in effect for the duration of the water shortage set forth in the resolution.

(Ord. 2010-12 § 2 (part), 2010).

16.01.030 APPLICATION OF REGULATIONS.

The provisions of this chapter shall apply to all persons using or consuming water both inside and outside the city and within the city water service area, and regardless of whether any person using water shall have a contract for water service with the city.

(Ord. 2010-12 § 2 (part), 2010).

16.01.040 PRECEDENCE OF REGULATIONS.

Where other provisions of the municipal code, whether enacted prior or subsequent to this chapter, are inconsistent with the provisions of this chapter, the provisions of this chapter shall supersede and control for the duration of the water shortage set forth in the resolution of the city council.

(Ord. 2010-12 § 2 (part), 2010).

16.01.050 DEFINITIONS.

(a) "Director" refers to the director of the city of Santa Cruz water department.

(b) "Water" refers to water produced and served by the city of Santa Cruz water department.

(c) "City" refers to the city of Santa Cruz.

(d) "Water department" refers to the city of Santa Cruz water department.

(e) "Seasonal water demand" refers to the demand, measured in gallons, placed by customers on the city water supply between April 1st and October 31st each calendar year.

(f) Issue/Declare. Whenever this chapter references the director's issuance or declaration of an alert, warning, emergency, or regulation, said alert, warning, emergency or regulation shall be put into effect by the placement of a legal advertisement in a newspaper of general circulation, by a posting on the city's Internet website and by a posting in the following public places: Santa Cruz City Hall, 809 Center Street, Santa Cruz; Santa Cruz Water Department Office, 212 Locust Street, Santa Cruz; Capitola City Hall, 420 Capitola Avenue, Capitola; and the Santa Cruz County Governmental Center, 701 Ocean Street, Santa Cruz. Any such alert, warning, emergency or regulation shall take effect upon the date of its publication in the Santa Cruz Sentinel.

(g) "Customer" shall refer to any account customer of the city of Santa Cruz water department as well as to any consumer of city water who may not be a city of Santa Cruz water department account customer.

(h) "Dry year" refers to the type of water year under the city's water year classification system, which begins October 1st and ends September 30th, in which the total annual discharge of the San Lorenzo River at Felton measures between twenty-nine thousand and forty-nine thousand acre-feet.

(i) "Critically dry year" refers to the type of water year under the city's water year classification system, which begins October 1st and ends September 30th, in which the total annual discharge of the San Lorenzo River at Felton measures less than twenty-nine thousand acre-feet.

(j) "Independent hearing officer" refers to a person appointed by the city to preside at administrative hearings pursuant to Title 4 of this code.

(Ord. 2015-07 § 1, 2015: Ord. 2010-12 § 2 (part), 2010).

16.01.055 WATER DEPARTMENT CUSTOMER CLASSIFICATIONS/ALLOCATIONS.

For determining a water department customer's water allocation during a declared water shortage under this chapter and for all other purposes under this title, the following customer classification definitions shall apply based on the customer's ownership or occupation of the following types of property served by the water department:

(a) 1. Single-Family Residential. Individually metered residential dwelling units (regardless of housing type). This classification shall apply whether or not the residential dwelling unit is being put to a use other than, or in addition to, residential use, and whether or not the residential use is permanent or transient in nature including use as a vacation rental unit. A residential dwelling unit is considered an occupant's permanent residence when, on average, the occupant resides in the unit for at least twenty-one days within each monthly water service period.

2. Multiple-Family Residential. Any residential account with more than one residential dwelling unit served by one water meter. This classification shall apply whether or not the residential dwelling units are being put to a use other than, or in addition to, residential use and whether or

not the residential use is permanent or transient in nature including use as a vacation rental unit. A residential dwelling unit is considered an occupant's permanent residence when, on average, the occupant resides in the unit for at least twenty-one days within each monthly water service period.

3. Business. Commercial establishments including restaurants, hotel/motel, retail, medical, schools, offices, churches and mixed-use buildings. This category also includes county and state government accounts.

4. Industry/UCSC. This category is comprised of one primary customer, the University of California, Santa Cruz, and a small number of manufacturing businesses.

5. Municipal. This category is comprised of city-owned and operated facilities such as city offices, parks, police and fire stations, water and wastewater treatment plants, street medians, and parking lots.

6. Irrigation. Dedicated water services for landscape irrigation associated with large multiple residential complexes and homeowners associations, or with commercial, industrial, and institutional sites, including schools, churches, and parks.

7. Golf Irrigation. Accounts serving the two golf courses in the water service area.

8. Coast Irrigation. Agricultural accounts receiving untreated water on the north coast.

9. Miscellaneous. Other uses such as temporary construction accounts, hydrant meters, and bulk water sales.

(b) Residency. For the purpose of determining residential water rationing allotments under water shortage Stages 3, 4 or 5 of this chapter, the number of persons in each household shall be determined by calculating the number of that household's permanent residents. A permanent resident is an occupant who resides in the subject residential dwelling unit, on average, for at least twenty-one days within each monthly water service period.

(Ord. 2015-07 § 2, 2015).

16.01.060 WATER WASTE PROHIBITIONS.

It shall be unlawful during any water shortage stage for any person, firm, partnership, association, corporation, political entity (including the city) or any other water department customer to use water for any of the following:

(a) Fire Hydrants. Use of water from any fire hydrant unless specifically authorized by permit from the city, except by regularly constituted fire protection agencies for fire suppression purposes, or for other authorized uses, including distribution system flushing, fire flow testing, and filling of approved vehicles for sewer system flushing, storm drain maintenance, and street sweeping purposes.

(b) Watering/Irrigation. The watering of grass, lawn, groundcover, shrubbery, open ground, crops and trees, including agricultural irrigation, in a manner or to an extent that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, gutter or ditch.

(c) Plumbing Leaks. The escape of water through leaks, breaks, or other malfunctions within the water user's plumbing or distribution system for any period of time after such break or leak should have reasonably been discovered and corrected. It shall be presumed that a period of twenty-four hours after the water user discovers such break, leak or malfunction, or receives notice from the city of such condition, whichever occurs first, is a reasonable time within which to correct such condition or to make arrangements for correction.

(d) Washing of Exterior Surfaces. The washing of sidewalks, walkways, driveways, parking lots, patios, or other exterior surfaces unless the hose is equipped with an automatic shutoff nozzle.

(e) Cleaning of Structures and Vehicles. The cleaning of building exteriors, mobile homes, cars, boats, and recreational vehicles unless the hose is equipped with an automatic shutoff nozzle.

(f) Fountains and Decorative Water Features. The operation of a water fountain or other decorative water feature that does not use re-circulated water.

(g) Commercial Car Washes. The washing of vehicles at a commercial car wash unless the facility utilizes water recycling equipment, or operates on a timer for a limited time period and shuts off automatically at the expiration of the time period.

(h) Construction. The use of potable water for dust control or soil compaction purposes in construction activities where there is a reasonably available source of reclaimed water appropriate for such use.

(i) The indiscriminate running of water or washing with water, not otherwise prohibited in this section which is wasteful and without reasonable purpose.

(Ord. 2010-12 § 2 (part), 2010).

16.01.070 STAGE 1: WATER SHORTAGE ALERT.

(a) The director is empowered to issue a water shortage alert and to enforce the water shortage restrictions in this section upon finding that the magnitude of an anticipated water shortage, per the criteria delineated in the city's adopted water shortage contingency plan, will be five percent and a minimal consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water supply conditions. In a Stage 1 water shortage, the city will enforce the following water shortage restrictions with the objective of realizing a seasonal water demand reduction of one hundred twenty-five million gallons or an average daily water demand reduction of six hundred thousand gallons.

(b) During Stage 1, it shall be unlawful for any person, firm, partnership, association, corporation, political entity (including the city) or any other water department customer:

1. To water or irrigate lawn, landscape, or other vegetated area between the hours of 10:00 a.m. and 5:00 p.m., except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low volume, nonspray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system;

2. To use a hose that is not equipped with a shutoff nozzle;

3. To use potable water to wash down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking lots, tennis courts, patios, or other paved surfaces, except when it is necessary to alleviate safety or sanitation hazards or to prepare paved surfaces for sealing;

4. To initially fill or to drain and refill residential swimming pools;

5. To serve water in a restaurant or other commercial food service establishment except upon the request of a patron; and/or

6. To operate a hotel, motel or other commercial lodging establishment without offering patrons the option to forego the daily laundering of towels, sheets and linens.

(Ord. 2010-12 § 2 (part), 2010).

16.01.080 STAGE 2: WATER SHORTAGE WARNING.

(a) The director is empowered to issue a water shortage warning and to enforce the water shortage restrictions in this section upon finding that the magnitude of an anticipated water shortage, per the criteria delineated in the city's adopted water shortage contingency plan, will be between five percent and fifteen percent and a moderate consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water supply conditions. In a Stage 2 water shortage, the city will enforce the following water shortage restrictions with the objective of realizing a seasonal water demand reduction of up to three hundred seventy-five million gallons and an average daily water demand reduction of up to one million eight hundred thousand gallons.

(b) During Stage 2, it shall be unlawful for any person, firm, partnership, association, corporation, political body (including the city) or other water department customer:

1. To water or irrigate lawn, landscape, or other vegetated area between the hours of 10:00 a.m. and 5:00 p.m., except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low volume, nonspray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system;

2. To use a hose that is not equipped with a shutoff nozzle;

3. To use potable water to wash down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking lots, tennis courts, patios, or other paved surfaces, except when it is necessary to alleviate safety or sanitation hazards or to prepare paved surfaces for sealing;

4. To initially fill or to drain and refill residential swimming pools;

5. To serve water in a restaurant or other commercial food service establishment except upon the request of a patron;

6. To operate a hotel, motel or other commercial lodging establishment without offering patrons the option to forego the daily laundering of towels, sheets and linens;

7. To water or irrigate lawn, landscape, or other vegetated area on days of the week other than the two days of the week authorized and publicized by the director, except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low volume, nonspray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system. Hourly restrictions set forth in subsection (b)(1) continue to apply on authorized watering days. This provision shall not apply to commercial growers/nurseries or to residential vegetable gardens/edible plantings watered with a hose equipped with a shutoff nozzle;

8. To water or irrigate lawn, landscape, or other vegetated area using an automatic irrigation system for more than fifteen minutes per watering station per assigned day. This provision shall not apply to automatic irrigation systems exclusively using low output sprinkler equipment, including rotors, stream rotors, or micro-spray systems;

9. To wash the exterior of dwellings, buildings or structures (with the exception of window washing and preparation of property for painting or for sale);

10. To irrigate or water landscapes in a manner that conflicts with a customer's landscape irrigation water budget when such a budget is required by the director per the criteria delineated in the city's adopted water shortage contingency plan; and/or

11. To disobey water department direction to large commercial, industrial or irrigation customers using one thousand three hundred thirty-seven or more billing units (one million gallons) per year to conduct water use audits, to prepare water conservation plans and to submit progress reports, or to immediately repair water system leaks, including leaks attributable to faulty pipes or fixtures.

(Ord. 2010-12 § 2 (part), 2010).

16.01.090 STAGE 3: WATER SHORTAGE EMERGENCY.

(a) The director is empowered to declare a water shortage emergency and to enforce the water shortage restrictions in this section upon finding that the magnitude of an anticipated water shortage, per the criteria delineated in the city's adopted water shortage contingency plan, will be between fifteen percent and twenty-five percent and a significant consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water supply conditions. In a Stage 3 water shortage, the city will enforce the following water shortage restrictions with the objective of realizing a seasonal water demand reduction of up to six hundred twenty-five million gallons and an average daily water demand reduction of up to three million gallons.

(b) During Stage 3, it shall be unlawful for any person, firm, partnership, association, corporation, political body (including the city) or other water department customer:

1. To water or irrigate lawn, landscape, or other vegetated area between the hours of 10:00 a.m. and 5:00 p.m., except when performed with a bucket or watering can, or by use of a drip

irrigation system or similar low volume, nonspray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system;

2. To use a hose that is not equipped with a shutoff nozzle;

3. To use potable water to wash down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking lots, tennis courts, patios, or other paved surfaces, except when it is necessary to alleviate safety or sanitation hazards or to prepare paved surfaces for sealing;

4. To initially fill or to drain and refill swimming pools;

5. To serve water in a restaurant or other commercial food service establishment except upon the request of a patron;

6. To operate a hotel, motel or other commercial lodging establishment without offering patrons the option to forego the daily laundering of towels, sheets and linens;

7. To water or irrigate lawn, landscape, or other vegetated area on days of the week other than the specified day(s) of the week authorized and publicized by the director, except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low volume, nonspray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system. Hourly restrictions set forth in subsection (b)(1) continue to apply on authorized watering days. This provision shall not apply to commercial growers/nurseries or to residential vegetable gardens/edible plantings watered with a hose equipped with a shutoff nozzle;

8. To water or irrigate lawn, landscape, or other vegetated area using an automatic irrigation system for more than ten minutes per watering station per assigned day. This provision shall not apply to automatic irrigation systems exclusively using low output sprinkler equipment, including rotors, stream rotors, or micro-spray systems;

9. To apply potable water to outdoor landscapes during and within forty-eight hours after measurable rainfall;

10. To wash the exterior of dwellings, buildings or structures (with the exception of window washing and preparation of property for painting or for sale);

11. To irrigate or water landscapes in a manner that conflicts with a customer's landscape irrigation water budget when such a budget is required by the director per the criteria delineated in the city's adopted water shortage contingency plan;

12. To disobey water department direction to large commercial, industrial or irrigation customers using one thousand three hundred thirty-seven or more billing units (one million gallons) per year to conduct water use audits, to prepare water conservation plans and to submit progress reports, or to immediately repair water system leaks, including leaks attributable to faulty pipes or fixtures;

13. To violate residential customer water rationing regulations, including regulations intended to preclude excessive water usage and specifying maximum water usage limitations, issued by the director in accordance with guidelines set forth in the city's adopted water shortage contingency plan; and/or

14. To disobey water department directives issued to commercial customers requiring the prominent placement of "Save Water" signage at specified locations at the customer's premises.

(Ord. 2015-07 § 3, 2015: Ord. 2010-12 § 2 (part), 2010).

16.01.100 STAGE 4: SEVERE WATER SHORTAGE EMERGENCY.

(a) The director is empowered to declare a severe water shortage emergency and to enforce the water shortage restrictions in this section upon finding that the magnitude of an anticipated water shortage, per the criteria delineated in the city's adopted water shortage contingency plan, will be between twenty-five percent and thirty-five percent and an extraordinary consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water supply conditions. In a Stage 4 water shortage, the city will enforce the following water shortage restrictions with the objective of realizing a seasonal water demand reduction of up to eight hundred seventy-five million gallons and an average daily water demand reduction of up to four million two hundred thousand gallons.

(b) During Stage 4, it shall be unlawful for any person, firm, partnership, association, corporation, political body (including the city) or other water department customer:

1. To water or irrigate landscape or other vegetated area between the hours of 10:00 a.m. and 5:00 p.m., except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low volume, nonspray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system;

2. To use a hose that is not equipped with a shutoff nozzle;

3. To use potable water to wash down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking lots, tennis courts, patios, or other paved surfaces, except when it is necessary to alleviate safety or sanitation hazards or to prepare paved surfaces for sealing;

4. To fill or to top off any swimming pools, outdoor spas, wading pools, and ornamental water features;

5. To serve water in a restaurant or other commercial food service establishment except upon the request of a patron;

6. To operate a hotel, motel or other commercial lodging establishment without offering patrons the option to forego the daily laundering of towels, sheets and linens;

7. To water or irrigate landscape or other vegetated area on days of the week other than the specified day(s) of the week authorized and publicized by the director, except when performed with a bucket or watering can, or by use of a drip irrigation system or similar low volume,

nonspray irrigation equipment, or for very short periods of time for the express purpose of allowing landscape contractors to adjust or repair an irrigation system. Hourly restrictions set forth in subsection (b)(1) continue to apply on authorized watering days. This provision shall not apply to commercial growers/nurseries or to residential vegetable gardens/edible plantings watered with a hose equipped with a shutoff nozzle;

8. To water landscapes using automatic irrigation systems for more than ten minutes per watering station per assigned day. This provision does not apply to automatic irrigation systems using water-efficient devices, including but not limited to weather-based controllers, drip/micro-irrigation systems and stream rotor sprinklers;

9. To wash the exterior of dwellings, buildings or structures (with the exception of window washing and preparation of property for painting or for sale);

10. To irrigate or water landscapes in a manner that conflicts with a customer's landscape irrigation water budget when such a budget is required by the director per the criteria delineated in the city's adopted water shortage contingency plan;

11. To disobey water department direction to large commercial, industrial or irrigation customers using one thousand three hundred thirty-seven or more billing units (one million gallons) per year to conduct water use audits, to prepare water conservation plans and to submit progress reports, or to immediately repair water system leaks, including leaks attributable to faulty pipes or fixtures;

12. To violate residential customer water rationing regulations, including regulations intended to preclude excessive water usage and specifying maximum water usage limitations, issued by the director in accordance with guidelines set forth in the city's adopted water shortage contingency plan;

13. To disobey water department directives issued to commercial customers requiring the prominent placement of "Save Water" signage at specified locations at the customer's premises;

14. To violate commercial customer water rationing regulations, including regulations intended to preclude excessive water usage and specifying maximum water usage limitations, issued by the director in accordance with guidelines set forth in the city's adopted water shortage contingency plan;

15. To disobey a water department order to customers identified as "dedicated irrigation accounts" directing those customers to further limit their landscape irrigation and watering activity so as to preserve only the customers' most valuable trees and plants;

16. To water lawns or turf, unless such watering is authorized by the director in accordance with a landscape irrigation water budget and is consistent with the guidelines set forth in the city's adopted water shortage contingency plan;

17. To install new landscaping which requires any irrigation or watering;

18. To wash or clean vehicles, including but not limited to automobiles, trucks, vans, buses, motorcycles, boats, or trailers, including the washing of fleet vehicles and the washing of vehicles on dealer lots. This restriction will not apply to commercial car wash businesses which use recycled water; and/or

19. To exercise any rights conferred by hydrant and bulk water permits that were issued prior to the severe water shortage emergency declaration absent special permission granted by the director. Said special permission may be granted only for projects necessary to protect the public health, safety and welfare where no alternative to potable water exists and for emergency response purposes.

(Ord. 2010-12 § 2 (part), 2010).

16.01.110 STAGE 5: CRITICAL WATER SHORTAGE EMERGENCY.

(a) The director is empowered to declare a critical water shortage emergency and to enforce the water shortage restrictions in this section upon finding that the magnitude of an anticipated water shortage, per the criteria delineated in the city's adopted water shortage contingency plan, shall be between thirty-five percent and fifty percent and an extreme consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water supply conditions. In a Stage 5 water shortage, the city will enforce the following water shortage restrictions with the objective of realizing a seasonal water demand reduction of up to one billion two hundred fifty million gallons and an average daily water demand reduction of up to six million gallons.

(b) During Stage 5, it is unlawful for any person, firm, partnership, association, corporation, political body (including the city) or other water department customer:

1. To water or irrigate any outdoor landscaping, unless such watering is authorized by the director and is consistent with the guidelines set forth in the city's adopted water shortage contingency plan;

2. To use a hose that is not equipped with a shutoff nozzle;

3. To use water for any outdoor washing purpose including commercial car washing, window washing, and paint preparation;

4. To fill or to top off any swimming pools, outdoor spas, wading pools, and ornamental water features;

5. To serve water in a restaurant or other commercial food service establishment except upon the request of a patron;

6. To operate a hotel, motel or other commercial lodging establishment without offering patrons the option to forego the daily laundering of towels, sheets and linens;

7. To use water for recreational purposes;

8. To operate public swimming pools;

9. To operate public showers;

10. To disobey water department direction to large commercial, industrial or irrigation customers using one thousand three hundred thirty-seven or more billing units (one million gallons) per year to conduct water use audits, to prepare water conservation plans and to submit progress reports, or to immediately repair water system leaks, including leaks attributable to faulty pipes or fixtures;

11. To violate residential customer water rationing regulations, including regulations intended to preclude excessive water usage and specifying maximum water usage limitations, issued by the director in accordance with guidelines set forth in the city's adopted water shortage contingency plan;

12. To violate commercial customer water rationing regulations, including regulations intended to preclude excessive water usage and specifying maximum water usage limitations, issued by the director in accordance with guidelines set forth in the city's December 2008 water shortage contingency plan;

13. To disobey water department directives issued to commercial customers requiring the prominent placement of "Save Water" signage at specified locations at the customer's premises;

14. To install new landscaping which requires any irrigation or watering; and/or

15. To exercise any rights conferred by hydrant and bulk water permits that were issued prior to the critical water shortage emergency declaration absent special permission granted by the director. Said special permission may be granted only for projects necessary to protect the public health, safety and welfare where no alternative to potable water exists and for emergency response purposes.

(Ord. 2010-12 § 2 (part), 2010).

16.01.120 EXCEPTIONS.

(a) The director, upon application made in writing by a customer on a form promulgated by the water department and accompanied by supporting documentation, shall be authorized to issue an exception from the strict application of any restriction, regulation or prohibition enforced pursuant to this chapter, upon the customer's production of substantial evidence demonstrating the existence of one or more of the following circumstances that are particular to that customer and which are not generally shared by other water department customers:

1. Exceptions Applicable to All Water Department Customers:

A. Failure to approve the requested exception would cause a condition having an adverse effect on the health, sanitation, fire protection, or safety of the customer or members of the public served by the customer;

B. Alternative restrictions to which the customer is willing to adhere are available that would achieve the same level of demand reduction as the restriction for which an exception is being sought and such alternative restrictions are enforceable by the water department;

C. Circumstances concerning the customer's property or business have changed since the implementation of the subject restriction warranting a change in the customer's water usage allocation.

2. Exceptions Applicable Only to Water Department Nonresidential Customers. For purposes of this subsection a residential dwelling unit which is used as a vacation rental shall not be classified as a business.

A. Strict application of the subject restriction, regulation or prohibition would impose a severe or undue hardship on a particular business customer or render it infeasible for a particular business customer or class of business customers to remain in operation;

B. A hospital or health care facility customer using industry best management practices is eligible for an exception upon demonstrating that the subject restriction, regulation or prohibition is interfering with or preventing it from providing health care service to its customers in accordance with industry hygiene, sanitation and health care standards; or

C. A business customer has already implemented environmental sustainability measures that have reduced water consumption to the maximum extent feasible. As used in this subsection the term "environmental sustainability measures" refers to installation of high efficiency plumbing fixtures, devices, equipment, and appliances, recycled water systems, and landscaping consisting exclusively of low-water-using plant materials using drip or similar high efficiency, nonspray irrigation systems, or to buildings that are designed, built, and continuously operated according to Leadership in Energy and Environmental Design (LEED) certification standards.

(b) In order to qualify for an exception, a customer must first complete a self water audit pursuant to standards and procedures promulgated by the water department. This audit shall be made part of the customer's exception application and water conservation measures indicated by the audit may be incorporated as conditions of approval to an exception in addition to any other conditions of approval imposed by the director in connection with the director's approval of the customer's exception application.

(Ord. 2015-07 § 4, 2015: Ord. 2010-12 § 2 (part), 2010).

16.01.130 WATER SHORTAGE APPEALS.

(a) A water shortage appeal procedure is hereby established which shall apply upon the director's issuance of any water shortage declaration and the implementation of water shortage restrictions pursuant to Sections 16.01.070 through 16.01.110. Thereafter during the declared water shortage, independent hearing officers shall be appointed to hear and rule upon water shortage appeals filed in accordance with this section.

(b) Any customer who considers an action taken by the director or an enforcement official under the provisions of this chapter, including actions on exception applications and the assessment of administrative penalties, to have been erroneously taken or issued may appeal that action or penalty in the following manner:

1. The appeal shall be made in writing, shall state the nature of the appeal specifying the action or penalty that is being appealed and the basis upon which the action or penalty is alleged to be in error. Penalty appeals shall include a copy of the notice of violation;

2. An appeal, to be effective, must be received by the director not later than ten business days following the date of the notice of violation or the date that the director took the action which is the subject of the appeal;

(A) A water service resident who is not an account customer may notify the water department of his or her intention to file a petition to force the resident's account customer to appeal an excess water use penalty within ten business days following the penalty;

(B) If the water department has been given a notice of intention to file a petition per subsection (b)(2)(A) by a water service area resident who is not an account customer, the appeal from the account customer must be received within fifteen business days after the account customer has been petitioned by the resident;

3. The director shall schedule the appeal for consideration by an independent hearing officer. The independent hearing officer shall hear the appeal within ninety days of the date of the appeal and issue its decision within thirty days of the date of the hearing;

4. The decision of the independent hearing officer shall be final. In ruling on appeals, the independent hearing officer shall strictly apply the provisions of this chapter, and shall not impose or grant terms and conditions not authorized by this chapter.

(Ord. 2015-07 § 5, 2015: Ord. 2010-12 § 2 (part), 2010).

16.01.140 ADMINISTRATIVE ENFORCEMENT.

(a) Any person, firm, partnership, association, corporation, political entity or other water department customer violating any provision of this chapter may be assessed an administrative penalty.

(b) Each and every day a violation of this chapter exists constitutes a separate and distinct offense for which an administrative penalty may be assessed.

(c) Penalties. The purpose of the administrative penalties assessed pursuant to this section is to assure future chapter compliance by the cited customer through the imposition of increasingly significant penalties so as to create a meaningful disincentive to commit future chapter violations. In acknowledgment of the fact that the city's water is a scarce and irreplaceable commodity and that this chapter is intended to equitably distribute that commodity among water department customers and to assure that, to the extent feasible, city water is conserved and used only for purposes deemed necessary for public health and safety, the penalty schedule herein prescribed is not to be construed as creating a "water pricing" structure pursuant to which customers may elect to pay for additional water at significantly higher rates. To this end, a customer's repeated violation of this chapter shall result in either the installation of a flow restriction device or disconnection of the customer's property from the city's water service system at the customer's cost.

(d) Administrative penalties for failure to comply with water waste prohibition requirements in Section 16.01.060 or mandatory water use restrictions and regulations commencing with Stage 1 in Section 16.01.070 are as follows:

1. First Offense. Written notice of violation and opportunity to correct violation.

2. Second Offense. A second violation within the preceding twelve calendar months is punishable by a fine not to exceed one hundred dollars.

3. Third Offense. A third violation within the preceding twelve calendar months is punishable by a fine not to exceed two hundred fifty dollars.

4. Fourth Offense. A fourth violation within the preceding twelve calendar months is punishable by a fine not to exceed five hundred dollars. In addition to any fines, the director may order a water flow restrictor device be installed.

5. Large Customers. Administrative penalties for customers that use an average of one thousand three hundred thirty-seven billing units (one million gallons) or more per calendar year shall be triple the amounts listed above.

6. Discontinuing Service. In addition to any fines and the installation of a water flow restrictor, the director may disconnect a customer's water service for willful violations of mandatory restrictions and regulations in this chapter. Upon disconnection of water service, a written notice shall be served upon the customer which shall state the time, place, and general description of the prohibited or restricted activity and the method by which reconnection can be made.

(e) Excessive Water Use Penalties. An excessive use penalty shall be assessed where the customer, during any given billing cycle, uses more than the customer's water allotment per the director's water rationing regulations issued pursuant to this chapter commencing with Stage 3 in Section 16.01.090. Excess use penalties shall be in addition to ordinary water consumption charges, as follows:

1. One percent to ten percent over customer rationing allotment: not to exceed twenty-five dollars/CCF.

2. More than ten percent over customer rationing allotment: not to exceed fifty dollars/CCF.

3. In addition to any excess use penalties, the director may order a water flow restrictor device be installed and/or may disconnect a customer's water service for willful violations of the water rationing regulations in this chapter. Upon disconnection of water service, a written notice shall be served upon the customer which shall state the time, place, and general description of the prohibited or restricted activity and the method by which reconnection can be made.

4. The director is authorized to develop administrative policies and procedures for the waiver of excessive water use penalties.

(f) Cost of Flow Restrictor and Disconnecting Service. A person or entity that violates this chapter is responsible for payment of charges for installing and/or removing any flow-restricting device and for disconnecting and/or reconnecting service in accordance with the city's miscellaneous water service

fee resolution then in effect. The charge for installing and/or removing any flow restricting device must be paid before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

(g) Notice and Hearing. The director will issue a notice of violation by mail or personal delivery at least ten business days before taking any enforcement action described in subsection (d). Such notice must describe the violation and the date by which corrective action must be taken. A customer may appeal the notice of violation by filing a written notice of appeal with the city no later than the close of the business day before the date scheduled for enforcement action, accompanied by a twenty-five-dollar appeal fee. Any notice of violation not timely appealed will be final. Upon receipt of a timely appeal, a hearing on the appeal will be scheduled, and the city will mail written notice of the hearing date to the customer at least ten days before the date of the hearing. Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the director may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violation and the current declared water shortage condition.

(Ord. 2015-07 § 6, 2015: Ord. 2010-12 § 2 (part), 2010).

16.01.150 ADDITIONAL ENFORCEMENT AUTHORITY.

In addition to the remedies referenced above, the director is empowered to pursue any additional remedies necessary, including criminal, civil and administrative remedies listed in Title 4 of the Santa Cruz Municipal Code, to correct a violation of this chapter.

(Ord. 2010-12 § 2 (part), 2010).

16.01.160 SEVERABILITY.

If any portion of this chapter is held to be unconstitutional, it is the intent of the city council that such portion of the chapter be severable from the remainder and that the remainder be given full force and effect.

(Ord. 2010-12 § 2 (part), 2010).

The Santa Cruz Municipal Code is current through Ordinance 2016-07, passed May 24, 2016.
Disclaimer: The City Clerk's Office has the official version of the Santa Cruz Municipal Code. Users should contact the City Clerk's Office for ordinances passed subsequent to the ordinance cited above.

RESOLUTION NO. NS-29,012

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SANTA CRUZ AMENDING RESOLUTION NO. NS-28,836 CONCERNING DROUGHT COST RECOVERY FEE

WHEREAS, Title 16 of the Santa Cruz Municipal Code Provides rules governing the administration and operation of the City's Water System, including identification of the various sources of authority to establish and amend rates, fees, and system development charges by Resolution; and

WHEREAS, on September 23, 2014, the City Council adopted Resolution No. NS-28,836 establishing new water rates and ready-to-serve charges; and

WHEREAS, this resolution pertains to Section 1, number 4, Drought Cost Recovery Fee rates only; and

WHEREAS, the City Council recognized the need to replenish water sales revenues lost due a water shortage declaration and instituted a Drought Cost Recovery Fee on September 23, 2014; and

WHEREAS, the maximum amount of revenue which can be collected through the Drought Cost Recovery Fee is tied to estimated annual revenue shortfalls effected by a water shortage stage declared by the City Council; and

WHEREAS, the language contained in the resolution regarding the Drought Cost Recovery Fee needs further clarification to be consistent with prior noticing and intent; and

WHEREAS, the City Council further finds that the rates established by Resolution No. NS-26,836 and as hereinafter set forth do not exceed the amount of the estimated costs required to provide the services for which the rates are levied; and

WHEREAS, the City Council further finds that the rates previously established to cover the estimated annual shortfall caused by a drought declaration are reasonable and required for the proper operation of the water system, and are exempt from the California Environmental Quality Act, pursuant to Section 21080(b)(8) of the Public Resources Code, because they are for the purposes of (1) meeting operating expenses, (2) purchasing or leasing supplies, equipment and materials, (3) meeting financial reserve requirements, and (4) obtaining funds for capital projects necessary to maintain service within existing service areas.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Santa Cruz as follows:

Section 1: WATER RATES AND CHARGES

The water rates for customers inside and outside of the City Limits are hereby amended to read as follows:

4. The Drought Cost Recovery Fee maximum amounts set forth below are a fixed fee and are hereby established and shall be applicable for the full fiscal year (twelve months) following the water shortage declaration made by City Council. The maximum targeted cost recovery amount is indicated below and is linked to the water shortage stage declared by the City Council.

Service Size	Stage 1 – 5% Shortage	Stage 2 – 15% Shortage	Stage 3 – 25% Shortage	Stage 4 – 35% Shortage	Stage 5 – 50% Shortage
Maximum Targeted Cost Recovery	$ 1,000,000	$ 2,500,000	$ 4,000,000	$ 5,500,000	$ 7,500,000
5/8-in	$ 2.45	$ 6.12	$ 9.79	$ 13.46	$ 18.35
3/4-in	$ 2.45	$ 6.12	$ 9.79	$ 13.46	$ 18.35
1-in	$ 6.13	$ 15.30	$ 24.48	$ 33.65	$ 45.88
1 1/2-in	$ 12.25	$ 30.60	$ 48.95	$ 67.30	$ 91.75
2-in	$ 19.60	$ 48.96	$ 78.32	$ 107.68	$ 146.80
3-in	$ 36.75	$ 91.80	$ 146.85	$ 201.90	$ 275.25
4-in	$ 61.25	$ 153.00	$ 244.75	$ 336.50	$ 458.75
6-in	$ 122.50	$ 306.00	$ 489.50	$ 673.00	$ 917.50
8-in	$ 281.75	$ 703.80	$ 1,125.85	$ 1,547.90	$ 2,110.25
10-in	$ 347.90	$ 869.04	$ 1,390.18	$ 1,911.32	$ 2,605.70

BE IT FURTHER RESOLVED that, except as amended by this resolution, all water-related fees and charges established by Resolution No. NS-28,836 and not amended herein shall not be affected by this Resolution.

Section 2. EFFECTIVE DATE.

This Resolution shall be in force and effect so as to appear in all billings from and after October 27, 2015.

PASSED AND ADOPTED this 27th day of October, 2015, by the following vote:

AYES:	Councilmembers Chase, Terrazas, Comstock, Posner, Noroyan; Vice Mayor Mathews; Mayor Lane.
NOES:	None.
ABSENT:	None.
DISQUALIFIED:	None.

APPROVED: _____
Mayor

ATTEST: _____
City Clerk Administrator

Chapter 16.02
WATER CONSERVATION

Sections:

16.02.010 Purpose.
16.02.020 Application of regulations.
16.02.030 Definitions.
16.02.040 Regulations.
16.02.050 Disconnection.
16.02.060 Reconnection.
16.02.070 Appeal.
16.02.080 Violation.
16.02.090 Enforcement.

16.02.010 PURPOSE.

The purpose of this chapter is to ensure that the water supply of the city of Santa Cruz is put to maximum beneficial use and that waste or unreasonable use or unreasonable method of use of water be prevented.

(Ord. 2003-13 § 2 (part), 2003).

16.02.020 APPLICATION OF REGULATIONS.

The provisions of this chapter shall apply to all persons using water, both in and outside the city and within city water service areas, and regardless of whether any person using water shall have a contract for water service with the city. Notwithstanding other code provisions inconsistent with this chapter, the provisions of this chapter shall supersede and prevail until termination of this chapter.

(Ord. 2003-13 § 2 (part), 2003).

16.02.030 DEFINITIONS.

For the purpose of this chapter, the following words shall have the meanings set forth below:

(a) “Director” is the director of the water department of the city of Santa Cruz, or his or her designated representative.

(b) “Drip irrigation” shall mean low-flow point specific irrigation systems that apply water directly to plant root zones through emitters, low volume micro-spray devices that are components of a drip irrigation system, and soaker hoses.

(c) “Person” shall mean any individual, firm, partnership, association, corporation, or political entity.

(d) “Water” shall mean any water obtained from the water department of the city of Santa Cruz.

(Ord. 2003-13 § 2 (part), 2003).

16.02.040 REGULATIONS.

It is unlawful for any person to use water for any of the following:

(a) Fire Hydrants. Use of water from any fire hydrant unless specifically authorized by permit from the city, except by regularly constituted fire protection agencies for fire suppression purposes, or for other authorized uses, including distribution system flushing, fire flow testing, and filling of approved vehicles for sewer system flushing, storm drain maintenance, and street sweeping purposes.

(b) Watering/Irrigation. The watering of grass, lawn, groundcover, shrubbery, open ground, crops and trees, including agricultural irrigation, in a manner or to an extent which allows excess water to run to waste.

(c) Plumbing Leaks. The escape of water through leaks, breaks, or malfunction within the water user's plumbing or distribution system for any period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of twenty-four hours after the water user discovers such break, leak or malfunction, or receives notice from the city of such condition, whichever occurs first, is a reasonable time within which to correct such condition or to make arrangements for correction.

(d) Washing of Exterior Surfaces. The washing of sidewalks, walkways, driveways, parking lots, patios, or other exterior surfaces unless the hose is equipped with an automatic shutoff nozzle.

(e) Cleaning of Structures and Vehicles. The cleaning of building exteriors, mobile homes, cars, boats, and recreational vehicles unless the hose is equipped with an automatic shutoff nozzle.

(f) Fountains. The operation of an ornamental fountain, unless such water is recycled in the fountain.

(g) Cooling. The use of water in new ice-making machines and any other new mechanical equipment that utilizes a single pass cooling system to remove and discharge heat to the sanitary sewer. Water used for all cooling purposes shall be recycled.

(h) Commercial Car Washes. The washing of vehicles at a commercial car wash unless the facility utilizes water recycling equipment, or operates on a timer for a limited time period and shuts off automatically at the expiration of the time period.

(i) Construction. The use of potable water for dust control or soil compaction purposes in construction activities where there is a reasonably available source of reclaimed water appropriate for such use.

(j) Clothes Washing. Water for new non-recirculating industrial clothes wash systems.

(k) The indiscriminate running of water or washing with water not otherwise prohibited in this section, which is wasteful, and without reasonable purpose.

(l) Any other nonessential uses of water, as determined and publicly announced by the director, in response to below average water supply conditions that could result in carryover storage in Loch Lomond Reservoir being drawn down to levels that would trigger the declaration of a water supply emergency in the event of a subsequent dry year, including, but not limited to:

1. Use of potable water to irrigate turf, lawns, gardens, or ornamental landscaping between 10:00 a.m. and 5:00 p.m. unless by drip irrigation, or by hand watering with a quick acting positive shut off nozzle. (Exceptions may be made by the director for professional gardeners where there is no ability to not water between 10:00 a.m. and 5:00 p.m.).

2. Serving drinking water to any customer, unless expressly requested, by a restaurant, hotel, cafe, cafeteria, or other public place where food is sold, served, or offered for sale.

The water director shall provide notification to city council and the public before any such restrictions are put into effect.

(Ord. 2003-13 § 2 (part), 2003).

16.02.050 DISCONNECTION.

Any person in violation of the provisions of this chapter who failed to take corrective action within fifteen days of receiving the first notification of the violation shall be subject to disconnection of water service. Upon disconnection of water service a written notice shall be served upon the violator, or conspicuously posted at the entrance of the violator's premises, and shall state the time, place and general description of the violation and the method by which reconnection can be accomplished.

(Ord. 2003-13 § 2 (part), 2003).

16.02.060 RECONNECTION.

Where water service is disconnected, as authorized above, it shall be immediately reconnected upon correction of the condition or activity and the payment of the reconnection charge in an amount specified by resolution of the city council.

(Ord. 2003-13 § 2 (part), 2003).

16.02.070 APPEAL.

Any person who feels that the activity or condition, which resulted in the disconnection of water service pursuant to this chapter, did not constitute a violation of this chapter may appeal the disconnection to the city council in the manner specified in Chapter 1.16 of the Santa Cruz Municipal Code. If the city council finds that the activity or conduct did not constitute a violation of this chapter, the reconnection charge will be refunded.

(Ord. 2003-13 § 2 (part), 2003).

16.02.080 VIOLATION.

Any person violating this chapter shall be deemed guilty of an infraction. Any person violating this chapter shall be subject to criminal, civil, and/or administrative enforcement action as provided in Title 4 of the Santa Cruz Municipal Code. Each and every day a violation of this chapter exists constitutes a separate and distinct offense for which enforcement action may be taken.

(Ord. 2003-13 § 2 (part), 2003).

16.02.090 ENFORCEMENT.

All peace officers and persons authorized by law to issue citations within the water service area shall, in conjunction with duties imposed by the law, diligently enforce the provisions of this chapter. Pursuant to the provisions of Section 836.5 of the State Penal Code, the following officers and employees of the city of Santa Cruz are hereby designated and authorized to issue citations for enforcement of this chapter:

Director of the water department;

Deputy director/Operations manager;

Water quality manager;

Customer service manager;

Utility supervisor;

Production superintendent;

Water conservation coordinator;

Utility service representative;

Water department employees designated by the director.

(Ord. 2003-13 § 2 (part), 2003).

The Santa Cruz Municipal Code is current through Ordinance 2016-07, passed May 24, 2016.
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CITY OF SANTA CRUZ

Information About Proposed Water Rate Increases

To Fund Water System Upgrades
August 2014

Learning From the Past; Preparing for the Future

The mission of the City of Santa Cruz Water Department is to provide a safe, clean and continuous supply of water that meets or exceeds local, State and Federal standards for public health and environmental quality, and to provide courteous, responsive and efficient service in the most cost-effective manner to our customers. The Department provides water to 93,000 customers, 24 hours a day, 365 days per year and there hasn't been a lapse in our service delivery in over 100 years.

There have been a lot of changes to the process of producing and delivering water. A century ago, Santa Cruz's water pipes were hollowed out redwood logs. Raw water from local rivers and creeks was piped directly to homes, without any treatment. Water was taken from rivers and creeks without concern that there wouldn't be enough left for fish.

A lot has been learned from the past to help us now prepare for the future. Our past tells us that our water sources aren't always plentiful, so we need to conserve what we have. With dramatically increased regulations to treat and store water, we've learned how critical it is for us to maintain and improve the facilities we have. We've learned that our consumption of water has had negative impacts on critical habitat for endangered species. And we've learned that our local rainfall, which provides 100% of our water supply, isn't as predictable as it was in years past.

Our community's health, safety, economy and quality of life rely on our water supply. Local water infrastructure needs to be updated so we don't waste precious drops of water and to ensure continued service efficiency. The water treatment plant needs to be retrofitted so we are prepared to comply with changing processes and regulations to effectively treat water. And pipes and delivery systems that have far outlived their lifespans need to be replaced.

www.cityofsantacruz.com/waterrates

Proposed Rate Increases

Collecting, treating and delivering water is a capital-intensive service. We're proposing a rate increase over the next five years.

What will the proposed rate increases look like?

Customers currently pay a monthly "Ready to Serve" charge, which is a service charge to cover part of the fixed costs of delivering water. This service charge is currently approximately $17 to $22 per month for residential customers and we are proposing to increase it by 10% each year for the next five years. Customers also pay for the volume of water consumed, which is currently in the range of $1.50 to $9.00 per unit (a unit is 748 gallons of water) for residential customers. The rate for the volume of water is proposed to increase 10% each year for the next five years. (See enclosed proposed rate and fee schedules.)

The City is also proposing a Drought Cost Recovery fee for the next two years. Under curtailment and rationing, customers use less water and the Water Department earns less revenue. However, it still costs the Department just as much to operate the water delivery system – those costs don't decrease because most of the expense for delivering water is in system infrastructure.

For each stage of water shortage during drought conditions, Water Department revenue declines over $1 million dollars, combined with increased costs for implementing curtailment and rationing, while most Water Department costs for continued operations, maintenance and capital replacement of the water system remain fairly constant. The current Stage 3 water shortage, for example, has resulted in approximately $3 million dollars in lost revenue, combined with additional costs related to implementing Stage 3 rationing. In order to cover the cost of Department operations, maintenance and capital depreciation during periods of reduced consumption, the proposed rate increase includes Drought Cost Recovery fee that is progressively higher for each stage of water shortage, as shown on the proposed fee schedule below.

The proposed Drought Cost Recovery Fee will be assessed on a monthly basis and would be implemented for the full fiscal year.

What will you get for your money?

In addition to funding ongoing Water Department operations, administration and future planning, during the next five years, the Water Department proposes to make significant investments in upgrading and rehabilitating your water delivery system. While still functional, most of the system is many decades old and things are wearing out. In addition, there are many new regulations for treating water that didn't exist when our system was built. You can think of our system like a classic car; still a solidly built machine, but continually requiring replacements and upgrades to keep it running smoothly.

The projects that the water department will be undertaking to upgrade, improve and maintain the water system are as follows. These projects are proposed to be funded through a rate increase.

PROJECT	FY 2015	FY 2016	FY 2017	PROJECT TOTALS 2008-2017
North Coast System Rehabilitation	$8.9 million		$1 million	**$14.1 million**
Graham Hill Water Treatment Plant Upgrades	$14.4 million			**$15.8 million**
Bay Street Reservoir Tank Construction	$6.1 million			**$26.3 million**
Water Main Replacement Projects	$2.6 million	$2.6 million	$2.6 million	**$12.1 million**
Other: Storage Tank Rehab, Well and Pump Station Rehab, Facility Improvements	$7.7 million			**$47.9 million**

Water System Upgrade Projects

North Coast System Rehabilitation

The Santa Cruz Water Department has operated and maintained the 18-mile-long North Coast system since the 1880s. Diversion structures ranging in age from approximately 80 years to over 120 years direct flows from North Coast sources (including Liddell Springs and Reggiardo, Laguna and Majors creeks,) into a pipe system, which conveys water by gravity to the Coast Pump Station adjacent to the City's San Lorenzo River intake. The Coast Pump Station lifts water to the Graham Hill Water Treatment Plant where it is treated and delivered to customers. The North Coast sources rely on rainfall and groundwater to furnish up to 30% of the City's overall water production and this water is the City's highest quality water. A significant portion of the 18-miles of pipeline is approaching, or has exceeded, its lifespan. This aging infrastructure is prone to higher levels of maintenance and an increased potential for failure. This $45 million project is segmented into 6 phases to be completed over approximately 15 years. Phases 1 and 2 were completed between 2006 and 2012; the City is currently working on Phase 3.

Graham Hill Water Treatment Plant Upgrades

The Graham Hill Water Treatment Plant (GHWTP) was commissioned in 1960 and has undergone expansion and improvements over the last five decades. A series of recent studies have identified a number of projects that are necessary to meet complex water quality regulations and plant reliability goals. The priority project includes rehabilitation of the existing filters and filter bays. Valued at $4.5 million, this project consists of structural improvements to the filter and drain system infrastructure and associated piping, valve, and electrical and instrumentation improvements. Construction of the project is scheduled to begin in fall 2014. The project is tentatively scheduled to be completed by October 2015. Future proposed projects include rehabilitation of various other tanks and basins as well as their mechanical, electrical and communications components.

Bay Street Reservoir

The Bay Street Reservoir was originally constructed in 1924 to hold untreated water from North Coast water sources. The reservoir originally held approximately 35 million gallons of water. The reservoir was converted to store treated water and a roof was added in 1976 to protect finished drinking water from airborne contaminants. Due to growing risks of the aging infrastructure and the management practice of reducing the overall volume of stored treated water to reduce stagnation and byproduct build-up the Water Department demolished the original Bay Street Reservoir in fall 2007. A $26 million project to construct two replacement 6-million gallon tanks at the facility is currently underway, with the first tank placed into service in October 2013. The second tank is under construction and expected to be complete in spring of 2015.

Water Main Replacement

The Santa Cruz water delivery system is made up of over 300 miles of water mains. This includes over 30 miles of large diameter mains from the City's water sources, such as Loch Lomond Reservoir, and more than 250 miles of water mains within City and County streets, which deliver treated drinking water to customers. Guided by water industry standards, the Water Department reserves funds to replace 2-4 miles of aging water mains each year. Many factors guide replacement priority including the need to maintain water system reliability and water quality, deliver adequate fire flows, improve circulation, and reduce maintenance costs by coordinating street paving with other planned projects.

Storage Tank Rehabilitation, Facilities Improvements, Well and Pump Station Rehabilitation

These projects will include the rehabilitation of a storage tank for treated water located on Empire Grade, an evaluation of the intake system on the San Lorenzo River, replacement of several pumps and motors throughout the system and completion of the Beltz 12 well project.

CITY OF SANTA CRUZ

Rates Inside the City of Santa Cruz

Inside City Ready-to-Serve Rates (fixed)

Meter Size	Current Rates	FY 2015 Effective October 2014	FY 2016 Effective July 2015	FY 2017 Effective July 2016	FY 2018 Effective July 2017	FY 2019 Effective July 2018
5/8-in	$17.41	$19.16	$21.08	$23.19	$25.51	$28.07
3/4-in	$17.41	$19.16	$21.08	$23.19	$25.51	$28.07
1-in	$43.52	$47.88	$52.67	$57.94	$63.74	$70.12
1 1/2-in	$87.05	$95.76	$105.34	$115.88	$127.47	$140.22
2-in	$139.27	$153.20	$168.52	$185.38	$203.92	$224.32
3-in	$261.14	$287.26	$315.99	$347.59	$382.35	$420.59
4-in	$435.24	$478.77	$526.65	$579.32	$637.26	$700.99
6-in	$870.46	$957.51	$1,053.27	$1,158.60	$1,274.46	$1,401.91
8-in	$2,002.05	$2,202.26	$2,422.49	$2,664.74	$2,931.22	$3,224.35
10-in	$2,472.09	$2,719.30	$2,991.23	$3,290.36	$3,619.40	$3,981.34

Inside City Commodity Rates (volumetric)

	Current Rates	FY 2015 Effective October 2014	FY 2016 Effective July 2015	FY 2017 Effective July 2016	FY 2018 Effective July 2017	FY 2019 Effective July 2018
SFR	$ / ccf	$ / ccf	$ / ccf	$ / ccf	$ / ccf	$ / ccf
Tier 1	$1.57	$1.73	$1.91	$2.11	$2.33	$2.57
Tier 2	$4.00	$4.40	$4.84	$5.33	$5.87	$6.46
Tier 3	$5.14	$5.66	$6.23	$6.86	$7.55	$8.31
Tier 4	$7.05	$7.76	$8.54	$9.40	$10.34	$11.38
Tier 5	$8.79	$9.67	$10.64	$11.71	$12.89	$14.18
Uniform (Non-SFR)	$4.00	$4.40	$4.84	$5.33	$5.87	$6.46
North Coast	$1.27	$1.40	$1.54	$1.70	$1.87	$2.06

Rates Outside the City of Santa Cruz

Outside City Ready-to-Serve Rates (fixed)

Meter Size	Current Rates	FY 2015 Effective October 2014	FY 2016 Effective July 2015	FY 2017 Effective July 2016	FY 2018 Effective July 2017	FY 2019 Effective July 2018
5/8-in	$22.20	$24.42	$26.87	$29.56	$32.52	$35.78
3/4-in	$22.20	$24.42	$26.87	$29.56	$32.52	$35.78
1-in	$55.50	$61.05	$67.16	$73.88	$81.27	$89.40
1 1/2-in	$110.98	$122.08	$134.29	$147.72	$162.50	$178.75
2-in	$177.56	$195.32	$214.86	$236.35	$259.99	$285.99
3-in	$332.95	$366.25	$402.88	$443.17	$487.49	$536.24
4-in	$554.92	$610.42	$671.47	$738.62	$812.49	$893.74
6-in	$1,109.83	$1,220.82	$1,342.91	$1,477.21	$1,624.94	$1,787.44
8-in	$2,553.34	$2,808.68	$3,089.55	$3,398.51	$3,738.37	$4,112.21
10-in	$3,151.92	$3,467.12	$3,813.84	$4,195.23	$4,614.76	$5,076.24

Outside City Commodity Rates (volumetric)

	Current Rates	FY 2015 Effective October 2014	FY 2016 Effective July 2015	FY 2017 Effective July 2016	FY 2018 Effective July 2017	FY 2019 Effective July 2018
SFR	$ / ccf	$ / ccf	$ / ccf	$ / ccf	$ / ccf	$ / ccf
Tier 1	$2.00	$2.20	$2.42	$2.67	$2.94	$3.24
Tier 2	$5.10	$5.61	$6.18	$6.80	$7.48	$8.23
Tier 3	$6.55	$7.21	$7.94	$8.74	$9.62	$10.59
Tier 4	$8.98	$9.88	$10.87	$11.96	$13.16	$14.48
Tier 5	$11.21	$12.34	$13.58	$14.94	$16.44	$18.09
Uniform (Non-SFR)	$5.10	$5.61	$6.18	$6.80	$7.48	$8.23

Drought Cost Recovery Fees & Water Rate Comparison

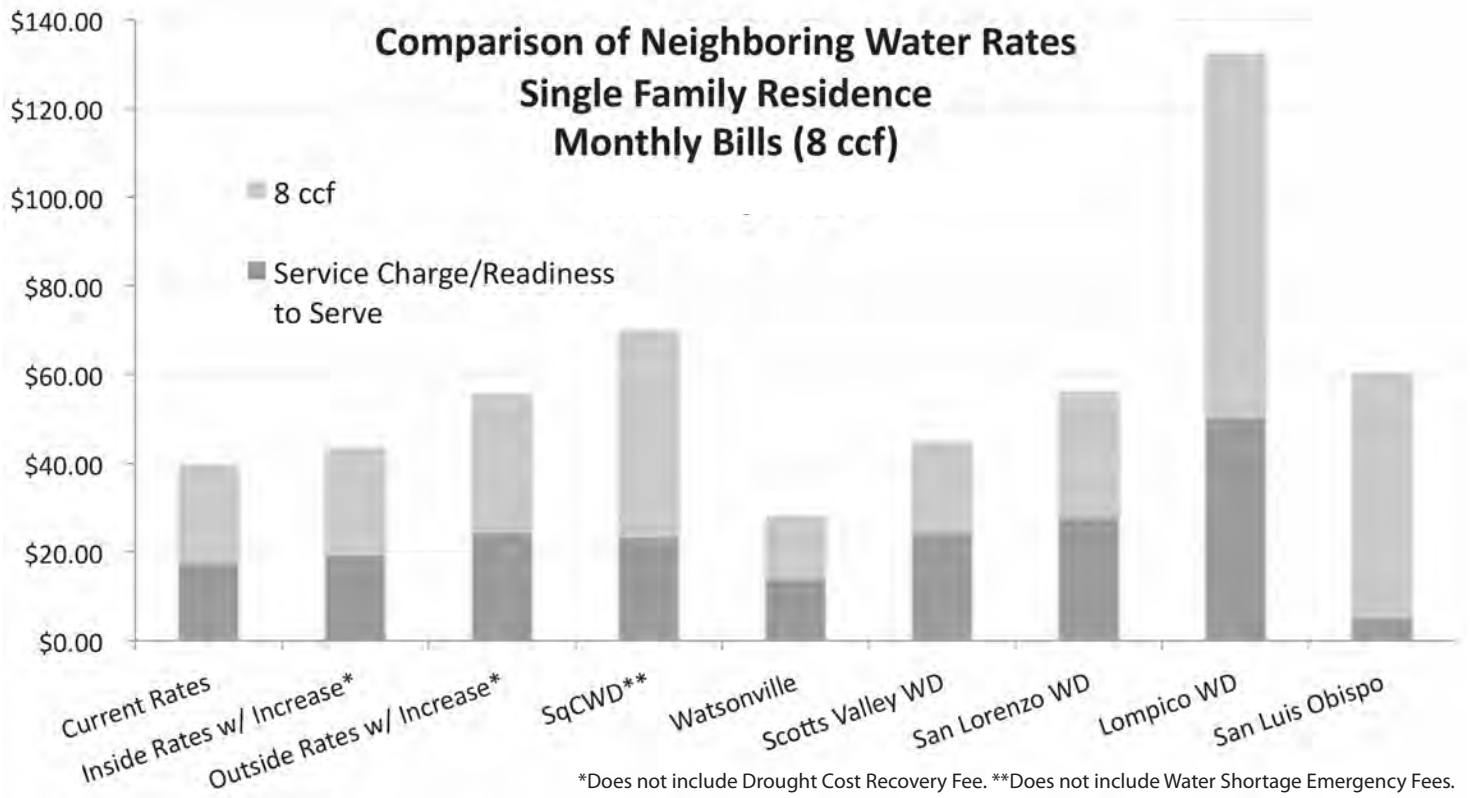
Proposed Drought Cost Recovery Fees

DROUGHT STAGE	CUTBACK REQUIRED	MAXIMUM TARGETED COST RECOVERY	3/4-INCHOR 5/8-INCH DROUGHT RECOVERY FEE
Stage 1	5%	$1,000,000	$2.45
Stage 2	15%	$2,500,000	$6.12
Stage 3	25%	$4,000,000	$9.79
Stage 4	35%	$5,500,000	$13.46
Stage 5	50%	$7,500,000	$18.35

The proposed Drought Cost Recovery Fee will be assessed on a monthly basis and would be implemented for the full fiscal year

Inside and Outside City Drought Cost Recovery Fee Ready-to-Serve Rates (fixed)

DROUGHT FEES	FY 2015 – EFFECTIVE OCTOBER 2014	FY 2016 – EFFECTIVE JULY 2015
ON RTS		
5/8-IN	$7.37	$2.45
3/4-IN	$7.37	$2.45
1-IN	$18.43	$6.13
1 1/2-IN	$36.85	$12.25
2-IN	$58.96	$19.60
3-IN	$110.55	$36.75
4-IN	$184.25	$61.25
6-IN	$368.50	$122.50
8-IN	$847.55	$281.75
10-IN	$1,046.54	$347.90
COMMODITY	$0 / CCF	$0 / CCF



*Does not include Drought Cost Recovery Fee. **Does not include Water Shortage Emergency Fees.

Notice of Public Hearing

The City Council for the City of Santa Cruz will hold a Public Hearing Tuesday, September 23, 2014, during the regular meeting of the City Council at 7:00 pm.

The City Council will consider adoption of a proposed water rate increase affecting all water customers. Interested persons are encouraged to attend and comment on the issues being discussed. The meeting will be held in City Council Chambers at 809 Center Street.

Written protests: **Any property owner or a tenant who is a customer of the Water Department may protest the proposed water rates.** Only one written protest per parcel, filed by an owner or a tenant who is a customer, will be counted. Only written and signed protests that include the writer's address and/or assessor parcel number will be counted to determine whether a majority protest to the proposed water rate increase exists. Written protests may be mailed or hand delivered to the Mayor and Council of Santa Cruz at 809 Center Street, Room 10, Santa Cruz, CA 95060.

If you oppose the proposed rate increases, your protest must be submitted in writing to be counted, even if you plan to attend the Public Hearing. To be counted, the protest must: 1) be in writing; 2) state opposition to the proposed rate increase; 3) identify the parcel by assessor's parcel number or street address; 4) include the original signature of the owner of record or a tenant who is a customer of the Water Department submitting the protest; 5) be received before the conclusion of the Public Hearing on September 23, 2014. The meeting will be held in City Council Chambers at 809 Center Street.

For more information, visit www.cityofsantacruz.com/waterrates.

CITY OF SANTA CRUZ

Santa Cruz Water District
212 Locust Street
Santa Cruz, CA 95060

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Notice of Public Hearing
Proposed Water Rates
Affecting Your Area

CITY OF SANTA CRUZ WATER DEPARTMENT

LONG RANGE FINANCIAL PLAN

JUNE 2016

LONG RANGE FINANCIAL PLAN

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Executive Summary

The Long Range Financial Plan (LRFP or Financial Plan) was developed to ensure the financial sustainability of the City of Santa Cruz's Water Enterprise Fund during the ten year period 2016 – 2026. This Financial Plan is specifically designed to support the continued operations and maintenance of the water system and its ability to serve the community with a high quality and reliable water supply, and to lay out the funding strategy that will be needed to finance major capital investments in water system infrastructure and the construction of a water supply augmentation project.

To prepare this Financial Plan, the Water Department and its consultants Raftelis Financial Consultants and Public Financial Management developed a series of financial planning inputs and outputs including:

- Prepared annual Operations and Maintenance Budgets for the Water Department;
- Developed a 10 Year Capital Improvement Plan;
- Integrated the Department's financial planning with existing Financial Policies and Goals, including developing a new financial policy on debt service coverage ratios and providing a strategy for fully funding all reserves;
- Projected revenue requirements for the 10 year period July 1, 2016 through June 30 2026;
- Completed a comprehensive Cost of Service Analysis;
- Identified a financing strategy that combines debt financing and pay-as-you-go investments to support the implementation of the 10 Year Capital Improvement Program;
- Updated Water Rate Structures, including considering the impacts to customers or a range of rate structure options; and
- Developed recommended Water Rates to implement the recommended water rate structure and meet the identified revenue requirements.

Capital investments of $127.9 million are planned for the next five years from Fiscal Year (FY) 2017 through FY 2021, with 33% of those costs ($42 Million) required to comply with state regulatory requirements. The CIP for FY 2022 through FY 2026 requires an additional investment of $169 million for a ten year CIP total of $296.9 million.

Using the revenue requirements data developed as part of the financial planning work, a five-year schedule of water rates is proposed for implementation. The proposed water rate structure includes the following assumptions and provisions:

- For the purposes of rate development, assume that the amount of water to be sold during the five-years covered by the proposed rates is 2.5 billion gallons per year.
- Adopt a rate structure that collects enough fixed fee revenue to recover the revenue necessary to cover the cost of meter reading, meter maintenance, billing preparation and distribution, and customer service. For FY 2017 this amounts to about 10% of total operating costs. Adopt volume-based user rates to collect the remaining revenues.
- Create a new fee called the Infrastructure Reinvestment Fee (IRF). The purpose of this fee is to help communicate to customers what their rate dollars are paying for which, in this case, involves major reinvestments in existing water system infrastructure. This fee would generate the revenues needed to pay for "pay-as-you-go" capital investments and debt service for capital projects. The cost to customers of this fee would be based on customer water use which, again, supports achievement of high priority pricing objectives.
- Acknowledge and mitigate for the risks to revenue stability associated with moving to a more volume based rate using two strategies**:**
  1. Maintaining the conservative assumption at 2.5 billion gallons per year;
  2. Beginning with the planned July 1, 2018 rate increase, apply a $1.00 surcharge per unit of water consumption (a hundred cubic feet or CCF) to increase the amount of the Rate Stabilization Reserve from the current minimum level of $2.3 million to a total of $10 million. In any normal water year where 2.5 billion gallons of water is not sold, the revenue shortfall associated with this situation would be covered by resources from this fund.

This Financial Plan lays out a road map for the Department and informs policy makers and the community about what it will take for the Department to develop and operate the water system needed to deliver service to 95,000 customers in northern Santa Cruz county.

In addition to three appendices that provide some additional details, a Glossary of terms can be found at the end of the Plan.

1. INTRODUCTION

This Long Range Financial Plan includes a ten year financing strategy with a specific financial plan for the first five year period. Overall, the Financial Plan is intended to support the City of Santa Cruz Water Department in achieving the following goals:

- **Address the repair and rehabilitation of critical infrastructure and the needed augmentation of the City's available water supply;**
- **Establish and maintain financial policies, reserve levels, and stable revenues needed to ensure financial sustainability and provide flexibility to adapt to unforeseen circumstances or challenges;**
- **Maintain the credit rating needed to support the Department's ability to debt finance the major capital investments and reinvestments needed to ensure supply and system reliability;**
- **Maintain reasonable rates in the near and medium term;**
- **Achieve an equitable allocation of capital costs/charges between current and future system users; and**
- **Manage rates in a predictable and reasonably stable manner.**

Working together with its consultants, Public Financial Management (PFM) and Raftelis Financial Consultants (Raftelis), a financial planning model was created to allow the Department to project operating and capital budgets and forecast annual revenue requirements. These projections include:

- **Revenues needed to cover debt service payments for the financing expected to be used to fund capital investments;**
- **Assumptions about how much of the capital program will be cash (pay-as-you-go funding) financed versus debt financed; and**
- **Funds required to meet financial reserve targets.**

Raftelis developed proposed water rates using these revenue projections, the Cost of Service Analysis, and Rate Structure Redesign work they completed during the fall and winter of 2015. Based on input received from the Water Commission and City Council in March 2015, priority objectives for pricing water were established to include:

- Revenue sufficiency,
- Promotes efficiency;
- Perceived to be fair by the public;

- Affordable for essential uses,
- Revenue stability,
- Understandable by customers,
- Promotes conservation, and
- Rate stability.

2. BACKGROUND

The Santa Cruz Water Department is an entirely self-funded operation. User rates, fees, and charges are the source of all revenues used to support the ongoing operation, maintenance, planning, management, and capital investments needed to deliver water to some 95,000 water users every day.

The unrestricted fund balance of the Water Operating fund (Fund 711) has historically been strong, but has been declining during the past four fiscal years. A major cause of this decline is cash funding of large Capital Improvement Program (CIP) projects such as the $26 million reconstruction of the Bay Street Reservoir.

The customer base is stable, primarily residential and reasonably diverse with the top 10 customers accounting for only 11% of total operating revenues. The service area economy is also stable and anchored by the University of California at Santa Cruz.

The three primary cost drivers of the LRFP include the following;

- **Capital projects to comply with State regulatory requirements;**
- **Capital projects to address infrastructure reinvestment and rehabilitation of major elements of the water system; and**
- **One or more capital projects to augment water supply that will result from implementing the recommendations of the Water Supply Advisory Committee.**

1.1 PLANNED CAPITAL INVESTMENTS

Capital investments of $127.9 million are planned for the next five years from Fiscal Year (FY) 2017 through FY 2021, with 33% of those costs ($42 Million) required to comply with state

regulatory requirements. The CIP for FY 2022 through FY 2026 requires an additional investment of $169 million[1] for a ten year CIP total of $296.9 million.

Capital projects planned for over the ten year period include:

- **PROJECTS FOCUSED ON EITHER REHABILITATING OR REPLACING EXISTING FACILITIES:**
  - Felton Diversion Dam and Pump Station
  - Laguna Dam
  - Majors Creek Diversion
  - San Lorenzo River Diversion and Tait Wells
  - Newell Creek Pipeline (between Newell Creek Dam and the Graham Hill Water Treatment Plant via Felton)
  - Newell Creek Dam Inlet/Outlet Pipeline – a project required to meet state regulatory requirements
  - Additional Phases of the North Coast Pipeline Replacement Project
  - Graham Hill Water Treatment Plant Concrete Tanks
  - Graham Hill Water Treatment Plant Solids Handling
  - Distribution System Water Main Replacements
  - Recoating of University Reservoir Tanks No. 4 and 5
  - Pressure Regulating Stations
  - Beltz 11 Well Replacement
  - Water Treatment Upgrades
- **PROJECTS FOCUSED ON UPGRADING OR IMPROVING EXISTING FACILITIES:**
  - Advanced Metering Infrastructure
  - Loch Lomond Recreation ADA Improvements
  - Photovoltaic/Solar Projects
  - Building for Water Resources Staff
  - Security Camera and Building Access Upgrades
- **PROJECTS FOCUSED ON IMPLEMENTING THE RECOMMENDATIONS OF THE WATER SUPPLY ADVISORY COMMITTEE TO IMPROVE WATER SUPPLY RELIABILITY:**
  - Winter water harvest strategies including in lieu recharge and studies to evaluate and pilot test aquifer storage and recovery

[1] These figures are in inflation adjusted 2015 dollars

- Study of options for the development and use of recycled water
- Source water quality evaluation related to future potential water treatment requirements, especially as changing source water characteristics might affect water treatment requirements
- Construction of one or some combination of water supply augmentation projects as needed to either increase available stored water by 2.4 billion gallons or provide an additional 3 to 4 million gallons per day source of supply to meet community needs during drought conditions.

The Department proposes to fund these projects with a combination of annual pay-as-you-go revenues and long-term debt.

The total capital investment for the 10 year planning horizon equals $296.9 million.

1.2 CURRENT FINANCIAL PROFILE

In the spring of 2014, the Water Department worked with the City's Finance Department staff to refinance its one existing debt issue from 2006. This step was undertaken to deal with a declining fund balance and the looming impacts of drought-required reductions in water use. The goal of the refinancing was to lower the interest rate and establish a less constraining debt service coverage requirement.

Standard and Poor's Rating Service and Fitch Ratings were asked to provide credit ratings for the Water Department as part of the 2014 refinancing of its debt. A credit rating is useful when an agency needs to access capital markets and issue debt at lower interest rates than would be available without a credit rating. Higher credit ratings can reduce borrowing costs and generate more competition from investors.

The Department's historical credit rating has been AA (high quality). Following the credit rating agency review, Standard and Poor's Rating Service downgraded the utility's credit rating to AA- with a Negative Rating Outlook. Fitch Ratings went farther, providing a rating of A+ (upper medium grade), two steps down from the Department's former AA rating. Both Rating Agencies cited the lack of a recent rate increase, the Department's declining fund balance, in insufficient debt service coverage, and the pending drought as reasons for their views of the Department's creditworthiness.

In the summer of 2015, Standard & Poor's revisited the Water Department's rating. This review took into account the City's action on a five-year program of rate increases in September 2014,

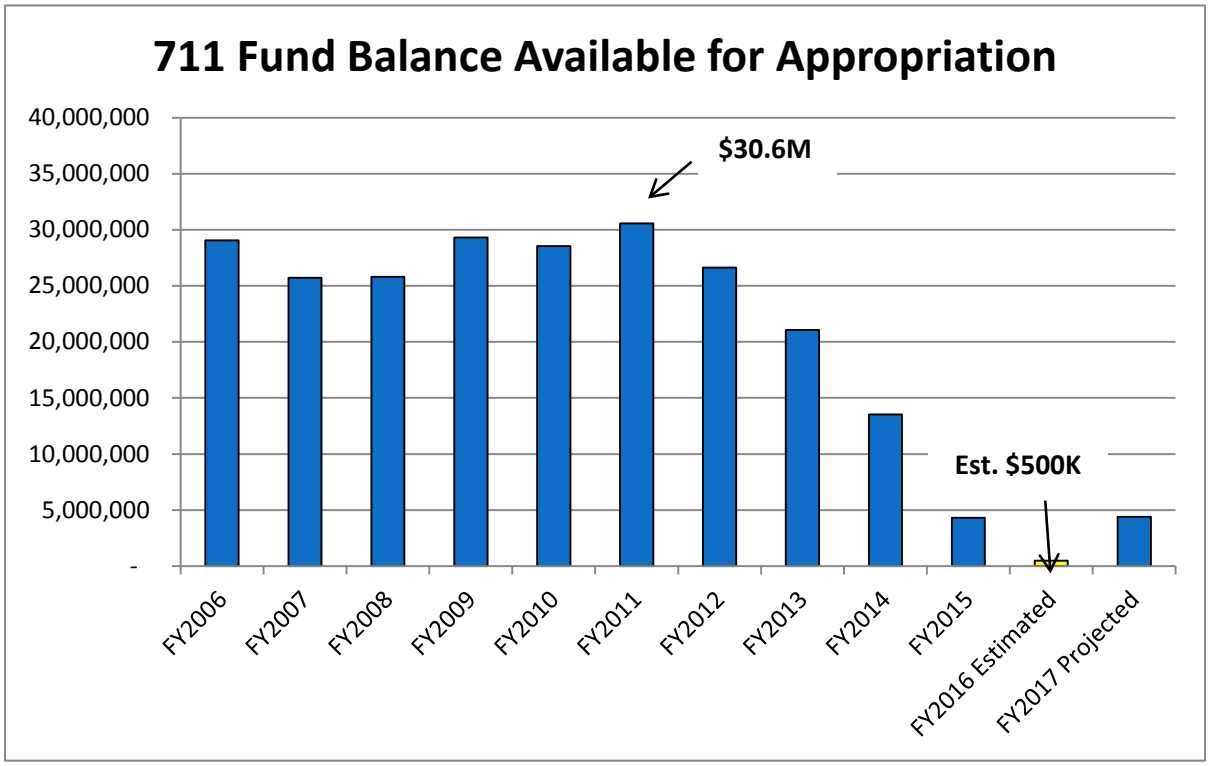
the utility's and the community's positive response to required water rationing, and the progress being made on the community-based water supply planning process. Standard and Poor's chose to retain the previous AA- rating but revised its rating outlook from Negative to Stable. Fitch Ratings is scheduled to revisit its rating for the Water Department in June of this year.

Annual rate increases of 10% have been approved through 2018. Water rate structure redesign and rate-setting work are currently underway and revised rates will be proposed for action by the Water Commission and the City Council during the winter and spring of 2016. The redesigned rates will replace and extend the original five-year rate increase program adopted in 2014.

For planning purposes, it has been assumed that the first year of any revised rate structure and increase will be applied on October 1, 2016. However, to address the immediate issue of declining cash and fund balance it is recommended that the originally planned 10% increase be implemented on July 1, 2016 and be replaced when the new structure is implemented in October. Remaining rate increases for years two through five of the new five-year rate program would be applied on July 1, in each year 2017, 2018, 2019, and 2020.

Figure 1 shows the Department's fund balance in Water Enterprise Operating Fund (Fund 711) demonstrating a high of $30.6 Million in 2011 that has steadily declined in the last five years and is estimated to approach $500,000 by end of FY 2016. The cause of the steady decline in this fund balance is cash financing the Department's Capital Improvement Program, reduced revenues resulting from restricting water use in the summers of 2014 and 2015, and rates not being set high enough to recover ongoing operating costs, even when water use is not restricted.

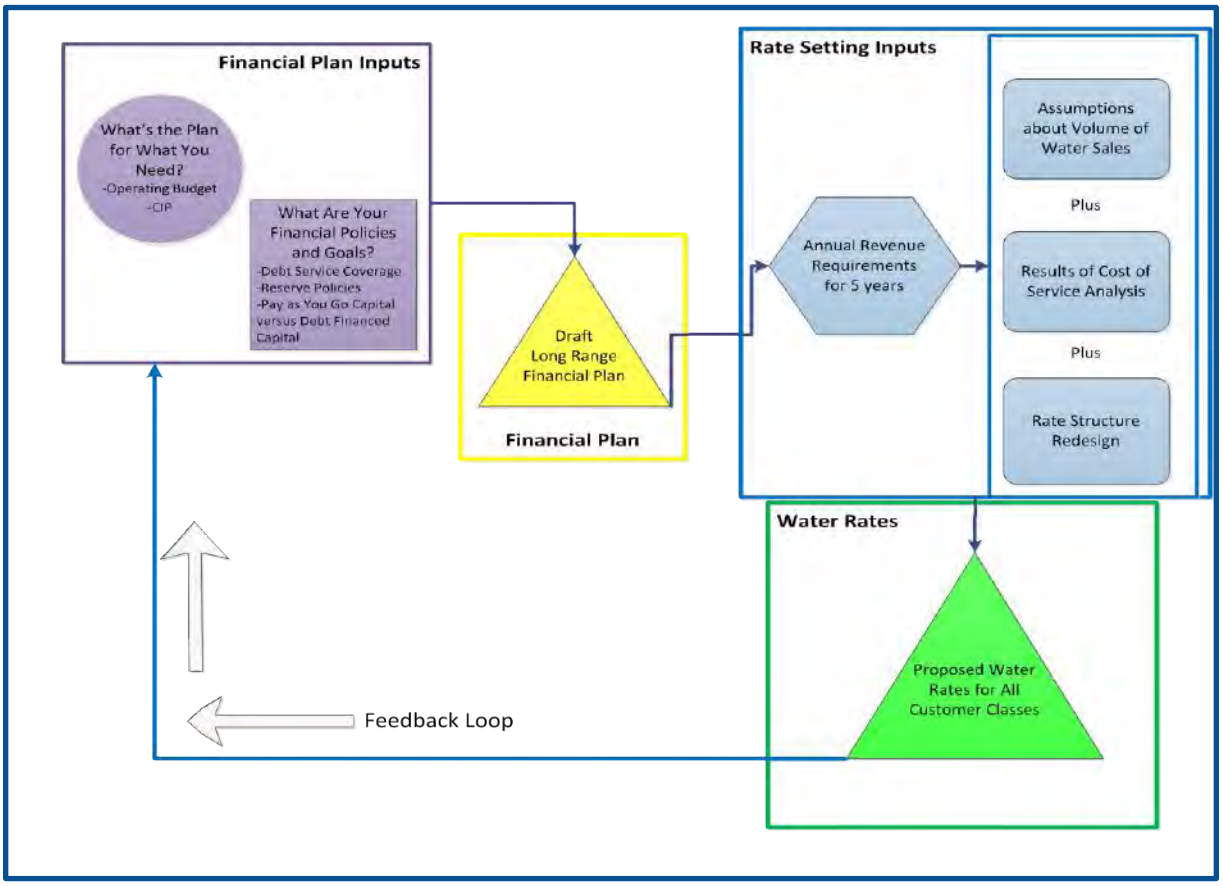
Figure 1
Operating Fund Balance



3. CONCEPTUAL MODEL FOR UTILITY FINANCIAL PLANNING

Financial planning and rate making for today's water utility involves a multi-stepped process depicted in Figure 2 below. The figure shows the inputs and outputs of the utility financial planning and rate making processes. It also shows the feedback loop between proposed rates, the end product of the process, and the organization's budget and CIP, which are key inputs to the beginning of the process.

Figure 2
Conceptual Model of Utility Financial Planning and Rate Making



Financial policies and financial indicators are a second key input in the financial planning process. These policies and indicators help measure financial performance. An organization's financial performance is a key factor in establishing its credit rating, which affects the interest rate that will be charged on borrowed funds.

4. INPUTS TO THE FINANCIAL PLAN

The draft Financial Plan and ten-year Pro Forma shown in Appendix A have been prepared using an Excel-based capital planning model developed by PFM. Briefly, the model uses as inputs the following financial data:

1. **The beginning fund balance for the Department's Operating Fund (Fund 711),**
2. **Multi-year operating expenses, as modified by specific inflation factors,**
3. **Multi-year capital costs, including specific inflation factors, and**
4. **Multi-year debt service costs.**

The model then produces the following outputs:

1. **Multi-year revenue projections,**
2. **Financial performance metrics related to the debt service coverage ratio and financial reserve goals, and**
3. **The sizing and timing of new debt issues.**

4.1 KEY FINANCIAL POLICIES AND GOALS

Having and meeting goals for key financial performance indicators is central to good financial management. This Financial Plan is purposefully focused on defining and creating a clear and achievable method to meet a set of financial policies and performance indicators that will be necessary for the Department's financial success.

4.1.1 UTILITY CREDIT RATINGS

One typical measure of a Utility's financial performance is its credit rating. Table 1 below describes the factors considered by Credit Rating Agencies in assigning credit ratings.

Table 1

Rating Agency Factors Used in Assigning an Agency Credit Rating

Rating Factor	Rating Sub-Factors & Description
System Characteristics	• asset condition • service area wealth (median family income) • gross county product • unemployment rate • annual utility bill as a % of median family income • system size (O&M)
Financial Strength	• annual debt service coverage • days cash on hand • debt to operating revenues • debt to capitalization ratio
Management	• rate management • regulatory compliance • capital planning • financial planning (debt & investment policies) • operational risk (water supply adequacy)
Legal Provisions	• rate covenant • debt service reserve requirement

Credit rating agencies consider a variety of factors in assigning a credit rating, and utilities that have the best credit ratings typically will include policies that specifically address the financial strength metrics listed in Table 1.

4.1.2 FINANCIAL GOALS AND PERFORMANCE INDICATORS

Over the years, the City Council has established some financial performance metrics for the Water Utility, including a Rate Stabilization Reserve in 1993, and Operating and Emergency Reserves in 2014. As of June 30, 2015, the Rate Stabilization Reserve Fund balance was $2.4 million and the Emergency Reserve Fund balance was $600,000. A 90 Day Operating Reserve Fund was also created in September 2014, but was not funded at June 30, 2015.

The Council's intent in creating the Rate Stabilization Reserve[2] in 1993 was to "shield the Water Fund from the financial effects of extraordinary circumstances." As originally approved by the Council at the time, the rate stabilization reserve would have been used to help the Department deal with one or a combination of the following conditions:

- **Increased CIP or capital outlay expenditures due to an extraordinary non-recurring need or circumstance;**
- **A fluctuation in water consumption revenues creating an unanticipated shortfall, or**
- **Catastrophic losses as the result of a natural disaster.**

In the 23 years since the City Council created this $2.3 million reserve, infrastructure and operating costs have increased substantially and in 2014 the Department recommended and the Council approved creating additional reserves. These additional reserves, one for 90 days of operating cash, and one to address natural disaster types of emergency conditions, effectively replaced the first and third purposes intended to be served by the original Rate Stabilization Reserve. These more substantial reserves also begin the process of moving the utility to a stronger financial position, which better prepares it to deal with future costs.

This Financial Plan incorporates and, in the Financial Plan implementation section later in this document, proposes a method to fund the following goals for key financial performance metrics:

- **Maintain the Rate Stabilization Reserve (Fund 713) of $2.3 million;**
- **Maintain a Water Emergency Reserve Fund (Fund 717) at minimum level of $3 million; and**
- **Create additional operating reserves equal to 180 days of operating expenses. This would be accomplished by Maintaining the new Water Operating Cash Reserve Fund (Fund 716) at the equivalent of 90 days of operating cash and maintaining a minimum fund balance in Operating Fund (Fund 711) at a minimum of an additional 90 days of operating cash.[3]**

Another key financial performance metric is a target for debt service coverage ratio (DSCR). The DSCR is a measure of net operating revenues to annual debt payments. The Water Department has issued relatively little debt over the past 20 years so hasn't formally established or used a debt service coverage ratio (DSCR) target in its financial planning. The

[2] See http://www.cityofsantacruz.com/home/showdocument?id=3255

[3] In Fiscal 2017, 90 days of operating cash is equivalent to $6.5 Million

bond covenant for utility debt issued in 2006 included a 1.25 DSCR. When that debt was refinanced in 2014, the DSCR was reduced to 1.15.

A financial plan that only supports meeting the legal minimum figure can put the utility at risk of technical default on its bonds if revenues are reduced by, say, drought conditions when water use restrictions are put into place. Establishing a target that is above the minimum legal requirement is a good idea because it builds into the system needed flexibility that makes the utility more financially resilient in the face of uncertainty. The LRFP specifically includes the following debt service coverage ratio target:

- **Maintain a minimum debt service coverage ratio target of 1.5, requiring that a ratio of 1.5 be maintained between annual net revenues and annual debt service.**

Typically the calculation of the debt service coverage ratio does not include funds held in reserve as including reserves in calculating the ratio could result in masking a structural problem in the way rates are set.

4.2 PROJECTED OPERATING BUDGETS

Table 2 shows anticipated operating and capital expenses for FYs 2017 through 2021. Appendix A includes the complete ten year Pro Forma from which the information in Table 2 was excerpted.

Table 2

Anticipated Expenses FY 2017 – 2021

Operating Expenses	2017	2018	2019	2020	2021
Personnel	$12,741,984	$13,868,008	$15,086,021	$15,882,276	$16,733,349
Services, Supplies & Other	12,616,410	13,247,231	13,909,592	14,605,072	15,335,325
Capital Outlay	965,000	1,013,250	1,063,913	1,117,108	1,172,964
Total Operating	**$26,323,394**	**$28,128,488**	**$30,059,525**	**$31,604,455**	**$33,241,638**

Operating costs have been developed based on very modest changes to staffing and departmental operations over time. The changes in Operating costs are based on the annual inflation factors shown in Table 3. These inflation factors are based on actual historical experience and long term industry trends.

Table 3[4]

Operating Budget Inflation Factors

Expense Category	Annual Inflation Factors (percent)		
	2017	2018	2019-2026
Salaries & Wages	3.0	3.0	3.0
Employee Benefits	9.0	9.0	9.0
Operating Supplies and Chemicals	9.2	5.0	5.0
Energy	9.1	5.0	5.0
All Other Categories	3.0	3.0	3.0

1.3 CAPITAL IMPROVEMENT PLAN

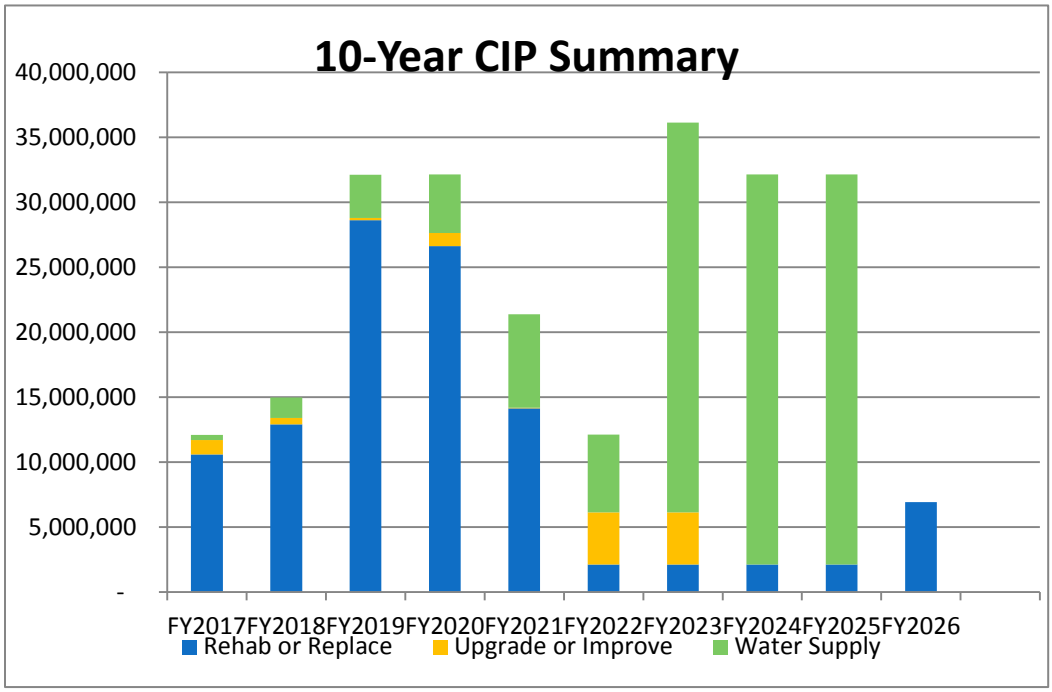
Section 1.1 describes the Department's anticipated capital spending of $127.9 million during the first five years covered by the Financial Plan. Capital projects during the first five years will be focused on system rehabilitation and replacement projects. Major expenses to implement the Water Supply Augmentation Strategy[5] are anticipated to occur in the second five years of the financial planning horizon. Figure 3 summarizes the planned capital spending in the three categories described in Section 1.1 Planned Capital Expenditures. Those categories are:

- **Rehabilitation and Replacement, including projects to meet regulatory requirements**
- **Upgrades and Improvements**
- **Water Supply Augmentation**

[4] Inflation factors were developed using a combination of actual historical experience (Energy and Chemicals), City projections (salaries and benefits) and industry trends for everything else. The Handy Whitman Index, which focuses on the inflation of construction cost for projects using significant quantities of concrete and steel, and is particularly applicable for water utilities, has been used to escalate the cost of projects in the Capital Improvement Program.

[5] The Water Supply Augmentation Strategy is the result of the community-based water supply planning process completed by the City Council appointed Water Supply Advisory Committee in October 2015.

Figure 3
10 Year CIP



Appendix B provides the details of the Ten Year Capital Improvement Plan, including both brief project descriptions and a ten year plan of spending.

5. LONG RANGE FINANCIAL PLAN RECOMMENDATIONS

This LRFP has been developed based on a specific five year forecast within a ten year planning horizon. The purpose of using the 10 year time frame is to ensure that steps taken during the first five years don't unduly constrain what financial capacity the Department has to address the financial investments needed during the second five years when it expects to construct one or more projects to augment water supply. The specific recommendations are limited to the first five years because that is as far ahead as the Department can establish rates under the limits set by California's Proposition 218.

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The elements of the Long Range Financial Plan integrate the key financial plan inputs included in Section 4 above, as well as a Capital Financing Strategy, a forecast of Revenue Requirements, and Water Rates needed to meet the Revenue Requirements.

5.1 CAPITAL FINANCING STRATEGY

The Financial Plan recommends that the identified CIP be funded with a combination of rate revenue and debt financing. Over the next five years, pay-as-you-go rate revenue would cover an average of 33% of capital costs, with debt financing covering 67%. Using debt financing to fund a major portion of the CIP provides for inter-generational equity and, by spreading these costs over time, helps to moderate and stabilize near term adjustments to water rates.

In a preliminary way, implementation of this recommendation has already begun. The Department's request for a loan of $25 million from the California Infrastructure and Economic Development Bank (I-Bank) was approved on March 22, 2016. Funding from the I-Bank is expected to be disbursed following completion of the anticipated Proposition 218 notification process planned for August 2016.

The I-Bank loan provides for the retro-active debt financing of significant capital expenditures that have resulted in depletion of the utility's fund balance in its main operating fund (Fund 711). This approach was authorized by the Council when it adopted a reimbursement resolution on April 8, 2014. Of the $25 Million I-Bank loan, the Department expects to replenish its fund balances by reimbursing itself for $22 Million in already expended capital costs. As discussed later in this Financial Plan, once the department has been reimbursed for prior capital costs, available funding will provide the resources needed to fully fund reserves. The remainder of the I-Bank funds would support additional capital projects planned to be completed in FY 2017 and 2018.

One of the reasons for developing the LRFP was to be able to assess the Department's capacity to use debt financing for major elements of its CIP. A measure of the Department's financial capacity is what portion of its revenues would be used for debt service. For example, the amount of financial flexibility of an organization is substantially reduced as the percent of its revenue dedicated to paying debt service rises.

During the first five years, the Department anticipates issuing debt totaling $85.9 million. The annual average debt service is not expected to exceed 8% of annual rate revenue during the first five years, but it would continue to rise to a maximum of about 24% of annual revenues at the end of the 10 year period. These figures are obviously significantly greater than the Department's figure of less than 5% of its revenues being currently dedicated to debt service, but the Department's financial advisors are satisfied that the Department has the debt capacity needed to support the implementation of the LRFP capital financing strategy, as long as the

Department is able to increase rates and charges as outlined in the LRFP, and is able to meet key financial targets, including maintaining financial reserves and meeting the 1.5 debt service coverage ratio.

5.2 REVENUE REQUIREMENTS FOR FY 2017 – FY 2021

As shown in Figure 2, a significant output of financial planning is the revenue requirements that inform the rate making process. Based on the recommendations and assumptions described in Section 4, the Department was able to calculate revenue requirements. Table 4 summarizes the revenue requirements, operating and capital costs, and debt service coverage in the first five years of the financial plan.

Table 4
FY 2017 – FY 2021 Projected Revenue Requirements

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
Infrastructure Reinvestment Fee Amount	$5,990,512	$8,700,797	$9,166,040	$10,169,506	$11,239,068
Rate Stabilization Reserve Amount	-	$3,342,224	$3,342,224	$3,342,224	$3,342,224
O&M Revenue Requirement	$26,323,394	$28,128,488	$30,059,525	$31,604,455	$33,241,638
TOTAL	**$32,313,906**	**$40,171,529**	**$42,567,809**	**$45,116,205**	**$47,822,950**

Revenue requirements have been set at a level needed to ensure that both a minimum 1.50 debt service coverage ratio and a minimum of 180 days of operating cash are maintained.

A more complete version of this table which provides the Department's detailed Financial Pro Forma can be found in Appendix A.

5.3 WATER RATES

Using the revenue requirements data developed as part of the financial planning work and shown in Table 4 above, a five-year schedule of water rates is proposed for implementation. The proposed water rate structure includes the following assumptions and provisions:

- **For the purposes of rate development, assume that the amount of water to be sold during the five-years covered by the proposed rates is 2.5 billion gallons per year[6].**
- **Adopt a rate structure that collects enough fixed fee revenue to recover the revenue necessary to cover the cost of meter reading, meter maintenance, billing preparation and distribution, and customer service. For FY 2017 this amounts to about 10% of total operating costs. Adopt volume-based user rates to collect the remaining revenues.**
- **Create a new fee called the Infrastructure Reinvestment Fee (IRF). This fee would generate the revenues needed to pay for "pay-as-you-go" capital investments and debt service for capital projects. The cost to customers of this fee would be based on customer water use which, again, supports achievement of high priority pricing objectives.**

The IRF is designed specifically to help focus and support customer communication about what water rates are paying for, particularly during the first five years of the CIP, which is emphasizing system rehabilitation and replacement projects for major elements of the system's backbone infrastructure.

- **Acknowledge and mitigate for the risks to revenue stability associated with moving to a more volume based rate using two strategies**:

  1. **Maintaining the conservative assumption at 2.5 billion gallons per year;**
  2. **Beginning with the planned July 1, 2018 rate increase, apply a $1.00 surcharge per unit of water consumption (a hundred cubic feet or CCF) to increase the amount of the Rate Stabilization Reserve from the current minimum level of $2.3 million to a total of $10 million. In any normal water year where 2.5 billion gallons of water is not sold, the revenue shortfall associated with this situation would be covered by resources from this fund.[7]**

In addition to the water rate structure changes and described above, the revenue requirements shown in Table 4 require a significant increase in FY 2017 to begin to fund the capital program, maintain operations, and establish the financial foundation described in Section 4. On a simple

[6] Note: Water sales in calendar year 2013 equaled 3 billion gallons, in calendar year 2014 equaled 2.5 billion gallons and in calendar year 2015 equaled 2.25 billion gallons.

[7] The Rate Stabilization Reserve Fund would be used to augment revenues during "normal" water years if the amount of water sold falls below 2.5 billion gallons. In water years where water restrictions are required due to inadequate supply, a Drought Cost Recovery charge would be used to ensure revenues are adequate to meet system costs and debt service obligations.

year over year basis, revenues need to increase 21% between FY 2016 and FY 2017, followed by a 24% increase in FY 2108, a by 6% a year in FY 2019, FY 2020 and FY 2021. The big driver of rate increases in FY 17 is capital spending, which is reflected in the Infrastructure Reinvestment Fee. In 2018, the big drivers are additional capital spending and initiating the effort to increase the Rate Stabilization Reserve Fund from the current $2.4 million to $10 million.

These percent increases in revenues are not translated directly to customer bills because of different use patterns and the recommended rate structures. For example, one impact of the recommended rate structure that emphasizes volume based rates is that it will tend to stabilize the cost of water for those whose use of water is very low. Conversely, customers whose use of water contributes to peaking will experience greater increases. And inside city customer will experience a greater increase than outside city customers due to the reduction in the outside city surcharge from 27.5% to 14.5%.

Additional details about the recommended rate structure and water rates can be found in Appendix C.

5.4 REVIEW AND REVISION OF THE LRFP

The LRFP is designed to be used as an ongoing guide for the Water Department as the plan is implemented. The financial planning and rate models that from the analytical basis of the LRFP are effective tools for support the Department's financial decision-making, and will be used and updated as new information is available. In 2021, the Department would expect to complete a new Cost of Service Analysis to use in setting rates of FY 2022 through FY 2026. Using these results as well as updated information on revenue requirements, the Department will comprehensively review and revise the LFRP to guide the next five years.

6. IMPLEMENTING THE LONG RANGE FINANCIAL PLAN

The LRFP is intended to be a living document that will provide a financial foundation for the Department to use in annual budget planning and management activities. A major review and revision of the LRFP will occur at the five year mid-point and, along with other relevant work such as an updated cost of service analysis, revisions to the Financial Plan and water rates will be developed as needed. The LFRP will also be used to measure progress toward meeting LRFP goals during each five year segment covered by the plan.

Working with its consultant team, Department staff has created a Financial Plan that is realistic and implementable. Details of the approaches needed to implement the Plan are presented in the following sections.

6.1 FUND BALANCE RESERVE GOALS

Reserve policies are particularly important to manage risks to an agency's financial condition. In addition, they help an organization establish and maintain a good bond rating, thereby reducing the cost of borrowing.

Beginning in 1993, the Department has built and maintained a Rate Stabilization Reserve Fund (Fund 713). In 2014, the City Council approved two additional reserve funds; a 90-Day Operating Cash Reserve Fund (716) and an Emergency Reserve Fund (717).

Apart from the Rate Stabilization Fund, the remaining reserves have not been fully funded as the utility's financial condition did not enable it to address this important goal. A major driver of the Department's inability to fund these new reserves was the drought, which had a significant negative impact on the Department's revenues. Table 5 provides information on the status at 6-30-2015 and goals of each of the Department's reserve funds.

Table 5
Fund Balance Reserve Goals

Fund		Fund Balance (6-30-2015)	Funding Goal
711	Water Operations & Maintenance	$4,321,718	90 Days Operating Cash $6.5M in 2017
713	Water Rate Stabilization Reserve[8]	$2,447,938	$10,000,000
716	Water 90-Day Operating Cash Reserve	$0	90 Days Operating Cash$6.5 M in 2017
717	Water Emergency Reserve	$600,000	$3,000,000

[8] Once implemented in FY 2018, the expectation is that it would take two years to achieve the $10 million goal for the Rate Stabilization Reserve. For further discussion of how funds in the Rate Stabilization Reserve would be accrued and used, please see section 6.5.2.2.

Establishing the 90-Day Operating Cash Reserve Fund was an important step, however for bond rating purposes a 180-day reserve is preferable. To that end, the financial plan also envisions keeping a 90-day reserve in the operating fund (711) in addition to the 90-Day Operating Cash Reserve Fund (716). Providing a reserve equal to 180-days of operating expenses (between balances in Fund 711 and 716) is considered to be the minimum reserve to maintain a strong bond rating (AA category) and access to capital markets. Increasing these reserves above 180-days operating cash may be pursued if and when resources become available.

The Rate Stabilization Reserve Fund has been maintained at the historic $2.3 million level and seeks to provide a cushion to cover one-time situations where expenses exceed rate revenue. At 6-30-2015, this fund had increased to $2.4 million including interest income. As noted above, the $1/CCF surcharge will be used to help increase this fund to $10 million, as part of the mitigation for moving to a more volume based rate structure. This approach is discussed in greater detail in Section 6.5.2 below.

Initial funding of $600,000 for the Emergency Reserve Fund was made possible by using drought related one-time excessive use penalty revenue accrued during calendar year 2014. An additional $500,000 was accrued from penalty revenue in calendar year 2015 and is expected to be used to increase this reserve for a total of $1.1 Million. The goal for the Emergency Reserve Fund is to maintain a $3 million funding level that would provide funds in the event of an extreme event or natural disaster.

6.2 APPROACH TO FULLY FUNDING RESERVES

In April of 2014, the Water Department recommended that the City Council approve a reimbursement resolution that would allow the Department to debt finance capital improvement work already in construction. The purpose of this request was to allow the Department to reimburse the Department's main operating fund for cash expenditures for capital projects such as the $26 Million Bay Street Reservoir replacement project once a bond issue was completed.

From the $25 Million I-Bank loan mentioned previously, the Department expects to receive reimbursement of $22 million in past capital expenditures from the Department's fund balance. Resources from this cash balance would be used to fund the Department's reserves as follows:

- **$6.5 Million to fully fund the 90-Day Operating Cash Reserve Fund (716)**
- **$2.0 Million to bring the existing $1.1 Million in cash (from excess water use penalties received in FY 2014 and 2015) to $3.1 Million (Fund 717); and**

- **Additional resources needed to maintain a fund balance in the Department's Operating Fund (711) at 90 days of operating cash**

6.3 DEBT FINANCING ASSUMPTIONS

In evaluating future financing needs, the LRFP includes assumptions on the initial and ongoing costs associated with issuing debt. Table 6 shows the projected current interest rate and terms for various debt issuance mechanisms that would most likely be used in debt funding the planned CIP.

Table 6
Debt Mechanism Estimated Rates & Terms

Debt Mechanism	Assumed Interest Rate (percent)	Term (years)
Tax-Exempt Financing (Bonds)	**5.0**	**30**
California Infrastructure & Economic Development Bank (I-Bank)	**3.24**	**30**
Drinking Water State Revolving Loan Fund	**1.6**	**30**

For planning purposes, additional debt issuance is assumed to be tax-exempt bonds issued in seven series. In addition to borrowing, the Department will work to acquire grant funding for capital investments if and as available. Grant funds may most likely be an option to defray some of the costs of the projects included in the Water Supply Augmentation Strategy. The Department will also pursue below market Drinking Water State Revolving Loan Fund loans for rehabilitation and replacement projects that would score well in meeting that program's competitive criteria.

The size and timing of debt issues to finance these capital projects are summarized in Table 7. The draft LRFP envisions three debt issue series from FY 2017 through FY 2021 for a total of $85.9 million. Another four debt issues series are shown from FY 2022 to FY 2025 for a total of $140 million. The total for all seven series is $226 million.

Table 7

Size and Timing of Debt Issues Needed to Fund Capital Program

Debt Issuance Assumptions								
Series	Series 2018	Series 2020	Series 2021	Series 2022	Series 2024	Series 2025	Series 2026	7 Series Total
Assumptions								
Debt Proceeds	$ 37,515,936	$ 29,775,262	$ 18,648,772	$ 51,733,379	$ 39,162,683	$ 42,572,248	$ 6,798,552	$ 226,206,832
Term of Debt	30 Years	30 Years	30 Years	30 Years	30 Years	30 Years	30 Years	
Call Date	3/1/2028	3/1/2030	3/1/2031	3/1/2032	3/1/2034	3/1/2035	3/1/2036	
Assumed Rate	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	
Project Fund Earnings	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	

6.4 CONSIDERATIONS IN THE TIMING AND SIZING OF DEBT

In order to effectively use a debt financing approach to minimize interest costs associated with borrowing, it is necessary to actively manage the timing and sizing of debt issues to avoid paying interest on cash sitting idle in a bank account. Given this concern, when issuing debt, it makes sense to take into account the following:

- **Set a minimum debt financing amount of $15 million;**[9]
- **Consider the spending rate on current and near term capital projects;**[10]
- **Consider market conditions or interest rate changes that might be more or less favorable in the future;**
- **Explore the potential to use one or more bridge funding mechanisms such as a bank letter of credit or internal borrowing (from City reserve funds, for example) that would allow for debt issuance at a later date.**

The PFM model includes a debt sizing function that can be used to forecast capital expenditures and anticipate when additional borrowing is needed. The model uses both built in parameters, such as the minimum $15 million in borrowing, and the opportunities to consciously consider

[9] The reason for establishing a minimum issuance amount for a debt issue is based on reasoning that is similar to the advice of travel gurus regarding going to the ATM when you're on vacation in a foreign country. There are certain transaction costs associated with taking money out of the ATM that don't vary (or don't vary very much) with the size of the withdrawal. Therefore, it is more cost effective to go to the ATM fewer times and take out more money rather than doing the opposite. Issuing debt also has certain borrowing costs that accrue, and borrowing in bigger chunks helps manage and minimize the impact of some of these costs.

[10] The Department's CIP shows spending patterns that reflect the staff's best estimate of how the project will play out. The environmental review, right-of-way, and regulatory climate in California is complex and project spending can be greatly influenced by this reality. In sizing and timing debt issues, it will be important to use the most up-to-date information about progress on projects.

the sizing and timing of debt. City staff will be actively using this model in ongoing financial analyses and management activities, and the timing and sizing of each debt issue may be revised based on market conditions at the time.

6.5 WATER RATES NEEDED TO MEET REVENUE REQUIREMENTS

During FY 2016, Water Department staff worked with Raftelis Financial Consultants and the Santa Cruz Water Commission to evaluate several options for rate structures, each of which would need to address the City's priority pricing objectives as identified by the Council and the Water Commission during the winter of 2015. These pricing objectives are shown in Table 8 below, in priority order:

Table 8
Priority Pricing Objectives

Composite Pricing Objectives for the City Council and Water Commission, March 2015	
1. Revenue sufficiency	5. Revenue stability
2. Promotes efficiency	6. Understandable by customers
3. Perceived to be fair by the public	7. Promotes conservation
4. Affordable for essential uses	8. Rate stability

In designing new rates for FY 2017 – FY 2021, the Department took into account these priorities and the very strong preference stated by customers in various forums to reduce the amount of revenue generated by fixed charges.

Santa Cruz's water customers are unusual in many respects, including their typically lower levels of water consumption. Even before the drought, 15% of single family customers used an average of 2 CCF or less per month. And 46% (15% + 31%) used an average of 5 or fewer CCF per month. Sixty-four percent used no more than 7 CCF per month.

In 2004, the Department changed its rate structure to increase the number of tiers for single family customers from three to five and also implemented a series of fairly significant price increases between 2004 and 2011. As a result of these actions, many single family residential customers were incentivized to reduce consumption of the more expensive blocks of water, contributing to the distribution patterns that were being observed prior to the drought. Included in this pattern was a shift of the total percent of annual consumption used between

May 1 and October 31 from 65% to 59%. Two years of water rationing for residential customers further reinforced these new use patterns.

Coupled with a strong conservation ethic in Santa Cruz is the concern for affordability of water for those customers using very low amounts of water. Fixed charges are viewed as diluting the conservation incentive that rates can provide as well as raising the cost of water for those routinely using small amounts of water.

6.5.1 CHANGES TO THE RATE STRUCTURE

The Department is recommending moving from its current rate structure in which about 35% of revenue is collected through fixed charges and 65% is collected through volume or commodity charges to one that collects substantially more of the total revenue through volume charges. Roughly 10% of operating costs would be collected in fixed costs based on meter size, with the remainder being collected in the form of charges related to the amount of water used.

Tiered rates for single family residential customer would be retained with the number of tiers being reduced from five to four[11]. Revised tiers would be as follows:

- **0 – 5 CCF = Tier 1 (average winter use)**
- **6 – 7 CCF = Tier 2 (average spring and fall use)**
- **8 – 9 CCF = Tier 3 (average summer use)**
- **≥ 10 CCF = Tier 4**

Multi-family residential rates would also be tiered using the same tiers as for single family but multiplying the tier allocations by the number of dwelling units in a master metered complex.[12]

Landscape irrigation accounts would be billed based on a simplified water budget system that would establish an allocation for each account. Usage up to that water budget allocation would be billed at tier 1 of the irrigation rates, up to 150% of the allocation would be billed at tier 2 of the irrigation rates, and all usage above 150% of the allocation would be billed at tier 3 of the landscape irrigation rates.

[11] The change in the number of tiers was the result of the analysis done by Raftelis Financial Consultants as part of the Cost of Service Study and was based on evolving water use patterns for residential customers.

[12] Master metered systems may include irrigation or have irrigation on a separate meter. For water utility billing purposes, individually metered multi-family units are treated as single family residential properties.

The remaining customer classes would be billed using uniform rates established for each class based on the Cost of Service Analysis. For example, this means that the University of California at Santa Cruz, whose water use includes some seasonal peaking, would pay a higher uniform rate than those customer classes that do not.

6.5.2 MITIGATING THE POTENTIAL REVENUE STABILITY RISKS OF MOVING TO A MORE VOLUME BASED RATE STRUCTURE

Moving to a more volume-based rate structure creates inherent revenue stability risks for a utility. In making a decision to move in this direction, Water Department staff carefully considered how this risk might influence revenues by evaluating the character and water use consumption patterns in the City's service area.

Even before the recent drought, Santa Cruz water customers were among the lowest water users in the state on both system-wide and residential gallons per capita per day metrics. During the drought, that pattern continued. Anecdotally, staff is observing some continuing shifts in water use that may reflect some long-term changes in use patterns that will ultimately be attributed to the drought becoming permanent. One very likely candidate for this kind of change is residential landscape irrigation.

Revenue streams that depend on the volume of water sold are particularly susceptible to weather driven changes in consumption, and changes in consumption due to price effects. The Department's recent experiences make it keenly aware of this dynamic. The challenges of managing ongoing operations and management of the water utility while simultaneously planning for and implementing major capital improvements aren't insurmountable with a more volume based rate structure, but certainly introduce an element of uncertainty that should be carefully considered before proceeding. This is what Department staff has done.

Rather than avoid recommending a rate structure that seems well-suited to the community's and policy maker's values and priorities, Department staff recommends planning for and implementing as part of the rate structure the mechanisms needed to mitigate these potential risks.

These risks come in two basic forms: drought risks, and non-drought risks. The risk mitigation approaches being recommended to address each is discussed in more detail below.

6.5.2.1 DROUGHT RISKS

In 2014, the Water Department instituted a drought cost recovery fee mechanism that is put in place as a fixed charge. Table 9 shows the Drought Cost Recovery Fee revenue recovery target for each stage of the City's Water Shortage Contingency Plan and provides the amount charged for a typical single family residential customer using a 5/8th or 3/4th inch meter.

Table 9
Drought Cost Recovery Fee Financial Targets and
Example Fixed Charge for 5/8th and 3/4th inch Meters

Drought Stage	Cutback Required	Targeted Cost Recovery	Fixed Charge per 5/8th or 3/4th inch meter
Stage 1	5%	$1.0 Million	$2.45
State 2	15%	$2.5 Million	$6.12
Stage 3	25%	$4.0 Million	$9.79
Stage 4	35%	$5.5 Million	$13.46
Stage 5	50%	$7.5 Million	$18.35

Additional Details on the Drought Cost Recovery Fees for other meter sizes can be found in Appendix C.

A Drought Cost Recovery Fee was levied in Santa Cruz from October 1, 2014 through June 30, 2016. Levying the fee is explicitly linked to an action by the Santa Cruz City Council to declare a drought and establish curtailment stage in advance of each year's dry season (May through October).

The Department's 2014 Proposition 218 notice included the Drought Cost Recovery Fee Schedule. The planned summer 2016 Proposition 218 notice will also include publication of this fee.

6.5.2.2 NON-DROUGHT RELATED RISKS

In the earlier discussion of rates in Section 5.3 above, the basic risk mitigation approach for non-drought years was described. It involved two basic strategies:

1 **Setting the assumption about how much water will be sold at a conservative 2.5 billion gallons per year;**
2 **Beginning in July 2018, apply a $1.00 per unit of water consumption surcharge to increase the amount of the Rate Stabilization Reserve from the current level of $2.3 million to a total of $10 million. In any "normal" year where 2.5 billion gallons of water is not sold, use revenues from the rate stabilization reserve to cover the resulting revenue shortfall.**

The planned $1.00 surcharge is not being designed to be an "on-off" mechanism but is currently proposed to be permanent. Use of these funds once the Rate Stabilization Reserve reaches $10 million is recommended to be used as follows:

- **Once the Rate Stabilization Reserve reaches its target level of $10 Million, funds from this surcharge would be allocated as needed to ensure that Operating Cash and Emergency Reserves are fully funded and then directed to fund "pay-as-you-go" capital expenditures, reducing the need to issue debt.**

6.5.3 ALLOCATIONS OF REVENUES THAT ARE HIGHER THAN EXPECTED

A reasonable question is what to do if revenue stability does not turn out to be an issue because consumption is either stable at 2.5 billion gallons per year or is greater than 2.5 billion gallons. The Department proposes the following conditional approach to addressing this situation if it occurs:

If….

- **the minimum debt service coverage ratio target of 1.5 is being consistently met, and**
- **reserves are fully funded, and**
- **"pay-as-you-go" capital is being funded at an average over the previous 3 years of at least 25%;**

Then either…

- **additional planned rate increases will be adjusted to the level needed to produce required revenues without any excess,[13] or**

[13] The public notices required under Proposition 218 are required to identify (and justify based on the cost of service) the maximum amount that will be charged for a service. A utility has the option of charging less than the maximum amount published in the required notices. The obverse, however, is not true, which is the major reason for building into a more heavily volumetric rate structure a mechanism to mitigate for lower than anticipated revenues due to lower than forecasted water sales.

- **The Water Department will ask the City Council for additional direction regarding adjusting the amount of funding in the Emergency Reserve and the Rate Stabilization Reserve to be an established percent of the Operating budget (rather than a fixed dollar amount), accelerating capital reinvestment in system infrastructure, or increasing the proportion of capital that is being paid for with "pay-as-you-go" funding.**

Glossary

- **Bond covenant** – A legally binding term of an agreement between a bond issuer and a bond holder. Bond covenants are designed to protect the interests of both parties. Bond covenants are commitments that the City makes to the bondholders to ensure timely payment of principal and interest.
- **Capital Improvement Plan** – A multi-year plan that lists the rehabilitation, replacement, major maintenance, and new water system facilities and systems that are needed to maintain reliable and high quality water service or meet regulatory requirements;
- **CCF** (One Hundred cubic feet of water) – 748 gallons of water. A CCF is the unit used by the Santa Cruz Water Department as the basis for charges to customers based on water use.
- **Debt service coverage ratio** – The ratio of net operating revenue to annual debt payments.
- **Emergency reserve fund** – A reserve fund specifically designed to provide resources to address the consequences of natural disasters on water system facilities or resources or a catastrophic failure of a water system facility;
- **Pro forma** (financial statement) - A pro forma financial statement is a forecast of the utility's revenues and expenditures based on certain assumptions and projections;
- **Ninety-day operating cash reserve fund** – A reserve created to help ensure the utility's ability to meet operating expenses, provide financial stability, and resilience and support establishing and maintaining a good credit rating.
- **Operating budget** – The portion of the Department's overall budget that pays for ongoing operations of the utility, including the costs related to personnel, materials and services such as water treatment chemicals, and energy resources, and non-capital improvement project professional and technical services;
- **Pay-as-you-go capital funding** – paying for capital improvement projects using current year or accumulated rate revenues rather than the use of short or long term debt;
- **Proposition 218** – a 1996 California Constitutional Amendment that established the "cost-of-service" requirements for utility rates as well as certain noticing and public review process requirements related to water rate increases;[14]
- **Rate structure design** – Characteristics of water rates that provides for the amount of revenue produced by fixed and variable charges, the use of different tiers for different amounts of water use, etc.;

[14] Proposition 218 also includes other provisions that aren't relevant to water rates and finances.

- **Rate stabilization reserve** – a financial reserve specifically intended to provide a hedge against revenue variability resulting from weather conditions, such as a cool wet spring that results in less water than projected being used for outdoor irrigation.
- **Reimbursement resolution** – A Council action that authorizes the Department to reimburse itself for funds expended on capital projects using proceeds from future debt issues.
- **Water Supply Augmentation Strategy** – This is the plan developed by the Council appointed Water Supply Advisory Committee and accepted by the City Council for implementation in November 2015.

APPENDIX A – FINANCIAL PRO FORMA

This Appendix includes a 10 year Pro Forma from the Department's financial Model.

City of Santa Cruz Water Department FY 2017 – FY 2026 Financial Pro-Forma

City of Santa Cruz Water Department Pro-Forma Projections										
Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Revenues										
Rate Revenue										
Fixed Fee Revenue	$ 4,655,461	$ 2,960,622	$ 3,153,062	$ 3,358,011	$ 3,576,282	$ 3,808,740	$ 4,056,308	$ 4,319,968	$ 4,600,766	$ 4,899,816
Volumetric Revenue	$ 27,555,340	$ 33,747,904	$ 35,941,518	$ 38,277,717	$ 40,765,768	$ 43,415,543	$ 46,237,553	$ 49,242,994	$ 52,443,789	$ 55,852,635
Elevation Surcharges	$ 103,105	$ 120,759	$ 130,985	$ 138,233	$ 138,656	$ 139,242	$ 139,830	$ 140,421	$ 141,015	$ 141,611
Rate Stabilization Surcharge	$ -	$ 3,342,244	$ 3,342,244	$ 3,342,244	$ 3,342,244	$ 3,342,244	$ 3,342,244	$ 3,342,244	$ 3,342,244	$ 3,342,244
Total Rate Revenue	$ 32,313,906	$ 40,171,529	$ 42,567,809	$ 45,116,205	$ 47,822,950	$ 50,705,769	$ 53,775,936	$ 57,045,628	$ 60,527,814	$ 64,236,306
Non-Rate Revenue										
Other Income	$ 203,600	$ 203,600	$ 203,600	$ 203,600	$ -	$ -	$ -	$ -	$ -	$ -
Investment Income	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Non-Rate Revenue	$ 203,600	$ 203,600	$ 203,600	$ 203,600	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenues	$ 32,517,506	$ 40,375,129	$ 42,771,409	$ 45,319,805	$ 47,822,950	$ 50,705,769	$ 53,775,936	$ 57,045,628	$ 60,527,814	$ 64,236,306
Operating Expenses										
Personnel	$ 12,741,984	$ 13,868,008	$ 15,086,021	$ 15,882,276	$ 16,733,349	$ 17,643,670	$ 18,618,048	$ 19,661,714	$ 20,780,352	$ 21,980,139
Services, Supplies & Other	$ 12,616,410	$ 13,247,231	$ 13,909,592	$ 14,605,072	$ 15,335,325	$ 16,102,091	$ 16,907,196	$ 17,752,556	$ 18,640,184	$ 19,572,193
Capital Outlay	$ 965,000	$ 1,013,250	$ 1,063,913	$ 1,117,108	$ 1,172,964	$ 1,231,612	$ 1,293,192	$ 1,357,852	$ 1,425,745	$ 1,497,032
Other Operating Expenses	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Operating Expenses	$ 26,323,394	$ 28,128,488	$ 30,059,525	$ 31,604,455	$ 33,241,638	$ 34,977,373	$ 36,818,437	$ 38,772,122	$ 40,846,280	$ 43,049,364
Net Operating Revenues	$ 6,194,112	$ 12,246,641	$ 12,711,884	$ 13,715,350	$ 14,581,312	$ 15,728,396	$ 16,957,500	$ 18,273,506	$ 19,681,534	$ 21,186,943
Capital Expenditures	$ 12,457,850	$ 15,886,978	$ 35,774,344	$ 37,574,757	$ 26,251,158	$ 15,635,558	$ 48,913,507	$ 45,672,352	$ 47,955,970	$ 10,854,470
Grant Funded	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SRF Funded	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Currently Funded	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pay-Go Funded	$ 12,457,850	$ 9,092,599	$ 5,052,786	$ 7,799,495	$ 7,602,387	$ 7,467,490	$ 5,348,196	$ 6,509,669	$ 5,383,722	$ 4,055,918
Debt Funded	$ -	$ 6,794,378	$ 30,721,558	$ 29,775,262	$ 18,648,772	$ 8,168,068	$ 43,565,311	$ 39,162,683	$ 42,572,248	$ 6,798,552
Debt Service	$ 1,110,238	$ 2,089,418	$ 3,364,562	$ 4,286,397	$ 6,171,547	$ 7,404,928	$ 10,701,862	$ 10,800,876	$ 13,275,920	$ 16,046,053
Net Income	$ (7,373,976)	$ 1,064,624	$ 4,294,536	$ 1,629,457	$ 807,378	$ 855,979	$ 907,441	$ 962,961	$ 1,021,892	$ 1,084,972
Total Cash Balances										
Beginning Total Cash Balance	$ 4,071,118	$ 18,697,143	$ 22,761,766	$ 27,056,302	$ 28,685,759	$ 29,493,137	$ 30,349,115	$ 31,256,557	$ 32,219,518	$ 33,241,410
I-Bank Reimbursements	$ 22,000,000	$ 3,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Calculated Change to Cash Balances	$ (7,373,976)	$ 1,064,624	$ 4,294,536	$ 1,629,457	$ 807,378	$ 855,979	$ 907,441	$ 962,961	$ 1,021,892	$ 1,084,972
Ending Total Cash Balance	$ 18,697,143	$ 22,761,766	$ 27,056,302	$ 28,685,759	$ 29,493,137	$ 30,349,115	$ 31,256,557	$ 32,219,518	$ 33,241,410	$ 34,326,381
Beginning Cash Balances by Fund										
Fund 717 (Emergency Reserve)	$ 1,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000
Fund 713 (Rate Stabilization)	$ 2,447,939	$ 2,447,939	$ 5,790,183	$ 9,132,427	$ 10,000,000	$ 10,000,000	$ 10,000,000	$ 10,000,000	$ 10,000,000	$ 10,000,000
Fund 716 (90 Day Operating Reserve)	$ -	$ 6,490,700	$ 6,935,792	$ 7,411,938	$ 7,792,879	$ 8,196,568	$ 8,624,558	$ 9,078,519	$ 9,560,249	$ 10,071,685
Fund 711 (Water Operations)	$ 523,179	$ 6,658,504	$ 6,935,792	$ 7,411,938	$ 7,792,879	$ 8,196,568	$ 8,624,558	$ 9,078,038	$ 9,559,269	$ 10,069,724
Changes to Cash Balances by Fund										
Fund 717 (Emergency Reserve)	$ 2,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Fund 713 (Rate Stabilization)	$ -	$ 3,342,244	$ 3,342,244	$ 867,573	$ -	$ -	$ -	$ -	$ -	$ -
Fund 716 (90 Day Operating Reserve)	$ 6,490,700	$ 445,092	$ 476,146	$ 380,942	$ 403,689	$ 427,989	$ 453,961	$ 481,731	$ 511,436	$ 543,226
Fund 711 (Water Operations)	$ 6,135,324	$ 277,288	$ 476,146	$ 380,942	$ 403,689	$ 427,989	$ 453,480	$ 481,231	$ 510,456	$ 541,746
Ending Cash Balances by Fund										
Fund 717 (Emergency Reserve)	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000	$ 3,100,000
Fund 713 (Rate Stabilization)	$ 2,447,939	$ 5,790,183	$ 9,132,427	$ 10,000,000	$ 10,000,000	$ 10,000,000	$ 10,000,000	$ 10,000,000	$ 10,000,000	$ 10,000,000
Fund 716 (90 Day Operating Reserve)	$ 6,490,700	$ 6,935,792	$ 7,411,938	$ 7,792,879	$ 8,196,568	$ 8,624,558	$ 9,078,519	$ 9,560,249	$ 10,071,685	$ 10,614,912
Fund 711 (Water Operations)	$ 6,658,504	$ 6,935,792	$ 7,411,938	$ 7,792,879	$ 8,196,568	$ 8,624,558	$ 9,078,038	$ 9,559,269	$ 10,069,724	$ 10,611,470
Coverage and Targets										
Debt Service Coverage (W/Out Reserves)	5.58x	4.26x	2.78x	3.00x	2.36x	2.12x	1.58x	1.69x	1.48x	1.32x
Debt Service Coverage Target	1.50x	1.50x	1.50x	1.50x	1.50x	1.50x	1.50x	1.50x	1.50x	1.50x
Debt Service Coverage (W/Reserves)	22.42x	16.76x	11.82x	9.89x	7.14x	6.22x	4.51x	4.67x	3.99x	3.46x
Days' Cash (Includes only Funds 711 & 716)	182	180	180	180	180	180	180	180	180	180
Days' Cash Target	180	180	180	180	180	180	180	180	180	180

APPENDIX B – 10 YEAR CIP

This Appendix includes a spreadsheet listing projects, funding and schedules and project descriptions

Water Department FY 2017 – FY 2018 Capital Improvement Program

10-Year CIP by Primary Driver										
	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026
Rehabilitate or Replace										
Felton Diversion Replacement & Pump Station		1,500,000	1,500,000	1,500,000						
Laguna Dam										500,000
Majors Creek Diversion										300,000
San Lorenzo River Diversion & Tait Wells										
Newell Creek Pipeline Rehabilitation	1,000,000	1,000,000	8,000,000	8,000,000						
Newell Creek Dam I/O Pipeline & Aerators	2,000,000	2,000,000	14,000,000	12,000,000	12,000,000					
North Coast System Rehab	4,150,000									4,000,000
WTP Concrete Tank Evaluation & Replacement	600,000	3,000,000	3,000,000	3,000,000						
WTP Solids Handling	500,000									
Water Main Replacements - City Engineering	1,395,000	1,440,000	1,440,000	1,440,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
Water Main Replacements - Outside Agency	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000
Water Main Replacements - Customer Initiated	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Water Main Replacements - Distribution	325,000	325,000	325,000	325,000	325,000	325,000	325,000	325,000	325,000	325,000
Pressure Regulating Stations	10,000	60,000	60,000	60,000						
Recoat University Reservoir No. 4	75,000	1,300,000								
Recoat University Reservoir No. 5	75,000	1,675,000								
Beltz 11	70,000	300,000								
Water Treatment Upgrades	100,000									
Subtotal	**10,600,000**	**12,900,000**	**28,625,000**	**26,625,000**	**14,125,000**	**2,125,000**	**2,125,000**	**2,125,000**	**2,125,000**	**6,925,000**
With inflation	**10,918,000**	**13,685,610**	**31,886,676**	**31,141,725**	**17,347,257**	**2,740,252**	**2,877,265**	**3,021,128**	**3,172,185**	**10,854,470**
Upgrade or Improve										
Advance Metering Infrastructure (AMI)					50,000	4,000,000	4,000,000			
Loch Lomond Rec Improvements			165,000	1,000,000						
Photovoltaic/SolarProjects		500,000								
Water Resources Building	1,000,000									
Security Camera & Building Access Upgrades	95,000									
Subtotal	**1,095,000**	**500,000**	**165,000**	**1,000,000**	**50,000**	**4,000,000**	**4,000,000**	-	-	-
With inflation	**1,127,850**	**530,450**	**183,801**	**1,169,642**	**61,406**	**5,158,122**	**5,416,028**	-	-	-
Water Supply Reliability										
Aquifer Storage & Recovery		1,075,000	325,000	300,000						
Recycled Water										
Water Supply- WSAS Implementation				1,200,000	7,200,000	6,000,000	30,000,000	30,000,000	30,000,000	
Source Water Evaluation & Implementation	400,000	500,000	3,000,000	3,000,000						
Subtotal	**400,000**	**1,575,000**	**3,325,000**	**4,500,000**	**7,200,000**	**6,000,000**	**30,000,000**	**30,000,000**	**30,000,000**	-
With inflation	**412,000**	**1,670,918**	**3,703,867**	**5,263,390**	**8,842,495**	**7,737,183**	**40,620,213**	**42,651,224**	**44,783,785**	-
Total Projects w/o Inflation	12,095,000	14,975,000	32,115,000	32,125,000	21,375,000	12,125,000	36,125,000	32,125,000	32,125,000	6,925,000
Handy-Whitman Construction Inflation Factor	3%	3%	5%	5%	5%	5%	5%	5%	5%	5%
Total Projects with Cumulative Inflation	12,457,850	15,886,978	35,774,344	37,574,757	26,251,158	15,635,558	48,913,507	45,672,352	47,955,970	10,854,470

REHABILITATE OR REPLACE
Felton Diversion Replacement & Pump Station (c701602) This project consists of evaluating the existing dam and pump station with recommendations to rehabilitate or replace existing facilities. Alternate diversions to be considered will include horizontal collector wells and other subsurface intake(s). This project will replace aging facilities and evaluate potentially more efficient ways to divert water from the San Lorenzo River at Felton. Additional funding for construction in FY2019.
Laguna Dam (c70xxxx) Evaluate condition of dam and make recommended modifications. The project will follow completion of anadromous Habitat Conservation Plan.
Majors Creek Diversion (c701302) Majors Creek Diversion is nearly 100 years old. This project will evaluate the condition of the structure, make recommendations to replace or repair, and complete the construction. Evaluation of facility to occur in FY2017 with scheduling of rehabilitation TBD.
San Lorenzo River Diversion & Tait Wells (c709872) Conduct a condition assessment of the existing diversion and wells including consideration of sanding issues, potential dam replacement, the potential use of infiltration gallery, and relocation of existing wells. Project will ensure reliable and efficient diversion of water from the San Lorenzo River at Tait St. Condition assessment followed by recommended intake modifications and/or new wells. Current project consists of replacing 2 wells, rehabilitating 1 existing well, and abandoning 1 well. (Project title modified from San Lorenzo Tait Intake.)
Newell Creek Pipeline Rehabilitation (c701701) Conduct a condition assessment and program level environmental review followed by full or partial replacement of the pipeline between the base of Loch Lomond Reservoir and the Graham Hill Water Treatment Plant. This pipeline was constructed in the 1960s. This project is intended to ensure continued reliability of this water supply transmission main. (Project title modified from Newell Creek Supply Main Rehabilitation.)
Newell Creek Dam I/O Pipeline & Aerators (c701606) The Newell Creek Dam was installed in the 1960's. A pipeline runs through the base of the dam to deliver water to the reservoir from Felton Diversion and from the reservoir to the Graham Hill Water Treatment Plant. The pipeline rehabilitation includes inspection of the pipeline and its appurtenances which will result in rehabilitation or replacement of all or parts of the facility.
North Coast System Rehab (c709835) Springs and streams along the coast north of the City limits supply approximately 25% of the City's raw water. Some of the facilities related to these water supplies are reaching the end of their useful life. This program consists of multiple projects over the next 15 to 20 years to evaluate, rehabilitate, and replace portions of the existing infrastructure to ensure continued reliability. Engineering, environmental review, and permitting for the coast segment (Phase 3) began in FY 2013 and continues through FY 2017. Construction scheduled to begin in FY 2016.
WTP Concrete Tank Evaluation & Replacement (c701501) As part of an overall plan to ensure compliance with changing water quality regulations, improvements are needed at the Graham Hill Water Treatment Plant. This project will evaluate

the condition of four concrete tanks located at the site (as well as an off-site concrete tank), make improvement recommendation, and construction. Project title modified from WTP Filter Water Tank. Includes $145,000 endowment for MHJB HCP mitigation.
WTP Solids Handling (c701605) Solids produced at the Graham Hill Water Treatment Plant are currently disposed of in the City's sewer collection system. Treatment and disposal of these solids needs to be evaluated with the existing Water Treatment Plant Concrete Tank Assessment and Rehabilitation project (c701501) with improvements made accordingly.
Water Main Replacements - City Engineering (c700002, c709833, and c700017) Recurring program to replace deteriorated or undersized mains as identified and prioritized by the Department. Priorities are based on the need to maintain water system reliability, deliver adequate fire flows, improve circulation and water quality, and reduce maintenance costs. These projects focus on pipes less than 10" in diameter and are typically installed by contractors according to bid plans and specifications.
Water Main Replacements - Outside Agency (c700003) Water main, service line, valve, or water meter relocation necessitated by County or other Agency road improvement, storm drain improvement projects, and/or other projects that conflict with existing water infrastructure.
Water Main Replacements - Customer Initiated (c700004) Recurring program similar to the other Main Replacement Projects; however, these projects are initiated on an as-needed basis to accommodate customer-requested service connections to undersized or inadequate mains. Funds, to the extent of the appropriation, are disbursed to customers on a first-come, first-served basis. This project is funded by System Development Charges (100% SDC – Fund 715).
Water Main Replacements – Distribution (c701507) Recurring program to replace deteriorated or undersized water mains, as identified and prioritized by the Department and implemented by the Distribution Section. Projects are typically based on leak history, but also address water quality and fire flow issues.
Pressure Regulating Stations (c701703) Evaluation and replacement of pressure regulating stations (PRS). A PRS maintains (sustains or reduces) downstream pressure in order to deliver sufficient water pressure. The water distribution system contains 15 PRS and they vary in age from 66 years old to 8 years old. This project will evaluate the condition of each PRS and prioritize rehabilitation or replacement.
Recoat University Reservoir No. 4 (c701505) Perform engineering analysis and condition assessment of the aging University 4 tank to ensure continued reliable service. Establish scope of work for recoating/rehabilitation project. Acquire construction easements from UCSC and perform environmental analysis to install temporary tank for use during construction. Create plans and specifications for recoating/rehabilitation project.

Recoat University Reservoir No. 5 (c701506) Perform engineering analysis and condition assessment of the aging University 5 tank to ensure continued reliable service. Establish scope of work for recoating/rehabilitation project. Create plans and specifications for recoating/rehabilitation project. Install temporary tank and variable speed pumps for use during construction. Construct recoating/rehabilitation project.
Beltz 11 (c700026) This project would convert an existing monitoring well to a production well, renamed Beltz 11. Beltz 11 would pump from the Santa Margarita aquifer. The project would reduce pumping from the Purisima Formation which is impacted by pumping by the City and other users. Project includes feasibility study, pump test, CEQA and construction efforts.
Water Treatment Upgrades (c700025) Upgrades to the Graham Hill Water Treatment Plant are necessary to meet new and planned regulatory requirements, and increase overall system reliability. This is a recurring project to prioritize needs and make smaller improvements. The current project includes upgrades to the bulk chemical storage area.
UPGRADE OR IMPROVE
Advance Metering Infrastructure (AMI) (c701603) Evaluate the use of AMI as replacement to the current AMR metering (Automatic Meter Reading). AMR provides 1-way communication between a meter and the City and AMI provides two-way communication between a meter and the City as well as between a meter and the customer. Benefits include early leak detection, customer conservation affect, and workflow management. Implementation to occur in future years.
Loch Lomond Rec Improvements (c701301) Complete facilities assessment and improvement program at Loch Lomond. A Use study was completed in FY 2013 which resulted in a number of planned projects to enhance the recreation area usability for its visitors. Several ADA and other recreational improvements are being pursued over the next 5 years.
Photovoltaic/Solar Projects (c701607) Ongoing project to evaluate, design and construct PV systems on various water department facilities. The current project is at the Bay Street Tank Site. Once installed, each project will add to the departments and City's green energy portfolio and work towards meeting and exceeding our climate action goals.
Water Resources Building (c701702) The Watershed Resources Division is currently housed in temporary trailers. This project consists of a needs assessment, design, and construction. The needs assessment portion of the project has been completed; FY 2016 will focus on site selection and design; FY 2017 will be construction.
Security Camera & Building Access Upgrades (c701704) Evaluation and implementation of security camera and building access upgrades at various Water facilities. Current security equipment is proprietary and could be improved. A transition to a new system will require camera replacement and additional video storage equipment.

WATER SUPPLY RELIABILITY
Aquifer Storage & Recovery (c701609 and c701610) Evaluate the feasibility of Aquifer Storage and Recovery as per the recommendations of the Water Supply Advisory Committee. Funds in FY 2016 and 2017 will be used for Phase 1 of the proposed study. Phase 2 will include pilot work and be funded in FY 2018. Project would potentially provide additional potable water to City and other agency customers, addressing part or all of water supply deficiencies.
Recycled Water (c701611 and c701612) Evaluate the feasibility of using advanced treated wastewater for beneficial uses as per the recommendations of the Water Supply Advisory Committee. The project will be collaboration amongst the Water and Public Works Departments. The project would potentially provide additional water to City and other agency customers, addressing all or part of water supply deficiencies.
Water Supply- WSAS Implementation (c70xxxx) Funding tentatively scheduled for FY2020.
Source Water Evaluation & Implementation (c701608) Evaluate source water quality, operational and infrastructure alternatives to maximize use of surface water. This project was prompted in part by the recommendations of the Water Supply Advisory Committee, accepted by Council in Nov 2015, to evaluate use of additional winter flows in the San Lorenzo River for various purposes to solve the regional water supply issues.

APPENDIX C – PROPOSED WATER RATES AND FEES FOR FY 2017-FY 2021

The tables below were excerpted from a more complete presentation on water rates and charges prepared for and presented to the Santa Cruz Water Commission on June 6, 2016. That presentation can be accessed online at the Water Commission's website. (see http://www.cityofsantacruz.com/departments/water/city-water-commission/meetings-and-agenda)

Table C-1

Inside City Customer Fixed Monthly Charges

Inside		FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
Meter Size	# of Meters	Proposed Ready-to-Serve ($/Meter)	9%	7%	5%	5%
5/8-in	14,348	$ 8.78	$ 9.53	$ 10.18	$ 10.71	$ 11.26
3/4-in	150	$ 9.01	$ 9.78	$ 10.45	$ 10.99	$ 11.56
1-in	748	$ 9.70	$ 10.53	$ 11.25	$ 11.83	$ 12.44
1 1/2-in	294	$ 10.61	$ 11.52	$ 12.31	$ 12.94	$ 13.61
2-in	250	$ 13.14	$ 14.26	$ 15.24	$ 16.02	$ 16.85
3-in	35	$ 31.74	$ 34.45	$ 36.82	$ 38.71	$ 40.71
4-in	15	$ 38.63	$ 41.93	$ 44.81	$ 47.11	$ 49.55
6-in	6	$ 54.70	$ 59.37	$ 63.45	$ 66.71	$ 70.16
8-in	3	$ 73.07	$ 79.31	$ 84.76	$ 89.11	$ 93.73
10-in	3	$ 93.74	$ 101.75	$ 108.73	$ 114.32	$ 120.24

Table C-2

Inside City Customer Volume Rates

Inside	FY 2017 Commodity Rate ($/ccf)	FY 2018 Commodity Rate ($/ccf)	FY 2019 Commodity Rate ($/ccf)	FY 2020 Commodity Rate ($/ccf)	FY 2021 Commodity Rate ($/ccf)
SFR & MFR					
Tier 1	$ 7.30	$ 8.97	$ 9.49	$ 10.03	$ 10.60
Tier 2	$ 8.75	$ 10.56	$ 11.18	$ 11.86	$ 12.59
Tier 3	$ 10.28	$ 12.25	$ 12.97	$ 13.78	$ 14.64
Tier 4	$ 12.65	$ 14.85	$ 15.73	$ 16.75	$ 17.84
COM					
Uniform	$ 8.84	$ 10.67	$ 11.29	$ 11.97	$ 12.70
UCSC					
Uniform	$ 9.11	$ 10.96	$ 11.60	$ 12.31	$ 13.06
North Coast AG					
Uniform	$ 6.63	$ 8.29	$ 8.74	$ 9.34	$ 9.99
Landscape					
Tier 1	$ 9.68	$ 11.59	$ 12.27	$ 13.04	$ 13.86
Tier 2	$ 13.38	$ 15.65	$ 16.58	$ 17.67	$ 18.83
Tier 3	$ 14.54	$ 16.91	$ 17.93	$ 19.10	$ 20.33
Elevation Surcharge					
Elevation Surcharge	$ 0.42	$ 0.46	$ 0.49	$ 0.51	$ 0.54

Table C-3
Outside City Customer Fixed Monthly Charges

Outside		FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
Meter Size	# of Meters	Proposed Ready-to-Serve ($/Meter)	9%	7%	5%	5%
5/8-in	7,507	$ 10.05	$ 10.91	$ 11.66	$ 12.26	$ 12.89
3/4-in	65	$ 10.32	$ 11.20	$ 11.97	$ 12.59	$ 13.24
1-in	574	$ 11.11	$ 12.06	$ 12.89	$ 13.55	$ 14.25
1 1/2-in	164	$ 12.16	$ 13.20	$ 14.10	$ 14.83	$ 15.60
2-in	157	$ 15.05	$ 16.34	$ 17.46	$ 18.35	$ 19.30
3-in	14	$ 36.36	$ 39.47	$ 42.17	$ 44.34	$ 46.64
4-in	9	$ 44.25	$ 48.03	$ 51.33	$ 53.96	$ 56.76
6-in	5	$ 62.66	$ 68.01	$ 72.68	$ 76.42	$ 80.37
8-in	1	$ 83.71	$ 90.86	$ 97.10	$ 102.09	$ 107.38
10-in	-	$ 107.38	$ 116.55	$ 124.55	$ 130.95	$ 137.74

Table C-4
Outside City Customer Volume Rates

Outside	FY 2017 Commodity Rate ($/ccf)	FY 2018 Commodity Rate ($/ccf)	FY 2019 Commodity Rate ($/ccf)	FY 2020 Commodity Rate ($/ccf)	FY 2021 Commodity Rate ($/ccf)
SFR & MFR					
Tier 1	$ 8.38	$ 10.15	$ 10.75	$ 11.37	$ 12.03
Tier 2	$ 10.05	$ 12.00	$ 12.70	$ 13.49	$ 14.32
Tier 3	$ 11.85	$ 13.96	$ 14.79	$ 15.73	$ 16.72
Tier 4	$ 14.60	$ 16.98	$ 18.01	$ 19.18	$ 20.43
COM					
Uniform	$ 10.13	$ 12.07	$ 12.79	$ 13.57	$ 14.40
Landscape					
Tier 1	$ 11.09	$ 13.13	$ 13.91	$ 14.79	$ 15.73
Tier 2	$ 15.32	$ 17.78	$ 18.85	$ 20.10	$ 21.42
Tier 3	$ 16.66	$ 19.23	$ 20.40	$ 21.73	$ 23.14
Elevation Surcharge					
Elevation Surcharge	$ 0.48	$ 0.52	$ 0.56	$ 0.59	$ 0.62

Table C-5

Drought Cost Recovery Fees

Meter Size	Stage 1 – 5% cutback	Stage 2 – 15% cutback	Stage 3 – 25% cutback	Stage 4 – 35% cutback	Stage 5 – 50% cutback
5/8-in	$2.45	$6.12	$9.79	$13.46	$18.35
3/4-in	$2.45	$6.12	$9.79	$13.46	$18.35
1-in	$6.13	$15.30	$24.48	$33.65	$45.88
1 1/2-in	$12.25	$30.60	$48.95	$67.30	$91.75
2-in	$19.60	$48.96	$78.32	$107.68	$146.80
3-in	$36.75	$91.80	$146.85	$201.90	$275.25
4-in	$61.25	$153.00	$244.75	$336.50	$458.75
6-in	$122.50	$306.00	$489.50	$673.00	$917.50
8-in	$281.75	$703.80	$1,125.85	$1,547.90	$2,110.25
10-in	$347.90	$869.04	$1,390.18	$1,911.32	$2,605.70

Back Cover

CITY OF SANTA CRUZ

Water Department Prop. 218 Notice Proposed Rates

July 2016

Building a Water System for Our Future

The mission of the City of Santa Cruz Water Department is to provide a safe, clean and continuous supply of water that meets or exceeds local, state and federal standards for public health and environmental quality, and to provide courteous, responsive and efficient service in the most cost-effective manner to our customers. We provide service to about 95,000 customers, 24 hours a day, 365 days a year.

The City of Santa Cruz Water Department is proposing a rate increase and changes to rate structures.

The nation's water utilities face a significant challenge due to a need to repair and replace aging water systems, a decrease in water sales due to increased conservation, a changing climate that creates supply instability, and changes in regulatory requirements. The Santa Cruz water system faces all of these challenges and our current rates will not support the work needed to be done to respond to them. We are proposing increases to water rates and a change to the current rate structures, and new fees that will go directly to support projects that both maintain existing back-bone infrastructure and build critical new infrastructure.

When we raised rates in fall 2014, we committed to use the increased rates to fund ongoing Water Department projects and operations, as well as to complete several critical infrastructure projects. As promised, by the end of 2016 we will have completed:

- The $25 million Bay Street Tanks;
- A $6 million rehabilitation of six filter basins at the Graham Hill Water Treatment Facility;
- The $4.9 million Beltz 12 Well and Water Treatment Facility;
- The $10.3 million Phase 3 of the North Coast System; and
- Replacement of the $267,000 Ocean Street trunk main valve.

In addition, we have completed both the rate studies and financial planning work directed by the City Council in 2014, which results in this proposal to increase current rates, change current rate structures, and add new fees to directly support new infrastructure reinvestment.

Proposed Rate Changes

Historically, capital projects have been financed on a "pay-as-you-go" basis and in consequence, have depleted the Department's available funds. Now, with several new capital projects facing the water system with significantly higher price tags than past projects, it would be impossible for the Department to continue to fund projects through "pay-as-you-go" without ongoing and unacceptably large increases to current rates. Accordingly, the Department will begin issuing debt to finance about two-thirds of planned capital spending. In addition to the financial constraints of "pay-as-you-go," there is also an equity consideration; it is more equitable to spread costs of major system improvements out over time because projects funded and built today continue to benefit water users and rate payers for decades to come.

The proposed rate changes reflect the strong conservation values of the community by shifting away from collecting a large portion of water service costs from fixed charges (such as the Ready-to-Serve charge), to collecting over 90% of revenues through volumetric-pricing based on customer use. Though customers will see a decrease in their Ready-to-Serve charge, the proposed cost per unit of water will increase on all types of accounts and depending upon the amount of water used, customers may see a big jump in their water bill. Changes to rate structures are also proposed so that multi-family accounts will now pay the same per-unit costs as single families, and proposed changes to irrigation accounts include an assigned water budget that reflects efficient irrigation practices for each property.

The costs to treat and distribute drinking water are fixed; the shift to collect needed revenue through fluctuating water sales comes with some risk. To mitigate that risk while still implementing a more volume-based rate structure that encourages conservation, a $1 per unit of water Rate Stabilization fee will be charged beginning in 2017.

The newest change proposed to your water bill is an Infrastructure Reinvestment Fee that will support reinvestment in critical infrastructure projects. Since the rate increase in 2014, infrastructure projects have been added to the Water Department's work plan at significantly greater costs than past projects: a state-required rehabilitation of the inlet-outlet pipeline in the Newell Creek dam for $42 million; rehabilitation of the pipeline between Loch Lomond and Felton for $18 million; replacement and improvements to the pump station at the Felton diversion dam for $4.5 million; replacement of several concrete tanks at the Graham Hill Water Treatment Plant for $9 million; and initial feasibility work on a water supply project, as directed by the Council-approved work of the Water Supply Advisory Committee, which was completed in fall 2015.

We are also proposing a continuation of the Drought Cost Recovery fee, which will only go into effect in the event that the Council imposes restrictions on water use due to drought.

For those customers who…

Are charged an Elevation Surcharge for the increased energy used to pump water to homes in higher elevations – the proposed new surcharge will be $0.42.

Have private fire protection/ sprinkler service – there is a proposed new $1 per fire-service meter charge, per month, to cover the costs for maintaining separate fire protection meters. There is no charge for water used to respond to a fire, but leaking fire services will be charged at the commercial per-unit rate for water, which is intended to incentivize prompt repairs to leaks.

Inside City Rates

Inside City Fixed Rates - Ready to Serve

Meter Size	Ready to Serve ($/Meter)				
	As of 10/1/16	As of 7/1/17	As of 7/1/18	As of 7/1/19	As of 7/1/20
5/8-in	$ 8.78	$ 9.53	$ 10.18	$ 10.71	$ 11.26
3/4-in	$ 9.01	$ 9.78	$ 10.45	$ 10.99	$ 11.56
1-in	$ 9.70	$ 10.53	$ 11.25	$ 11.83	$ 12.44
1 1/2-in	$ 10.61	$ 11.52	$ 12.31	$ 12.94	$ 13.61
2-in	$ 13.14	$ 14.26	$ 15.24	$ 16.02	$ 16.85
3-in	$ 31.74	$ 34.45	$ 36.82	$ 38.71	$ 40.71
4-in	$ 38.63	$ 41.93	$ 44.81	$ 47.11	$ 49.55
6-in	$ 54.70	$ 59.37	$ 63.45	$ 66.71	$ 70.16
8-in	$ 73.07	$ 79.31	$ 84.76	$ 89.11	$ 93.73
10-in	$ 93.74	$ 101.75	$ 108.73	$ 114.32	$ 120.24
Fire Service - All Sizes *	$1 /month	$1.09 /month	$1.15 /month	$1.21 /month	$1.26 /month

Inside City Volume (Commodity) Rates - Consumption

	As of 10/1/16	As of 7/1/17	As of 7/1/18	As of 7/1/19	As of 7/1/20
Single Family Residential and Multi-Family Residential (calculation is based upon the number of dwelling units multiplied by the tier width)					
Tier 1 (0-5 ccf**)	$ 5.75	$ 6.24	$ 6.66	$ 7.01	$ 7.37
Tier 2 (6-7 ccf)	$ 6.42	$ 6.97	$ 7.45	$ 7.83	$ 8.24
Tier 3 (8-9 ccf)	$ 7.41	$ 8.05	$ 8.60	$ 9.04	$ 9.51
Tier 4 (10 ccf & above)	$ 8.79	$ 9.54	$ 10.20	$ 10.72	$ 11.28
Commerical: Business, Industrial, Restaurant, Hotel, Golf, Municipal, Bulk, Fire Service Leaks					
Uniform	$ 6.57	$ 7.13	$ 7.62	$ 8.01	$ 8.43
UCSC					
Uniform	$ 6.70	$ 7.27	$ 7.77	$ 8.17	$ 8.60
Landscape / Irrigation (tiers based on percent of water budget)					
Tier 1 (≤100% of budget)	$ 6.86	$ 7.44	$ 7.95	$ 8.36	$ 8.80
Tier 2 (101% - 150%)	$ 9.15	$ 9.93	$ 10.62	$ 11.16	$ 11.74
Tier 3 (150% & above)	$ 10.27	$ 11.14	$ 11.91	$ 12.52	$ 13.17
Elevation Surcharge					
As Applicable	$ 0.42	$ 0.46	$ 0.49	$ 0.51	$ 0.54

Inside City Volume (Commodity) Rates - Infrastructure Reinvestment Fee

	As of 10/1/16	As of 7/1/17	As of 7/1/18	As of 7/1/19	As of 7/1/20
Single Family Residential and Multi-Family Residential (calculation is based upon the number of dwelling units multiplied by the tier width)					
Tier 1 (0-5 ccf**)	$ 1.55	$ 1.73	$ 1.82	$ 2.02	$ 2.23
Tier 2 (6-7 ccf)	$ 2.32	$ 2.59	$ 2.73	$ 3.03	$ 3.34
Tier 3 (8-9 ccf)	$ 2.86	$ 3.20	$ 3.37	$ 3.74	$ 4.13
Tier 4 (10 ccf & above)	$ 3.85	$ 4.30	$ 4.53	$ 5.02	$ 5.55
Commerical: Business, Industrial, Restaurant, Hotel, Golf, Municipal, Bulk					
Uniform	$ 2.27	$ 2.53	$ 2.66	$ 2.96	$ 3.27
UCSC					
Uniform	$ 2.40	$ 2.68	$ 2.82	$ 3.13	$ 3.46
Landscape / Irrigation (tiers based on percent of water budget)					
Tier 1 (≤100% of budget)	$ 2.82	$ 3.14	$ 3.31	$ 3.67	$ 4.06
Tier 2 (101% - 150%)	$ 4.22	$ 4.71	$ 4.96	$ 5.50	$ 6.08
Tier 3 (150% & above)	$ 4.27	$ 4.77	$ 5.02	$ 5.57	$ 6.16

Inside City Volume (Commodity) Rates - Rate Stabilization Fee

	As of 10/1/16	As of 7/1/17	As of 7/1/18	As of 7/1/19	As of 7/1/20
All accounts (Per ccf)	$ -	$ 1.00	$ 1.00	$ 1.00	$ 1.00

*This amount may be billed annually and will be added to any other applicable water use fixed and volume charges. **ccf equals 100 cubic foot of water.

Outside City Rates

Outside City Fixed Rates - Ready to Serve

Meter Size	Ready to Serve ($/Meter)				
	As of 10/1/16	As of 7/1/17	As of 7/1/18	As of 7/1/19	As of 7/1/20
5/8-in	$ 10.05	$ 10.91	$ 11.66	$ 12.26	$ 12.89
3/4-in	$ 10.32	$ 11.20	$ 11.97	$ 12.59	$ 13.24
1-in	$ 11.11	$ 12.06	$ 12.89	$ 13.55	$ 14.25
1 1/2-in	$ 12.16	$ 13.20	$ 14.10	$ 14.83	$ 15.60
2-in	$ 15.05	$ 16.34	$ 17.46	$ 18.35	$ 19.30
3-in	$ 36.36	$ 39.47	$ 42.17	$ 44.34	$ 46.64
4-in	$ 44.25	$ 48.03	$ 51.33	$ 53.96	$ 56.76
6-in	$ 62.66	$ 68.01	$ 72.68	$ 76.42	$ 80.37
8-in	$ 83.71	$ 90.86	$ 97.10	$ 102.09	$ 107.38
10-in	$ 107.38	$ 116.55	$ 124.55	$ 130.95	$ 137.74
Fire Service - All Sizes *	$1.15 /month	$1.23 /month	$1.30 /month	$1.35 /month	$1.40 /month

Outside City Volume (Commodity) Rates - Consumption

	As of 10/1/16	As of 7/1/17	As of 7/1/18	As of 7/1/19	As of 7/1/20
Single Family Residential and Multi-Family Residential (calculation is based upon the number of dwelling units multiplied by the tier width)					
Tier 1 (0-5 ccf**)	$ 6.59	$ 7.16	$ 7.65	$ 8.04	$ 8.46
Tier 2 (6-7 ccf)	$ 7.37	$ 8.00	$ 8.55	$ 8.99	$ 9.46
Tier 3 (8-9 ccf)	$ 8.54	$ 9.27	$ 9.90	$ 10.41	$ 10.95
Tier 4 (10 ccf & above)	$ 10.15	$ 11.02	$ 11.78	$ 12.38	$ 13.02
Commerical: Business, Industrial, Restaurant, Hotel, Golf, Municipal, Bulk, Fire Service Leaks					
Uniform	$ 7.53	$ 8.17	$ 8.73	$ 9.18	$ 9.66
North Coast AG					
Uniform	$ 3.58	$ 3.88	$ 4.15	$ 4.36	$ 4.59
Landscape / Irrigation (tiers based on percent of water budget)					
Tier 1 (≤100% of budget)	$ 7.85	$ 8.53	$ 9.11	$ 9.58	$ 10.08
Tier 2 (101% - 150%)	$ 10.48	$ 11.38	$ 12.16	$ 12.79	$ 13.45
Tier 3 (150% & above)	$ 11.76	$ 12.77	$ 13.64	$ 14.34	$ 15.09
Elevation Surcharge					
As Applicable	$ 0.48	$ 0.52	$ 0.56	$ 0.59	$ 0.62

Outside City Volume (Commodity) Rates - Infrastructure Reinvestment Fee

	As of 10/1/16	As of 7/1/17	As of 7/1/18	As of 7/1/19	As of 7/1/20
Single Family Residential and Multi-Family Residential (calculation is based upon the number of dwelling units multiplied by the tier width)					
Tier 1 (0-5 ccf**)	$ 1.78	$ 1.99	$ 2.10	$ 2.33	$ 2.57
Tier 2 (6-7 ccf)	$ 2.68	$ 2.99	$ 3.15	$ 3.49	$ 3.86
Tier 3 (8-9 ccf)	$ 3.30	$ 3.69	$ 3.88	$ 4.31	$ 4.76
Tier 4 (10 ccf & above)	$ 4.44	$ 4.96	$ 5.22	$ 5.80	$ 6.41
Commerical: Business, Industrial, Restaurant, Hotel, Golf, Municipal, Bulk					
Uniform	$ 2.59	$ 2.90	$ 3.05	$ 3.38	$ 3.74
North Coast AG					
Uniform	$ 3.05	$ 3.40	$ 3.58	$ 3.98	$ 4.39
Landscape / Irrigation (tiers based on percent of water budget)					
Tier 1 (≤100% of budget)	$ 3.23	$ 3.60	$ 3.79	$ 4.21	$ 4.65
Tier 2 (101% - 150%)	$ 4.83	$ 5.39	$ 5.68	$ 6.30	$ 6.97
Tier 3 (150% & above)	$ 4.89	$ 5.46	$ 5.75	$ 6.38	$ 7.05

Outside City Volume (Commodity) Rates - Rate Stabilization Fee

	As of 10/1/16	As of 7/1/17	As of 7/1/18	As of 7/1/19	As of 7/1/20
All accounts (Per ccf)	$ -	$ 1.00	$ 1.00	$ 1.00	$ 1.00

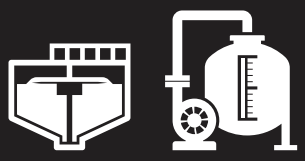
*This amount may be billed annually and will be added to any other applicable water use fixed and volume charges. **ccf equals 100 cubic foot of water.

Drought Cost Recovery Fee (DCRF)

	Stage 1 – 5% Shortage	Stage 2 – 15% Shortage	Stage 3 – 25% Shortage	Stage 4 – 35% Shortage	Stage 5 – 50% Shortage
Maximum Targeted Cost Recovery	$ 1,000,000	$ 2,500,000	$ 4,000,000	$ 5,500,000	$ 7,500,000
5/8-in	$ 2.45	$ 6.12	$ 9.79	$ 13.46	$ 18.35
3/4-in	$ 2.45	$ 6.12	$ 9.79	$ 13.46	$ 18.35
1-in	$ 6.13	$ 15.30	$ 24.48	$ 33.65	$ 45.88
1 1/2-in	$ 12.25	$ 30.60	$ 48.95	$ 67.30	$ 91.75
2-in	$ 19.60	$ 48.96	$ 78.32	$ 107.68	$ 146.80
3-in	$ 36.75	$ 91.80	$ 146.85	$ 201.90	$ 275.25
4-in	$ 61.25	$ 153.00	$ 244.75	$ 336.50	$ 458.75
6-in	$ 122.50	$ 306.00	$ 489.50	$ 673.00	$ 917.50
8-in	$ 281.75	$ 703.80	$ 1,125.85	$ 1,547.90	$ 2,110.25
10–in	$ 347.90	$ 869.04	$ 1,390.18	$ 1,911.32	$ 2,605.70

The Drought Cost Recovery Fee maximum amounts set forth above are a fixed fee and are hereby established and shall be applicable for the full fiscal year (twelve months) following the water shortage declaration made by City Council. The maximum targeted cost recovery amount is indicated below and is linked to the water shortage stage declared by the City Council.

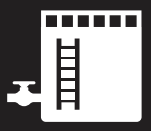
How Your Money Has Been Spent



Beltz Well #12 and Treatment Plant
$4.9 million

Ocean Street Trunk Main Valve Replacement
$267K

Filters at Graham Hill Treatment Plant
$6 million



Bay Street Reservoir
$25 million

North Coast System – Phase 3
$10.3 million

What is the need to increase water rates?

Much of the City's water infrastructure has reached or is reaching the end of its functional lifespan. Therefore the Water Department is planning a major infrastructure reinvestment program, with $128 million needed for projects over the next five years.

What are the proposed changes to rates?

The Water Department is proposing changes to both how rates are structured and to the per-unit costs. Water rates are currently structured so that about 1/3 of revenue comes from fixed rates, such as the Ready-to-Serve charge. The new rate structure will collect less from fixed charges and more from the volume of water used. Because fixed-fee revenues are going down, per unit water rates will be going up to produce needed revenues. This design is more in line with the values expressed by the community, which is to encourage less water use.

How much more will customers pay with the proposed rate increases?

It depends on how much water a customer uses. Very low water users will actually pay less than they currently pay; very high users will pay substantially more.

Customers were told to conserve water, but are now being told that the drop in water sales is causing the need to raise rates. That doesn't seem fair?

It's true that the loss in revenue from selling less water is part of the need to increase rates. However it's a small part. The driving force behind raising rates is the need to reinvest in the City's drinking water treatment and delivery infrastructure.

What will customers get for their money?

Major rehabilitation of the inlet-outlet pipeline in the dam at Loch Lomond; rehabilitation or replacement of the Felton Diversion Dam and Pump Station and the Felton-to-Loch Lomond pipeline; and additional rehabilitation of the Graham Hill Water Treatment Plant are all projects that will be completed.

What's the difference between the current Ready-to-Serve charge and the proposed new Infrastructure Reinvestment Fee?

The Ready-to-Serve charge pays for ongoing operations, such as meter reading and maintenance, producing and delivering bills, and customer service. The proposed Infrastructure Reinvestment Fee is specifically for pay-as-you-go capital investment and debt service for capital expenditures.

What's the difference in the Rate Stabilization Fee proposed and the Drought Cost Recovery Fee?

The Drought Cost Recovery Fee will only be levied during an official declaration of water restrictions. The Rate Stabilization Fee was created to mitigate the risk inherent in basing so much revenue on the volume of water sold.

Will there be a "lifeline" rate for those on fixed and low incomes?

Proposition 218 requires that all customers be charged only for the costs of service provided – no more; no less. Unfortunately it therefore does not make allowances for "lifeline" rates.

Notice of Public Hearing

The City Council for the City of Santa Cruz will hold a Public Hearing Tuesday, August 23, 2016, during the regular meeting of the City Council at 7:00 pm.

The City Council will consider adoption of a proposed water rate increase affecting all water customers. Interested persons are encouraged to attend and comment on the issues being discussed. The meeting will be held in City Council Chambers at 809 Center Street.

Written protests: Any property owner or a tenant who is a customer of the Water Department may protest the proposed water rates. Only one written protest per parcel, filed by an owner or a tenant who is a customer, will be counted. Only written and signed protests that include the writer's address and/or assessor parcel number will be counted to determine whether a majority protest to the proposed water rate increase exists. Written protests may be mailed or hand delivered to the Mayor and Council of Santa Cruz at 809 Center Street, Room 10, Santa Cruz, CA 95060.

If you oppose the proposed rate increases, Proposition 218 requires that your protest be submitted in writing to be counted, even if you plan to attend the Public Hearing. To be counted, the protest must: 1) be in writing; 2) state opposition to the proposed rate increase; 3) identify the parcel by assessor's parcel number or street address; 4) include the printed name and original signature of the owner of record or a tenant who is a customer of the Water Department; 5) be received before the conclusion of the Public Hearing on August 23, 2016.

For more information, visit www.cityofsantacruz.com/h2orates.

CITY OF SANTA CRUZ

Santa Cruz Water District
212 Locust Street
Santa Cruz, CA 95060

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Notice of Public Hearing
Proposed Water Rates
Affecting Your Area

Technical Memorandum

Prepared for:	The City of Santa Cruz
Project Title:	Water Conservation Master Plan, Phase 2
Subject:	Overview of Current Findings from Water Conservation Master Planning Effort
Date:	March 30, 2016
To:	Toby Goddard, City of Santa Cruz Water Department
From:	Lisa Maddaus, Maddaus Water Management Inc.
	Bill Maddaus, Maddaus Water Management Inc.

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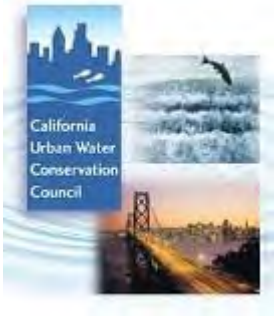
1. INTRODUCTION

This technical memorandum provides an overview of current findings from the water conservation master planning effort.

1.1 Background

Water is a precious natural resource that is vital to the health and welfare and to the economy of the Central Coast region. The City of Santa Cruz relies entirely on local sources for the community's drinking water supply. Because water supplies are limited, it is important that everyone uses water efficiently. The City of Santa Cruz has had a long-standing commitment to water conservation and offers a variety of programs, informational materials, and incentives to help City water customers become more water-efficient.



In 2000, the City adopted a Water Conservation Plan, the goal of which was to reduce water demand system-wide by 282 million gallons per year in 2010. Through plumbing fixture and appliance rebate programs, technical assistance, regulations, and other strategies, residential and commercial customers have saved over 330 million gallons of water per year so far. The City is also a member of the California Urban Water Conservation Council (CUWCC) and is active in promoting water conservation statewide.

In 2013, the Water Conservation Office contracted with Maddaus Water Management (MWM) to develop an updated Water Conservation Master Plan. The goal of the updated plan is to define the next generation of water conservation activities and serve as a roadmap to help our community achieve maximum, practical water use efficiency. Strengthening water conservation efforts has been identified as top priority by the City Council, the City's Water Commission, and more recently by the City's Water Supply Alternatives Committee in its effort aimed at delivering a safe, adequate, affordable, and environmentally sustainable water supply.

1.2 Need and Plan Objectives

The City of Santa Cruz's Water Conservation Master Plan (WCMP or Plan) strives to maximize the community's efficient use of water in the most equitable and cost-effective manner to the extent practical for implementation by City staff.

Key priorities of the WCMP include the following:

- Capitalize on opportunities to meet the future water needs of the Santa Cruz Water Department customers through cost-effective and sustained water conservation and water use efficiency efforts
- Demonstrate environmental stewardship and foster innovative, responsible and efficient practices
- Commit to and implement a water conservation program that supports the health of rivers, streams, and groundwater integral to the region's quality of life and economy
- Monitor and measure performance to ensure conservation potential is being met as forecasted

Achieving these goals will allow the Water Department to:

- Maintain and exceed the water savings already achieved by the City of Santa Cruz as well as identify the best path to achieve those savings and to monitor commitments to the CUWCC Memorandum of Understanding (MOU) Regarding Urban Water Conservation;
- Maintain a long-term plan for compliance with SB X7-7 to meet the gallons per capita per day (GPCD) target by 2020; and
- Meet the City's integrated water resource management goals to reduce peak season demands.

1.3 WSAC Recommended Approach to Demand Management

The City's Water Supply Advisory Committee (WSAC) was supported by City staff and Maddaus Water Management in its review of remaining conservation potential to future goals for the City's Conservation Program. In the WSAC's Final Report

published in October 2015, the following key assumptions about the demand management program (Recommended Program) were presented:

- "The Econometric Demand Forecast [building on previous assumptions prepared by MWM in the DSS Model] includes significant demand reductions associated with the implementation of existing plumbing and building codes, the continuation of existing demand management programs (as a baseline) and as a function of the effect on demand of expected increases in water rates.
- "A focus of new demand management programs will be on peak season demand reduction, which is also a significant focus of the expected demand reduction associated with anticipated price increases.
- "New and enhanced demand management programs will be developed to build on the Water Department's current program that has contributed to reducing per capita demand in Santa Cruz to one of the lowest levels in the state.
- "The programs to be implemented in the coming decade[s] are a mix of lower cost and some higher cost measures. Those higher cost measures are meant as small-scale experiments that may be broadened if they prove popular and their costs decline over time. Together these measures incur an average total program cost of no more than $10,000 per million gallons of water saved. This figure is lower than the expected cost of supply augmentation projects recommended to be pursued as a result of WSAC's work."

2. PLAN DEVELOPMENT (SUMMARY OF PROCESS)

Work on the Water Conservation Master Plan began with a kick-off meeting in January 2013. Since that time, the Water Commission has developed the goals of the planning effort; identified and selected a suite of potential quantifiable conservation measures for technical analysis; and evaluated system-wide conservation potential through selection of a recommended program scenario.

In preparation for this project, the City completed a Residential and Commercial Baseline Water Use Survey in May 2013 to assess the current status of plumbing fixtures, appliances, and landscape characteristics present in the City's water service area.

There have been two (2) main phases in the City's planning process separated by an intervening year that included an in-depth review of the work by WSAC. The process followed in the Plan is summarized as follows:

Phase 1: January 2013-October 2014

- Analyze water use and review City's Baseline Survey for remaining conservation potential
- Identify, screen, and prioritize measures, with significant public input via Water Commission Meetings and workshops
- Model measures
- Formulate programs, leading to a recommended Program "C" to maximize total annual water savings based on conservation potential
- Present outcomes to Water Commission on October 6, 2014

WSAC Review: October 2014-September 2015

- Review prior Phase 1 analytical results from the Least Cost Decision Support System Model (DSS Model – Model described in Appendix A) and seek to answer additional questions with City and MWM technical assistance
- Shift conservation program emphasis to peak season (April-October) water savings rather than maximizing overall higher annual volume and/or more cost-effective water efficiency savings to better address the City's supply-demand gap.
- Prepare and adopt a new econometric-based demand forecast

- Produce recommendations for additional conservation measures to be included in the Final Water Conservation Master Plan

Phase 2: October 2015-present

- Recalibrate model to updated econometric demand forecast and reset planning horizon to 2015-2035
- Incorporate input (changes to existing measures and adding new measures) from WSAC process, with focus on peak season demand reduction
- Incorporate new plumbing code changes based on the State's Emergency Drought Regulations, effective December 1, 2015
- Formulate the "Recommended Program" into the DSS Model and evaluate results

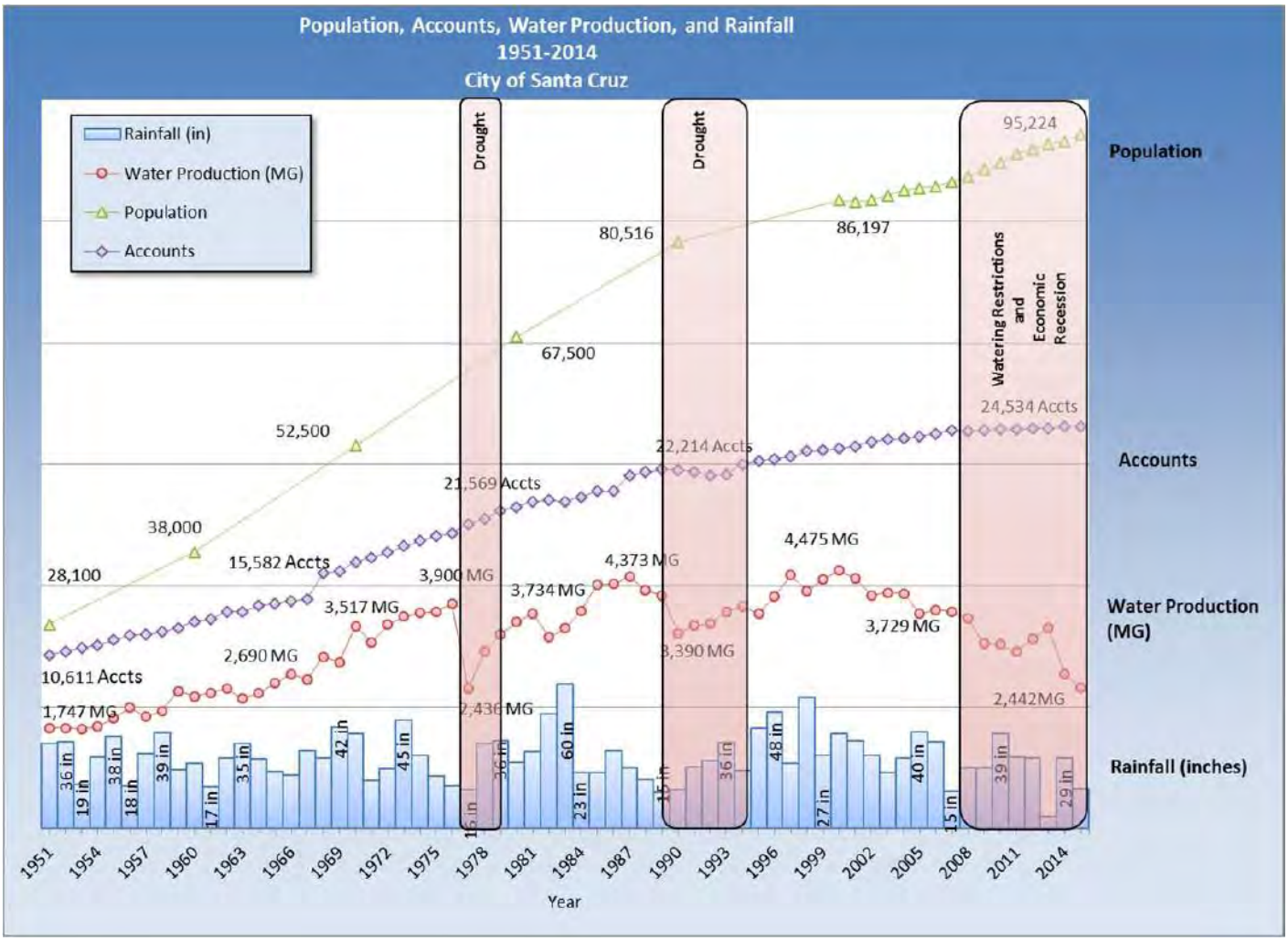
3. BASELINE DEMANDS

The WCMP process comprises four distinct steps: 1) input/analysis of system-wide demand projections to establish demand planning baseline with and without plumbing and building codes; 2) evaluation of system-wide conservation potential; 3) identification and study of potential conservation measures; and 4) deliberation and adoption of preferred long-term conservation program. Each of these steps is described in more detail in the following sections. This section presents a summary of the City's historical demand trends as well as the basis for the demand forecast.

3.1 Historical Trends

As seen in Figure 3-1, the historic trend in system water use paralleled account growth and population, except during two major drought periods. Around 2000, the pattern changed and system demand began a long period of decline, accelerated in 2009 by drought, economic downturn, and other influencing factors. The City has not seen a full demand recovery since the recent economic recession due to the ongoing drought. In 2013 system-wide demand was 3,364 million gallons per year, with Stage 1 water shortage regulations and restrictions in effect. In 2015 with the full rationing scheme in place, the City reduced production to 2,442 million gallons on the level not seen since the drought in the 1970s. Water demands are projected to remain depressed after the year 2015 due to persistent drought conditions and long-term behavioral changes related to water use. While it is prudent to assume that future demands will eventually recover when rainfall patterns/drought conditions and the economy normalize, it might not be to the same level as before due to widespread, long-term conservation measures taken in response to drought and ongoing adjustments in water rates.

Figure 3-1. Historical Trends for City of Santa Cruz



3.2 Basis for Demand Forecast

Maddaus Water Management (MWM) employed its Least Cost Planning Decision Support System Model (DSS Model) for the technical analysis. In addition to considering historical demand trends based on billing consumption data, the DSS Model takes into account the following parameters: total population, single family population, multifamily population, UC Santa Cruz population, commercial employment, business-industrial growth, and municipal growth.

In the M.Cubed August 2015 "City of Santa Cruz Water Demand Forecast," David Mitchell conducted an econometric analysis of water demand and forecasts of class-level customer demands and total system production through 2035. The report was commissioned by the City of Santa Cruz Water Department and the City's Water Supply Advisory Committee. Its purpose was to update the Department's existing demand forecast adopted as part of the 2010 UWMP to reflect current information on water usage and to account for effects of current conservation (using DSS Model Program A), water rates, and other factors expected to impact the future demand for water. With the start of Phase 2, MWM's DSS Model was carefully updated to incorporate this econometric analysis by inputting the regression equations and data sets used by M.Cubed and calibrated to ensure consistency between the two demand forecast models.

The updated DSS model starts with a "baseline" demand forecast, which is <u>not</u> the same forecast as presented by M.Cubed. It differs in that it backs out the earlier estimates for plumbing code savings and the estimated future water saving associated with the City's current water conservation program that were provided by MWM to M.Cubed in 2015 and embedded in that final demand forecast. All other variables, including average water use per account, forecasts of account growth, and economic factors used to forecast water use in the M.Cubed report, were taken directly from that model and used to populate the DSS model.

Table 3-1 below compares the primary water demand forecast presented by M.Cubed without the code savings and program savings that were previously generated from the DSS Model analysis completed in October 2014 compared to the updated DSS "baseline" demand completed in February 2016.

Table 3-1. Comparison of M.Cubed Demand Forecast and DSS "Baseline" Forecast (MG)

Demand (MG)	2020	2025	2030	2035
M.Cubed Final Demand Forecast, October 2015	3,385	3,351	3,388	3,442
2014 Estimate of Plumbing Code Savings (Prior DSS Model version)	65	132	197	235
2014 Estimate of Conservation Program Savings – Program "A" (Prior DSS Model version)	110	143	139	134
M.Cubed Final Demand Forecast without Plumbing Code or Conservation Program Savings	3,560	3,626	3,724	3,811
DSS Model "Baseline" Demand	3,560	3,636	3,743	3,838
Difference, MG	0	10	19	27
Difference, %	0.0%	0.3%	0.5%	0.7%

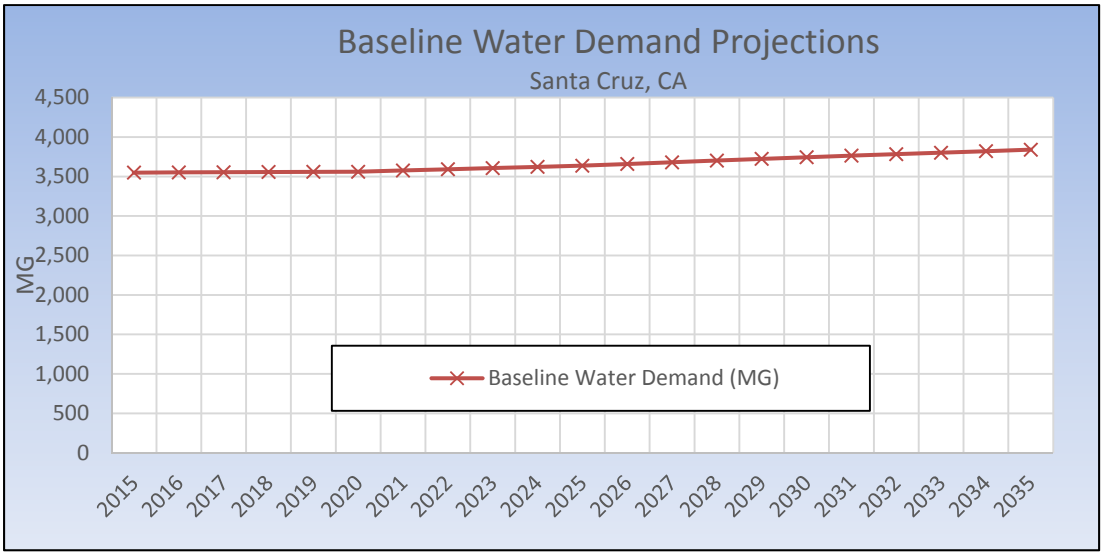
Note: Plumbing code and program savings: M.Cubed, 2015, Attachment 8, were originally based on results from the DSS Model prior work in 2014 by Maddaus Water Management, which are updated with the most recent DSS Model results from February 2016.

As can be seen in the above table, the two models are in close agreement and in all years differ by less than 1%.

The baseline demand forecast is shown in the following Figure 3-2. As referenced in the M Cubed report, the baseline forecast is predicated on average weather and normal economic conditions and is not expected to match realized demand, especially in the short term. City staff will continue to monitor production and consumption through and following the drought.

The next step involves calculating the effect of passive savings against the "baseline" demand. The results differ from earlier estimates of plumbing code savings presented in 2014-15 for two reasons: 1) lower baseline demand and 2) additional passive savings due to recent changes in California codes resulting from 2015 emergency conservation regulations adopted in California, effective December 1, 2015 (after the publication of the M.Cubed report).

Figure 3-2. Baseline Demand Forecast Without Plumbing Code Savings



Source: City of Santa Cruz. DSS Model, Section: Demand Analysis, Feb 16, 2016.

4. BASELINE DEMANDS WITH PASSIVE SAVINGS 2015-2035

Future community-wide conservation savings will be achieved by implementing both passive and active measures. Passive measures are federal and state codes and standards that increase conservation savings as older appliances and fixtures are replaced over time naturally with more water efficient models. Active measures are those in which the City will invest to promote water conservation, such as incentives and educational programs.

4.1 Basis for Plumbing Code Savings

Since it is beneficial to model the impact of the natural changes in the mix of types of appliances, the DSS Model forecasts service area water fixture use. In the codes and standards part of the DSS Model, specific fixture end-use type (point of use fixture or appliance), average water use, and lifetime are compiled. Additionally, state and national plumbing codes and appliance standards for toilets, urinals, showers, and clothes washers are modeled by customer category. These fixtures and plumbing codes can be added to, edited, and/or deleted by the user. This yields two demand forecasts – one with and one without plumbing code savings.

A key input in the model is fixture water use and life, as well as the initial proportions of individual fixtures in each customer class. The following Figure 4-1 presents an example of the initial proportions used in existing single family accounts. Table 4-1 on the following page provides the list of fixtures, average water use, and assumptions for fixture life used in this analysis.

Figure 4-1. Initial Fixture Proportions for Single Family Toilets (screen shot from the DSS Model)

Initial Fixture Proportions - Single Family Toilets	
1.28 gpf HET Residential	7.2%
1.6 gpf ULFT Residential	82.7%
High Use Toilet Residential	10.1%
<1.0 gpf Toilet Residential	0.0%
Total	100.0%

Data collected from the recently completed City of Santa Cruz Water Use Baseline Survey was used for this purpose. Other input parameters include estimates for annual replacement rate and assumed market share for both replacement and new equipment at various points in the planning horizon.

The scope of analysis involved assessing the rate of change of toilets, shower heads, lavatory and non-lavatory/kitchen faucets, and clothes washers in both existing single family and multifamily accounts, and toilets, urinals, and lavatory and non-lavatory/kitchen faucets in commercial accounts. Fixture characteristics are also tracked in new accounts, which are subject to the requirements of the 2015 California Green Building Code and 2015 California Code of Regulations Title 20 Appliance Efficiency Regulations adopted by the California Energy Commission (CEC) on September 1, 2015. This was an update in Phase 2, from the prior work in Phase 1, of preparing the DSS Model.

The controlling law for **toilets** is Assembly Bill (AB) 715. This bill requires high efficiency toilets (1.28 gpf) to be exclusively sold in California beginning January 1, 2014. The controlling law for wall-mounted urinals is the 2015 CEC efficiency regulations requiring that ultra-high efficiency pint **urinals** (0.125 gpf) be exclusively sold in California beginning January 1, 2016. This is an efficiency progression for urinals from AB 715's requirement of high-efficiency (0.5 gpf) urinals starting in 2014 that was modeled during WCMP Phase 1.

Standards for **residential clothes washers** fall under the regulations of the U.S. Department of Energy. Even though both front loading and top loading models will still be available for the foreseeable future, national water efficiency standards for both types are becoming more stringent over time, in steps. In March 2015, the federal standard reduced the maximum water factor for non-Energy Star certified top- and front-loading washing machines to 8.4 and 4.7, respectively. In 2018, the maximum water factor for standard top-loading machines will be further reduced to 6.5. Beginning in 2015, the maximum water factor for Energy Star certified washers was 4.3 for top-loading machines and 3.7 for front-loading.

Showerhead flow rates are newly regulated under the 2015 California Code of Regulations Title 20 Appliance Efficiency Regulations adopted by the CEC, which requires the exclusive sale in California of 2.0 gpm showerheads at 80 psi as of July 1, 2016 and 1.8 gpm showerheads at 80 psi as of July 1, 2018. The WaterSense specification applies to showerheads that have a

maximum flow rate of 2.0 gallons per minute (gpm) or less. This represents a 20% reduction in showerhead flow rate over the current federal standard of 2.5 gpm, as specified by the Energy Policy Act of 1992.

Faucet flow rates have likewise been recently regulated by the 2015 CEC Title 20 regulations. This standard requires that the residential faucets and aerators manufactured on or after July 1, 2016 be exclusively sold in California at 1.2 gpm at 60 psi; and public lavatory and kitchen faucet/aerators sold or offered for sale on or after January 1, 2016 be 0.5 gpm at 60 psi, and 1.8 gpm at 60 psi (with optional temporary flow of 2.2 gpm), respectively. Previously, all faucets had been regulated by the 2010 California Green Building Code at 2.2 gpm at 60 psi.

Plumbing code related water savings are considered reliable, long-term savings, and can be counted on over time to help reduce the City's overall system water demand. This projection further assumes no active involvement by the City, and that the costs of purchasing and installing replacement equipment (and new equipment in new construction) are borne solely by the customers, occurring at no direct utility expense. The inverse of the Fixture Life is the natural replacement rate, expressed as a percent (i.e., 10 years is a rate of 10% per year).

Table 4-1. List of Fixtures

Fixture Name	End Use	Average Water Use	Units	Fixture Life (yrs.)
Efficient Front Loader	Clothes Washers	13.0	gal per use	10
Medium Efficient Front Loader	Clothes Washers	19.0	gal per use	10
Top Loader	Clothes Washers	34.0	gal per use	10
0.5 gpm Non-Residential Lavatory Faucet	Lavatory Faucets	0.1	gal per use	15
1.2 gpm Residential Lavatory Faucet	Lavatory Faucets	0.3	gal per use	10
2.2 gpm Residential Lavatory Faucet	Lavatory Faucets	0.6	gal per use	10
2.2 gpm Non-Residential Lavatory Faucet	Lavatory Faucets	0.6	gal per use	15
2.5 gpm Residential Lavatory Faucet	Lavatory Faucets	0.6	gal per use	10
2.5 gpm Non-Residential Lavatory Faucet	Lavatory Faucets	0.6	gal per use	15
>2.5 gpm Residential Lavatory Faucet	Lavatory Faucets	0.9	gal per use	10
>2.5 gpm Non-Residential Lavatory Faucet	Lavatory Faucets	0.9	gal per use	15
1.8 gpm Residential Non-Lavatory/Kitchen Faucet	Non-Lavatory/Kitchen Faucets	1.8	gal per use	10
1.8 gpm Non-Residential Non-Lavatory/Kitchen Faucet	Non-Lavatory/Kitchen Faucets	1.8	gal per use	15
2.2 gpm Residential Non-Lavatory/Kitchen Faucet	Non-Lavatory/Kitchen Faucets	2.2	gal per use	10
2.2 gpm Non-Residential Non-Lavatory/Kitchen Faucet	Non-Lavatory/Kitchen Faucets	2.2	gal per use	15
2.5 gpm Residential Non-Lavatory/Kitchen Faucet	Non-Lavatory/Kitchen Faucets	2.5	gal per use	10
2.5 gpm Non-Residential Non-Lavatory/Kitchen Faucet	Non-Lavatory/Kitchen Faucets	2.5	gal per use	15
>2.5 gpm Residential Non-Lavatory/Kitchen Faucet	Non-Lavatory/Kitchen Faucets	3.5	gal per use	10
>2.5 gpm Non-Residential Non-Lavatory/Kitchen Faucet	Non-Lavatory/Kitchen Faucets	3.5	gal per use	15
High Efficiency 1.5 gpm	Showers	10.4	gal per use	25
High Efficiency 1.8 gpm	Showers	12.5	gal per use	25
High Efficiency 2 gpm	Showers	13.9	gal per use	25
Low Flow 2.5 gpm	Showers	18.3	gal per use	25
High Flow > 3 gpm	Showers	23.5	gal per use	25

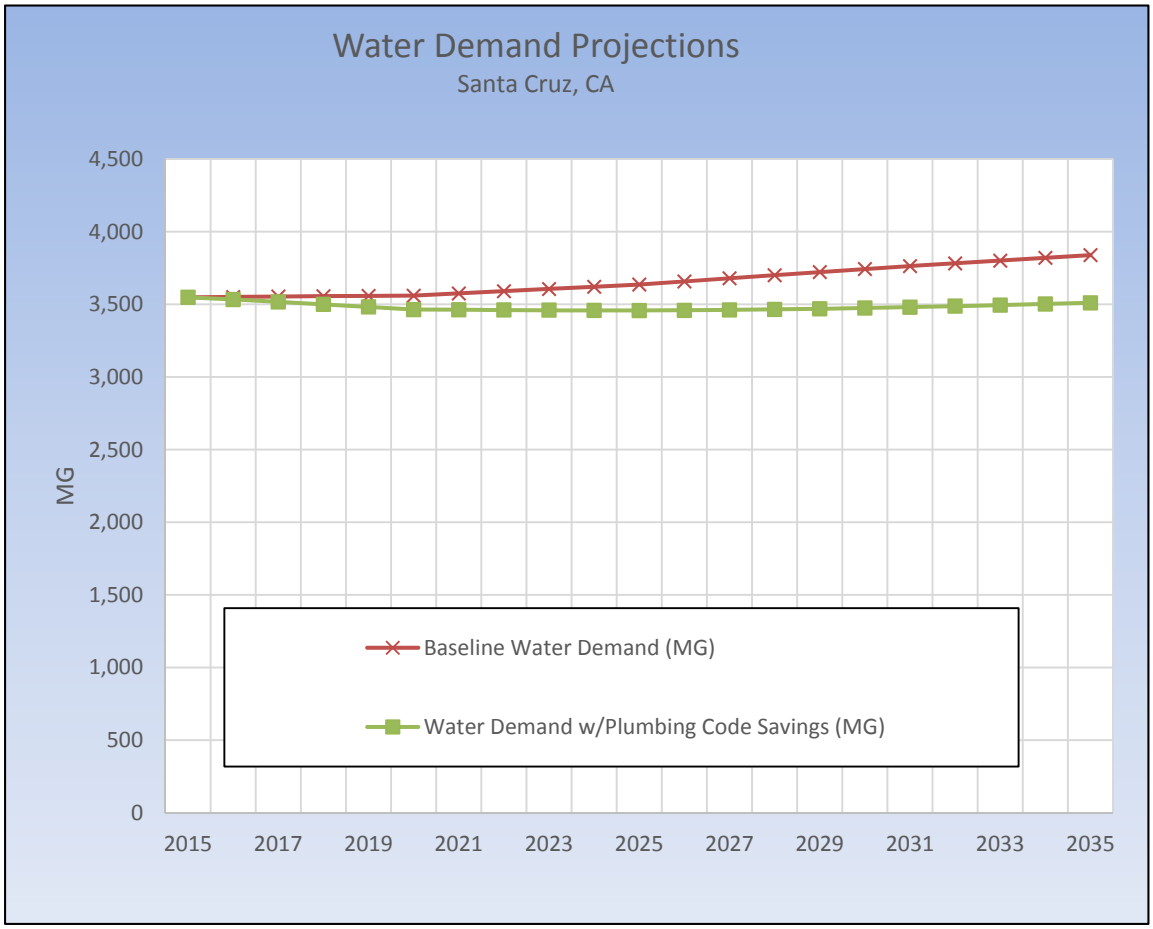
Table 4-1. List of Fixtures (continued)

Fixture Name	End Use	Average Water Use	Units	Fixture Life (yrs.)
<1.0 gpf Toilet Non-Residential	Toilets	1.0	gpf	50
1.28 gpf HET Residential	Toilets	1.3	gpf	50
1.28 gpf HET Non-Residential	Toilets	1.3	gpf	50
1.6 gpf ULFT Residential	Toilets	1.8	gpf	33
1.6 gpf ULFT Non-Residential	Toilets	1.8	gpf	50
High Use Toilet Residential	Toilets	3.5	gpf	25
High Use Toilet Non-Residential	Toilets	3.5	gpf	33
Waterless Urinal	Urinals	0.0	gpf	50
Pint Urinal	Urinals	0.1	gpf	50
Quart Urinals	Urinals	0.3	gpf	50

4.2 Baseline Demands with Passive Savings 2015-2035

The DSS Model estimates total cumulative plumbing code savings of 329 million gallons/year in 2035. As seen in Figure 4-2 below, water savings from fixture and appliance codes alone is expected to reduce total water demand (without plumbing code) from approximately 3.8 million gallons per year to about 3.5 million gallons by 2035, a reduction of about 8.6% due to plumbing code savings. Table 6-3 in section 6.1 shows the water savings in 5-year increments due to plumbing codes. Table 6-4 in section 6.2 presents projected water demands with plumbing code savings in 5-year increments.

Figure 4-2. Demand Forecast With and Without Plumbing Code Savings



Source: City of Santa Cruz. DSS Model, Section: Demand Analysis, Feb 16, 2016.

5. RECOMMENDED MEASURES

Maddaus Water Management (MWM) employed its Least Cost Planning Decision Support System Model (DSS Model) for the technical analysis. The following sections describe key elements used in the analysis that were reviewed during past Water Commission Meetings with public input along with both a webinar and two in-person workshops, including interested local community stakeholders, Water Commission members, and Water Supply Advisory Committee members. This section also presents a summary of the proposed measures, including their descriptions and estimated water savings. Background information on MWM's DSS Model can be found in Appendix A.

The initial process to identify and thoroughly evaluate potential conservation measures was iterative. First, an extensive list of more than 90 potential measures was generated based on input from City staff, consultants, Water Commissioners, and the public. This task included a review of the current active water conservation measures and the identification of new measures that may be appropriate for the City's service area. Next, the list of potential measures was screened to set aside measures that may not be appropriate for myriad reasons to seek those that would be included in the future program. The following criteria were used to narrow the list of potential measures:

- Water Saving Potential – emphasize measures that reduce average daily water use the most within the Santa Cruz community
- Sustainable Water Savings – emphasize measures that have long-term reliability
- Quantifiable Water Savings – emphasize measures where water savings can be accurately predicted
- Widespread Community and Social Acceptance – emphasize measures with high participation rates, low out-of-pocket expenses, and are equitable across customer type and social demographics
- Feasibility of Implementation/Secondary Impacts – emphasize measures that can achieve objectives
- Ancillary Benefits – emphasize measures that achieve additional goals, such as reducing energy/greenhouse gases (GHGs), reducing peak-season use, providing valuable customer service, and other non-quantifiable benefits (behavioral change, public awareness, etc.)

Further details about this process as well as a list of all the 90 potential measures are available from City staff. From the screening, the Water Commission added to and approved the recommended list of measures for the technical analysis phase of the project.

During the WSAC Report development, several additional measures were considered and added to the program. The result of the WSAC work on demand management was to shift the focus more toward reducing peak season use to increase supply reliability. It did so by considering measures to reduce outdoor use in residences and large landscapes, but also by enhancing base or indoor measures that lessen overall demand or that target specific uses, including visitor-serving uses, and thereby help reduce the City's peak season water use. The recommended program now matches the recommended measures list published in the October 2015 Water Supply Advisory Committee Final Report on Agreements and Recommendations, Table 14. The following table presents a basic description of each measure and the types of customers each measure targets. More detailed information and assumptions are described in the DSS Model.

Table 5-1. Basic Measure Descriptions

No.	Measure Name	Type of Customer	Description
1	System Water Loss Reduction	System	This measure's purpose is to identify and reduce water losses in the City's water system. The City is currently doing a water loss control study to review its annual water audit, look at water losses, and design a cost-effective water loss control program. The City currently loses an average of 7.5% of all treated water due to leaks, meter inaccuracies, and other problems. The goal of this measure is to reduce the City's system water losses on a long-term basis by an average of 1%. A new state law passed in 2015 that will require water suppliers to conduct water system audits, verify, and report water losses every year to the state beginning in 2017.
2	Advanced Metering Infrastructure (AMI)	Single Family (SF), Multifamily (MF), Commercial (COM)	This measure involves a major investment to upgrade meter reading technology and data management abilities. The City currently uses an Automatic Meter Reading system (AMR) in which water meters are read monthly by radio equipment that then transmits the information back to the City. This system may increase the frequency of meter reading from once a month to once an hour. The main water conservation (savings) benefits are for customer in-home or outdoor leak detection and increased customer awareness of water use. Other benefits include more action in enforcing the drought restrictions and more efficient customer service. Utility billing would continue to be on a monthly basis.
3	Large Landscape Budget-Based Water Rates	Irrigation (IRR)	This measure includes the development of individual monthly water budgets for irrigation customers. Water budgets are connected to a water rate schedule where water rates increase when a customer goes above their landscape water budget, or decreases if they are below budget. Budgets are typically based on factors like the size of the irrigated area, plant material and changes in weather conditions.
4	General Public Information	SF	This measure addresses opportunities to use public information programs as an effective tool to inform customers about the need for water conservation and conservation-related benefits. The current campaign is called "*Surf City Saves"* program. This measure includes paid and public service advertising, newsletters, bill inserts, information on the utility bill, a website, flyers and brochures, media campaigns, community meetings, direct mailings, community engagement at local activities, and other techniques. Public information is often carried out and coordinated with other agencies, groups, and schools.
5	Public Information (Home Water Use Report)	SF	This measure involves contracting with a firm to produce a detailed water billing report for high use customers that is in addition to their normal utility bill. This billing report compares water use in the neighborhood and offers suggestions to customers on ways to reduce water use.
6	Residential Leak Assistance	SF, MF	Customer leaks can go uncorrected at homes where owners are not able to pay the costs of repair. This measure would involve the City either paying part of the repair or paying the entire cost of the repair with funds that are paid back from customer water bills over time. This measure may also include an option to replace inefficient plumbing fixtures at low-income residences.
7	Single Family Residential Surveys	SF	This measure provides an outdoor water survey for existing single family residential customers. High water users will be targeted. This measure may include giving away water-efficient showerheads, faucet aerators, and toilet devices. This measure would provide a basic outdoor survey (look for leaks, irrigation problems and scheduling, plant information, etc.) and promote landscape and irrigation programs and improvements to reduce peak season water use.
8	Plumbing Fixture Giveaway/ Opt	SF, MF	The City would buy large amounts of efficient showerheads, kitchen and lavatory faucet aerators, shower timers and hose timers. Hose nozzles and leak detection tablets would be available for distribution at the Utility office and at community events.
9	Residential Ultra High Efficiency Toilet Rebates	SF, MF	This measure provides a rebate or voucher for the installation of an ultra-high efficiency toilet (UHET) that uses 1.0 gallons of water or less per flush (gpf).
10	High Efficiency Clothes Washer Rebates	SF, MF	The City would provide a rebate for high-efficiency clothes washing machines (HECW) to single family homes and in-unit condo/apartment complexes that do NOT have common laundry rooms. This program would be similar to the City's current program, except that higher rebate amounts would be increased for qualifying machines that are listed as Energy Star "Most Efficient" Clothes Washers.
11	High Efficiency Clothes Washer - New Development	SF, MF, COM	This measure would involve amending the City's building regulations to require building developers to install an efficient clothes washer (meeting certain water efficiency standards, such as gallons per load). Inspections would be coordinated with City and County building departments to make sure that an efficient washer is installed before the new home or building is occupied.
12	Hot Water On Demand - New Development	SF, MF, COM	The City would work to pass an ordinance requiring developers and major building remodels (for example, 50% of value of improvements) to equip new homes or buildings with efficient hot-water-on-demand systems. These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to the water heater or to move the water heater into the center of the house and/or reduce hot water waiting times by having an on-demand pump on a recirculation line looping back to the hot water heater.
13	Toilet Retrofit at Time of Sale	SF, MF, COM	This measure involves tracking real estate sales within the City's water service area and working with buyers, sellers, and the real estate industry to retrofit older, inefficient toilets, showerheads, and urinals are upgraded with the most efficient fixtures when real estate is sold. A property inspection by either City staff or a licensed plumbing/general building would be required to verify compliance with the regulation.

No.	Measure Name	Type of Customer	Description
14	COM MF Common Laundry Room High Efficiency Clothes Washer	MF, COM	This measure provides a rebate for the installation of a high efficiency commercial washer (HEW) in COM laundromats and MF common area laundry rooms.
15	COM Incentives	MF, COM	After getting a free water use survey (Measure 17), the City will analyze the survey recommendations and determine if the MF or COM site qualifies for a financial incentive (reward). Financial incentives will be provided after analyzing the cost-benefit ratio of each proposed project. Incentives are designed to fit each individual site as each site has varying water savings potentials. Incentives will be given based on the decisions of the City specifically and while the money lasts.
16	Pre-Rinse Spray Nozzle Installation	COM	The City will provide free 1.3 gpm (or lower) pre-rinse spray nozzles, and possibly free installation of nozzles, in restaurants and other commercial kitchens.
17	COM Surveys	MF, COM	This measure will offer top MF and COM water customers a professional water survey that would evaluate ways for the site to save water and money. The surveys would be for large accounts (accounts that use more than 5,000 gallons of water per day, or the top 3%), such as hotels, restaurants, stores, and schools.
18	High Efficiency Urinal Program	COM, Municipal (MUN), Industrial (IND)	The City will provide a rebate or voucher for the replacement of older, high use urinals with high efficiency urinals (HEU) and flush valves using 0.125 gpf (1 pint) or less.
19	Public Restroom Faucet Retrofit - MUN	MUN	This measure includes the direct installation of high efficiency (0.5 gpm) sensor faucet fixtures in institutional (public) buildings, such as schools, hospitals, etc. High-use municipal building will be focused on first.
20	Public Restroom Faucet Retrofit - COM	COM	This measure includes the direct installation of high efficiency (0.5 gpm) sensor faucet fixtures in commercial buildings, such as businesses. High-use commercial buildings will be focused on first.
21	School Retrofit	MUN	This school retrofit program involves a school receiving funding to replace non-efficient fixtures, retrofit mixed use meters to dedicated irrigation meters, and upgrade irrigation systems.
22	Water Efficient Landscape Ordinance	SF, MF, COM, MUN, IND	This measure accounts for the lower irrigation water use that new accounts have due to their more efficient landscape designs, which are a result of the City's Landscape Code (implementation of Statewide Model Landscape Ordinance). The City is in the process of updating this code to keep up with new state regulations and technology for irrigation controllers and irrigation equipment.
23	Single Family Residential Turf Removal	SF	This measures provides a per-square-foot incentive to SF customers to remove and replace turf (grass) with low-water-use plants or permeable hardscape (pavers, concrete, etc. that allows water to soak through and into the ground). This is modeled after the City's current program. The rebate is currently $0.50 per square foot and capped at $500 per year for a single family residence. To increase participation, this measure would increase the rebate to $1 per square foot and a $1,000 maximum per year, or more in both cases.
24	Multifamily Residential/CII Turf Removal	MF, COM, MUN, IRR	This measure provides a per-square-foot incentive to MF, COM, MUN, and IRR customers to remove and replace turf with low-water-use plants or permeable pavers (or other permeable hardscape). The rebate is currently $0.50 per square foot of turf removed and capped at $2,500 per year for multifamily or commercial residences. This measure would increase the rebate to $1 per square foot and a $5,000 maximum per year, or more to increase participation.
25	Expand Large Landscape Survey/Water Budgets	IRR	This measure expands on the City's existing landscape water budget program to include more dedicated irrigation accounts Outdoor water audits will be offered for existing customers with problems of overwatering or water waste. Normally those with high water use are focused on and provided a customized report telling them how to save water. All multifamily residential, CII, and public irrigators of large landscapes would be eligible for free landscape water audits upon request. This measure is connected to Measure 3 above, Large Landscape Budget-Based Water Rates.
26	Sprinkler Nozzle Rebates	SF, MF, COM	The City will provide rebates to replace standard spray sprinkler nozzles with more efficient rotating nozzles. Nozzles cost about $6 each.
27	Gray Water Retrofit	SF	The City will hold a workshop to support a Gray Water Challenge or similar program. A rebate will be offered that will help to cover a portion of the cost to single family homeowners per year who install gray water systems. A gray water kit/package, available from local hardware stores, would be supported by this City rebate.
28	Residential Rain Barrels	SF	The City will provide an incentive for the installation of rain barrels. This could involve rebates, purchasing rain barrels in high quantities, and giveaways of barrels, as well as workshops on proper installation and use of captured rain water for landscape irrigation.
29	Climate Appropriate Landscaping	SF, MF, COM, MUN	This measure will provide incentives for the installation of climate-appropriate and rainwater infiltration landscape (soaks up water on-property as opposed to running off-property). This measure will provide rebates to Home Owners Associations (HOAs), businesses, and institutions that increase their outdoor water use efficiency

No.	Measure Name	Type of Customer	Description
	and Rainwater Infiltration		by replacing qualifying high water use landscape and/or upgrading to qualifying high efficiency irrigation equipment or climate appropriate landscape. To qualify, sites must participate in a pre-inspection before beginning their project or purchasing materials. Single family homes, multifamily homes, and business properties with qualifying irrigated landscape (i.e., irrigated turf or a functional swimming pool) can receive rebates for replacing high-water-use landscape (e.g., irrigated turf grass) with a minimum of 50% plant coverage consisting of low-water-use plants from the Approved Plant List. Recommendations from the Water Supply Alternatives Committee (WSAC) Report include: • Increase turf conversion rebate • Require conversion of spray to drip for shrub irrigation • Discourage runoff through rainwater infiltration features (i.e., permeable pavers) • Support local actions for climate-appropriate landscaping • Focus on landscape narrower than 10 feet – no spray irrigation and/or next to hardscapes
30 SF	SF Conservation Pricing - Water and Sewer	SF	This measure is awaiting the results of an ongoing rate study conducted by Rafetlis Financial Consultants, Inc. in 2016.
30 MF	MF Conservation Pricing - Water and Sewer	MF	This measure is awaiting the results of an ongoing rate study conducted by Rafetlis Financial Consultants, Inc. in 2016.
30 COM	COM Conservation Pricing - Water and Sewer	COM	This measure is awaiting the results of an ongoing rate study conducted by Rafetlis Financial Consultants, Inc. in 2016.
31	Single Family Multifamily Dishwasher Rebates	SF, MF	This measure provides incentives for the purchase of water efficient dishwashers (Residential WF of 6.25 or less).
32	Hot Water Recirculation Systems	SF, MF, COM	This measure provides incentives for the installation of a hot water recirculation system. Having hot water discharge promptly is important for energy and water use efficiency. A hot water recirculating system enables the cold water in the hot water pipes to be continually returned to the water heater and reheated before the hot water faucet is turned on. Rebates would be available to the following water customer groups: - single family dwellings, including townhomes and mobile homes - apartment complexes - commercial institutions - commercially zoned businesses or institutions Maximum rebates allowable: (a) $300 per single family account and (b) $3,000 per commercial, industrial, or institutional account (e.g., as laundromats and apartments).
33	Rewarding Businesses For Adopting Best Practices	COM	This measure offers commercial customers who employ best practices an increased water supply reliability and a lower price. For a business, the difficulty of rationing water during severe drought years can have a negative effect on its profits. This measure proposes that the City's Water Shortage Contingency Plan be changed so that businesses who adopt best practices, such as efficient plumbing fixtures, hotel laundry recycling, and climate-appropriate landscaping, would get a lower level of water usage reduction during a severe drought. For example, in a Stage 4 drought, with a system-wide goal of 35% reduction, the current plan is to have the water allotment of businesses be 87% of their normal year water use. Under this measure, businesses adopting best practices would be expected to cut back to only 95% of normal use, rather than 87%. These businesses could also be rewarded with a lower rate for their water use.
34	Additional Building Code Requirements for New Development	SF, MF, COM, MUN, IND	New CalGreen Building Codes already included in DSS Model (see Section 4 above) already takes many of the items recommended by WSAC into account. This measure currently cannot be measured with regard to future additional CalGreen updates and water savings. This measure involves the coming together of a working group of planners, builders, conservation groups, and Water Department personnel to evaluate possible additions to current codes and fee structures that would encourage water conservation. Some examples include: (1) requiring high efficiency washers in new development and (2) requiring hot water on demand/structured plumbing in new development. It is also intended that the work group track and incorporate new technologies in future City codes.
35	Innovation Incubator Program	SF, MF, COM, MUN	This measure would establish an Innovation Incubator Program allowing Santa Cruz to continue its leadership in water management by creating a program that supports new developments in: • New technologies, customer financing programs, and customer outreach programs; and • Pilot projects to promote popular adoption of rainwater for toilets & washers, new technology toilets in institutional buildings, onsite recycling of graywater, rainwater irrigated lawns, and promotion of native plant landscapes. Small grants would be offered to local businesses and/or working with state and national organizations like California Urban Water Conservation Council, California Water Foundation, California Urban

No.	Measure Name	Type of Customer	Description
			Water Agencies, University of California (Santa Cruz or Davis), Alliance for Water Efficiency, Water Research Foundation, US Bureau of Reclamation, or other coalitions of utilities or research-focused organizations.

Notes:

AMI – Advance Metering Infrastructure	HECW – high efficient clothes washing machine	MF – multifamily
AMR – Automatic Meter Reading System	HEU – high efficiency urinal	MUN – municipal
COM – commercial	HEW – high efficiency commercial washer	SF – single family
gpf – gallons per flush	HOA – Home Owners Association	UHET – ultra-high efficiency toilet
gpm – gallons per minute	IND – industrial	WF – water factor, gallons per cubic foot
	IRR – irrigation	WSAC – Water Supply Alternatives Committee

A total of 35 individual measures are evaluated in the current Santa Cruz DSS Model. This number counts the three pricing measures as one measure (which is yet to be fully defined until the City's Water Rate Study is complete). For each measure selected to be modeled, a measure description, as well as details on each measure's utility and customer costs, time period, and targets can be found in the DSS Model's measure inputs. More detailed information on model inputs for each measure is available from City staff. Some of the key assumptions used in evaluating the water savings, benefits, and costs include the following:

- Applicable customer class
- Applicable end use
- Estimated annual account participation rates
- Evaluation start and end year
- Measure length, years
- Measure life, years
- Utility unit cost, $
- Customer unit cost, $
- Estimated annual administration and marketing overhead, %

These measures listed in Table 5-1 make-up the City's Recommended Program which consists of both passive and active elements. Plumbing code measures account for 53% of the future conservation potential achieved and are independent of any program – the savings are based on customers following applicable current local, state and federal laws, building codes and ordinances. Recommended Program active measures fall within one of four categories: 1) general measures, 2) residential measures (indoor), 3) commercial measures (indoor), and 4) irrigation measures (outdoor).

6. RECOMMENDED PROGRAM RESULTS

This section presents the Recommended Program water savings as well as projected demand and per capita water use with these savings. The Recommended Program's overall cost of water saved and proposed schedule is also shown.

6.1 Total Water Savings

Table 6-1 below presents each Recommended Program measure's water savings in million gallons (MG) per year for year 2035 as a result of each measure's design and implementation schedule. Year 2035 savings include ongoing savings still valid since the measure's start. Savings per measure presented in the Table assume the measures are implemented on a stand-alone basis (i.e., without interaction or overlap from other measures that might address the same end use or uses).

It is important to understand that the savings from measures presented in the table, which address the same end use(s) are not simply additive. The DSS Model uses impact factors to avoid double counting in estimating the water savings from programs of measures. For example, if two measures are planned to address the same end use and both save 10% of the prior water use, then the net effect is not the simple sum (20%). Rather it is the cumulative impact of the first measure reducing the use to 90% of what it was without the first measure in place and then reducing the use another 10% to result in the use being 81% of what it was originally. In this example the net savings is 19%, not 20%. Using impact factors, the model computes the reduction as follows, 0.9 x 0.9 = 0.81 or 19% water savings.

Since interaction between measures has not been accounted for in Table 6-1 below, it is not appropriate to include a total in the bottom row. However, the table is useful to give a close approximation of the savings of each individual measure.

Table 6-1. Recommended Program Individual Measure Cost of Water Saved and 2035 Water Savings (MGY)

No.	Measure Name	Cost of Water Saved ($/MG)	2035 Water Savings (MG)
1	System Water Loss Reduction	$3,923	34.87
2	Advanced Metering Infrastructure	$1,269	45.94
3	Large Landscape Budget-Based Water Rates	$194	12.83
4	General Public Information	$8,334	5.73
5	Public Information (Home Water Use Report)	$2,518	11.39
6	Residential Leak Assistance	$2,117	22.03
7	Single Family Residential Surveys	$7,735	2.78
8	Plumbing Fixture Giveaway/Opt	$1,479	2.03
9	Residential Ultra High Efficiency Toilet Rebates	$5,316	2.91
10	High Efficiency Clothes Washer Rebates	$2,794	36.20
11	High Efficiency Clothes Washer - New Development	$1,368	12.53
12	Hot Water On Demand - New Development	$7,849	4.46
13	Toilet Retrofit at Time of Sale	$1,516	8.70
14	CII MF Common Laundry Room High Efficiency Clothes Washer	$4,258	3.07
15	CII Incentives	$533	18.39
16	Pre-Rinse Spray Nozzle Installation	$153	9.16
17	CII Surveys	$4,056	19.24
18	High Efficiency Urinal Program	$5,220	3.22
19	Public Restroom Faucet Retrofit - MUN	$23,467	0.29
20	Public Restroom Faucet Retrofit - COM	$9,780	8.47
21	School Retrofit	$1,883	2.88
22	Water Efficient Landscape Ordinance	$602	6.66
23	Single Family Residential Turf Removal	$22,157	4.18
24	Multifamily Residential/CII Turf Removal	$32,186	2.39
25	Expand Large Landscape Survey/Water Budgets	$20,948	1.97
26	Sprinkler Nozzle Rebates	$13,643	3.35
27	Gray Water Retrofit	$15,742	0.24
28	Residential Rain Barrels	$4,672	3.42
29	Climate Appropriate Landscaping and Rainwater Infiltration	$33,221	8.26
30SF	SF Conservation Pricing - Water and Sewer[1]	N/A	N/A
30MF	MF Conservation Pricing - Water and Sewer[1]	N/A	N/A
30COM	COM Conservation Pricing - Water and Sewer[1]	N/A	N/A
31	Single Family Multifamily Dishwasher Rebates	$29,602	0.20
32	Hot Water Recirculation Systems	$15,650	1.38
33	Rewarding Businesses For Adopting Best Practices	$6,030	3.64
34	Additional Building Code Requirements for New Development[2]	N/A	N/A
35	Innovation Incubator Program	N/A	N/A

[1]Pricing measure costs and savings are not yet available. These measures are awaiting the results of an ongoing rate study scheduled to be completed in 2016.
[2] New CalGreen Building codes, effective as of January 2016, are already modeled. This measure is awaiting support from a Working Group yet to be formed.

Notes:

1. This table does not contain a total in the bottom row intentionally. It is not applicable since interaction between measures has not been accounted for in this table but is at the program level.
2. Source: City of Santa Cruz. DSS Model, Section: Conservation Analysis, Feb 16, 2016.

Table 6-2 presents the benefit cost analysis summary for the Recommended Program, which includes all the measures listed in the previous Table 6-1.

Cost categories are defined as follows:

- Utility Costs – those costs that the City as a water utility will incur to operate the measure including administrative costs

- Utility Benefits – the avoided cost of producing water

The column headings in Table 6-2 are defined as follows:

- Average Cost of Water Saved ($/MG) = average cost to implement the program divided by the water savings over the life of the conservation measure.
- Water Savings in 2035 (MGY) = water saved in million gallons. The year 2035 is presented as this represents the end of the planning horizon for both the 2015 UWMP and this analysis effort.

Table 6-2. Recommended Program Costs and Savings

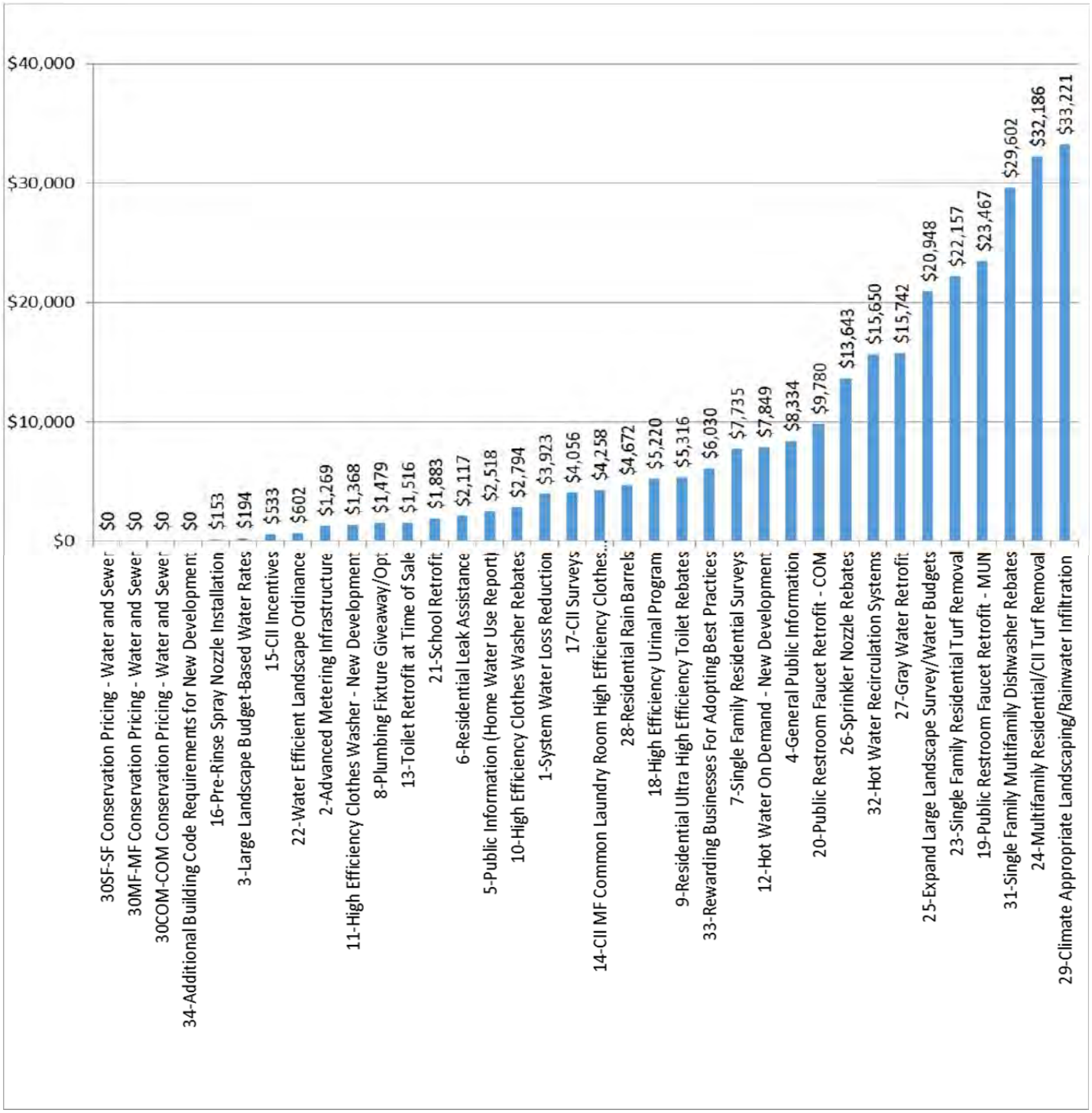
Conservation Program	Average Cost of Water Saved $/MG	Water Savings over "Baseline" Demand in 2035 (MGY)
Recommended Program with Plumbing Code Savings	$4,572/MG	619

Notes:

1. Across the modeling time period of 2015-2035, administrative costs average approximately 22% of total utility costs annually.
2. Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.

Figure 6-1 shows the costs of water saved for individual measures ranked from lowest to highest. The measures to be implemented in the next several years are a mix of some lower cost and some higher cost measures. Several of the measures addressing peak season water use have the highest unit costs, but, together as a package, the Recommended Program is $4,572/MG, well below the $10,000/MG the maximum level established by the WSAC which is lower than the expected unit cost of supply augmentation projects recommended to be pursued as a result of the WSAC's work.

Figure 6-1. Conservation Measures Unit Cost of Water Saved ($/MG)



Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.

Table 6-3 below shows the savings in 5-year increments for the plumbing codes, Recommended Program, and the Recommended Program with plumbing code savings.

Table 6-3. Long Term Conservation Program Savings over "Baseline" Demand (MG/Year)

Conservation Program	2020	2025	2030	2035
Plumbing Code	96	179	269	329
Recommended Program	137	232	269	291
Recommended Program with Plumbing Code Savings	233	411	538	619

Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.

The Recommended Program consists of both passive (plumbing codes which include state and Federal legislation for efficient fixture requirements for customers served by the City) and active elements. Plumbing code measures account for 53% of the future conservation potential achieved and are independent of any active conservation program.

6.2 Water Demand with Projected Savings

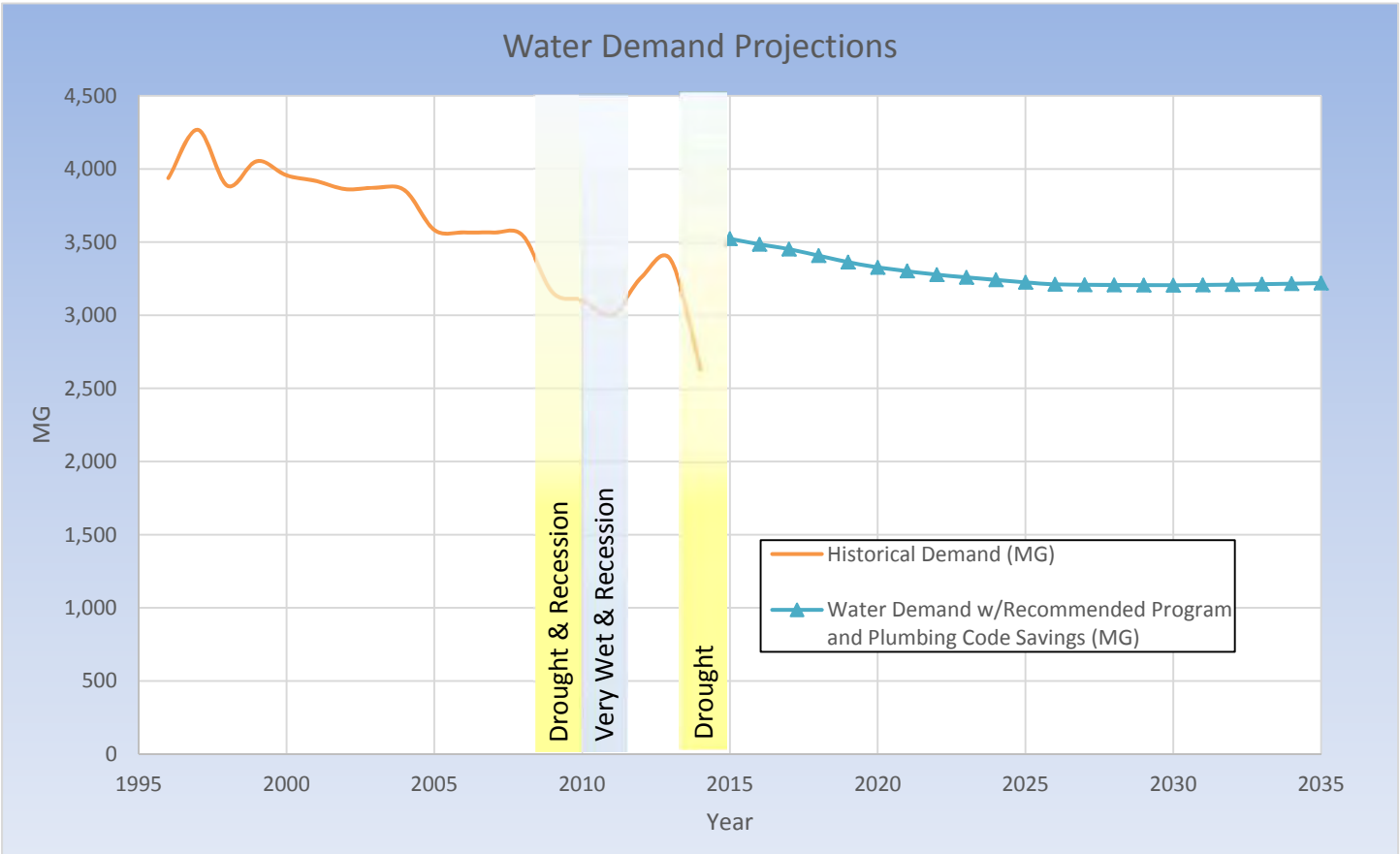
The Recommended Plan is envisioned to include strong customer participation to support additional planned growth while keeping total water use relatively constant for the next 20 years. New development will be built to water efficient standards following the 2015 CalGreen Plumbing Code, 2015 CEC Code, and other local ordinances (e.g., City's landscape ordinance). Water use in new homes should be less and more efficient than existing homes on comparable lot sizes. Table 6-4 and Figure 6-2 below present the Recommended Program projected water demands. Note that the Recommended Program with Plumbing Code is lower than the Demand Forecast by M.Cubed shown in Table 3-1. The Recommended Program forecast is 222 MGY lower (6%) than the M.Cubed forecast in 2035. This is due to increased savings by the new plumbing codes and new conservation programs that would be added over time.

Table 6-4. Water Use Projections (MG/Year)

	2020	2025	2030	2035
Demand with Plumbing Code (MGY)	3,464	3,456	3,474	3,510
Demand with Plumbing Code and Recommended Program (MGY)	3,327	3,225	3,205	3,220

Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.

Figure 6-2. Recommended Program Projected Water Demands



Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.

6.3 Per Capita Water Use

With two possible conservation target tracks to follow, the City has selected to aim to achieve SB X7-7 Method 3: 95% of State Hydrological Region Target by 2020. The City's baseline and target GPCD are as follows:

- Baseline GPCD = 113 GPCD
- 2015 Interim Target = 111 GPCD
- 2020 target = 110 GPCD
- CUWCC 2018 target = 101 GPCD

Table 6-5 below shows the projected per capita water use in gallons per day per person (GPCD) in 5-year increments for the projected demand with no plumbing code savings, projected demand with plumbing code savings, and projected demand with Recommended Program implementation and plumbing code savings.

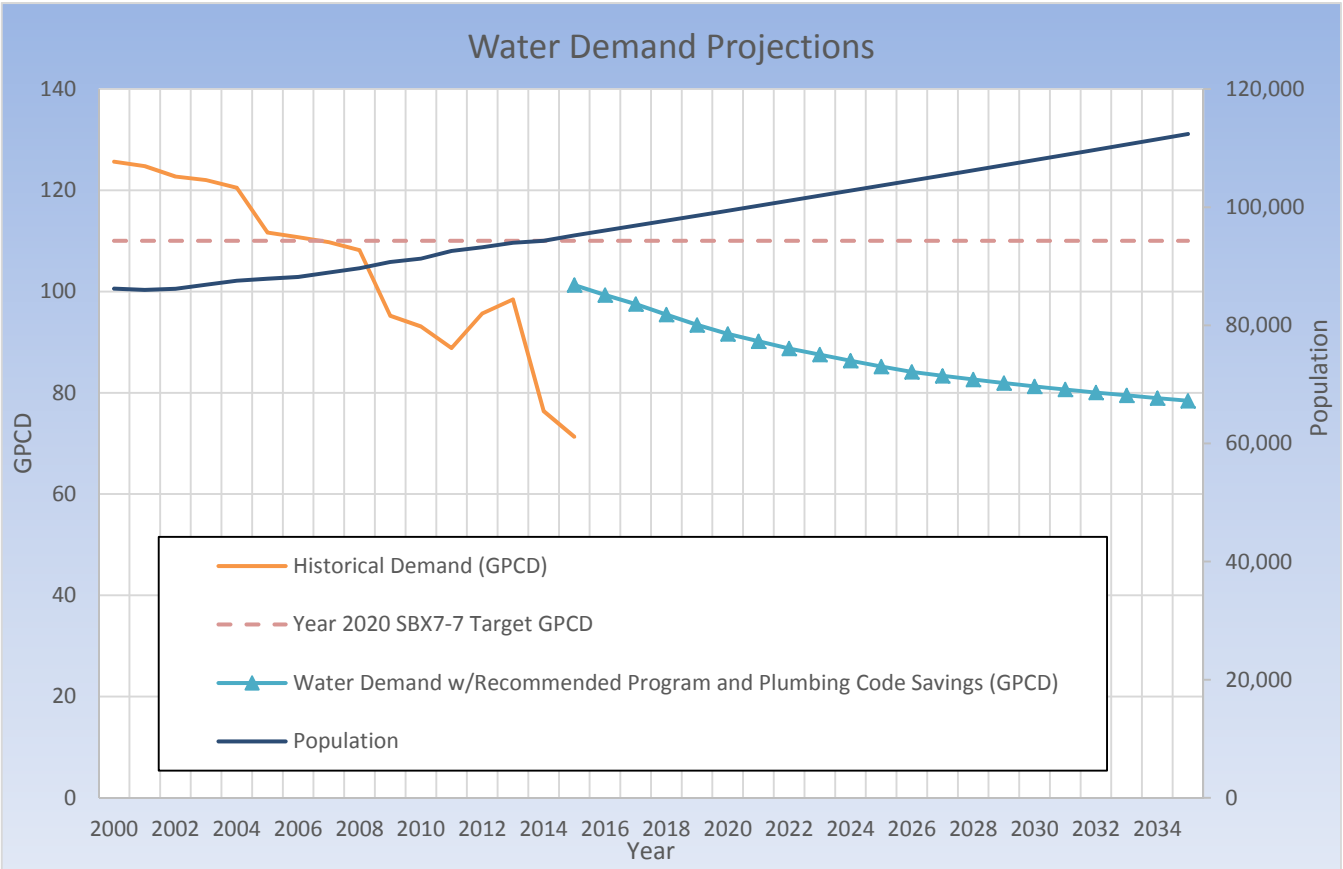
Table 6-5. Projected Population and Per Capita Water Use (GPCD)[1]

	2020	2025	2030	2035
Population [2]	99,403	103,620	107,989	112,390
"Baseline" Demand without Plumbing Code (GPCD)	98	96	95	94
Demand with Plumbing Code (GPCD)	95	91	88	86
Demand with Plumbing Code and Recommended Program (GPCD)	92	85	81	78

[1] City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.
[2] WSAC Final Report, October 2015.

The following Figure 6-3 presents the SB X7-7 year 2020 GPCD target and historical and projected GPCD estimates with plumbing codes and Recommended Program savings. As seen below, the City has already met its state-mandated 2020 target and surpassed its voluntary CUWCC 2018 goal. The goal of the City's plan is to press beyond these state targets and instead maximize conservation savings to help meet local resource needs for current and future water demands.

Figure 6-3. Water Conservation Program Savings Projections – SB X7-7 Target, GPCD



Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.

6.4 Overall Cost of Water Saved

The cost of water saved per unit volume ($/MG) for the Recommended Program is $4,572/MG. This is below the Water Supply Alternatives Committee's recommended threshold for overall cost of water saved, which is $10,000/MG.

The cost of water saved for the Recommended Program can be compared to the City's avoided cost of water as one indicator of the cost effectiveness of the conservation program. It should be noted that the cost of water saved value somewhat undervalues the cost of savings because program costs are discounted to present value and the water benefit is not.

6.5 Key Findings

As a result of this comprehensive analysis here are some summary observations and conclusions:

1. The additional, incremental water savings from the Recommended Program, compared to the City's recent demand forecast, amount to about 220 million gallons in 2035.
2. The estimated annual demand will decline over time to about 3.2 billion gallons per year (bgy) in 2035, versus about 3.4 bgy estimated in the demand study. That estimate is comparable to the actual level of water production experienced in the late 1960s, when the service area population was around 50,000.
3. The impact on water savings from 2015 changes in the fixture plumbing codes prompted by the emergency conservation regulations (which would not have been factored in but for the delay associated with the Water Supply Advisory Committee's process) is over 100 million gallons more than previously estimated.
4. The overall cost of water saved by the Recommended Program is about half of what the WSAC set as a recommended threshold.
5. Gross per capita water use is expected to gradually decline to a level of less than 80 GPCD in 2035.

6.6 Proposed Schedule

The following Figure 6-4 presents the proposed Recommended Program implementation schedule.

Figure 6-4. Recommended Program Proposed Implementation Schedule

No.	Measure	Time Period	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	System Water Loss Reduction	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2	Advanced Metering Infrastructure	2021 - 2035							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3	Large Landscape Budget-Based Water Rates	2018 - 2020				■	■	■															
4	General Public Information	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5	Public Information (Home Water Use Report)	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
6	Residential Leak Assistance	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
7	Single Family Residential Surveys	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
8	Plumbing Fixture Giveaway/Opt	2015 - 2017	■	■	■																		
9	Residential Ultra High Efficiency Toilet Rebates	2015 - 2020	■	■	■	■	■	■															
10	High Efficiency Clothes Washer Rebates	2015 - 2026	■	■	■	■	■	■	■	■	■	■	■	■									
11	High Efficiency Clothes Washer - New Development	2021 - 2035							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
12	Hot Water On Demand - New Development	2021 - 2035							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
13	Toilet Retrofit at Time of Sale	2015 - 2019	■	■	■	■	■																
14	CII MF Common Laundry Room High Efficiency Clothes Washer	2015 - 2024	■	■	■	■	■	■	■	■	■	■											
15	CII Incentives	2021 - 2026							■	■	■	■	■	■									
16	Pre-Rinse Spray Nozzle Installation	2015 - 2016	■	■																			
17	CII Surveys	2021 - 2026							■	■	■	■	■	■									
18	High Efficiency Urinal Program	2015 - 2018	■	■	■	■																	
19	Public Restroom Faucet Retrofit - MUN	2021 - 2023							■	■	■												
20	Public Restroom Faucet Retrofit - COM	2021 - 2030							■	■	■	■	■	■	■	■	■	■					
21	School Retrofit	2021 - 2030							■	■	■	■	■	■	■	■	■	■					
22	Water Efficient Landscape Ordinance	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
23	Single Family Residential Turf Removal	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
24	Multifamily Residential/CII Turf Removal	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
25	Expand Large Landscape Survey/Water Budgets	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
26	Sprinkler Nozzle Rebates	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
27	Gray Water Retrofit	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
28	Residential Rain Barrels	2015 - 2035	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
29	Climate Appropriate Landscaping and Rainwater Infiltration	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
30SF	SF Conservation Pricing - Water and Sewer	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
30MF	MF Conservation Pricing - Water and Sewer	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
30COM	COM Conservation Pricing - Water and Sewer	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
31	Single Family Multifamily Dishwasher Rebates	2018 - 2022				■	■	■	■	■													
32	Hot Water Recirculation Systems	2018 - 2022				■	■	■	■	■													
33	Rewarding Businesses For Adopting Best Practices	2020 - 2035						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
34	Additional Building Code Requirements for New Development	2018 - 2035				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
35	Innovation Incubator Program	2021 - 2035							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Source: City of Santa Cruz. DSS Model. Section: Conservation Analysis, Feb 16, 2016.

6.7 Monitoring

The Plan is intended to be dynamic and changes and adjustments are expected. Monitoring progress on implementing recommended programs should be a priority. Costs, participation rates, and water use should be tracked to ensure that the plan is on target to meet goals. As new promising technologies emerge, they should be tested and possibly replace programs that are underachieving. Summary reports should be issued citing progress and recommending changes in program content. Comprehensive review of the plan every five years will ensure the plan reflects current technology and codes, and will provide an opportunity to check success and progress in meeting conservation goals.

7. NEXT STEPS

Obtain Commission approval and support to gain City Council direction to proceed with completion of writing the Water Conservation Master Plan document.

8. REFERENCES

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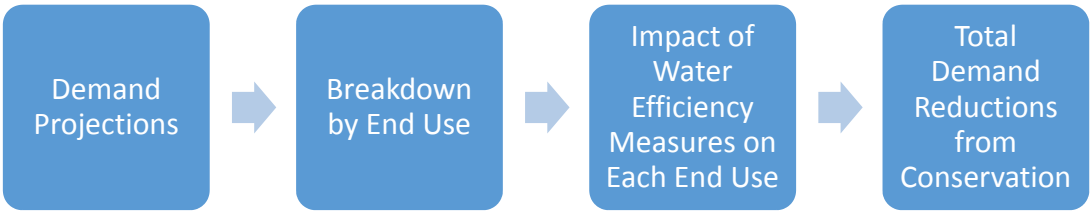
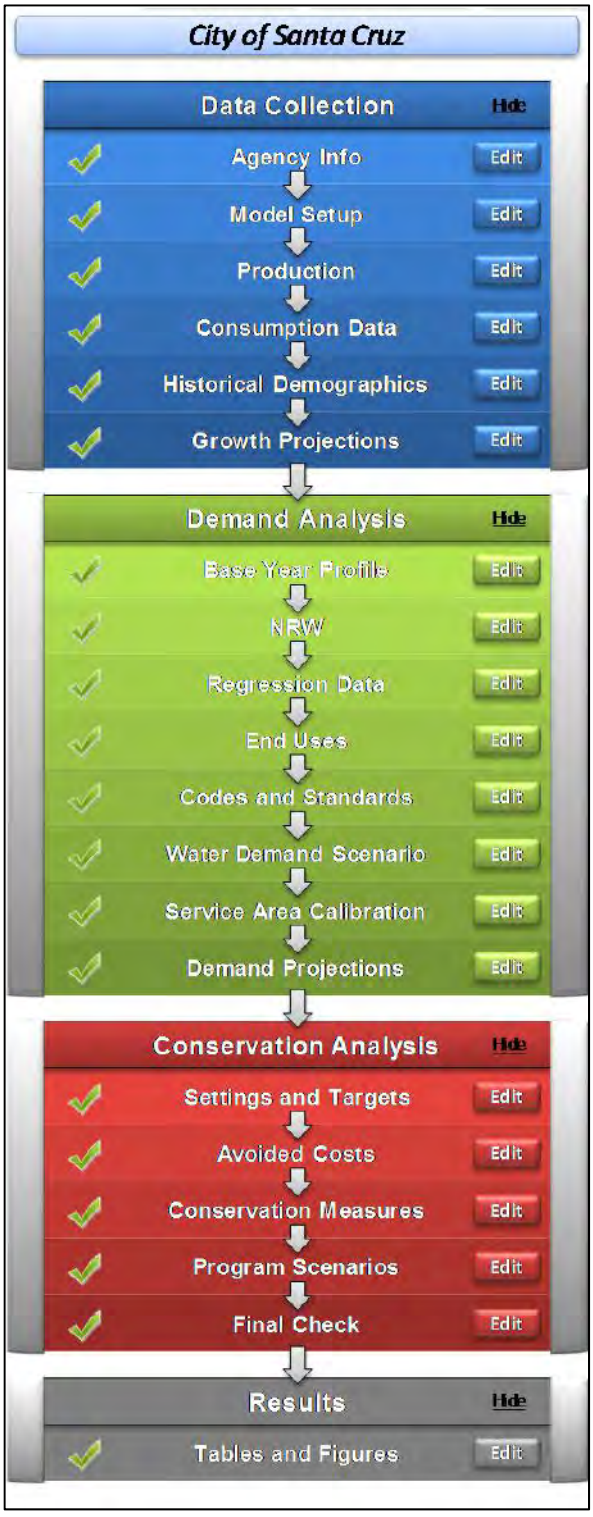
APPENDIX A: DESCRIPTION OF THE DSS MODEL





The DSS Model prepares long-range, detailed demand projections. The purpose of the extra detail is to enable a more accurate assessment of the impact of water efficiency programs on demand. A rigorous modeling approach is especially important if the project will be subject to regulatory or environmental review.

The DSS Model is an end-use model that breaks down total water production (water demand in the service area) to specific water end uses. The model uses a bottom-up approach that allows for multiple criteria to be considered when estimating future demands, such as the effects of natural fixture replacement, plumbing codes, and conservation efforts. The DSS Model may also use a top-down approach with a utility prepared water demand forecast.

To forecast urban water demands using the DSS Model, customer demand data is obtained from the water agency being modeled. The demand data is reconciled with available demographic data to characterize the water usage for each customer category in terms of number of users per account and per capita water use. The data is further analyzed to approximate the split of indoor and outdoor water usage in each customer category. The indoor/outdoor water usage is further divided into typical end uses for each customer category. Published data on average per-capita indoor water use and average per-capita end use is combined with the number of water users to calibrate the volume of water allocated to specific end uses in each customer category. In other words, the DSS Model checks that social norms from end studies on water use behavior (e.g., flushes per person per day) are not exceeded.

The DSS Model evaluates conservation measures using benefit cost analysis with the present value of the cost of water saved ($/Acre-Foot). Benefits are based on savings in water and wastewater facility operations and maintenance (O&M). The figures above and to the left illustrate the processes for forecasting conservation water savings, including the impacts of fixture replacement due to plumbing codes and standards already in place.

The DSS Model has been used for practical applications of conservation planning in over 230 service areas representing 20 million people, including extensive efforts nationally in California, Colorado, Hawaii, Utah, Georgia, Florida, North Carolina, Oregon, and Ohio, and internationally in Australia, New Zealand, and Canada.

CUWCC BMP Retail Coverage Report 2013

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

6270 City of Santa Cruz Water Department

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name:	Toby Goddard
Title:	Water Conservation Manager
Email:	tgoddard@cityofsantacruz.com

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.		http://www.codepublishing.com/CA/SantaCruz/html/SantaCruz16/SantaCruz16.html	See Santa Cruz Municipal Code Chapter 16 for the following: a) 16.01 Water Shortage Regulations and Restrictions b) 16.02 Water Conservation/Water Waste Prohibition Ordinance c) 16.16 Water Efficient Landscape Ordinance
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			

At Least As effective As No

CUWCC BMP Retail Coverage Report 2013

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

Exemption No

Comments:

The City of Santa Cruz declared a Stage 1 Water Shortage Alert effective May 1, 2013 and insitituted water restrictions throughout the year. Two temporary staff were hired to patrol the service area leading to 731 water waste enforcement actions.

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control **NOT ON TRACK**

6270 City of Santa Cruz Water Department

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
City of Santa Cruz 2013 Annual Water Audit.xls	
AWWA Water Audit Validity Score?	65
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	No
Component Analysis?	No
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repar unreported leaks to the extent cost effective?	No
Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
267	100884	320768		False		

At Least As effective As No

Exemption No

Comments:

To CUWCC Staff: Please note that the operational efficiency indicators from the AWWA water audit software did not automatically populate the BMP database after uploading and saving. We tried converting format from .xlsx to .xls. We are using V5.0

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

6270 City of Santa Cruz Water Department

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	737
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes

Date: 12/16/2013

Uploaded file name:

Completed a written plan, policy or program to test, repair and replace meters	Yes

At Least As effective As No

Exemption No

Comments:

1) The City bills all inside City and some large outside City customers on a monthly basis; outside City customers are billed bi-monthly. 2) Recent analysis of CII accounts shows 940 accounts with no outdoor water use, and 737 with mixed use.

NOT ON TRACK

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

6270 City of Santa Cruz Water Department

Implementation (Water Rate Structure) **ON TRACK**

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Comodity Charges	(M) Total Revenue Fixed Carges
Single-Family	Increasing Block	Yes	5918548.95	4472338.86
Multi-Family	Uniform	Yes	4107973.04	1268495.67
Commercial	Uniform	Yes	3379123.99	1074308.13
Industrial	Uniform	Yes	1320577.7	164488.08
Institutional	Uniform	Yes	313841.02	165728.5
Dedicated Irrigation	Uniform	Yes	1423156.26	325452.27
Agricultural	Uniform	Yes	39245.11	35365.59
Other	Uniform	Yes	36483.72	12810.98
			16538949.79	**7518988.08**

Calculate: V / (V + M) **69 %**

Implementation Option: Use Canadian Water Wastewater Association Rate Design Model

☐ Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: Yes **NOT ON TRACK**

Customer Class	Rate Type	Conserving Rate?
Single-Family	Non-Volumetric Flat Rate	No
Multi-Family	Non-Volumetric Flat Rate	No
Commercial	Uniform	Yes
Industrial	Uniform	Yes
Institutional	Uniform	Yes
Dedicated Irrigation	Service Not Provided	No

At Least As effective As No

Exemption No

Comments:

Note to CUWCC staff: We are using Option 3 for BMP 1.4. Coverage calculator does not seem to work; the City earned 37 points in our matrix score.

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

6270 **City of Santa Cruz Water Department** **Retail**

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

The name of agency, contact name and email address if not CUWCC Group 1 members

Did at least one contact take place during each quater of the reporting year? Yes

Public Outreach Program List	Number
Newsletter articles on conservation	8
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	4
Website	12
Landscape water conservation media campaigns	2
General water conservation information	6
Total	**32**

Did at least one contact take place during each quater of the reporting year? Yes

Number Media Contacts	Number
Articles or stories resulting from outreach	12
News releases	12
Newspaper contacts	24
Total	**48**

Did at least one website update take place during each quater of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Public Information and Outreach	28000
Total Amount:	**28000**

Public Outreah Additional Programs
Stage 1 Water Shortage Alert and associated water restrictions

Description of all other Public Outreach programs

Green Gardener program

Comments:

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

In addition to Water Conservation, there was considerable public outreach about future water supply. In late 2013, the City created a citizen's Water Supply Advisory Committee. The Water Department also hired its first Community Relations Specialist

At Least As effective As	No

Exemption	No	0

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

6270 City of Santa Cruz Water Department **Retail**

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Materials meet state education framework requirements? Yes

15 local 4th and 5th grade classes participated in the Wetlands and Watersheds program. The program includes a teacher workshop and day-long field trip to the City's reservoir and the San Lorenzo River to learn about water supply and water quality.

Materials distributed to K-6? Yes

Each student receives a copy of "Our Water Works in Santa Cruz County" booklet and a journal they complete at the river. Techers receive a county watershed map and background material to support watershed education in the classroom.

Materials distributed to 7-12 students? Yes (Info Only)

As part of the Watershed Academy, described below, materials include scientific literature, news articles, hydrographs, data sheets, etc.

Annual budget for school education program: 27000.00

Description of all other water supplier education programs

Watershed Academy: City staff teaches a small group of 10th grade students in the San Lorenzo Valley about watershed processes, fisheries, land use and drinking water source protection, both in the classroom and through a series of field trips

Comments:

Budget figure above is for the Coastal Watershed Council contract managed by Water Resources section.

At Least As effective As No

Exemption No 0

CUWCC BMP Retail Coverage Report 2014

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

6270 City of Santa Cruz Water Department

1. Conservation Coordinator provided with necessary resources to implement BMPs?	Name:	Toby Goddard
	Title:	Administrative Services Manager
	Email:	tgoddard@cityofsantacruz.com

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.		http://www.codepublishing.com/CA/SantaCruz/html/SantaCruz16/SantaCruz16.html	See Santa Cruz Municipal Code Chapter 16 for the following: a) 16.01 Water Shortage Regulations and Restrictions b) 16.02 Water Conservation/Water Waste Prohibition Ordinance c) 16.16 Water Efficient Landscape Ordinance
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			

At Least As effective As No

CUWCC BMP Retail Coverage Report 2014

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

Exemption No

Comments:

The City of Santa Cruz declared a Stage 3 Water Shortage Emergency effective May 1, 2014 and instituted water rationing for all residential and irrigation accounts, drought regulations for CII accounts, and outdoor water restrictions for all users.

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control **NOT ON TRACK**

6270 City of Santa Cruz Water Department

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
City of Santa Cruz 2014 Annual Water Audit.xls	
AWWA Water Audit Validity Score?	66
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	No
Component Analysis?	No
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repar unreported leaks to the extent cost effective?	No
Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
227	119438.04	244565		False		

At Least As effective As No

Exemption No

Comments:

The City of Santa Cruz has contracted with Water Systems Optimization, Inc to conduct a water loss control project. The contract is for FY16, but the test period to be validated is 2014. See comment in 2013 re: AWWA OEI data not uploading properly

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

6270 City of Santa Cruz Water Department

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	737
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes

Date: 12/16/2013

Uploaded file name:

Completed a written plan, policy or program to test, repair and replace meters	Yes

At Least As effective As No

Exemption No

Comments:

The City instituted water rationing in 2014 in response to a water shortage emergency and migrated all its customers to monthly billing effective April 2014. Previously most outside City accounts were billed bimonthly.

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

6270 City of Santa Cruz Water Department

Implementation (Water Rate Structure) **ON TRACK**

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Comodity Charges	(M) Total Revenue Fixed Carges
Single-Family	Increasing Block	Yes	4097421.24	4674757.04
Multi-Family	Uniform	Yes	3615070.34	1333880.79
Commercial	Uniform	Yes	3178492.82	1131061.45
Industrial	Uniform	Yes	1178030.78	168046.78
Institutional	Uniform	Yes	183173.76	168907.53
Dedicated Irrigation	Uniform	Yes	853359.46	338205.43
Agricultural	Uniform	Yes	35224.07	37459.42
Other	Uniform	Yes	33070.92	12069.64
			13173843.39	**7864388.08**

Calculate: V / (V + M) **63 %**

Implementation Option: Use Canadian Water Wastewater Association Rate Design Model

☐ Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: Yes **NOT ON TRACK**

Customer Class	Rate Type	Conserving Rate?
Single-Family	Non-Volumetric Flat Rate	No
Multi-Family	Non-Volumetric Flat Rate	No
Commercial	Uniform	Yes
Industrial	Uniform	Yes
Institutional	Uniform	Yes
Dedicated Irrigation	Service Not Provided	No

At Least As effective As No

Exemption No

Comments:

Note to CUWCC staff: The City of Santa Cruz is using Option 3 for BMP 1.4. Coverage calculator does not seem to work; City earned 39 points in its matrix score.

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

6270 **City of Santa Cruz Water Department** **Retail**

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

The name of agency, contact name and email address if not CUWCC Group 1 members

Did at least one contact take place during each quater of the reporting year? Yes

Public Outreach Program List	Number
Newsletter articles on conservation	8
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	24
Website	100
Landscape water conservation media campaigns	2
General water conservation information	100
Total	**234**

Did at least one contact take place during each quater of the reporting year? Yes

Number Media Contacts	Number
Articles or stories resulting from outreach	50
News releases	24
Newspaper contacts	100
Total	**174**

Did at least one website update take place during each quater of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Public Information and Outreach	28000
Total Amount:	**28000**

Public Outreah Additional Programs
Stage 3 Water Shortage Emergency and associated water restrictions
Water Supply Advisory Committee

Description of all other Public Outreach programs

Green Gardener program

Comments:

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

In addition to Water Conservation, there was considerable public outreach about future water supply. The City created a citizen's Water Supply Advisory Committee which met twice a month during 2014.

At Least As effective As	No

Exemption	No	0

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

6270 City of Santa Cruz Water Department **Retail**

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Materials meet state education framework requirements? Yes

12 local 4th and 5th grade classes participated in the Wetlands and Watersheds program. The program includes a teacher workshop and day-long field trip to the City's reservoir and the San Lorenzo River to learn about water supply and water quality.

Materials distributed to K-6? Yes

Each student receives a copy of "Our Water Works in Santa Cruz County" booklet and a journal they complete at the river. Techers receive a county watershed map and background material to support watershed education in the classroom.

Materials distributed to 7-12 students? Yes (Info Only)

As part of Watershed Academy, described below, materials include scientific literature, news articles, hydrographs, data sheets, etc.

Annual budget for school education program: 27000.00

Description of all other water supplier education programs

Watershed Academy: City staff teaches a small group of 10th grade students in the San Lorenzo Valley about watershed processes, fisheries, land use and drinking water source protection, both in the classroom and through a series of field trips

Comments:

Budget figure above is for the Coastal Watershed Council contract managed by Water Resources section.

At Least As effective As No

Exemption No 0

CUWCC BMP Coverage Report 2014

6270 City of Santa Cruz Water Department

Baseline GPCD: 123.83

GPCD in 2014 75.8

GPCD Target for 2018: 101.50

Biennial GPCD Compliance Table

ON TRACK

		Target		Highest Acceptable Bound	
Year	Report	% Base	GPCD	% Base	GPCD
2010	1	96.4%	**119.40**	100%	**123.80**
2012	2	92.8%	**114.90**	96.4%	**119.40**
2014	3	89.2%	**110.50**	92.8%	**114.90**
2016	4	85.6%	**106.00**	89.2%	**110.50**
2018	5	82.0%	**101.50**	82.0%	**101.50**

CITY OF SANTA CRUZ

WATER DEPARTMENT

212 Locust Street, Santa Cruz, CA 95060 • (831) 420-5200 • Fax (831) 420-5201 • www.cityofsantacruz.com

July 19, 2016

Susan Mauriello, County Administrative Officer
County of Santa Cruz
Santa Cruz County Governmental Center
701 Ocean Street, Room 520
Santa Cruz, CA 95060

SUBJECT: 2015 Urban Water Management Plan Update

Dear Ms. Mauriello,

This letter is to notify you that the City of Santa Cruz has recently completed an update of its 2015 Urban Water Management Plan. The draft plan is available online at the City's website for your review: http://www.cityofsantacruz.com/2015UWMP. We welcome comments and input from you and from applicable County departments on the draft plan.

The Santa Cruz Water Commission will review and discuss the plan at its meeting on Monday, August 1, 2016 at 7:00 p.m. in the City Council Chambers.

A public hearing on the proposed plan has been scheduled for Tuesday, August 9, 2016 at 2:30 p.m. in the City Council Chambers at Santa Cruz City Hall, 809 Center Street, Santa Cruz, California. The plan will be brought back to City Council at its following meeting August 23, 2016 for adoption, barring any substantial modifications.

Written comments on the plan may be received up to the date of the public hearing and should be sent to:

Santa Cruz Water Department
Attn: Mr. Toby Goddard
212 Locust Street, Suite B
Santa Cruz, CA 95060

Please contact Toby Goddard, Water Conservation Manager at 420-5232, or via email tgoddard@cityofsantacruz.com if you have any questions or wish to discuss the information contained in report.

Sincerely,

Rosemary Menard
Water Director

cc: Ms. Kathleen Previsich, Director of Planning
Mr. John Ricker, Water Resources Division Director
Mr. John Presliegh, Director of Public Works

CITY OF SANTA CRUZ

WATER DEPARTMENT

212 Locust Street, Santa Cruz, CA 95060 • (831) 420-5200 • Fax (831) 420-5201 • www.cityofsantacruz.com

July 19, 2016

Jamie Goldstein, City Manager
City of Capitola
420 Capitola Ave.
Capitola, CA 95010

SUBJECT: 2015 Urban Water Management Plan Update

Dear Mr. Goldstein,

This letter is to notify you that the City of Santa Cruz has recently completed an update of its 2015 Urban Water Management Plan. The draft plan is available online at the City's website for your review: http://www.cityofsantacruz.com/2015UWMP. We welcome your comments and input on the draft plan.

The Santa Cruz Water Commission will review and discuss the plan at its meeting on Monday, August 1, 2016 at 7:00 p.m. in the City Council Chambers.

A public hearing on the proposed plan has been scheduled for Tuesday, August 9, 2016 at 2:30 p.m. in the City Council Chambers at Santa Cruz City Hall, 809 Center Street, Santa Cruz, California. The plan will be brought back to City Council at its following meeting August 23, 2016 for adoption, barring any substantial modifications.

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Santa Cruz, CA 95060

Please contact Toby Goddard, Water Conservation Manager at 420-5232, or via email tgoddard@cityofsantacruz.com if you have any questions or wish to discuss the information contained in report.

Sincerely,

Rosemary Menard
Water Director

cc: Mr. Richard Grunow, Community Development Director

Santa Cruz Sentinel
1800 Green Hills Rd., Ste. 210
Scotts Valley, CA 95066
831-429-2415
scslegals@santacruzsentinel.com

3487424

SANTA CRUZ WATER DEPARTMENT
RENEE COLETTA
212 LOCUST ST
STE A
SANTA CRUZ, CA 95060

Proof of Publication
(2015.5 C.C.P.)

STATE OF CALIFORNIA

SS.

COUNTY OF SANTA CRUZ

Public Notice

I, the undersigned, declare:

That I am over the age of eighteen and not interested in the herein-referenced matter; that I am now, and at all times embraced in the publication herein mentioned was, a principal employee of the printer of the Santa Cruz Sentinel, a daily newspaper printed, published and circulated in the said county and adjudged a, newspaper of general circulation by the Superior Court of California in and for the County of Santa Cruz, under Proceeding No. 25794; that the advertisement (of which the annexed is a true printed copy) was published in the above-named newspaper on the following dates, to wit:

07/31/2016, 08/07/2016

I declare under penalty of perjury that, the foregoing is tru and correct to the best of my knowledge.

This 8th day of August, 2016 at Santa Cruz, California.

Signature

Legal No. **0005767616**

CITY OF SANTA CRUZ

Notice of Public Hearing

The City Council of the City of Santa Cruz will hold a public hearing on the draft

2015 Urban Water Management Plan

on Tuesday, August 9, 2016 at 2:30 p.m.
or soon thereafter
at City Council Chambers
809 Center Street, Santa Cruz

State law requires water suppliers to prepare an Urban Water Management Plan and to update it every five years. The plan describes the City's water supply resources and projected needs through the year 2035 and covers related subjects including conservation, supply reliability, system sources, and water shortage management. The public hearing will also address the integration of the Final Report on Agreements and Recommendations, as developed by the Water Supply Advisory Committee, into the Plan.

The draft plan is available for review at:

- Water Department Office
- Online at www.cityofsantacruz.com/2015UWMP
- Central Library

Interested members of the public and local businesses are encouraged to provide comments to the City of Santa Cruz and participate in the plan review process.

For additional information please contact:
City of Santa Cruz Water Department
212 Locust St, Suite B
Santa Cruz, CA
(831) 420-5200
or email: tgoddard@cityofsantacruz.com

STATE OF CALIFORNIA)
) ss.
County of Santa Cruz)

EXCERPT OF MINUTES

I, Bren Lehr, City Clerk Administrator of the City of Santa Cruz, California, do hereby certify that the following is a true excerpt of the draft minutes showing the action taken at the August 9, 2016 Regular City Council Meeting:

PUBLIC HEARING ITEM:

11. 2015 Urban Water Management Plan Update (WT)

Associate Planner II K. Moore and Water Administrative Services Manager T. Goddard gave a presentation and responded to Councilmember questions.

Director of Water R. Menard briefly discussed this item.

Mayor Mathews opened the public comment period. The following person spoke:

Nate Kennedy

Mayor Mathews closed the public comment period.

MOTION: Councilmember Lane moved, seconded by Councilmember Terrazas, to direct staff to bring back to Council the final plans for adoption.

ACTION: The motion carried unanimously with the following vote.

AYES:	Councilmembers Noroyan, Lane, Terrazas, Posner, Comstock; Vice Mayor Chase; Mayor Mathews.
NOES:	None.
ABSENT:	None.
DISQUALIFIED:	None.

Bren Lehr
City Clerk Administrator
City of Santa Cruz

Written Comments Received from the Public

Water Commission Members

Doug Engfer

Thanks again for making time for me to discuss the UWMP in advance of Monday's meeting. This is the first time I've been involved in the review cycle, so I'm sure I have much to learn!

I'll say at the outset that I found the document clear and useful. I think that your strategy of "building on" the State's foundational organizational structure, specifically by including many and detailed documents as appendices, makes the package complete. As a recovering member of the WSAC, I will also note that I'm gratified to see that the committee's recommendations are adopted in the whole here. Yay!

As you'd expect, I have a number of questions and comments, as well as suggested copy edits. The attached Word file has all of my questions, comments, and suggestions. It's organized and formatted as follows:

- "State Act Questions"
    - Questions I have relating to our compliance with the State Act.
    - I would expect that we would discuss these during Friday's call. I may bring them up on Monday, depending upon our Friday conversation.
- "UWMP Draft"
    - "Questions, comments, suggestions"
        - I've identified these items by page number (both according to document pagination, and to relative page within the PDF).
        - Where you see ~~strikethrough~~ text, I've found the answer already, elsewhere in the document, or in the Act. You may ignore the strikethrough text.
        - I would expect that we would spend the bulk of our time on Friday on these items.
        - Items in this list would be candidates for me to bring up during the SCWC review of the document on Monday (though I may change my mind about the salience of individual items between now and Monday)
    - "Typos and stylistic suggestions"
        - I've identified these items by page number (both according to document pagination, and to relative page within the PDF).
        - Where you see ~~strikethrough~~ text, I've found the answer already, elsewhere in the document, or in the Act. You may ignore the strikethrough text.
        - I would expect these items to be non-controversial. I offer them here by way of helping you make the document the best it can be. I would not expect that you and I would spend any time on them on Friday's call. However, if something here seems controversial to you and you'd like to talk about it on Friday, that's fine with me.

PARKS

1 Moore Creek Preserve
2 University Terrace
3 Westlake
4 Trescony
5 Sgt. Charles Derby and Skate Park
6 Garfield
7 Bethany
8 Neary Lagoon Wildlife Refuge
9 Depot Park, Scott Kennedy Fields, Freight Building and Bicycle Trip Bike Park
10 Beach Flats
11 Poet's
12 Town Clock
13 Mission Plaza
14 Harvey West
15 Pogonip
16 Grant
17 San Lorenzo
18 Central
19 Ken Wormhoudt Skate Park/ Mike Fox Roller Hockey Practice Area
20 Jessie Street Marsh
21 Ocean View
22 Tyrrell
23 Arana Gulch
24 Frederick Street
25 Star of the Sea
26 Laurel
27 DeLaveaga
28 DeLaveaga Golf Course
29 Disc Golf Course
30 John Franks
31 Lighthouse Neighborhood
32 Pump Track
33 Pacheco Dog Park
34 Mimi de Marta Dog Park
35 Riverside Gardens

greenbelt property

FACILITIES

A Surfing Museum
B Santa Cruz Wharf and Lifeguard Headquarters
C Nueva Vista Community Center
D Louden Nelson and Teen Center
E Pacific Avenue
F Civic Auditorium
G City Hall
H Harvey West Clubhouse, Scout House and Pool
I Museum of Natural History
J Kaiser Permanente Arena
K Archery Range
L Tannery Arts

+ Louden Nelson Community Center
- Parks, Beaches & Open Spaces
  - Beaches
  - Dog Off Leash Areas
  - Open Spaces
    + Arana Gulch
    - Moore Creek
    - Pogonip
  + Parks
  - Parks Master Plan
- Recreation Events
+ Reservations
+ Senior Programs
+ Sports
+ Teach a Class With Us!
- Teen Center and Teen Programs
+ Youth Programs

Due to financial impacts of the COVID-19 pandemic, the Parks and Recreation Department has seen a temporary reduction in staffing levels. To mitigate this reduction the following parks have been temporarily closed:

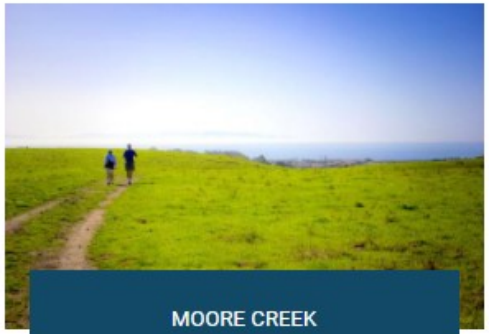
- Lower DeLaveaga Park and George Washington Grove (Trails at DeLaveaga remain open)
- Laurel Park
- San Lorenzo Park Benchlands

Park restrooms will be replaced by portable restrooms and handwashing stations at Grant Park, San Lorenzo Park, Frederick St. Park, Ocean View Park, Neary Lagoon, and Garfield Park.

List of amenities and park features that have been affected countywide.

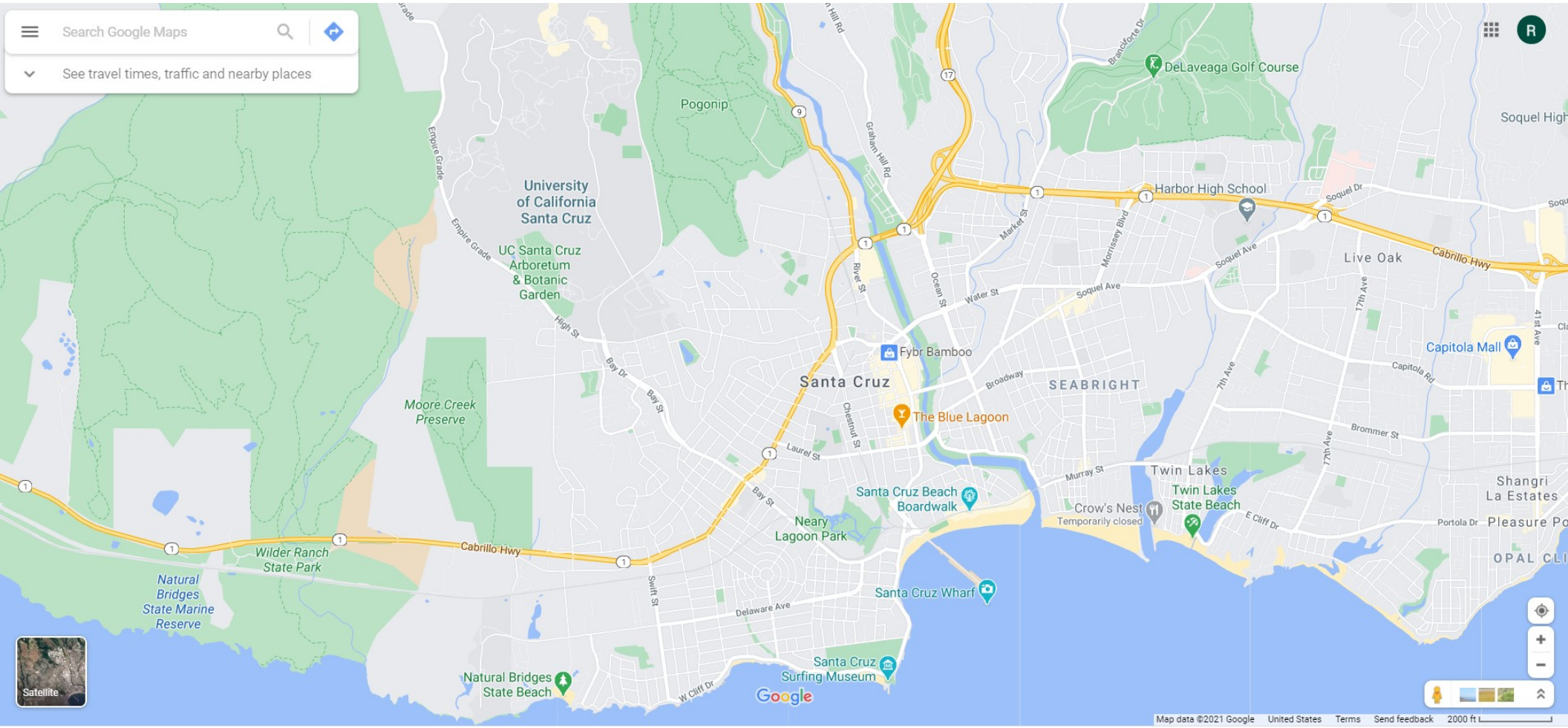
To help safeguard our community, please observe CDC guidance on stopping the spread of germs and review the Parks & Recreation COVID-19 page to keep up to date with our efforts to flatten the curve.

ARANA GULCH



MOORE CREEK

POGONIP


Search Google Maps
See travel times, traffic and nearby places
Pogonip
DeLaveaga Golf Course
Soquel High
University of California Santa Cruz
UC Santa Cruz Arboretum & Botanic Garden
Harbor High School
Live Oak
Capitola Mall
Fybr Bamboo
Santa Cruz
SEABRIGHT
The Blue Lagoon
Moore Creek Preserve
Twin Lakes
Twin Lakes State Beach
Crow's Nest
Temporarily closed
Santa Cruz Beach Boardwalk
Neary Lagoon Park
Shangri La Estates
Pleasure Po
OPAL CLI
Wilder Ranch State Park
Natural Bridges State Marine Reserve
Santa Cruz Wharf
Natural Bridges State Beach
Santa Cruz Surfing Museum
Cabrillo Hwy
Empire Grade
Graham Hill Rd
River St
Ocean St
Water St
Soquel Ave
Soquel Dr
Market St
Morrissey Blvd
Broadway
Chestnut St
Laurel St
Bay St
Bay Dr
High St
Swift St
Delaware Ave
W Cliff Dr
E Cliff Dr
Portola Dr
Murray St
Brommer St
7th Ave
17th Ave
41st Ave
Capitola Rd
Satellite
Google
Map data ©2021 Google
United States
Terms
Send feedback
2000 ft

City Beaches

Santa Cruz City beaches are the heart of Santa Cruz coastline. Whether taking a scenic walk along the shore, enjoying a game of volleyball, exploring the Santa Cruz Wharf, or getting your toes in the soft sand, City beaches are the essential stop for any trip to Santa Cruz.

We ask visitors to help us stop the spread of COVID-19 in our community by remembering to do the following:

✔Wear a mask - the order is still in effect ✔Wash your hands ✔ Keep 6 foot distance

"Pack it in, Pack it out": There are reduced trash services on the beaches at this time. If you are using the beach we ask you to be responsible and take your trash with you when you leave.

Please visit our COVID-19 resource page for additional information.

Visit

Guidelines

Beach Conditions & Safety

Reserve

Beach Volleyball

Water Craft Launching

Surf Schools

Main Beach
108 Beach St
Santa Cruz, CA 95060

Cowell Beach
21 Municipal Wharf
Santa Cruz, CA 95060
Cowell Beach closed midnight to one hour before sunrise.
Beach visitors are allowed to cross the beach to access the water

Mitchell's Cove
West Cliff Drive
Santa Cruz, CA 95060

Lifeguard Headquarters
#1 Municipal Wharf
831-420-5715

Lifeguard Service:

- Area serviced- Cowell Beach to the San Lorenzo River

Informational Links

Junior & Little Guards
The Santa Cruz Wharf
The Surfing Way: Surf Etiquette Brochure
Beach Safety
Water Quality
Santa Cruz Weather
Santa Cruz Surf Forecast
National Weather Service Marine Forecast
Visit Santa Cruz
Santa Cruz County Beaches

+ Civic Auditorium
Current Job Openings
+ Event Permits
+ Facilities
+ How Do I...
+ Louden Nelson Community Center
+ Parks, Beaches & Open Spaces
Recreation Events
+ Reservations
- **Senior Programs**
Senior Services
Senior Activities
Walking Adventure Group
Senior Computer Center
Trips
Senior Clubs
+ Sports
+ Teach a Class With Us!
Teen Center and Teen Programs
+ Youth Programs

DOWNTOWN SENIOR CENTER

at Louden Nelson Community Center

SENIOR ACTIVITIES

SENIOR SERVICES

SENIOR COMPUTER CENTER

WALKING ADVENTURE GROUP

TRIPS

SENIOR CLUBS

- Parks & Recreation
+ COVID-19
Virtual Recreation
+ Advisory Bodies
+ Civic Auditorium
Current Job Openings
+ Event Permits
+ Facilities
+ How Do I...
+ Louden Nelson Community Center
+ Parks, Beaches & Open Spaces
Recreation Events
+ Reservations
+ Senior Programs
+ Sports
+ Teach a Class With Us!
Teen Center and Teen Programs
+ Youth Programs

SANTA CRUZ TEEN CENTER

Government » City Departments » Parks & Recreation »

Santa Cruz Teen Center

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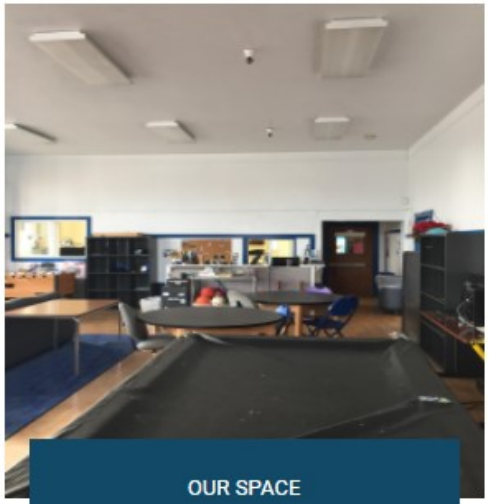
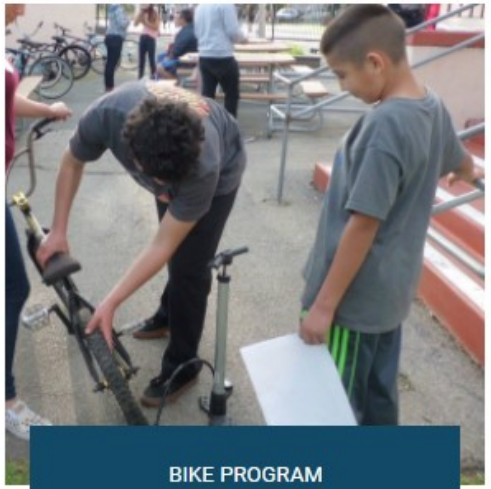
MONTHLY CALENDAR



OUR SPACE



BIKE PROGRAM

+ Civic Auditorium

Current Job Openings

+ Event Permits

+ Facilities

+ How Do I...

+ Louden Nelson Community Center

+ Parks, Beaches & Open Spaces

Recreation Events

+ Reservations

+ Senior Programs

+ Sports

+ Teach a Class With Us!

Teen Center and Teen Programs

+ Youth Programs

Today | Next 7 days | Next 30 days | All Upcoming | All Past | All

No results found.

Welcome to the City of Santa Cruz's Virtual Recreation Page.

Follow us on social media for more fun activities and updates. Share your Virtual Recreation with #CruzFunAtHome.

The Winter/Spring Activity Guide is online and interactive!

Want more information on a park or program? Click links for updates and details. Like a photo? Click on it to enlarge. Videos can be played right from the guide!

Parks & Recreation is committed to keeping our community members safe, active and connected!

Check back often as we will continue to add content!

- **Message from the Director**
- **Fun For Seniors**
- **Senior Center Without Limits**
- **Fun At Home**
- **Fun Outside**
- **Arts & Culture**
- **Get Active**
- **COVID Creations**
- **Local Resources**
- **Stay Connected**

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City of Santa Cruz

PARKS MASTER PLAN 2030

Parks • Recreational Facilities • Open Spaces • Beaches

CITY OF SANTA CRUZ PARKS AND RECREATION

City of Santa Cruz

PARKS MASTER PLAN 2030

Parks • Recreational Facilities • Open Spaces • Beaches

AUGUST 2020

CITY OF SANTA CRUZ
PARKS & RECREATION DEPARTMENT

Parks Make Life Better!

rhaa
LANDSCAPE ARCHITECTURE + PLANNING

ACKNOWLEDGEMENTS

This plan would not have been possible without the assistance and participation of a great number of individuals. A special thanks to all of the members of the public who participated in the public input process for the Santa Cruz Parks Master Plan 2030.

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- **5.7 Joint Study Session Presentation**
- **5.8 Presentations from Subcommittee Meetings**
- **5.9 Potential Grant Sources**

CHAPTER 1: EXECUTIVE SUMMARY

1.1 Executive Summary

Mitchell’s Cove

SECTION 1.1: EXECUTIVE SUMMARY

A. Purpose of the Parks Master Plan 2030
B. Planning Process
C. Organization of the Parks Master Plan 2030
D. Overview of Chapters & Sections

A. PURPOSE OF THE PARKS MASTER PLAN 2030

The *Santa Cruz Parks Master Plan 2030* (Parks Master Plan 2030) is a tool to guide the City of Santa Cruz in parks, facility, beach, and open space planning on a long-term basis. This document contains policies and actions for the provision of parks services and recommendations for improvements at specific parks.

B. PLANNING PROCESS

The planning process included three significant report milestones:

- Administrative Draft – A working draft of the Parks Master Plan 2030 distributed amongst key City staff for review, study, and comment.
- Draft Plan – Comments on the Administrative Draft were incorporated, and the report was open to public review and comment.
- Final Plan – Final comments from the public, City Council, Parks & Recreation Commission, and key City staff were incorporated before release of the Final Plan. The Final Plan was adopted by the City Council on October 13, 2020.

University Terrace Park

C. ORGANIZATION OF THE PARKS MASTER PLAN 2030

The Parks Master Plan 2030 is comprised of the following chapters and sections:

CHAPTER 1: EXECUTIVE SUMMARY

1.1 Executive Summary

CHAPTER 2: INTRODUCTION & INVENTORY - WHO WE ARE & WHAT WE HAVE

2.1 Goals & General Objectives

2.2 History & Introduction

2.3 Community Profile

2.4 Existing Conditions

CHAPTER 3: COMMUNITY OUTREACH & NEEDS ASSESSMENT - WHAT WE NEED & WANT

3.1 Community Outreach

3.2 Emerging Trends

CHAPTER 4: IMPLEMENTATION - WHERE WE'RE HEADED & HOW WE'RE GETTING THERE

4.1 Goals, Policies & Actions

4.2 Asset Inventory & Specific Recommendations

4.3 Funding Strategies

4.4 Ongoing Planning & Updates

CHAPTER 5: APPENDICES

5.1 Existing Plans

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5.3 Community Meeting Materials: Flyer, Handout, & Boards

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5.6 Stakeholder Interviews

5.7 Joint Study Session Presentation

5.8 Presentations from Subcommittee Meetings

5.9 Potential Grant Sources

View up Woodrow Avenue, planted with drought-tolerant vegetation

D. OVERVIEW OF CHAPTERS & SECTIONS

CHAPTER 1: EXECUTIVE SUMMARY

This chapter provides an overview of the purpose and organization of the Parks Master Plan 2030, while also explaining the process that the Plan undergoes in order to be approved.

CHAPTER 2: INTRODUCTION & INVENTORY - WHO WE ARE & WHAT WE HAVE

In order to make relevant recommendations for the future, it is critical to understand the Santa Cruz community as well as the history and current condition of the parks system. This chapter presents an introduction to the City of Santa Cruz's existing parks and recreation system as well as the community. A detailed inventory and assessment of the existing parks, open spaces, beaches, and facilities is included. Specific recommendations for each of these assets can be found in Chapter 4.

Section 2.1 Goals & General Objectives of Master Plan

The Parks Master Plan 2030 presents a road map to improve the existing parks system and anticipate future needs of the community while still

preserving the City's unique character and environment. The Parks, Recreation, & Open Space chapter of the City of Santa Cruz General Plan 2030 provides the outline for the recommendations. The specific goals are:

- **Goal PR1**: Ample, accessible, safe, and well-maintained parks, open space, and active recreational facilities
- **Goal PR2**: High-quality, affordable recreational programs, activities, events, and services for all
- **Goal PR3**: Well managed, clean, and convenient public access to open space lands and coastline
- **Goal PR4**: An integrated system of citywide and regional trails

The objectives of the Parks Master Plan 2030 process were as follows:

- Identify and assess the City's various existing parks, open space, and facility assets.
- Conduct a comprehensive outreach effort including telephone surveys, community meetings, and interviews with key stakeholders and community members.
- Create a feasible vision and goals that prioritize community needs and desires for expansion and improvements.
- Generate policies to support community goals.
- Construct an implementable action plan to accomplish community goals, while establishing phasing and funding opportunities.

Section 2.2 History & Introduction

This section introduces the recreational lifestyle of Santa Cruz and the history of recreation in the City. The bay, beaches, and extensive greenbelts provide numerous opportunities to explore and recreate.

Additionally, the City has a variety of traditional park facilities for its residents and visitors. These include group picnic areas, a swimming pool, sports fields, basketball and tennis courts, playgrounds, a golf course, horseshoe pits and such unique facilities as an archery range and disc golf course. The City continues to embrace new trends in recreation with such facilities as pump tracks and pickleball courts. Indoor community facilities offer a wide variety of programs and activities. The extensive trail network provides both transportation and recreation throughout the City and access to a regional trail network.

Santa Cruz's history of recreation is also outlined in this chapter, starting with the incorporation of the City in 1866. Highlights include establishment of the Parks and Recreation Department, introduction of surfing, donation of DeLaveaga Park, construction of the wharf, interest in recreation after World War II, donation of Harvey West Park, and a rapid park expansion from the 60's to present time.

The City's 150th Anniversary Celebration on Main Beach in 2016

Section 2.3 Community Profile

This section focuses on the factors that influence recreation in Santa Cruz, including location, geography, climate, and demographics.

Santa Cruz's location, geography, and climate are conducive to recreation. The Monterey Bay and surrounding mountains provide diverse landscapes to accommodate a wide-range of recreational

interests and activities, and the mild climate facilitates year-round participation.

Increasing 7.1% between 2010 and 2014, the population of Santa Cruz continues to grow. The City has lower percentages of children and seniors than the state-wide averages, but both groups still need to be considered in recreation planning. The population of the University of California, Santa Cruz (UCSC) is a large user group for recreation. An additional significant user group that must be considered is the tourist population, with over three million trips to Santa Cruz County each year.

Youth Basketball at Kaiser Permanente Arena

Section 2.4 Existing Conditions

This section examines what assets the City of Santa Cruz has that can be used to meet the needs of the community.

Compared to other Central California cities, the City of Santa Cruz has a higher than average ratio of parks and open space. These ratios do not include other assets such as school property, privately owned recreation facilities, and adjacent county and state park lands.

Existing City facilities include 32 neighborhood parks, 6 community parks, 7 open spaces, and 18 community, cultural, or recreational facilities such as community centers. Though the overall ratio of parklands is relatively high, there are some neighborhoods that lack direct access to parks.

Besides the various parks owned and maintained by the city, there are many other resources both within and adjacent to the city. These include school facilities, the Boardwalk, the UC Santa Cruz campus, over 30 county parks, and 14 state parks in the county.

The City's parks have a great diversity of natural habitats that contribute significantly to Santa Cruz's unique character.

CHAPTER 3: COMMUNITY OUTREACH & NEEDS ASSESSMENT - WHAT WE NEED & WANT

The needs of the community are presented in this chapter, as uncovered through the public outreach process, and a discussion of emerging trends in parks and recreation that should be considered in future recreation planning.

Second community meeting at Louden Nelson Community Center

Section 3.1 Community Outreach

The goals, objectives and action items of the plan are the result of an extensive community outreach process which included quantitative surveys, open houses, stakeholder interviews and focus groups, department-wide meetings, and questionnaires distributed at parks, facilities, events, and online.

Key findings included:

- An overall favorable impression of City parks
- Concern about illegal activities and safety in many parks
- Need for more sports fields
- Desire for more recreation amenities and upgraded playgrounds
- Need for more bike trails and facilities
- Desire for greenbelt preservation
- Access to all parks and facilities for all users

The information obtained from the outreach process was used by a working group comprised of Parks and Recreation Commissioners, City Council members and City staff to frame key directives on parks management, specific parks and facilities action items, and safety and security.

Bicycle Trip Bike Park at Depot Park

Section 3.2 Emerging Trends

In addition to expressed community needs and desires, understanding trends in recreation is crucial for framing action items. These trends may influence future recreation needs within the community. Trends examined include changes in demographics, programming, access, marketing, and management.

CHAPTER 4: IMPLEMENTATION - WHERE WE'RE HEADED & HOW WE'RE GETTING THERE

Based on the information received in the community outreach and needs assessment process, this chapter frames specific recommendations, time frames for those recommendations, funding strategies, and ongoing planning and updates.

Scott Kennedy Fields re-opening dedication in 2014

Section 4.1 Goals, Policies & Actions

This section presents the vision, goals, policies, and actions proposed in the plan. Goals are intended to support those reached in the adopted City of Santa Cruz General Plan 2030 process and include:

- Provide attractive and sustainably maintained parks and facilities throughout the City.
- Provide ample parks and facilities throughout the City.
- Provide parks and facilities to meet the existing and emerging needs of residents and visitors of all ages and abilities.
- Protect the City's natural resources, wildlife habitat, and environment.
- Maintain a safe, clean, and comfortable environment for all park users.
- Provide an integrated parks system with clean, convenient access to parks, open spaces, and the coastline.
- Establish, maintain, and operate parks, facilities, and programs in a manner that is cost effective and manageable while engaging the community in a manner that maximizes involvement and support.

Each goal is supported by policies and action items that sustain that goal.

Section 4.2 Asset Inventory & Specific Facility Recommendations

This section contains recommendations and action items for specific parks, open spaces, beaches, and facilities. In addition there are detailed descriptions of amenities at each park, open space, beach, and facility. Many of the recommendations reflect community goals that have been studied and vetted during previous processes.

Section 4.3 Funding Strategies

This section examines possible funding mechanisms available in California for municipal parks and recreation acquisition, improvements, and on-going operations and maintenance costs. Funding strategies describe potential partnership opportunities for further exploration.

Section 4.4 Ongoing Planning & Updates

The Parks Master Plan 2030 is a means to guide future park improvements and to accommodate emerging needs to continue to provide a quality parks system. It is envisioned as a living document that continues to evolve and progress over time. Outlined in this section are the factors for consideration including need, environmental impact, and funding impacts. Other key factors are ability to move large projects forward with grants and responsiveness to community needs.

Pogonip Open Space

CHAPTER 5: APPENDICES

This chapter compiles the detailed information gathered throughout the planning process of the Parks Master Plan 2030 for reference and support of the final recommendations. Included in the appendices are links to pertinent existing plans, the results and analysis of the community telephone and email surveys, materials that were displayed and distributed at the community meetings, a summary of feedback from the community, the Joint Study and Subcommittee Meeting presentations, and potential grant funding sources.

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CHAPTER 2: INTRODUCTION & INVENTORY

WHO WE ARE & WHAT WE HAVE

2.1 Goals & General Objectives
2.2 History & Introduction
2.3 Community Profile
2.4 Existing Conditions

Grant Park

SECTION 2.1: GOALS & GENERAL OBJECTIVES

A. Introduction
B. Guiding Principles from the City of Santa Cruz General Plan 2030
C. Relationship of the Parks Master Plan 2030 to Existing Plans & Studies

A. INTRODUCTION

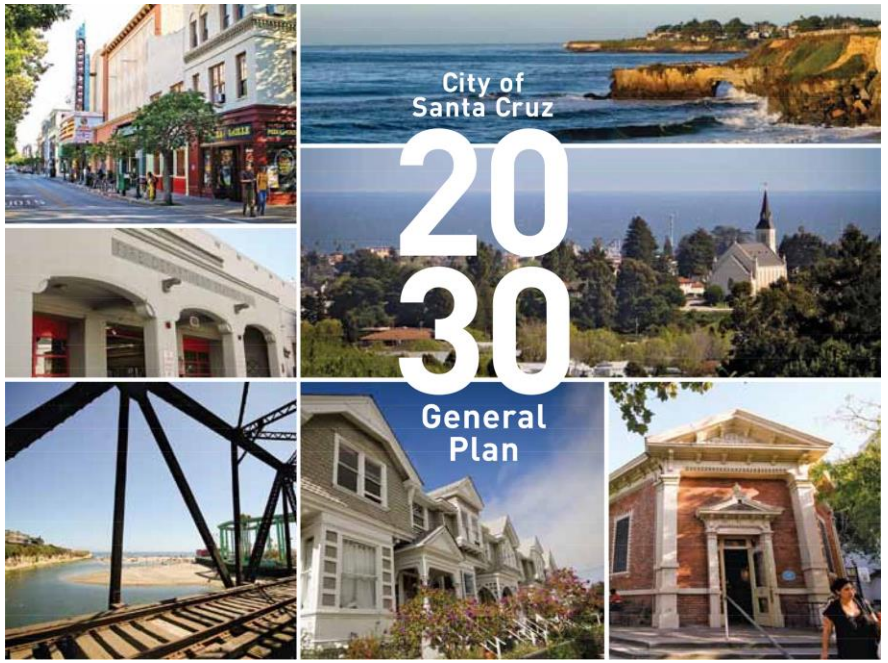
The *City of Santa Cruz Parks Master Plan 2030* (Parks Master Plan 2030) represents an opportunity to improve the existing parks system and anticipate future needs of the community while still preserving the unique character of the City's community and environment. The Parks Master Plan 2030 provides an analysis of the current parks, open spaces, and recreational facilities, based on assessments of the existing assets, quantitative and qualitative data gathered from the community, emerging trends in recreation, and standards for park development. This analysis directly shapes the Parks Master Plan 2030's recommendations, reflecting the wishes of the community and guiding the future development of the park system for the next 15 years.

The objectives of the Parks Master Plan 2030 process were as follows:

- Identify and assess the City's existing park, open space, beach, and facility assets.
- Conduct a comprehensive outreach effort including telephone surveys, community meetings, and interviews with key stakeholders and community members.
- Create a feasible vision and goals that prioritize community needs and desires for expansion and improvements.
- Generate policies to support the community goals.
- Create an implementable action plan to accomplish community goals, while establishing phasing and funding opportunities.

B. GUIDING PRINCIPLES FROM THE CITY OF SANTA CRUZ GENERAL PLAN 2030

The City of Santa Cruz General Plan 2030 acts as the long-term planning document for the City of Santa Cruz as required by California Law. The General Plan 2030 presents goals, policies, and recommendations for future development and is separated into State-mandated elements. The Parks Master Plan 2030 document helps implement the General Plan 2030, providing more detailed direction and recommendations for the future development and maintenance of parks, open spaces, beaches, and recreational facilities in Santa Cruz.



The Parks Master Plan 2030 lays out recommendations for the next 15 years, but is designed to be updated over time. This document should evolve with the City, providing a guiding framework while allowing for adjustments based on both presently anticipated and unforeseen future needs and community desires.

The general goals outlined in the Parks, Recreation, & Open Space chapter of the City of Santa Cruz General Plan 2030 helped to guide the progress of the Parks Master Plan 2030 and played a vital role in the development of its recommendations. Those goals are included here for reference:

- **Goal PR1**: Ample, accessible, safe, and well-maintained parks, open space, and active recreational facilities
- **Goal PR2**: High-quality, affordable recreational programs, activities, events, and services for all
- **Goal PR3**: Well managed, clean, and convenient public access to open space lands and coastline
- **Goal PR4**: An integrated system of citywide and regional trails

C. RELATIONSHIP OF THE PARKS MASTER PLAN 2030 TO EXISTING PLANS & STUDIES

Prior to the undertaking of this comprehensive Parks Master Plan 2030 process, the City of Santa Cruz has completed various other plans and studies that helped inform this document. The existing Plans listed here were considered, referenced, and incorporated where applicable into the overall Parks Master Plan 2030. Many suggestions from the community requested complying with the goals and actions of recently completed plans for specific parks. Conversely, as part of this planning process, new community needs were examined, and, some of the existing plans for specific parks and park assets may need to be updated to accommodate current and future trends and desires. These plans can be amended separately, and a concurrent amendment of the Parks Master Plan 2030 will not be required. The Plans are listed here alphabetically:

- Arana Gulch Master Plan (2006)
- Civic Auditorium - Concept Design Study (2012) and Business Planning Study (2015)
- Cowell and Main Beach Management Plan (2014)
- DeLaveaga Golf Course Master Plan (2002)
- DeLaveaga Park Master Plan (1960)
- Depot Park Master Plan (2001)
- Jessie Street Marsh Management Plan (1998)
- Moore Creek Interim Management Plan (2002)
- Neary Lagoon Management Plan (1992)
- Pogonip Clubhouse Rehabilitation Plan (2002)
- Pogonip Master Plan (1998)
- San Lorenzo Urban River Plan (2003)
- Santa Cruz Wharf Master Plan (2014)

The City has also adopted many plans to help guide the overall direction on community-wide level improvements that also helped inform this document. These plans include:

- Active Transportation Plan (2017)
- Arts Master Plan (2008)
- City-wide Creeks and Wetlands Management Plan (2008)
- Climate Action Plan and Climate Adaptation Plan (Currently being updated)
- Local Coastal Program (Currently being updated)

See Appendix 5.1 for links to view the full text of these existing plans, as well as summaries of other important documents that have provided background and context into the Parks Master Plan 2030 process.

SECTION 2.2: HISTORY & INTRODUCTION

A. A Recreational Lifestyle
B. Honoring Our Heritage

"The most rewarding use of life is to spend it for something that outlasts it!"

– Harvey West

A. A RECREATIONAL LIFESTYLE

Santa Cruz's temperate climate, location, scenic beauty, and diverse landscapes combine to create a unique and favorable recreational destination and support an active lifestyle. Santa Cruz and the surrounding region provide a broad range of recreational activities and natural treasures for residents and visitors to explore and enjoy.

THE COASTLINE:

Located at the northern tip of Monterey Bay, Santa Cruz is known for surf and beach play. The large sandy beaches of Cowell and Main Beach are popular to sunbathe, swim, play beach volleyball and other beach activities. These beaches host a variety of public and private programs and events such as the Junior Lifeguard Program, volleyball tournaments, concert performances, movies on the beach, and an occasional fireworks show. The Santa Cruz Wharf is located between Main and Cowell Beaches. The pier, spanning a half-mile in length, is the longest timber pile-supported pier structure in the United States. Visitors to the beaches and wharf can shop, dine, rent kayaks, fish, or view wildlife. Along the northern edge of Main Beach, the Santa Cruz Seaside Company's Beach Boardwalk amusement park features rides and games including the historic, wooden Giant Dipper roller coaster.

The coastal bluffs along West Cliff Drive are an additional feature, attracting visitors with coastal views and providing opportunities to walk, run, bicycle, watch wildlife, as well as access to beaches and surf breaks. Along this corridor resides Lighthouse Field and Natural Bridges State

Parks, managed by the California Department of Parks and Recreation. Natural Bridges State Park is an exceptional location to view large populations of Monarch Butterflies overwintering during the fall.

Santa Cruz is renowned for surfing, its numerous breaks are designated as a World Surfing Reserve. Surfing was introduced to Santa Cruz in 1885 by three Hawaiian princes, who surfed at the San Lorenzo River mouth. It is the first recorded board surfing in North and South America. Along West Cliff Drive, the Mark Abbott Memorial Lighthouse houses the Santa Cruz Surfing Museum and a Surfer Statue pays tribute to the sport. The museum is located on Lighthouse Point and contains interesting artifacts tracing more than 100 years of surfing in Santa Cruz. Lighthouse Point overlooks the world famous surf break, Steamer Lane, where spectators line the cliffs above the surf break to spectate. It is no wonder why most regard Santa Cruz as the "real surf city."

Steamer Lane

Additional resources along the City's coastline include the Santa Cruz Harbor Port District's Santa Cruz Harbor and the adjacent Seabright and Twin Lakes State Beaches. The Santa Cruz Harbor provides a boat launch ramp for recreational boating in addition to fishing, paddle boarding and kayaking rentals and other recreational opportunities.

THE GREENBELT:

Moore Creek Preserve

Beyond the coastline lay many scenic, natural environments to wander and admire. The City's Neary Lagoon Wildlife Refuge has a floating pathway which allows access across the lagoon. It is a respite of nature surrounded by urban development, where visitors can peacefully watch birds, turtles, and fish.

Arana Gulch Open Space features woodlands, creeks, and grasslands. Bluffs and bridges offer elevated perspectives of the creeks and surrounding natural features. Cattle graze the property seasonally to help restore the endangered Santa Cruz tarplant.

Pogonip Open Space contains natural habitat for a large variety of plants and animals. Trails pass through grasslands and forests and by creeks, former limestone quarries, and the historic Pogonip Clubhouse. The Emma McCrary trail is a relatively new addition and provides multi-use

access from the City to a regional network linking the City's Harvey West Park to the State's Henry Cowell and Wilder Ranch State Parks and UC Santa Cruz's wilderness areas.

The trails in Moore Creek Preserve wind through canyons, forests, and grasslands and provide views to the Pacific Ocean. Cattle graze the coastal prairie areas to help restore native plants and local species such as the Ohlone tiger beetle and San Francisco popcorn flower.

PARKS AND RECREATIONAL FACILITIES:

The City provides a variety of traditional park facilities including group picnic areas, a swimming pool, sports fields, basketball and tennis courts, playgrounds, community gardens, off-leash dog use areas, a golf course, and horseshoe pits. Throughout the years, the City has embraced new trends in recreation and the range of recreational facilities reflects the diversity of interests within the community. Sergeant Derby and Frederick Street parks were among the first public skate parks in the world, and the more recent addition of Ken Wormhoudt Skate Park has gained national recognition. Located in DeLaveaga Park, Santa Cruz Archery Range is an indoor and outdoor archery range and DeLaveaga Disc Golf Course is a 29 hole disc golf course that has hosted world championships. The San Lorenzo Park Lawn Bowling facility maintains a nearly perfectly flat artificial turf surface to meet playing standards. The Bicycle Trip Bike Park is the only ramped bike park of its kind in the area. The Main Beach volleyball courts allow for both pick-up games and tournaments. More recent recreational facility additions to accommodate emerging trends and desires have included pump tracks, pickelball courts, outdoor exercise equipment, bocce ball courts, and new multi-use trails.

Ken Wormhoudt Skate Park

COMMUNITY FACILITIES:

The City's community facilities provide programs and services. The 20,000 square foot Louden Nelson Community Center hosts Santa Cruz's teen center, community rooms for rent and programming, and an indoor auditorium and stage. The Civic Auditorium is a 34,000 square foot space which accommodates large gatherings, concerts, and sporting events.

Smaller community centers and facilities are leased out to separate non-profit providers to offer services. Senior Citizens Opportunity provides services and programming for seniors at 222 Market Street. At the Beach Flats Community Center, Community Bridges offers programs and

services for summer recreation, environmental education, application assistance, after school programs, advocacy, parent education, and food and nutrition. The Santa Cruz Museum of Natural History provides services, events, programs, exhibits, and other educational tools to inspire stewardship and connect people to nature and history at the Museum of Natural History. The City recently worked with Santa Cruz Shakespeare to locate a new outdoor amphitheater to hold summer performances in DeLaveaga Park.

Louden Nelson Community Center

TRAILS:

The City's 35 mile network of trails allow for hiking, biking, dog walking, and horseback riding. Many provide access through designated open spaces or along the coastline, and others provide linkages across the City to a regional network. Significant trails in the City include the Santa Cruz Riverwalk, an important north-south connector along the San Lorenzo River, and the Monterey Bay Sanctuary Scenic Trail which will soon cross through the City, connecting Davenport to Monterey.

Santa Cruz Riverwalk

B. HONORING OUR HERITAGE

The City of Santa Cruz General Plan 2030, the guiding document for the City, establishes a vision for the future.

"Surrounded by the greenbelt and the Pacific Ocean, Santa Cruz is a compact vibrant city that preserves the diversity and quality of its natural and built environments, creates a satisfying quality of life for its diverse population and workers, and attracts visitors from around the world".

The *Santa Cruz Parks Master Plan 2030* (Parks Master Plan 2030) will help achieve this vision and continue the traditions of efforts that led to the parks system we have today. The history of the parks system reflects a community that deeply cares about providing and preserving the quality and diversity of the recreational, natural, and urban environments. The following timeline highlights some of the milestones of the City's park system:

Santa Cruz Wharf and Cowell and Main Beaches

City incorporates.
1866

Jose De Laveaga leaves his 560 acre estate to the City and County for parkland. The City now owns more than 500 acres.
1894

The City forms a seven member recreation commission to guide recreation programs.
1944

Early programs concentrated on athletic skills development such as softball and swimming.
1946

A Workreation Program, modeled after similar programs in Oakland and Berkeley, was developed. It gave local youths job experience part of the day and supervised recreational activities for the remainder. The City continues to provide a Youth Trails Program where youths can gain work experience maintaining the parks.
1956

1885
Surfing introduced to Santa Cruz by three Hawaiian Princes.

1876
The City's first charter establishes the Streets and Parks Department as one of the five departments governed by a Mayor and a four member Common Council.

1904
Laura Hecox, a naturalist and collector, deeds her collection of seashells, minerals, fossils, Native American artifacts, and other specimens to the City of Santa Cruz to establish a museum which opened in 1905. The museum moved to the Seabright Branch Library building in 1954. In 2009, the City's non-profit partner, Santa Cruz Museum of Natural History, took over operations to avert closure due to lack of funding.

1914
The Santa Cruz Wharf was constructed for cargo handling and shipping and would later shift towards commercial fishing. In the 1950s, it started to become more commercially oriented and was expanded for commercial uses and parking.

1940
The Civic Auditorium was constructed with assistance from the Federal Works Progress Administration.

1948
Interest in recreation renewed after World War II and recreation would be integrated into the new City Charter and the Parks and Recreation Department was formed. The charter established the Council/Manager form of government, with a Mayor and six Councilmembers setting policy for the City and a City Manager to administer.

1957
Philanthropist Harvey West donates Harvey West Park to the City. Harvey West continued to supply lumber for park facilities and the bathhouse facilities for the original Harvey West Pool. The pool was constructed in 1959. He played a key role in the pool itself. He also purchased the Wagner Grove area for the City, and helped acquire the Southern Pacific steam engine.

1958
A levee is constructed along San Lorenzo River to mitigate flooding. Efforts in the late 80s and late 90s helped guide restoration, flood control, and public access improvements along the levee. In 2003, the San Lorenzo Urban River Plan updated the plans and includes recommendations for habitat, safety, and aesthetics.

1915 — Picnicking in DeLaveaga Park, Source of Information, Museum of Natural History.

Circa 1920s or 30s — Main Beach.

1960s

1964 — San Lorenzo Park opens.

1965 — The parents of Mark Abbott donated $20,000 to help construct the Mark Abbott Memorial Lighthouse. In 1986, the lighthouse became the location for the Surfing Museum.

1967 — Neary Lagoon is purchased by the City. Recreation facilities were developed gradually between 1975 and 1986.

1963 — "Serpent" at San Lorenzo Park.

1970s

1970 — The DeLaveaga Golf Course is constructed.

1971 — Garfield Park opens.

1973 — Grant Park opens.

1976 — Frederick Street Park opens.

1976 — John D. Franks Park is leased to the City without charge by the Franks family to provide park space in an underserved neighborhood. The City purchased the property from the Frank family in 1993.

1976 — Star of the Sea Park is dedicated.

1978 — Louden Nelson Community Center opens in the building previously used as an elementary school. The center was first known as the Laurel Community Center and was changed to honor Louden Nelson, a former slave who lived in Santa Cruz in the 1850s. Around the time of his death, Nelson owned land near the school and made an oral will leaving his estate to the school district of which the elementary school was a part of.

1978 — Bethany Curve Greenbelt was constructed.

1979 — Community interest grew to create greenbelt preserves and open spaces during the 1970s. In 1979, Measure O passed which identified specific open space properties to preserve.

1979 — Derby Park dedication (renamed to Sgt. Derby Park in 2014)

1980s

1980 — Ocean View Park is constructed.

1982 — Trescony Park is constructed.

1982 — Beach Flats Park is constructed.

1983 — University Terrace Park opens.

1984 — DeLaveaga Disc Golf course opens.

1988 — Pogonip Open Space is purchased.

1990s to Present

1993 — Beach Flats Community Center is constructed.

1994 — City purchases Arana Gulch Open Space.

1996 — Jessie Street Marsh is purchased.

1998 — The City acquires Moore Creek Preserve.

1999 — Lighthouse Avenue Park is constructed.

2003 — La Barranca Park is constructed.

2005 — Depot Park opens.

2007 — Ken Wormhoudt Skatepark opens.

2014 — Riverside Gardens Park is constructed.

2016 — Audrey Stanley Grove opens.

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SECTION 2.3: COMMUNITY PROFILE

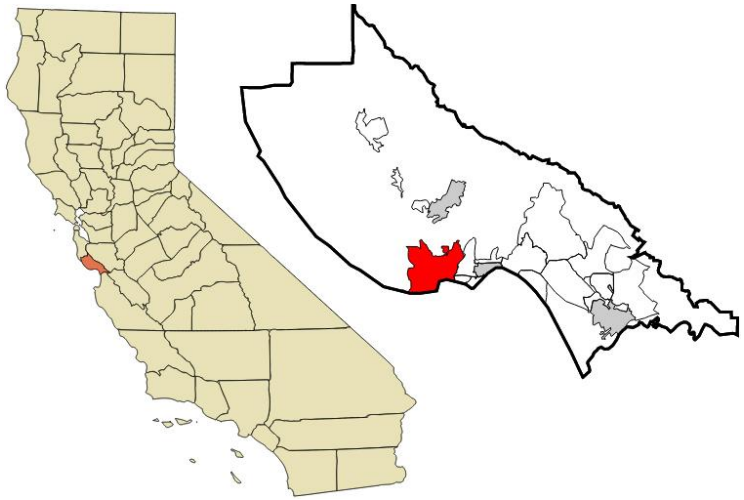
A. Location, Geography, and Climate
B. Demographics
C. Community Profile Summary

A. LOCATION, GEOGRAPHY, AND CLIMATE

The City's location, geography, and climate provide for a wide-range of outdoor recreational opportunities, not only within the City limits, but throughout the region. The City has a strong sense of physical identity because of its four miles of beautiful Monterey Bay coastline, and well defined natural features and open spaces along the City's edges. Its mild coastal Mediterranean climate contributes to the popularity of year round recreation.

LOCATION

Surrounded by the Santa Cruz Mountains, the City is on the northern edge of the Monterey Bay. The City is roughly 15.8 square miles in area, of which 12.7 square miles is land and 3.1 square miles is water. Part of Santa Cruz County, the City is approximately 32 miles south of San Jose and 75 miles south of San Francisco.



GEOGRAPHY

The geography of the City is split between the coastal plain and the slopes of the foothills and mountains. Divided by several rivers and streams, the coastal plain gently slopes toward the Bay and its beaches. The northern part of the City rises up into foothills along the edge of the Santa Cruz Mountains. The bay and mountains are natural boundaries which give Santa Cruz a strong physical identity.

CLIMATE

Santa Cruz has a Mediterranean climate influenced by its coastal location. According to the National Weather Service, temperatures are mild with monthly averages of highs ranging from 76 in the summer to 62 in the winter, and lows from 41 in the winter to 54 in the summer. Coastal fog, contributing to the mild summer climate, is common during morning and night hours in the summer. Rain occurs primarily during the months of November through March.

B. DEMOGRAPHICS

The following demographic figures are based on the 2010 Census and the US Census American Community Survey 2010-2014 projections.[1]

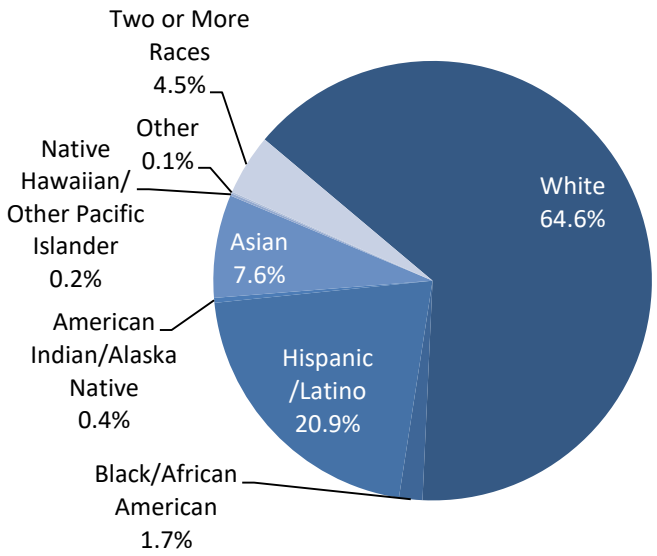
POPULATION

The City of Santa Cruz has a population of 63,364 (2014 US Census Bureau estimate). The population for Santa Cruz is higher in 2014 than that of 63,265 projected for 2020 in the Association of Monterey Bay Area Governments Monterey Bay Area 2008 forecast, indicating a strong growth pattern. In the 2010 Census, the City had a population of 59,948, showing a growth rate of 7.1% between 2010 and 2014.

RACE

The City of Santa Cruz is predominantly White and Hispanic. The chart below shows the racial distribution within the City.

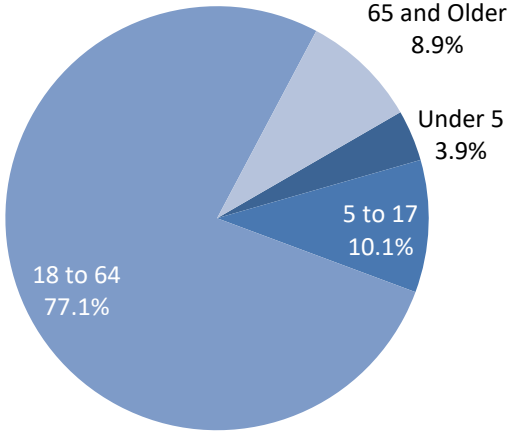
Racial Distribution in Santa Cruz



AGE DISTRIBUTION

According to the 2014 Census, at 77.1%, the majority of the population was between 18 and 64 years of age. The populations both under 18 and over 65 were significantly lower than the State-wide population averages at 13.7% and 8.8%, respectively. According to the census, the California population under 18 was 23.6% and the population over 65 was 12.9%. The senior population is expected to grow steadily. This existing and future distribution potentially influences the demand for active recreation in Santa Cruz.

Age Distribution in Santa Cruz



The City of Santa Cruz is home to the University of California, Santa Cruz. The three quarter average enrollment for the 2016-2017 year was 18,063 students. [2] The portion of this student population that declared Santa Cruz as their primary residence is included in the population data above, which may account for some of the skew in age distribution. Students do use City facilities and therefore should be considered in the needs assessment. This was particularly true during the recent drought conditions when the University stopped watering their sports fields. As a result, casual University sport groups used City sports fields.

POVERTY LEVEL

In 2014, 24.3% of the Santa Cruz population fell below the poverty level. This is higher than the overall California poverty level of 16.4%. This may impact the ability of certain persons to pay fees for recreation. Santa Cruz's large student population could impact poverty rates, as students living in non-campus housing are included in a census. Looking closely at the Census, the rates are highest for men and women age 18-24 in Santa Cruz which would include the student population.

DISABILITIES

The 2014 Census lists 9.2% of the population under 65 as having a disability and a total of 4,721 persons with disabilities. According to the website Local Disability Data for Planners', within the County of Santa Cruz, 11.6% of the population between the ages of 5 to 64 has a disability.[3] Neither the census or Local Disability Data for Planners' website gives statistics for persons below 5 or over 65, which would considerably raise these percentages. These statistics indicate a need for accommodation in park facilities and recreation programs for persons with physical and mental challenges.

TOURISM

One major influence on recreation in Santa Cruz is the large number of visitors to Santa Cruz. According to the Visit Santa Cruz County (VSCC) tourism board website, "Tourism ranks, alongside agriculture, as one of the top employers and revenue-producing industries in Santa Cruz County, generating over $700 million in direct travel expenditures annually. There are approximately 3 million visitor trips taken to Santa Cruz County each year."[4] In an intercept survey conducted by the VSCC, top activities of visitors included going to the beach, visiting attractions such as the Boardwalk and Wharf, exploring the area, and shopping. The high impact of visitors on recreation should be considered in recreation planning.

TRANSPORTATION

The City of Santa Cruz has high percentages of its population that commute by walking and bicycling. According to the American Community Survey, Journey to Work data 2010 - 2014, 9.9% of the population walked and 9.7% bicycled as compared to the state averages of 2.7% and 1.1% respectively. This indicates a need and high demand beyond recreation for pedestrian and bike routes and trails.

COMMUNITY WELL-BEING

According to the 2016 Community Well-Being Rankings, a report produced through Gallup-Healthways, Santa Cruz is highly ranked in the overall well-being of its community members.[5] The report assesses the following elements as indicators of well-being: purpose, social, financial, community, and physical. In the assessment, Santa Cruz ranked 3rd out of 189 communities evaluated in the United States revealing a high level of satisfaction with the City's quality of life.

C. COMMUNITY PROFILE SUMMARY

The City of Santa Cruz's location, climate and geography contribute to its recreation diversity and abundance. The population of the city is relatively young, most likely in part due to the adjacent university and the attraction of the outstanding access to outdoor recreation. Tourists are major users of Santa Cruz parks and beaches. Recreation programming and facility development will need to consider this community profile, while accommodating all age groups and abilities. When setting fees for recreation programs, consideration must be given to the large segment of the population that is below the poverty level.

REFERENCES

[1] United States Census Bureau, Quick Facts. Retrieved from http://www.census.gov/quickfacts/table/PST045215/0669112
[2] University of California Santa Cruz, Facts and Figures. Retrieved from https://www.ucsc.edu/about/facts-figures.html.
[3] Local Disability Data for Planners: A Planning Resource for County and State Data. Retrieved from http://disabilityplanningdata.com
[4] Visit Santa Cruz County, Tourism Facts. Retrieved from http://www.santacruzca.org/partners/tourism-facts.php
[5] State of American Well-Being: 2016 Community Well-Being Rankings. Retrieved from http://www.well-beingindex.com/2016-community-rankings

SECTION 2.4: EXISTING CONDITIONS

A. Parkland and Facility Inventory
B. Other Community Recreation and Facility Service Providers
C. Level of Service Assessment
D. Benchmarking Comparison of Similar Cities
E. Condition of Parks and Recreation Facilities
F. Safety and Security
G. Organizational Structure and Roles
H. Existing Parks Master Plans
I. Natural Resources

The City's Parks System covers more than 1,700 acres of parks, open spaces, beaches and recreational facilities. This section includes a review of the quantity, type, condition, level of service, access, and quality of the overall parks system. More information on each asset is provided in Section 4.2 Asset Inventory & Specific Recommendations.

A. PARKLAND AND FACILITY INVENTORY

The parks system is comprised of neighborhood parks, community parks, regional parks, open spaces, beaches and recreational facilities. The parks system offers a variety of recreational opportunities. Many recreational facilities are located within individual parks and open spaces and some stand alone. This section describes the types of parkland and recreational facilities that are provided in each area.

NEIGHBORHOOD PARKS

Neighborhood parks serve the recreational needs of those living or working within a service radius of one-half mile. They provide recreational facilities such as children's play areas, picnic areas, athletic fields, and outdoor basketball courts. The City's standard is to provide neighborhood parks at a ratio of 2.0 acres per 1,000 people. The City does not currently differentiate neighborhood parks from mini parks. Some communities account for parks smaller than 2 acres in size as a mini park. Smaller parks often provide less recreational opportunities for the surrounding neighborhood and the distinction helps in determining an adequate level of service.

Neary Lagoon Wildlife Refuge

Neary Lagoon Park and Chestnut Park have previously been accounted for as open space as part of the Neary Lagoon Wildlife Refuge. These parks provide neighborhood-serving facilities such as playgrounds, a basketball court, picnic tables, and tennis courts. These recreational facilities are more accurately described as neighborhood park space and have been listed as neighborhood parks in the inventory.

Neighborhood parks that have very limited recreational use such as Rincon Park, Scope Park, Town Clock Park, and El Portal Park are included in the neighborhood park inventory because they contain art, pathways,

landscaping treatments, monuments, or other features that provide a recreation benefit, although limited, to employees and residents.

School facilities are not included under neighborhood parks. School lands have been an important park resource for communities for the provision of park and recreational facilities during schools' off-hours. The use of school lands for public recreation can be an important resource to meet community needs given their size, distribution, seasonal and daily non-use periods, and proximity to neighborhoods. However, issues such as safety, liability, maintenance costs, enforcement, and vandalism have caused many schools to close or offer limited access during off-hours. The City's current reciprocal joint-use agreement with Santa Cruz City Schools is more specifically tailored for facility use and scheduled programming. The joint-use agreements could be updated and the acreage could be added to neighborhood parks at a future time.

The City leases underutilized land from private property owners to provide neighborhood park space at Beach Flats Community Garden and the Westside Pump Track. The leases are currently short-term. Therefore, the acreage has not been added to the total park acreage.

The City has 32 neighborhood parks (49 acres):

- Beach Flats Park (0.22 acres)
- Bethany Curve (3.4 acres)
- Branciforte Dog Park (0.22 acres)
- Central Park (0.16 acres)
- Chestnut Park (0.28 acres)
- El Portal Park (0.21 acres)
- Frederick Street Park (3.97 acres)
- Garfield Park (1.78 acres)
- Grant Park (2.36 acres)
- John D Franks Park (0.48 acres)
- La Barranca Park (2.26 acres)
- Laurel Park (1.77 acres)
- Lighthouse Avenue Park (0.35 acres)
- Mimi de Marta Dog Park(0.5 acres)
- Mission Plaza (0.94 acres)
- Moore Creek Overlook (0.12 acres)
- Neary Lagoon Park (1.27 acres)
- Ocean View Park (3.06 acres)
- Pacheco Dog Park (0.45 acres)
- Poets Park (0.13 acres) and Beach Flats Community Garden (Leased)
- Rincon Park (0.06 acres)
- Riverside Gardens Park (0.52 acres)
- Round Tree Park (0.28 acres)
- Scope Park (0.1 acres)
- Sgt. Derby Park (3.65 acres)
- Star of the Sea Park (2.1 acres)
- Town Clock (0.19 acres)
- Trescony Park (2 acres)
- Tyrrell Park (1.2 acres)
- University Terrace Park (8.7 acres)
- Westlake Park (6.03)
- Westside Pump Track (Leased)

Westlake Park

Table 2.4-1 below indicates facilities available in the parks system.

Table 2.4-1 Recreational Facilities by Location

General Recreational Facilities by Location	Baseball/Softball Field	Basketball Court	Bike Park	Bocce Courts	Community Gardens	Disc Golf	Exercise Equipment	Horseshoe Pits	Off-leash Dog Run	Pickleball Court	Playground/Play Equipment	Pump Track	Reservable Picnic Areas	Roller Hockey	Sand Volleyball Court	Skate Park	Soccer	Table Tennis	Tennis Court	Tot Lot Playground
Beach Flats Park											1									1
Branciforte Dog Park									1 (fenced)											
Central Park											1									
Chestnut Park		0.5									1									
Cowell Beach															2					
Depot Park/Bicycle Trip Bike Park /Scott Kennedy Fields			1								1						1 adult or 2 youth practice			
Frederick Street Park									1 (fenced)		1				1	1 (small)				1
Garfield Park		1									1							2		1
Grant Park	1 diamond field	1		1					1 (fenced)		1									1
Harvey West Park	6 baseball			2			1	2			1	1	9 (7 > 50 capacity)		1		2 (outfield of baseball fields)			1
John D. Franks Park							1				1									
Ken Wormhoudt Skate Park at Mike Fox Park		0.5								3 (painted on multi-purpose area)				1		1				
Laurel Park		1								1 (painted on b-ball)	1							1		1
Lighthouse Avenue Park					1 (18 plots)						1									1

Table 2.4-1 Recreational Facilities by Location

General Recreational Facilities by Location	Baseball/Softball Field	Basketball Court	Bike Park	Bocce Courts	Community Gardens	Disc Golf	Exercise Equipment	Horseshoe Pits	Off-leash Dog Run	Pickleball Court	Playground/Play Equipment	Pump Track	Reservable Picnic Areas	Roller Hockey	Sand Volleyball Court	Skate Park	Soccer	Table Tennis	Tennis Court	Tot Lot Playground
Lower DeLaveaga Park and George Washington Grove	2 softball			2				2			1		7 (5 > 50 capacity)		1					
Main Beach															16					
Mimi De Marta Park									1 (fenced)											
Mitchells Cove									1 (hour limitations on beach)											
Neary Lagoon Park											1								2	
Ocean View Park		0.5							1 (open, non-fenced)		1									1
Pacheco Dog Park									1 (fenced)											
Poets Park and Beach Flats Community Garden					2 (32 plots)						1									
Westside Pump Track												1								
Riverside Gardens					1 (11 plots)		1				1									
San Lorenzo Park						9 holes					1	1 (fiberglass)								1
Santa Cruz Riverwalk							2													
Sgt. Derby Park						3 holes				6 (painted on tennis courts)	1					1			2	
Trescony Park					1 (54 plots)						1									1

Table 2.4-1 Recreational Facilities by Location

General Recreational Facilities by Location	Baseball/Softball Field	Basketball Court	Bike Park	Bocce Courts	Community Gardens	Disc Golf	Exercise Equipment	Horseshoe Pits	Off-leash Dog Run	Pickleball Court	Playground/Play Equipment	Pump Track	Reservable Picnic Areas	Roller Hockey	Sand Volleyball Court	Skate Park	Soccer	Table Tennis	Tennis Court	Tot Lot Playground
Tyrrell Park																				
University Terrace Park		1							1 (Fenced-in)		1								2	
Westlake Park											1									1
West Cliff							1													
Total	**8**	**5.5**	**1**	**5**	**5 (115 plots)**	**2**	**6**	**4**	**8**	**10**	**21**	**3**	**16**	**1**	**21**	**3**	**3**	**3**	**6**	**11**

COMMUNITY PARKS

Community parks are designed to serve the entire community. They are generally larger than neighborhood parks and offer unique facilities such as larger picnic areas, swimming pools, ball fields, tennis courts, and recreation centers. They also host larger community events and recreation facilities. The City's standard for community parks is 2.5 acres per 1,000 people, with a service radius of 1.5 miles. The City currently has six community parks (181 acres).

- DeLaveaga Park - Lower DeLaveaga Park, George Washington Park, Audrey Stanley Grove, DeLaveaga Disc Golf Course, and DeLaveaga Archery Range (100 acres)
- Depot Park, Bicycle Trip Bike Park, & Scott Kennedy Fields (9 acres)
- Harvey West Park (44.77 acres)
- Ken Wormhoudt Skate Park at Mike Fox Park (1.25 acres)
- San Lorenzo Park (11.12 acres)
- West Cliff (14.64 acres)

San Lorenzo Park

REGIONAL PARKS

Regional parks serve the recreational needs of a regional population and are 150 acres in size or larger. They offer active and passive recreation with activities and amenities not found in neighborhood and community parks, such as large areas of open space, large picnic facilities, golf courses, lake boating, ball fields, and multi-use trails. An accepted national standard for regional parks is 20 acres per 1,000 people.

DeLaveaga Park could be categorized as a Regional Park because it is greater than 150 acres in size and includes active and passive recreation activities that serve the region. However, many of the activities that are provided can also be described under Community Parks because they serve the entire community and are similar in scale to other community park uses. Additionally, much of the area within DeLaveaga Park is wilderness area with steep slopes and sensitive habitat which will not be developed with regional serving facilities. Therefore, DeLaveaga Park has multiple functions that are reflected in the inventory in different categories. At 151 acres, the Golf Course has been categorized under Regional Park. Lower DeLaveaga Park, George Washington Park, Audrey Stanley Grove, DeLaveaga Archery Range, and DeLaveaga Disc Golf Course have been categorized under Community Park space. The remainder of land in DeLaveaga Park is listed under Open Space.

DeLaveaga Golf Course

OPEN SPACES

Open spaces are natural areas that provide valuable wildlife habitats, scenic and recreational enjoyment, and an escape from the built environment. Open space lands are essentially unimproved and devoted to an open space use for the purposes of natural resource preservation, outdoor recreation, and public health and safety. The beauty of these areas compels resident and visitor uses such as walking, jogging, hiking, bird watching, and relaxing. Multi-use trails also provide mountain biking and horseback riding opportunities in DeLaveaga Park Wilderness Area and Pogonip Open Space, and a paved multi-use path enables bicyclists to access and pass through Arana Gulch Open Space. The City's parks system includes seven open spaces (1,315 acres):

- Arana Gulch Open Space (67.7 acres)
- Arroyo Seco Canyon (33.94 acres)
- DeLaveaga Park Wilderness Area (269 acres)
- Jessie Street Marsh (3.2 acres)
- Moore Creek Preserve (263.75acres)
- Neary Lagoon Wildlife Refuge (37 acres)
- Pogonip Open Space (640 acres)

Moore Creek Preserve

BEACHES

The parks system includes four primary beaches (33 acres):

- Its Beach (approximately 1.5 acre portion, the remainder is owned by the California Department of Parks and Recreation)
- Cowell Beach (5 acres)
- Mitchell's Cove (0.4 acres)
- Main Beach (26 acres)

Its Beach

COMMUNITY, RECREATIONAL, AND CULTURAL FACILITIES

Community, Recreational, and Cultural Facilities are buildings and other, larger facilities that serve the specific recreational needs and interests of individuals, neighborhoods, groups, and the community. Recreational facilities are located throughout the park system and differ in scale, function, operations, and primary use. Some facilities (like the Civic Auditorium) are freestanding; others are located in parks. Community, Recreational and Cultural Facilities are shown in Table 2.4-2.

Louden Nelson Community Center

Harvey West Clubhouse

Table 2.4-2 Community, Recreational & Cultural Facilities

Community, Recreational, and Cultural Facilities	Address	Operations of City-Owned Community Recreational Facilities	Features
Beach Flats Community Center	131 Leibrandt St	The facility is operated by Community Bridges.	2,742 sq. ft. community center with a community room, computer lab, classroom, and kitchen.
Carmelita Cottages	321 Main St	Leased to Santa Cruz Hostel Society until 2021.	Youth Hostel.
Civic Auditorium	307 Church St	Operated by the Parks and Recreation Department.	Multi-purpose auditorium (34,739 sq. ft.) with stage and seating for total capacity of 2,021. Used for concerts, sporting events, expos, theatrical performances, movie screenings, conferences, and receptions.
DeLaveaga Park - Audrey Stanley Grove	501 Upper Park Rd	Leased to SC Shakespeare for summer performances during July and August. Contract needs to be extended in 2018. Rented for private use in September and October.	Outdoor amphitheater, tech booth, ticket office, parking area for performances. 496 seats.
DeLaveaga Park - DeLaveaga Archery Range	DeLaveaga Park -- Access from Brookwood Dr entrance	Operated by the Santa Cruz Archery Club. Membership is necessary to use facilities.	Indoor and outdoor archery range.
DeLaveaga Park - DeLaveaga Disc Golf Course	Accessed from Upper Park Rd.	Operated by the DeLaveaga Disc Golf Club	29 hole disc golf course.
DeLaveaga Park - DeLaveaga Golf Course	401 Upper Park Rd	Maintained by the city. The Pro Shop, Golf Course, Driving Range, and Golf Course Lodge are operated by GSL, Inc.	18 hole golf course w/ double-deck driving range and clubhouse (5,500 sq. ft.). Disc golf basket sleeves have been added to facilitate disc golf play during certain times of the week.
Depot Park Freight Building	119 Center St	The Parks and Recreation Department rents the facility for private use and hosts programming.	Community Room (3,000 sq. ft.).
Harvey West Park - Kids Kottage and Wagner Cottage	275 Harvey West Blvd	Kids Kottage is leased to County Office of Education for an alternative education program during the school year. The Parks and Recreation Department operates camp programs during the remainder of the year. The department also operates summer camp programs in Wagner Cottage.	Kids Kottage (1,500 sq. ft.) Wagner Cottage (1,000 sq. ft.)
Harvey West Park - Harvey West Pool	275 Harvey West Blvd	The pool is leased to a concessionaire to run the facility. The concessionaire teaches swim lessons in the small pool from March through October. The large pool is open from June through August for open swim.	Pool house (3,450 sq. ft.), 25 meter long lap pool and a wading pool.

Table 2.4-2 Community, Recreational & Cultural Facilities

Community, Recreational, and Cultural Facilities	Address	Operations of City-Owned Community Recreational Facilities	Features
Harvey West Park - Harvey West Scout and Clubhouse	326 Evergreen St	The Parks and Recreation Department rents the facility for private use.	Clubhouse (3,500 sq. ft.).
Louden Nelson Community Center	301 Center St	Staffed and maintained by the Parks and Recreation Department and used for programming and private rentals.	Community Center (20,085 sq. ft.). Includes Teen Center, meeting and dance rooms, and an auditorium with theater seating and stage.
Museum of Natural History	1305 East Cliff Dr	Leased to Santa Cruz Museum of Natural History to provide services.	Natural History Museum (3,500 sq. ft.).
Pogonip Clubhouse	Pogonip Open Space	Currently closed.	Historic clubhouse currently closed due to poor condition of building (8,000 sq. ft.).
Santa Cruz Wharf	21 Municipal Wharf	Wharf operated by the Parks and Recreation Department. Retail and restaurant space leased to private businesses by the Economic Development Department.	Municipal wharf. Restaurants, retail, restaurants, fishing, boat rentals, and tours.
San Lorenzo Park Lawn Bowling	137 Dakota St	Operated by the Santa Cruz Lawn Bowling Club.	18,000 sq. ft. outdoor artificial turf lawn bowling area and 1,500 sq. ft. clubhouse.
Senior Citizen's Opportunity	222 Market St	Leased to Senior Citizens Opportunity to provide services.	Senior Center (5,437 sq. ft).
Surfing Museum	701 W. Cliff Dr	Operated by the Parks and Recreation Department.	Surfing Museum (630 sq. ft.).

TRAILS

Trails allow for a variety of forms of recreation. Not only are they located within parks and open spaces, but they also can serve as important links between parks, recreation facilities, and natural and urban areas. In total, the City provides nearly 35 miles of trails and more are planned. The Monterey Bay Sanctuary Scenic Trail Network is a paved multi-use trail project which will connect from Davenport to Monterey along the existing rail right-of-way. The Public Works Department is overseeing the segment through the city which will add 2.1 miles of paved, multi-use trails. The Public Works Department also recently oversaw the completion of a pedestrian/bicycle bridge crossing Branciforte Creek, which is the last segment along the Santa Cruz Riverwalk. Table 2.4-3 below lists the trails within the parks system.

Pogonip Open Space

Table 2.4-3 City of Santa Cruz Trails

Location	Existing Trail Name/Segment	Hiking (Miles)	Hiking, Biking, and Horses - Non-Paved (Miles)	Hiking and Biking - Paved (Miles)
Arana Gulch	Coastal Prairie Loop Trail	0.84		
	Marsh Vista Trail	0.12		
	Multi-Use Path from Arana Creek to Agnes Street and Broadway			0.73
Arroyo Seco	Arroyo Seco from Grandview to paved path		0.37	
	Paved path from bottom to Meder St			0.63
DeLaveaga Park	Branciforte Creek Trail		0.6	
	La Corona Trail		1	
	Park Way		0.3	
	Redwood Lower Loop		1	
	Upper DeLaveaga Loop Trail		1.5	
	Enchanted Trail		1	
	Old Vineyard Trail		0.7	
	Brookwood Trail			1
Harvey West	Dos Fuentes	0.18		
	Harvey West Trail	0.33		
	Stage Coach	0.22		
	Wagner Grove to Meadow Rd	0.24		
Jessie Street Marsh	Between E. Cliff St and Lemos Ave	0.15		
Moore Creek Preserve	Prairie View Trail	1.1		
	Costa Vista Trail	0.3		
	Terrace Loop Trail	0.4		
	Vernal Ridge Trail	0.3		
	East Meadow Trail	0.25		
	Moore Creek Trail	0.5		
Neary Lagoon	Trails and boardwalks	0.85		

Table 2.4-3 City of Santa Cruz Trails

Location	Existing Trail Name/Segment	Hiking (Miles)	Hiking, Biking, and Horses - Non-Paved (Miles)	Hiking and Biking - Paved (Miles)
Pogonip Open Space	Brayshaw Trail	0.5		
	Fern Trail	0.8		
	Limekiln Trail	0.3		
	Lower Meadow	0.4		
	Ohlone Trail	0.3		
	Prairie Trail	0.3		
	Rincon Trail	0.7		
	Spring Trail	1.6		
	Spring Box Trail	0.2		
	Harvey West Trail	0.3		
	Lookout Trail	0.5		
	Pognip Creek Nature Trail	1.2		
	Emma McCrary		1.93	
	Rincon Trail		0.2	
	Rincon Connector Trail		0.2	
	U-Con Trail		0.5	
Santa Cruz Riverwalk				3.56
West Cliff Dr. to E. Cliff Dr	Natural Bridges to E. Cliff Drive			3.5
Wharf	Walkway	1		
Other Key Connections:	Bay Street Walkway			0.33
	Branciforte Creek Path			1.21
	Evergreen to Potrero Street			0.36
	Mission Street Ext.			0.18
	West Cliff to Depot Park			0.25
Total Miles of Trails per Type		**13.88**	**9.3**	**11.75**
Total Miles of Trails All Types				**34.93**

SCHOOL FACILITIES

School facilities provide recreational opportunities during the school's non-programming times. The City has an overarching reciprocal joint-use agreement with Santa Cruz City schools as well as joint-use agreements for specific facilities. The facilities are primarily used by the Parks and Recreation Department to facilitate specific recreation and sports programming. Santa Cruz City Schools also has facilities available for rent for public use. These include multi-purpose rooms, gyms, locker rooms, swimming pools, stadiums, practice fields, baseball fields, tennis courts, and theaters:

- Bayview Elementary
- Branciforte (B40) Middle School
- Branciforte Small Schools
- DeLaveaga Elementary School
- Harbor High School
- Gault Elementary
- Mission Hill Middle School
- Formerly Natural Bridges Elementary (Not currently in use)
- Santa Cruz High School
- Westlake Elementary School

Santa Cruz High School

OTHER CITY RECREATIONAL AREAS AND FACILITIES

Other major City recreation destinations and facilities include:

- The San Lorenzo River is a major watercourse through the City and a major physical feature. The lower 2.5 miles are channelized for flood control. The Santa Cruz Riverwalk is a paved multi-use pathway along the levee. Many parks and facilities are located along the Santa Cruz Riverwalk, and, when considered together, they comprise a larger recreational corridor that provides access to a wide range of natural and developed recreational areas. This corridor contains San Lorenzo Park, Riverside Gardens Park, Ken Wormhoudt Skate Park at Mike Fox Park, Mimi De Marta Dog Park, Jessie Street Marsh, Ocean View Park, Main Beach, Kaiser Permanente Arena, and the Tannery Arts Center. The Riverwalk also connects to the Monterey Bay Sanctuary Scenic Trail and Branciforte Creek Trail. Most importantly, the river and surrounding vegetation provide natural habitat for wildlife. The San Lorenzo Urban River Plan (2003) guides future improvements and restoration efforts along the river. The plan recognizes that the river is a habitat area and a recreational area for the City.

- The Del Mar Theatre is located in Downtown Santa Cruz and is available for community use through the Economic Development Department during certain times of the year. The theater contains the 495-seat Grand Auditorium, and two smaller 140-seat theaters, and is equipped with state-of-the-art sound and projection facilities.

- The Tannery Arts Center was developed through a partnership between the City and Artspace Project. It is a world–class arts campus with 100 affordable housing live/work spaces. The campus includes the 200-seat indoor Colligan Theater which is run by the Jewel Theatre Company.

- Kaiser Permanente Arena is a temporary 2,500 seat indoor arena which is home to the Santa Cruz Warriors Development League basketball team. During their off-season, the facility can be used for tradeshows, conventions, meetings, and large scale events.

The Economic Development Department is conducting an Arena Market and Financial Feasibility Study to analyze market, location, size, operations, management, economic development benefits, and other factors for locating a permanent arena.

- The City's Water Department operates the Loch Lomond Recreation Area (LLRA) in Felton. Loch Lomond Reservoir's primary function is water storage for Santa Cruz residents. The LLRA provides a range of recreational opportunities including boat rentals, picnicking, fishing, hiking, and natural resources interpretive programming.
- Downtown Santa Cruz is the business and commercial center in Santa Cruz and has a semi-mall concept. The promenade contains benches, outdoor patio areas, and landscaping treatments. Abbott Square is an outdoor plaza, and the City, under the administration of the Economic Development Department, partnered with the Santa Cruz Museum of Art and History to create the inviting and interactive community gathering space.
- The City Hall Complex includes a rose garden and other landscaping treatments. The Parks and Recreation Department maintains the landscaping.
- The East Cliff Accent is a walkway connecting Seabright Avenue to 4th Avenue along the coastal bluff above Seabright State Beach. A stairway at 3rd Avenue provides access down to the beach. The Parks and Recreation Department primarily maintains the site furnishings, trash, and weeds. The Public Works Department recently completed a cliff stabilization project at Mariner Park Way.
- The City partnered with NOAA's Office of National Marine Sanctuary. NOAA leased City land for the construction of the 12,000 square foot Monterey Bay National Marine Sanctuary Exploration Center. One of the goals of the center is to educate visitors about the unique and fascinating coastal and marine environment. The center is located across Beach Street from the Santa Cruz Wharf which is the Gateway to the Monterey Bay National Marine Sanctuary.
- The City's paved pedestrian and trail network is primarily maintained by the Public Works Department. The Active Transportation Plan (2017) plans to further integrate the walkways and bikeways that connect the City's communities to employment, education, and recreation destinations.

Monterey Bay National Marine Sanctuary Exploration Center

OTHER PARK AND RECREATION DEPARTMENT ASSETS

In order to maintain and administer the many parks, open spaces, beaches, and community recreational facilities in the City, the Parks and Recreation Department has a variety of other administrative, maintenance, and storage facilities. These facilities primarily include the following:

- Parks and Recreation Administrative Building
- Wharf Headquarters
- Wharf Maintenance Yard (leased)
- Golf Course Maintenance Yard
- Parks Maintenance Yard
- Lower DeLaveaga Park Office
- Ranger Station at Harvey West Park
- Junior Lifeguard Storage Building at Cowell Beach

Park and Recreation Administration Building

B. OTHER COMMUNITY RECREATION AND FACILITY SERVICE PROVIDERS

Besides the various parks and facilities maintained by the City, there are numerous resource providers within the City and region. This section focuses on land and water used for recreation which is open or planned to be open for public access.

UNIVERSITY OF CALIFORNIA SANTA CRUZ

The university is a 2,020 acre campus, and approximately half of the campus is located within the city limits. The campus offers amenities for active and passive recreation on the main campus, while the north and upper campuses currently are undeveloped open space. The main campus and recreational facilities are open to the public during daylight hours for walking, bicycling and visiting campus facilities, such as the Arboretum and Chadwick Gardens. Trails are located throughout the campus and provide connections to Wilder Ranch State Park, Pogonip Open Space, and Henry Cowell State Park.

MONTEREY BAY NATIONAL MARINE SANCTUARY

Designated in 1992, the Monterey Bay National Marine Sanctuary is a federally protected marine area off of the California Central Coast. The shoreline length of 276 miles spans from Marin to the north, to Cambria to the south, and covers more than 6,094 miles of ocean. The sanctuary is very popular for kayaking, paddle boarding, boating, fishing, wildlife viewing, and other ocean-oriented recreational activities.

PARKS & OPEN SPACES

- Antonelli Pond: 13.7 acre park adjacent to Moore Creek on the Westside of Santa Cruz; comprised of a large man-made pond, riparian habitat, and grasslands; managed by the Land Trust of Santa Cruz County
- Bonny Doon Ecological Reserve: 552 acre natural preserve in the Santa Cruz Mountains protecting several rare and endangered plant and animal species
- Cotoni-Coast Dairies National Monument: Nearly 6,000 acres near Davenport that were recently designated a national monument in 2017
- Santa Cruz Harbor: The Santa Cruz Harbor offers scenic and wildlife viewing walks, kayaking and boating opportunities, and important connections between recreational destinations

COUNTY OF SANTA CRUZ PARKS NEAR SANTA CRUZ

- Hestwood Park
- Old Jail/ Octagon
- Santa Cruz Gardens Park
- Simpkins Family Swim Center
- Veterans Memorial Building
- Winkle Farm Park
- Brommer Street Park
- Coffee Lane Park
- Chanticleer Park
- Felt Street Park
- Floral Park

- Jose Avenue Park
- Moran Lake Park
- Twin Lakes Park

Simpkins Family Swim Center

STATE PARKS & BEACHES

- Big Basin Redwoods State Park: More than 18,000 acre park featuring 81 miles of trails, old-growth forest of coast redwoods, and the majority of the Waddell Creek watershed; California's oldest State Park, established in 1902
- Castle Rock State Park: 5,242 acre, largely forested park with 32 miles of trails and popular with rock climbers because of its steep canyons and unusual rock formations
- Castro Adobe State Historic Park: Historic building standing as one of the best examples of a preserved rancho hacienda in the Monterey Bay
- The Forest of Nisene Marks State Park: 10,223 acre park with 40 miles of trails through secondary growth redwood forest
- Henry Cowell Redwoods State Park: 4,623 acre park with 15 miles of trails through a variety of forested areas
- Lighthouse Field State Beach: 38 acre site within the City of Santa Cruz and overlooking the ocean and popular Steamer Lane surfing hotspot
- Manresa State Beach: 138 acre beach near Aptos
- Natural Bridges State Beach: 65 acre park which is very popular for its Monarch Butterfly Natural Preserve
- New Brighton State Beach: 95 acre park near Capitola and consisting of a beach and campgrounds
- Santa Cruz Mission State Historic Park: Located near Santa Cruz's Mission Plaza and featuring the only building remaining of the original mission, which now houses a museum
- Seacliff State Beach: Beach in Aptos, known primarily for the fishing pier and the concrete ship, the *SS Palo Alto*, located at the pier's end
- Sunset State Beach: 1.5 mile long beach near Watsonville and just south of Manresa State Beach
- Twin Lakes and Seabright State Beaches: Long stretches of sandy beaches on either side of the Santa Cruz Harbor
- Wilder Ranch State Park: Around 7,000 acre park with 34 miles of trails through coastal terraces and valleys

Seacliff and Rio del Mar State Beaches

C. LEVEL OF SERVICE ASSESSMENT

The supply of the City's parkland and recreational facilities was assessed considering how the City's existing park acreage compares with the City of Santa Cruz General Plan 2030's level of service goals as well as how the City's provision of recreation facilities compares to other California Central Coast cities. The Level of Service Assessment only considers parks, open spaces, beaches, and recreational facilities that each City owns.

LEVEL OF SERVICE

The City of Santa Cruz General Plan 2030 established level of service (LOS) goals for the City's neighborhood parks and community parks to ensure parkland is equitably distributed, accessible, and adequately supplied. The acreage per population goal is a common standard to help plan for the amount of park space a community aspires to meet. It can also be used to assess if parkland is equitably distributed by population and geography. The service radius goal helps ensure that parkland is accessible from where people live and work. The City's standard is to provide neighborhood parks at a ratio of 2.0 acres per 1,000 people, with a service radius of ½ mile. The City's goal for community parks is 2.5 acres per 1,000 people, with a service radius of 1.5 miles. LOS goals were not established for regional parks, open spaces, beaches, and facilities.

PARK ACREAGE

The City is currently underserved for neighborhood and community park space. To meet existing goals, a total of 67 acres of parks would need to be created to meet the forecasted population growth associated with the City of Santa Cruz General Plan 2030 growth estimates.

Table 2.4-4 Park Acreage per Population

Population and Level of Service Targets	Neighborhood Parks	Community Parks	Combined
Existing Population	63,364		
General Plan's Forecasted Population	65,884		
Existing Park Acreage	48.76	180.78	229.54
General Plan LOS Target	2 acres per 1,000 residents	2.5 acres per 1,000 residents	4.5 per 1,000 residents
2017 LOS Acreage Goal	126.73	158.41	285.14
2017 Acreage Deficiency (-) or Surplus (+)	-77.97	22.37	-55.60
2030 LOS Acreage Goal	131.77	164.71	296.48
2030 Acreage Deficiency (-) or Surplus (+)	-83.01	16.07	-66.94

PARK ACCESS

Most areas of the City have access to neighborhood park and community park space; however, there are still areas that are not as comprehensively served by all types of assets. Even if an area appears to be covered according to the radius thrown by a nearby park, some neighborhoods have limited access to parks because of barriers such as topography, waterways, or highways. Additionally, proximity of Community Parks needs to be considered, because they provide recreational amenities that serve the surrounding neighborhoods.

The City of Santa Cruz General Plan 2030's neighborhood park definition does not distinguish size. The City's standard in the General Plan 2030 is to provide neighborhood parks at a ratio of 2.0 acres per 1,000 people. Neighborhood parks are commonly considered greater than 1-2 acres in size. Parks less than 1-2 acres in size are often categorized as pocket parks or mini-parks. Due to the smaller size and often more limited recreational opportunity, mini-parks commonly have a ¼ mile service radius for access compared to the ½ mile in the City of Santa Cruz General Plan 2030 for neighborhood parks. This evaluation assumes that all neighborhood parks acreage serves the corresponding neighborhoods

regardless of size but will apply a ¼ mile service radius for neighborhood parks less than one acre in size.

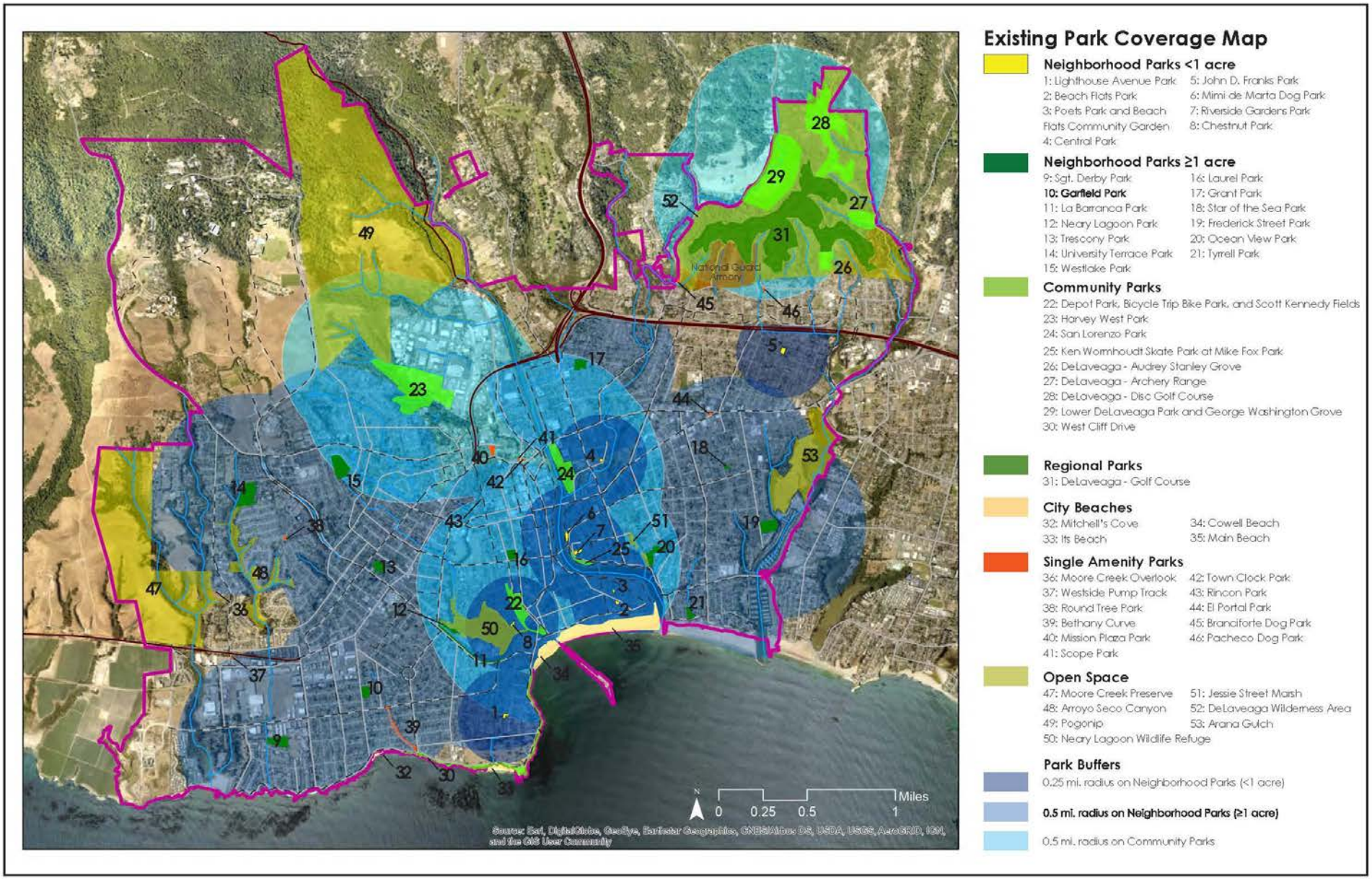
Community Parks provide recreational opportunities to surrounding neighborhoods. Applying a 1.5 mile radius from Community Parks shows that all neighborhoods in the City have access to Community Park space. Community Parks contain amenities that serve the surrounding neighborhoods. Therefore, to identify areas of the City that are underserved for access to any park space at a neighborhood-level, it is also important to consider areas that are neither located within a half-mile of a neighborhood park nor a community park, as these areas have less access to recreational amenities within a comfortable walking distance.

Harvey West Playground

Additionally, some neighborhood parks function as single-use facilities and do not provide a variety of recreational opportunities to serve the general population. Moore Creek Overlook, Westside Pump Track, Round Tree Park, Mission Plaza Park, Scope Park, Town Clock Park, Rincon Park, El Portal Park, Branciforte Dog Park, and Pacheco Dog Park serve very important roles in the parks system. However, they have not been included in the service mile radius due to their limited or specialized facilities. On the other hand, some single-use facilities are grouped with other nearby park assets and have been included in the service radius analysis. La Barranca Park and Mimi De Marta Dog Park are not considered single-use facilities because they are located within close proximity to other parks and serve a specific role in a broader mix of available uses.

The following exhibit, *Map A, Existing Park Coverage Map*, shows the access of residents to the parks, open spaces, and beaches owned by the City of Santa Cruz. The radii indicating walkable distances stop at major barriers such as freeways and rivers, when no pedestrian access across them is currently available. As shown in Map A, the areas with the most limited access opportunities include the portions of the Upper Eastside neighborhoods north of Soquel Avenue, the Carbonera Sphere neighborhood, and the areas on the west side near Shaffer Road and Grand View Street. Potential opportunities to improve access for the Upper Eastside include improving Joint Use Agreements with Santa Cruz City Schools and creating a small pocket park at the previous zoo site in DeLaveaga Park along Upper Park Road near the Pacheco Dog Park. For the west side areas near Shaffer Road and Grandview Street, the General Plan 2030 Goal LU1.1.4 describes that neighborhood parkland shall be considered on the 11-acre Swenson parcel during the planning process. The Carbonera Sphere neighborhood is more challenging given the lack of available land. Improvements could be explored to connect the neighborhood to Lower DeLaveaga Park if opportunities arise to work with adjacent property owners.

As Santa Cruz continues to grow, it will be necessary to evaluate park access and the corresponding wear and tear on existing facilities. If there is substantial growth in a specific neighborhood with limited park acreage or facilities, consideration should be given to providing additional neighborhood park amenities, either through expansion or rehabilitation of existing parks, or through purchase of new property.


Existing Park Coverage Map
Neighborhood Parks <1 acre
1: Lighthouse Avenue Park
2: Beach Flats Park
3: Poets Park and Beach Flats Community Garden
4: Central Park
5: John D. Franks Park
6: Mimi de Marta Dog Park
7: Riverside Gardens Park
8: Chestnut Park
Neighborhood Parks ≥1 acre
9: Sgt. Derby Park
10: Garfield Park
11: La Barranca Park
12: Neary Lagoon Park
13: Trescony Park
14: University Terrace Park
15: Westlake Park
16: Laurel Park
17: Grant Park
18: Star of the Sea Park
19: Frederick Street Park
20: Ocean View Park
21: Tyrrell Park
Community Parks
22: Depot Park, Bicycle Trip Bike Park, and Scott Kennedy Fields
23: Harvey West Park
24: San Lorenzo Park
25: Ken Wormhoudt Skate Park at Mike Fox Park
26: DeLaveaga - Audrey Stanley Grove
27: DeLaveaga - Archery Range
28: DeLaveaga - Disc Golf Course
29: Lower DeLaveaga Park and George Washington Grove
30: West Cliff Drive
Regional Parks
31: DeLaveaga - Golf Course
City Beaches
32: Mitchell's Cove
33: Its Beach
34: Cowell Beach
35: Main Beach
Single Amenity Parks
36: Moore Creek Overlook
37: Westside Pump Track
38: Round Tree Park
39: Bethany Curve
40: Mission Plaza Park
41: Scope Park
42: Town Clock Park
43: Rincon Park
44: El Portal Park
45: Branciforte Dog Park
46: Pacheco Dog Park
Open Space
47: Moore Creek Preserve
48: Arroyo Seco Canyon
49: Pogonip
50: Neary Lagoon Wildlife Refuge
51: Jessie Street Marsh
52: DeLaveaga Wilderness Area
53: Arana Gulch
Park Buffers
0.25 mi. radius on Neighborhood Parks (<1 acre)
0.5 mi. radius on Neighborhood Parks (≥1 acre)
0.5 mi. radius on Community Parks
National Guard Armory
N
0
0.25
0.5
1
Miles
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

D. BENCHMARKING COMPARISON OF SIMILAR CITIES

The National Recreation and Park Association recommends benchmarking to similar communities to help assess existing conditions in the evaluation of recreation goal setting for a community. There are currently no nationally accepted standards for determining levels of service for the variety of services that every parks system provides. Given that geography, climate, culture, demographics, and other characteristics vary widely nationally, a community must determine its own standards that are appropriate to meet their own local needs. Each community must establish standards that are relevant to its community. Benchmarking is useful because communities with similar characteristics can be compared to help evaluate how the City is performing in relation to them.

The Santa Cruz Parks System is unique for a number of factors and no City offers a perfect comparison. Watsonville, Monterey, San Luis Obispo, Santa Barbara, and Ventura were chosen for comparison because they are located in the California Central Coast region. All have favorable cool-summer or warm-summer Mediterranean climates for recreation. Santa Cruz, Watsonville and Monterey are located in the Monterey Bay region. Like Santa Cruz, Santa Barbara's and San Luis Obispo's top employers are universities. Santa Barbara, San Luis Obispo, and Ventura are also similar to Santa Cruz in that they are the county seat. San Luis Obispo has a large number of open spaces, while Monterey, Santa Barbara, and Ventura manage larger coastlines in addition to open spaces. There is no doubt that there are many differences between the communities. However, when considered together, Santa Cruz is near the average level of population size, median income, age demographics, square miles of City, population density per square miles, and funds allocated to provide Parks and Recreation Department services. That said, the cities' park systems offer a good comparison for the type, level, and provision of recreation services. The following comparison was completed in 2016 and uses budget data from FY 2016-17.

Table 2.4-5 Population Characteristics

Characteristics	Average of Comparable Cities	City of Santa Cruz
Population	64,833	63,364
<18	20%	16%
>65	13%	9%
Square Miles	14	13
Population Density Per Square Mile	4,860	4,974
Median Household Income	$57,752	$61,533
Park & Rec Department Operating Expense	$13,193,319	$14,997,297 (Includes the operating budget for the Santa Cruz Wharf)

COMPARISON OF PARK ACREAGE

As seen in the table below, the Santa Cruz Parks System currently supplies slightly more park acreage (excluding beaches) per resident, approximately the same developed park acreage per resident, and slightly more open space per resident than the average of the other communities.

Table 2.4-6 Park Acreage per Population

Park Acreage (Excluding Beaches)	Average of Comparable Cities	City of Santa Cruz
Population	64,833	63,364
Total Park Acreage (Acres)	1,493	1,696
Total Park Acreage (Acres)/1,000 Population	23	27
Developed Park Acreage	236	239
Developed Park (Acres)/1,000 Population	4	4
Open Space Acreage	1,161	1,315
Open Space Acreage (Acres)/1,000 Population	18	21

SPORTS FIELDS

The comparative analysis also considers the number of sports fields provided. The table below provides information on the number of fields that are lighted, grass or synthetic, and whether or not the baseball outfields are also used for soccer. It is important to note that there can be conflicts with sports programming, primarily in the spring, when the end of the baseball season conflicts with the beginning of the soccer season. For baseball, the majority of fields remain grass.

Comparison of the selected communities revealed that, for soccer, on average, half of the fields are synthetic turf and half are lighted. Seventy-five percent of the City of San Luis Obispo's fields are synthetic. All of San Luis Obispo's soccer fields are synthetic. Santa Cruz, Monterey, and Ventura have soccer fields located in the outfields of the diamond fields. Santa Cruz has the highest number of lighted fields.

Despite the number of ball fields reported, many of the communities are planning for additional field space. The City is particularly impacted in field space for soccer, and the overlap of baseball and soccer seasons has created difficult programming challenges to meet growing demand on shared fields. Harvey West and Scott Kennedy fields cannot accommodate additional needs for sports programming. As sports trends in soccer, lacrosse, and field hockey grow as seen at the State-level, there will be an even greater need for new field space.

Scott Kennedy Fields at Depot Park

Table 2.4-7 Sports Fields Comparison

Sports Fields (Excluding Joint Use Agreements with School Districts)		**avg.**	**Average LOS for Comparable Communities**	**City of Santa Cruz**	**LOS for City of Santa Cruz**
Diamond fields	Total	8	1 per 8,104	8	1 per 8,000
	#Grass	6	N/A	8	N/A
	#Synthetic	2	N/A	0	N/A
	#Lighted	4	N/A	8	N/A
Soccer Fields	*Total*	4	1 per 16,208	3	1 per 21,121
	#Grass	2	N/A	2	N/A
	#Synthetic	2	N/A	1	N/A
	#Lighted	1	N/A	2	N/A
	#Located in outfield	1	N/A	2	N/A

OUTDOOR FACILITIES

In terms of outdoor facilities, as seen in the following tables, Santa Cruz provides a high number of community garden plots, dog park areas, playgrounds, tot-lots, sand volleyball courts, skate parks, disc golf, baskets, and reservable picnic areas. Santa Cruz is also the only City to provide a BMX bike park and pump tracks.

Westside Pump Track

Santa Cruz provides less tennis courts than the other communities. Santa Barbara, Ventura, San Luis Obispo, and Monterey provide a tennis center with at least six courts. Santa Cruz and Santa Barbara have striped pickleball courts but nets are not currently provided.

In terms of swimming pools, Santa Barbara, Ventura, and San Luis Obispo offer 50 meter long pools that are part of a larger swim center and allow for the possibility of competitions. Santa Cruz seasonally offers 25 meter lap lanes; however, the County of Santa Cruz provides a larger pool complex and 50 meter long lap lanes at Simpkins Family Swim Center. The more populated City of Ventura's Aquatic Center includes a recreation pool, water playground pool, two water slides, a 50 meter competition pool with two one-meter and two three-meter diving boards, locker rooms, and picnic areas. The less populated City of Monterey has a very large indoor swim center which is described under Indoor Facilities.

Santa Cruz offers a high number of playground facilities. Santa Cruz does not currently provide larger playground destinations such as Monterey's renowned Dennis the Menace Park.

Santa Cruz's Ken Wormhoudt Skate Park, Santa Barbara's Skaters Point, and San Luis Obispo's SLO Skate Park are the largest facilities at greater than 14,000 square feet in size and offer concrete bowls and street features.

Ken Wormhoudt Skate Park

Table 2.4-8 Comparison of Outdoor Facilities in Comparable Communities

Common Outdoor Facilities	Average of Comparable Communities	Average LOS For Comparable Communities	City of Santa Cruz	Santa Cruz LOS
Basketball Courts	6	1 per 10,130	5.5	1 per 11,521
Playground	18	1 per 3,684	21	1 per 3,017
Sand Volleyball	8	1 per 7,906	21	1 per 3,017
Tennis Courts (Outdoor only)	12	1 per 5,403	6	1 per 10,561
Skate Park	1	1 per 46,309	3	1 per 21,121
Reservable Group Picnic Area	14	1 per 4,767	16	1 per 3,960

Table 2.4-9 Comparison of Less Common Outdoor Facilities in Comparable Communities

Less Common Outdoor Facilities	Median of Comparable Communities	Median LOS for Comparable Communities	City of Santa Cruz	City of Santa Cruz LOS
Community Garden Plots	117	1 per 555	115	1 per 551
Dog Park	1	1 per 64,883	8	1 per 7,921
Wading Pool	1	1 per 64,883	1	1 per 63,364
Swimming Pool	1	1 per 64,883	1	1 per 63,364
Disc Golf Course Baskets	0	N/A	59	1 per 1,074
BMX Park	0	N/A	1	1 per 63,364
Pump Track	0	N/A	3	1 per 21,121
Pickleball Courts (Painted/ no permanent nets)	0	N/A	10	1 per 6,336
Tot-Lot	5	1 per 12,967	11	1 per 5,760
Golf Course	0.5	1 per 129,766	1	1 per 63,364

INDOOR FACILITIES

The Cities compared provide a range of indoor recreation facilities. Not all the Cities provide each type of facility. Each City provides a community center and community rooms. Each City also provides teen and/or senior services out of the community center or has a separate facility to provide those services. Santa Cruz's Louden Nelson Community Center is the largest community center. Santa Cruz's Civic Auditorium is the largest auditorium. Santa Barbara and Monterey provide fitness centers. Monterey's Sports Center is one of a kind and offers two heated indoor pools, a water slide, sauna, a three court gymnasium, group exercise studios, and weight and cardio training areas. Santa Barbara has a large recreation center and a large gym. The City of Watsonville provides a high proportion of community facility space to the youth and seniors and provides a childcare center. Santa Barbara has a large number of facilities that can be rented out for weddings and private events.

Cabrillo Festival at the Civic Auditorium

Table 2.4-10 Comparison of Indoor Recreation Facilities in Comparable Communities

Indoor Recreation Facilities by City	Size (sq. ft.)	Community Center/ Meeting Rooms	Event Rental	Fitness Center	Gymnasium	Auditorium	Senior Center	Youth Center	Recreation Center	Pool
City of Monterey										
Casanova Oak Knoll Park Center	5,110	X								
Hilltop Park Center	18,400	X								
Monterey Sports Center	71,255			X	X				X	X
Monterey Youth Center	14,000							X		
Scholze Park Center	9,437	X					X			
City of Santa Barbara										
Cabrillo Pavilion Arts Center	15,000	X	X							
Carrillo Street Gym	10,000			X						
Carrillo Recreation Center	20,000	X	X							
Casa Las Palmas	2,000	X	X							
Chase Palm Park Center	3,200	X	X							
Chase Palm Arts and Crafts Center	1,000	X								
Franklin Neighborhood Center	12,000	X								
Louise Lowry Davis Center	4,000	X								
MacKenzi Park Adult Building	2,000	X								
Twelve 35 Teen Center	3,500							X		
Westside Community Center	2,000	X				X				
City of San Luis Obispo										
Ludwick Community Center	14,000	X			X					
Meadow Park Building	3,400	X								
SLO Senior Citizens Center	6000						X			
Historic Jack House and Gardens	3,000		X							
City of Watsonville										
Callaghan Park Cultural Center	3,400							X		
Gene Hourlaris and Waldo Rodriguez Youth Center	11,000							X		
Marinovich Community Center	10,000	X								

Table 2.4-10 Comparison of Indoor Recreation Facilities in Comparable Communities

Indoor Recreation Facilities by City	Size (sq. ft.)	Community Center/ Meeting Rooms	Event Rental	Fitness Center	Gymnasium	Auditorium	Senior Center	Youth Center	Recreation Center	Pool
Ramsay Park Family Center	2,800	X								
Senior Center	10000						X			
Childcare Center	2,670							X		
Veteran Memorial Building	6,000		X		X	X				
Muzzio Park Community Center	2,800	X						X		
City of Ventura										
Ventura Ave Adult Center	10,000						X			
Barranca Vista Center	3,500	X								
Westpark Community Center	11,000	X								
City of Santa Cruz										
Beach Flats Community Center	2,742	X								
Civic Auditorium	34,739	X	X		X	X				
Depot Freight Building	3,000	X	X							
Harvey West Kids Kottage and Wagner Cottage	2,500	X								
Harvey West Scout and Clubhouse	3,500	X	X							
Louden Nelson Community Center	20,085	X	X			X	X	X		
Senior Citizens Opportunity	5,437	X				X	X			

E. CONDITION OF PARKS AND RECREATION FACILITIES

Numerous studies have been conducted in recent years to study the condition of the larger recreational facilities in the parks system.

FACILITY CONDITION ASSESSMENT (2013)

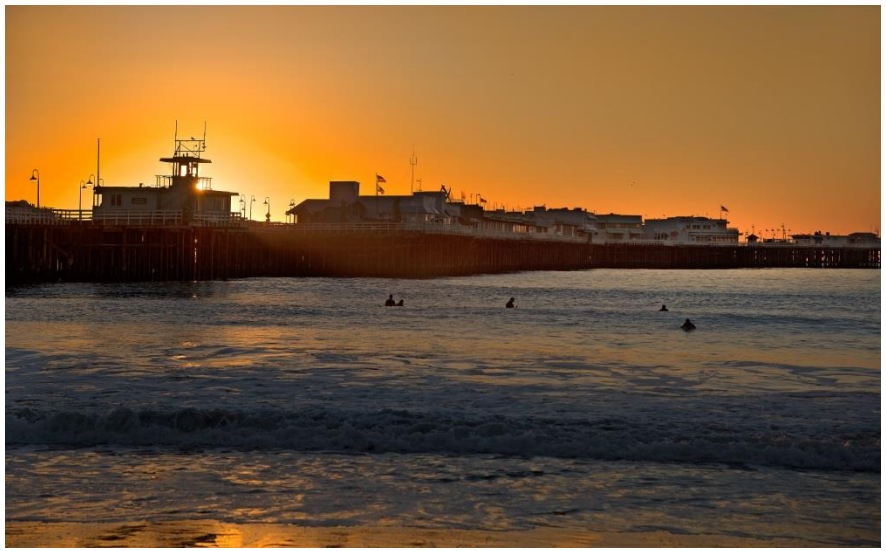
The Public Works Department hired a consultant to conduct a Facility Condition Assessment (2013) which included the study of building system needs including foundations, superstructures, exterior enclosure, interior construction, interior finishes, conveying systems, plumbing, HVAC, and fire protection and electrical. The following recreation facilities were identified as in need of building system improvements and needs were projected to 2018, as indicated in the table below:

Table 2.4-11 Facility Condition Assessment Costs

Parks and Recreation Buildings	Total Needs in 2018
Civic Auditorium	$4,745,316
Harvey West Clubhouse	$337,397
Harvey West Poolhouse	$196,464
Harvey West Ranger Station	$63,829
Wagner Cottage	$69,333
Golf Course Cart Storage	$447,309
Golf Course Clubhouse	$499,399
Louden Nelson Community Center	$2,774,057
Senior Citizen's Opportunity	$548,795
Parks Yard Maintenance Garage	$140,350
Parks Yard Office	$161,645
DeLaveaga Park Office	$14,696
Wharf Headquarters	$285,423
Parks and Recreation Admin Building	$424,033
Total	**$10,708,048**

SANTA CRUZ WHARF ENGINEERING REPORT (2014)

The Santa Cruz Wharf Engineering Report (2014) evaluated the Santa Cruz Wharf and found that it is generally in good condition but there is a need for pile replacements, general improvements to the pavement and substrate, and improvements to increase public safety, weight bearing capacity, sewer, fire protection, and landings. The estimated costs of the improvements are $16,000,000.



Santa Cruz Wharf

POGONIP CLUBHOUSE REHABILITATION PLAN (2000)

The Pogonip Clubhouse Rehabilitation Plan (2000) includes interior, exterior, structural, mechanical, and electrical evaluations. Costs to complete the plan are currently estimated at $7,000,000.

PLAYGROUND INSPECTIONS

The City's park playgrounds and tot lots were visited and inspected for compliance with California playground safety regulations, per the California Department of Public Health, on Tuesday, December 23rd, 2014 and Sunday, March 29th, 2015. These were not full inspections with formal testing, but visual inspections for apparent problems.

PLAYGROUND EQUIPMENT

The playground equipment is generally new and well maintained in all of the parks.

Riverside Gardens Playground

FALL PROTECTION

Engineered wood fibar is used extensively in Santa Cruz playgrounds for fall protection. This fibar meets the criteria for fall protection for most playground heights if of sufficient depth and maintained. Engineered wood fibar is wood shredded to specific dimensions to increase its fall protection. The depth of fibar was not determined in the site visits as that would have required digging. In the play areas that use rubber matting, the matting needs to be annually tested for retention of fall attenuation properties. As matting ages, it loses its softness and ability to absorb impacts.

ACCESSIBILITY

For surfacing, most playgrounds had rubber matting extending to the transfer deck but engineered wood fibar elsewhere. Engineered wood fibar is considered an accessible surface, but must meet the requirement of no more than ½" change in level from surface to surface to be considered accessible. To maintain this grade difference, ramps must be installed extending from the adjacent walks into the engineered wood fibar. As the fibar settles, the ramp becomes more exposed but maintains an accessible route into the playground. Of note for future playground renovation and construction, accessibility of engineered wood fibar is being challenged in courts, though no resolution has been reached to date.

Play equipment met the criteria for accessibility for the apparent dates of installation. Going forward, Santa Cruz should be aware of new criteria that require all equipment reachable from a transfer station or ramp to be accessible upon exit- i.e. must be on accessible surfacing. Existing criteria includes:

- One of each type of play equipment to be accessible by transfer or ramping,
- A percentage, based on number of components, of accessible by transfer or ramping.
- A percentage, based on number of components, of ground level play.

RECREATIONAL FACILITIES AND SITE FURNISHING CONDITIONS

Staff inspected the site furnishings and recreational facilities at each park, ranking each site furnishing or recreational facility from very good to very poor based on conditions relating to cosmetic defects, rusting and warping, and noted known structural and functional issues. Tables are provided for each park in Chapter 4, Section 4.2. In general, most site furnishings are in the good to very good condition. Harvey West Park Ball Fields is notable because the facilities have extensive issues with a high cost of repair.

F. SAFETY AND SECURITY

Illegal camping, drug-use, gang activities, and criminal misconduct stem from challenging social, mental health, economic, and moral issues. The impacts from these and other illegal activities on the City's parks system

are prevalent and often pose environmental and safety issues and consume many City resources to mitigate them. The City has recently begun fencing and locking some of its parks and open spaces to deter illegal activities. For example, a temporary curfew limiting access to Cowell Beach is currently in effect. Other steps have included installing security cameras, increasing volunteer and staff clean-up days, imposing temporary closures of restrooms and park areas, developing maintenance protocols to find discarded hypodermic needles, and changes to park policies and programs to try to increase legal use in order to deter illegal activities.

G. ORGANIZATIONAL STRUCTURE AND ROLES

The Parks and Recreation Department's three divisions help oversee parks system assets. The Recreation Division manages sports and beach programming and events, class, and teen and senior programming as well as the Civic Auditorium, Louden Nelson Community Center, and facility rentals and maintenance. The Administration Division supports programs and reservation rentals and creates policies and plans. The Parks Division oversees the maintenance and operation of the DeLaveaga Golf Course, Urban Landscaped Medians, Arana Gulch, the Santa Cruz Wharf and Cowell and Main Beaches, and the Park Rangers unit. Additionally, parks and open spaces are grouped under three management zones: the east, west, and central zone.

Though the recommendations from this Parks Master Plan 2030 focus primarily on core areas of the Parks and Recreation Department, it is important to note that the provision of recreation facilities is a multi-departmental effort. The following lists just some of the major roles other departments play:

- City Manager's Office:
    - Administers larger scale temporary and special use permits in parks, beaches, and open spaces.
    - Oversees important community studies and projects.
    - Coordinates GreenWharf projects and relationships with UCSC academic partners.
- Economic Development Department:
    - Administers contracts with businesses on the Santa Cruz Wharf and assists drafting leases with new vendors and concessionaires.
    - Manages the development of the Santa Cruz Wharf Master Plan and the Kaiser Permanente Siting Feasibility Study.
- Planning:
    - Planning and Community Development:
        - Often takes the lead on major planning efforts
        - Reviews new parks development applications to ensure code compliance.
- Public Works:
    - Oversees water quality efforts such as the tule removal and water quality testing at the Neary Lagoon Wildlife Refuge and along the San Lorenzo River and Main and Cowell Beaches
    - Removes vegetation from the San Lorenzo River corridor.
    - Manages the construction and maintains multi-use pathways such as the construction of the Arana Gulch Multi-Use Trail, the Santa Cruz Riverwalk, and the Monterey Bay Marine Sanctuary Scenic Trail segment through Santa Cruz.
    - Assesses condition of buildings and funds improvements.
    - Assesses cliff erosion and stabilization along West Cliff and East Cliff Drives.
    - Maintains the parking area at Depot Park.
    - Reviews engineering plans and makes recommendations for new development projects.
- Police Department:
    - The Parks Unit was created in 2006 following a voter-approved sales tax initiative in the city of Santa Cruz known as Measure H. The unit works closely with the Park Rangers to maintain a safe environment in neighborhood parks, open spaces and waterways.

H. EXISTING PARKS MASTER PLANS

The City has many master or management plans that help guide future uses and corresponding management actions for specific parks, open spaces, and beaches. Not all park assets have management plans. Some of the Management Plans could be updated to accommodate new facilities and activities to meet current needs and desires.

- Arana Gulch Master Plan (2006): The plan guided the development of the multi-use trail project which was completed in 2014. It also guides natural restoration of the property.

- Cowell and Main Beach Management Plan (2014): Guides beach maintenance operations, safety operations, recreation programming, commercial uses, and flood and drainage discharge operations for Cowell and Main Beaches.

- DeLaveaga Park Master Plan (1960): The plan includes ambitious recreational projects, many of which have been implemented. Projects include campgrounds, a small train track, a fishing lake, golf course, softball fields, a children's wading pond, tennis courts, a natural science center, a rifle and archery range, among others.

- DeLaveaga Golf Course Master Plan (2002): The plan recommends a variety of improvements, including constructing a new clubhouse to accommodate larger events, installing a new irrigation system to conserve water, adding solar to the upper deck of the golf course to provide shade and conserve energy, performing tree management work to reduce dead and diseased trees, redesigning and updating the sand traps, leveling the tees, grading the fairways, increasing the parking areas, and improving the maintenance yard.

- Depot Park Master Plan (2001): The plan guided uses and improvements to Depot Park were completed in 2005.

- Jessie Street Marsh Management Plan (1998): The plan aims to restore the marsh and improve access. A major component of the plan would be creating a tidal exchange between the fresh water marsh and the San Lorenzo Urban River. An interpretive trail would connect from East Cliff Drive to Lemos Avenue.

- Moore Creek Preserve Interim Management Plan (2002): Guides natural restoration activities and trail alignments, design, and use.

- Neary Lagoon Management Plan (1992): Guides activities to manage hydrology, water quality, vegetation, wildlife, mosquitoes, cultural resources, public use and safety, infrastructure, and aesthetics.

- Pogonip Clubhouse Rehabilitation Plan (2002): The plan guides the rehabilitation of the historic Pogonip Clubhouse.

- Pogonip Master Plan (1998): The plan envisions the restoration of the historic clubhouse, a Homeless Garden farming operation and support facilities, an outdoor education camp, improvements to trails, interpretive programs, parking improvements, and natural restoration activities.

- San Lorenzo Urban River Plan (2003): The San Lorenzo Urban River Plan provides a number of recommendations for the locations and designs of plazas, unpaved nature loops, native planting treatments, interpretive signage, bird watching platforms, and art. The plan recommends that restoring the river is the top priority.

- Santa Cruz Wharf Master Plan (under review): The Santa Cruz Wharf Master Plan guides future restoration and expansion including the development of a landmark building, an events pavilion, a gateway entrance sign, a welcome center, a small boat landing area, and increased pedestrian and bicycle access.

I. NATURAL RESOURCES

EXISTING NATURAL RESOURCES

The City's parks and open spaces contain several diverse, native plant and wildlife communities/habitats. Habitats include freshwater marsh, redwood forest, mixed evergreen forest, coastal scrub, grassland/coastal prairie, oak woodland, and riparian woodlands/corridors. Some of these habitats are considered sensitive because they are vulnerable to disturbance or do not recover easily once disturbed. Sensitive areas also include springs and seeps, nesting and breeding sites such as standing dead trees, riverbanks, movement and migration corridors, pathways to perennial streams, overwintering sites (i.e., Monarch butterfly), and foraging areas.

Riparian (streamside), and other wetland habitats (brackish and freshwater marshes), with their wide variety of plants and readily available water, are vital for wildlife such as waterfowl, fish, and amphibians. These habitats provide a drinking source and dense, green foliage for protection, shelter, and food. Perennial or seasonal water bodies are breeding areas for some amphibian and other wildlife species. Most wildlife species depend on external sources of water and will often travel long distances to reach it. Excessive human use in these areas can result in trampling, soil compaction, erosion, destruction of vegetation, alteration of water quality and temperature, introduction of non-native and invasive plant species, and frequent disturbances to wildlife.

Some of these habitats are protected by federal and state laws and require special permits for new improvements. City parks and open spaces containing rare, threatened, or endangered species as listed by Federal and/or State agencies are shown on the following tables. More information on sensitive habitats and species can be found in the City of Santa Cruz General Plan 2030, individual park master plans, and past studies.

Table 2.4-12 Native Habitats within City Open Spaces

Open Space	Brackish or Freshwater Marsh[2]	Redwood Forest	Mixed Evergreen Forest	Coastal Scrub	Grassland Coastal Prairie[2]	Riparian Woodland	Oak Woodland[2]	Eucalyptus Groves[1]
Pogonip Open Space		X	X	X	X	X	X	
Moore Creek Preserve		X	X	X	X	X	X	
DeLaveaga Wilderness Area	X	X	X	X	X	X	X	X
Neary Lagoon Wildlife Refuge	X					X		
Jessie Street Marsh	X				X	X	X	X
Arana Gulch Open Space	X				X	X	X	X
Arroyo Seco Canyon			X			X		X
San Lorenzo River	X					X		X

[1] Eucalyptus is a non-native tree species, but some eucalyptus groves in the City provide overwintering habitat for the Monarch butterfly.

[2] Sensitive habitat, as identified under City, State, and/or Federal policies.

Table 2.4-13 Special Status Plants and Animals Known within City Open Spaces

Open Space	San Francisco Popcorn Flower	Santa Cruz Tarplant	Gairdner's Yampah	Santa Cruz Clover	Robust Spineflower	CA Red-legged Frog	Southwestern Pond Turtle	Ohlone Tiger Beetle	Dusky-footed Woodrat	Monarch Butterfly[2]	Steelhead/Coho Salmon and Tidewater Goby
Pogonip Open Space	X		X	X	X	X	X	X[1]	X		
Moore Creek Preserve	X					X	X	X	X	X	
DeLaveaga Wilderness Area									X	X	
Neary Lagoon Wildlife Refuge							X		X		
Jessie Street Marsh											
Arana Gulch Open Space		X							X	X	
Arroyo Seco Canyon									X	X	
San Lorenzo River											X

[1]Ohlone Tiger Beetle last observed in 2004.

[2]Overwintering site.

RESOURCE MANAGEMENT

Selecting effective management strategies requires understanding natural ecological processes at a specific site. Management measures often include eliminating or restricting activities that destroy vegetation, restoring grasslands and meadows that were formerly maintained by natural processes, managing vegetation to benefit aquatic species, conservation grazing, perimeter fire management/fuel reduction, and controlling/ removing invasive, non-native vegetation. The City is also currently updating its Climate Action Plan and Climate Adaptation Plan which provide guidance for incorporating conservation and resiliency into management policy and actions.

Table 2.4-14 Resource Assessments, Guidance Documents, and Open Space Restoration Activities

Open Space	Natural Resource Assessments	Current Management Activities
Pogonip Open Space	Park-wide biotic assessment, 1996 Pogonip Master Plan, 1998 Various focused work area assessments, 1999 to 2017	Prairie management (mowing and invasive plant control). Rare plant survey and habitat management. Ohlone Tiger Beetle survey.
Moore Creek Preserve	Property-wide baseline environmental assessment, 1995 Moore Creek Preserve Interim Management Plan, 2001	Prairie management (grazing and invasive plant control). Rare plant survey and habitat management. Ohlone Tiger Beetle survey.
DeLaveaga Wilderness Area	Focused work area assessments from 2010 to 2017. No comprehensive biotic assessment has been performed.	Coastal prairie mowing.
Neary Lagoon Wildlife Refuge	Neary Lagoon Management Plan, 1990 Focused work area assessments	Marsh vegetation management.
Jessie Street Marsh	Jessie Street Marsh Management plan, 1998	Marsh vegetation management.
Arana Gulch Open Space	Biotic assessment, 1996 Arana Gulch Master Plan, 2006 Habitat management plan, 2013 Invasive Weed Work Plan, 2015	Prairie management (grazing, invasive plant control, revegetation planting). Rare plant survey and habitat management.
San Lorenzo River Corridor	San Lorenzo Urban River Plan, 2003	Riparian management.

CHAPTER 3: COMMUNITY OUTREACH & NEEDS ASSESSMENT

WHAT WE NEED & WANT

3.1 Community Outreach
3.2 Emerging Trends

Neary Lagoon Wildlife Refuge

SECTION 3.1: COMMUNITY OUTREACH

A. Introduction
B. Quantitative vs. Qualitative Data
C. Community Telephone Survey 2015
D. Community Meetings
E. Stakeholder Interviews and Focus Groups
F. Internal Department-Wide Meeting
G. Public Input Questionnaire and Email Correspondence
H. 1st Joint Study Session with Parks and Recreation Commission and City Council
I. Parks Master Plan Subcommittee Meetings
J. Community Email Survey 2016
K. 2nd Joint Study Session with Parks and Recreation Commission and City Council
L. Community Outreach Summary

A. INTRODUCTION

Parks and recreation services play a critical role in the quality of life for residents and visitors. The *Santa Cruz Parks Master Plan 2030* (Parks Master Plan 2030) will help guide future improvements to the parks system to improve the overall experience for park users. The Parks Master Plan 2030 outreach process provided an opportunity to engage community members and solicit their feedback to help inform the recommendations. Community input not only helps the City evaluate existing conditions and current and future needs, but also identify opportunities from the perspectives of park users.

Community input was gathered through a variety of methods, including a community telephone survey, community meetings, focus groups, questionnaires, stakeholder interviews, department-wide meetings, public meetings, and a supplemental quantitative email survey to receive representative input from the general community on topics where specific interests conflict.

B. QUANTITATIVE VS. QUALITATIVE DATA

Collection of data is provided in two forms as part of this outreach process: quantitative and qualitative. Quantitative data provides usable statistics through the generation of numerical data, formulating facts and uncovering patterns in research. Qualitative research reveals trends and opinions through non-statistical data analysis that provides explorative findings which inform further decision making.

The Parks Master Plan 2030 planning process provides quantitative data through statistically valid, random telephone and email surveys that utilized a prepared questionnaire. Qualitative data was collected through information gathered from interviews, community and departmental open houses, and questionnaires that were distributed at City parks, community events, and online. The qualitative data provides subjective information with additional detail in user interests. It was provided by respondents who chose to engage in the outreach process, rather than from a random sampling.

Comparing the quantitative and qualitative data collected through community outreach enables the planning process to identify emerging patterns and consistent themes and issues regarding park system use in Santa Cruz.

C. COMMUNITY TELEPHONE SURVEY 2015

In 2015, the City of Santa Cruz commissioned Godbe Research to conduct a telephone survey of residents to inform the Parks Master Plan 2030. The 2015 survey was conducted with the following research objectives:

- Gauge satisfaction with the overall quality of life in Santa Cruz
- Understand leisure time activity and sports preferences
- Assess the usage and importance of parks, trails, and recreation facilities
- Gauge satisfaction with specific services and facilities
- Determine attitudes towards DeLaveaga Municipal Golf Course and Harvey West Swimming Pool

- Understand resident support for financial funding of programs and facilities
- Identify any differences in opinion due to demographic and/or voter behavioral characteristics.

METHODOLOGY OVERVIEW

- Data Collection: Telephone Interviewing
- Universe: Adults 18 years of age or older
- Fielding Dates: January 6 – January 11, 2015
- Interview Length: 15.7 minutes
- Interview Language: English and Spanish
- Sample Size: 304
- Margin of Error: ± 5.06%

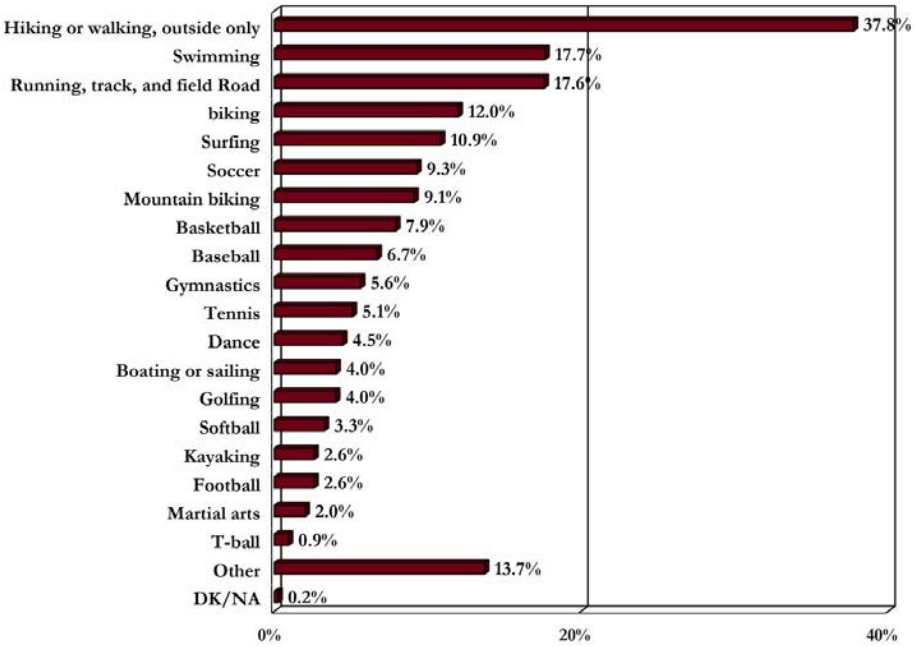
KEY FINDINGS

Quality of Life

- Santa Cruz residents enjoy their quality of life. More than 9 out of 10 respondents indicated that they were satisfied with the quality of life in Santa Cruz (92.4%).

Sports and Recreational Activities

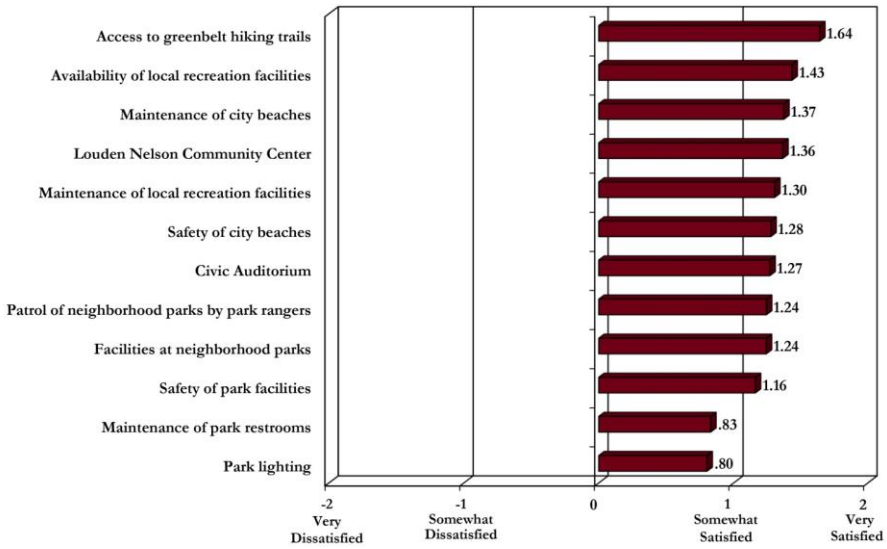
- Santa Cruz is a very active community. Respondents indicated that the top two preferences for leisure time activities include going to the beach and outdoor sports or athletic activities.
- More than three quarters of respondents indicated that a member of their household participates in an outdoor activity. The top preference for an outdoor recreation activity is hiking or walking outside.
- Respondents with children in their household tended to indicate at higher levels that they enjoyed "Basketball," "Baseball," "Surfing," "Swimming," and "T-ball" when compared to those residents without children in the household.



Recreational Activity Preferences from 2015 Phone Survey

Parks and Recreation Facilities

- A vast majority of respondents have visited City parks, trails, or recreation facilities in the past 12 months. About 46% of the households had used a walking or hiking trail in the past 12 months, 45% had used the beaches, and 43% had used a city park.
- Santa Cruz residents are highly satisfied with the parks and recreation services provided by the City of Santa Cruz. Of the services listed, park lighting and maintenance of park restrooms were the only services that fell below the somewhat satisfied ranking.



Satisfaction Responses from 2015 Phone Survey

- The availability of recreational activities such as walking, hiking, jogging, swimming, surfing, road cycling, and mountain biking are relatively more important to Santa Cruz residents than organized sports such as basketball, baseball, softball, football, and volleyball.
- The variety of recreation options is important to Santa Cruz residents.
  - All but one of the 18 sites and facilities reached or exceeded the level of somewhat important.
  - Two-thirds of the residents or more rated 8 of the 14 sports and recreational activities tested in the survey as at least "somewhat important."
  - More than 90% of respondents indicated importance for "City beaches," "Outdoor sports fields," "Open space parks," and "Trails."
  - More than 80% of residents placed importance on "Swimming pool," "Civic auditorium," 'Children's play areas," and "Community gardens."
  - More than 70% of survey respondents stated they felt "Gymnasium," "Reservable picnic areas or Harvey West Clubhouse," "Senior Center," "Teen center," "Louden Nelson Community Center," and "Dog parks" were important.
- A significant plurality of respondents (47.3%) preferred continuing to subsidize the DeLaveaga Golf Course, while a quarter (25.7%) preferred leasing the course to a private golf management company.
- Just over half of the respondents (50.9%) indicated that the Harvey West Swimming Pool should be open year round, while about a quarter (26.7%) felt the current schedule was adequate.
- A significant plurality of respondents (48.4%) believe that the parks should not be locked at night, while 38% believe they should be locked.

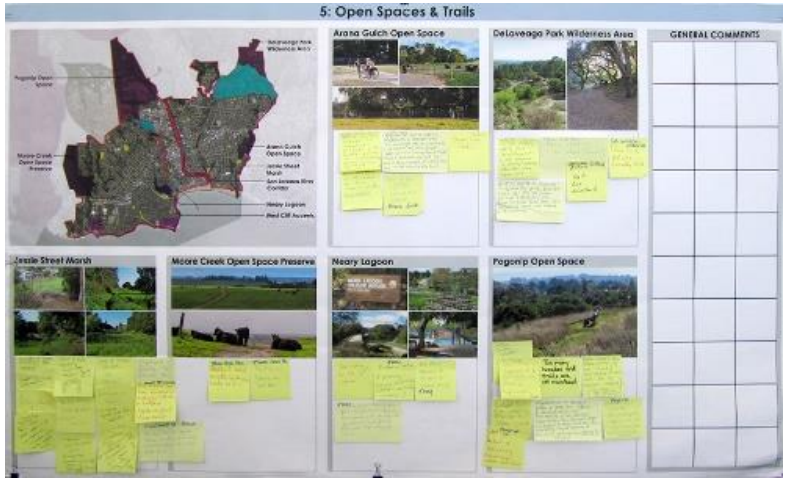
The Godbe report is available in Appendix 5.2 with a link to the report's appendices.

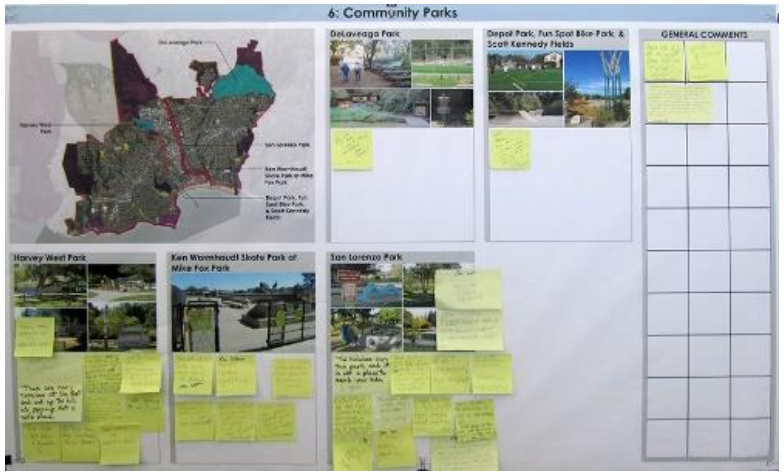
D. COMMUNITY MEETINGS

March 29th Community Meeting

Two open house meetings were held on March 26 and 29, of 2015, at the Louden Nelson Community Center. Approximately 60 community members attended the meetings. Community members were invited to review 12 exhibit posters and provide input by placing sticky notes onto

the exhibits or completing a questionnaire if they had more lengthy comments or suggestions. Staff, public officials, and the consultant were available to discuss topics and ideas. Spanish translators were available for Spanish translation. Appendices 5.3 and 5.5 contain presentation materials and a complete list of comments received during the community outreach process. Comments followed by a (C) were received during the community meetings.





Two of twelve exhibit posters with sticky note comments from meetings

E. STAKEHOLDER INTERVIEWS AND FOCUS GROUPS

From January 2015 to April 2015, staff and the consultant met with a variety of key staff members who manage the parks and recreation facilities as well as interested community members to hear perspectives on parks and recreation topics. Focus group discussions were held with organized sports field users, Friends of Parks and Recreation, and other interested community members. Appendix 5.6 includes comments received from stakeholder interviews and focus group meetings.

F. INTERNAL DEPARTMENT-WIDE MEETING

An internal open house meeting was held with parks maintenance and recreation personnel. Parks and Recreation staff have a unique perspective on the parks system. Not only are they park users, but they are also the day-to-day face of the Parks and Recreation Department. They hear feedback from park users regarding the parks and recreation facilities during their maintenance and recreation programming activities.

G. PUBLIC INPUT QUESTIONNAIRE AND EMAIL CORRESPONDENCE

Staff and the consultant created an English and Spanish version of a public input questionnaire. Community members were asked about their ideas and observations regarding parks and recreation facilities in Santa Cruz. The questionnaire was distributed by staff at parks and facilities. An online version was created and signs were posted at parks to inform park users of the opportunity to provide feedback. Staff had booths at six community events to answer questions and collect input through the questionnaires. Nearly 500 questionnaires and emails were received. Appendices 5.4 and 5.5 contain the general city-wide and park-specific questionnaires and the comments received during the outreach process. Comments followed by a (Q) are specifically from the questionnaire while comments followed by an (L) are from email and letter correspondence.

City staffed booth at the Santa Cruz Mountain Biking Festival on April 11, 2015

KEY FINDINGS

- Many community members describe a favorable impression of the upkeep of the parks system. Some expressed concern that maintenance should be a higher priority than expansion.
- A very high number of comments expressed concerns regarding illegal activity, safety, and cleanliness in the parks system and the desire for more enforcement.
- Sports field user groups and other community members expressed the need for more field space to accommodate off-season play and to limit use conflicts between baseball and soccer. Programs would expand if there were more fields to play-on. Harvey West fields could use renovation. Lacrosse is growing in demand and it would be difficult to accommodate the sport with the existing field space.
- Off-leash dog use is a popular activity in Santa Cruz and there is a desire for more opportunities. Some respondents expressed concerns about off-leash dog use at beaches and open spaces.
- There is a general desire for more recreational amenities and facilities throughout the parks system and more interesting playground features.
- The San Lorenzo River Corridor/Santa Cruz Riverwalk is a very important resource for community members. Many preferred more environmental restoration and learning activities; however, others requested more activities for recreation.
- Pickleball is a rapidly growing recreational activity and there is demand for more courts.
- Many expressed a desire to clean-up and add more amenities and events to San Lorenzo Park.
- Respondents shared that the Beach Flats Neighborhood area needs a permanent community garden facility.
- Mountain biking is a popular activity and there is a need for skill building areas and separated trails with obstacles. Concerns were raised regarding conflicts between bike riders and hikers, and impacts to the environment.
- Pump track bike riding is a growing recreational activity in the area and there is a desire to see more opportunities.
- Many expressed the need for more restrooms or the renovation of existing restrooms.
- Preservation and restoration of the City's greenbelts are important to the community.
- Harvey West Pool remains an important facility to teach kids how to swim and there is a need to expand the duration of the season.
- The Pogonip Clubhouse remains an important resource and there is a desire to see it restored.
- The City's beaches should remain clean and free from loose litter and debris, especially during the tourist season. Respondents noted that water quality at Main and Cowell Beaches needs to be improved.
- Jessie Street Marsh remains a challenging site and is in need of improvement.
- Parks and recreation facilities should be accessible for all users.
- More art and interpretive displays should be added to the parks.

H. 1ST JOINT STUDY SESSION WITH PARKS AND RECREATION COMMISSION AND CITY COUNCIL

On October 13, 2015, a Joint Study Session was held to provide staff with direction on topics where contrasting opinions were received during the outreach process. The high-level topics within the presentation included Safety and Illegal Activity, Neighborhood Parks, Community Parks, Open Space, Existing Facilities, and New Facilities. As part of the outcome of the meeting, a general recommendation was to continue to work through the topics with a subcommittee comprised of two Parks and Recreation Commission members and two City Council members. Below is a summary of the discussion that followed the presentation.

KEY DIRECTION

Parks Management

- Parks services must have resiliency regardless of the economy. Parks need to be funded to provide benefits to residents and visitors. Consider capacity issues in relation to staffing when seeking new development. Update the existing parks system before expanding the system further. There should be a strategic funding component of the Parks Master Plan 2030. Seek funding endowments.
- Parks and Recreation management should allow parks to evolve and be flexibly responsive to changing demands in recreation.
- Continue to seek ways to improve recreation on existing lands instead of purchasing new land. Utilize edges of existing open spaces to create more recreational opportunities rather than acquiring new land.
- Ensure that underserved communities are provided enough resources, parks, and facilities.

Parks and Recreation Facilities

- Use some of the greenbelt open space for active use. Land was originally designated for both open space and active use but the active use element has not been implemented successfully.
- Fully utilize existing parks.
- Increase the provision of sports fields. Continue the shared use of parks and sports fields. Seek creative uses of new and existing infrastructure such as locating sports fields on top of parking structures. Provide practice space throughout the City for sports teams.
- Increase mountain biking opportunities and partner with the industry to hold events. Protect hiking trails and reduce conflicts.
- Differences in opinion were expressed regarding acquiring Antonelli Pond and Lighthouse Field for the City's park system. Consider a partnership to improve maintenance of Lighthouse Field.
- Add more restrooms to parks. Some prefer the use of porta-potties for cost savings.
- Improve coordination for litter pick-up on beaches and expand the ranger program to patrol them.
- Support pickleball expansion and create dedicated courts.
- Create City-owned community gardens in every neighborhood, especially the Beach Flats Neighborhood. Consider roof-top gardens.
- Prioritize revisiting the Jesse Street Marsh Master Plan. Hold a neighborhood meeting to discuss options.
- More pump tracks including the Benchlands at San Lorenzo Park.
- Improve playgrounds.
  - Replace the wood chips with sand or rubber matting at playgrounds.
  - Build a themed 'Dennis the Menace' playground at San Lorenzo Park.
- Create a legal, supervised campground for the homeless to sleep to deter sleeping in parks.
- Civic Auditorium is not a high priority.
- Golf Course is highly subsidized and should be phased out unless it can bring in more revenue in the next five years.

- Use the Fire Department Training Structure as some kind of joint facility that can be used for recreation. For example, creating a ropes course.
- Expand the Harvey West pool use by adding times when the Simpkins Family Swim Center is not open for recreational swimming.
- Restore the Pogonip Clubhouse. Explore public-private partnerships. Release a request for proposal to explore options.
- Create more off-leash dog use areas.
- Create a Coastal Recreation Zone to showcase the natural resources and coastline and improve the coordination between multiple agencies.
- Support the Riverwalk project and activate the entire length of the river with art and lighting.
- Renovate Harvey West Park as it is currently underutilized.
- Establish better connectivity between existing parks by identifying gaps to close them.
- Recognize that natural areas are valued and are utilized through their preservation.
- Consider all users in design and expansion of system (ADA, seniors, etc.).

Safety and Security

- Safety and security are paramount. Increasing ranger patrols, lighting, activating parks with new amenities (low cost if possible), and park hosts should be explored as a way to help address safety issues. Park hosts could be tied to new restrooms to keep them clean and safe.

Appendix 5.7 contains the presentation from the Joint Study Session.

I. PARKS MASTER PLAN SUBCOMMITTEE MEETINGS

The Parks and Recreation subcommittee meetings were held on January 13, March 28, and April 4, of 2016, to provide staff direction on contentious issues and help develop policies and actions for the plan. The following feedback was received during the meetings:

KEY DIRECTION

Visioning

- Parks and Recreation enhances the quality of life of residents and visitors. Connectivity is important as the City moves in a sustainable direction. The City's natural heritage should be preserved and protected while providing experiences for a diverse community.

Parks and Recreation Facilities

- New off-leash areas should be fenced-in. A target for off-leash dog use areas should be created for each area of the City.
- DeLaveaga Park needs improved connectivity.
- Consider adding lights to Depot Field to optimize field space. More opportunities are needed for organized sports groups.
- Harvey West Park needs renovation.
- Renovate San Lorenzo Park and create a variety of opportunities, especially for families and youth. Create a safer environment. Increase programming, such as yoga in the park, and hold more events to draw people.
- Moore Creek Open Space Preserve needs improved access to the open space. Explore creating a parking area off of Highway 1.
- Pogonip is an open space and should not be used to locate sports fields. Restore the clubhouse. Minimize conflicts between hikers and bikers.
- The Santa Cruz Riverwalk is an important community asset and needs continued efforts to improve the area.
- The coastal area needs a more cohesive, consistent identity and needs a vision and plan to improve the long-term management and coordination between multiple agencies.
- The beach areas need to remain free of litter and debris and safe from illegal activity. Availability of bike parking should be increased and cyclists should feel confident they can park their bikes without fear of theft.

- The Louden Nelson Community Center is an important resource that needs some renovation. The park does not always feel safe for families.
- Need to use the plan to help fund improvements to facilities.

Safety and Security

- Park hosts could be a great program to help care for parks and could potentially create workforce housing opportunities. Avoid landlord tenant situations and instead provide hook-ups for an RV/Trailer.
- Volunteer docents could help monitor and care for parks.

Appendix 5.8 contains the agendas and presentations made at the March 28th and April 4th meetings.

J. COMMUNITY EMAIL SURVEY 2016

The outreach process identified several issues that needed more feedback from a representative sample of the community to inform the recommendations in the plan, resulting in a second survey being conducted in 2016. The first set of questions followed the same general format as the initial survey. The second set of questions allowed for more detailed feedback on specific areas and topics.

METHODOLOGY OVERVIEW

- Data Collection: Online interviews from email invitation
- Universe: Adults 18 years of age or older
- Fielding Dates: September 29 to October 12, 2016
- Interview Language: English and Spanish
- Sample Size: 314
- Margin of Error: ± 5.06%

KEY FINDINGS

Quality of Life

- At 72.4%, the reported satisfaction level of respondents in the 2016 survey was lower than the 2015 survey rate of 92.4%, though still quite high.

Sports and Recreational Activities

- Santa Cruz continues to be a very active community with 89.5% reporting that their household participates in fitness, athletic or sports activities in the 2016 survey compared to 77.5% in 2015.
- Comparing both surveys, the activities that respondents or members of their household participate in were very similar. Hiking or walking was the highest ranked. Swimming, running, road biking, mountain biking, surfing, and soccer scored in the medium tier.

Parks and Recreation Facilities

- As in 2015, a vast majority of respondents have visited City parks, trails, or recreation facilities in the past 12 months with only 0.8% using facilities less than once a year and 2.8% unsure of usage.
- The 2016 survey allowed for a more detailed response on park usage, with 78.4% of respondents indicating they visit a park, trail, beach and recreational facility at least a few times a month, and nearly 50% indicating a few times a week.
- Beaches had the highest percentage of usage at 82.7% followed by walking and hiking trails at 80.5%, parks at 75.6% and bike paths or lanes at 46.2%.

Parks and Recreation Satisfaction & Preferences

- Respondents were generally satisfied with the maintenance of local recreation facilities, with 62% being either very or somewhat satisfied, though restroom maintenance satisfaction was lower at 42.3%

- Regarding safety of facilities, only 52.5% replied satisfied with park safety, though 65.5% were satisfied with safety at City beaches. Park lighting satisfaction was less positive, with a total satisfaction rate of 50.5%. Patrol of neighborhood parks by park rangers also received a lower rating at 44.9%.
- The availability of local recreational facilities received a high satisfaction rating of 72.5%.
- 66.2% of respondents were satisfied with facilities at neighborhood parks.
- Satisfaction for access to greenbelt hiking trails was high at 70.3%, though satisfaction ratings on mountain bike trails was lower at 44.4%.

Importance of Recreational Activities & Frequency

- In line with usage responses, walking, hiking and jogging were extremely important activities for survey participants with 99.4 % of respondents ranking this as very important or somewhat important. Other sports ranking greater than 50% in importance were mountain biking and soccer.
- Facilities ranking highest in importance in descending order were open spaces with park amenities, undisturbed open spaces, paved trails, unpaved trails, children's play areas, outdoor sports fields, community gardens, mountain bike trails, and fenced and unfenced off-leash dog areas.

Park Planning Preferences

Survey results were very mixed on park planning preferences.

- For sports fields, there was more support than other activities with 52.3% of respondents favoring an increased number of sports fields. When asked where these fields should be built, contributors split evenly between using Pogonip, buying industrial land, and partnering with the school district for joint-use of its facilities.
- Three questions addressed the use of greenbelts as future resources for park planning. Responses on the question of building sports fields, trails, playgrounds and park amenities in the greenbelts were 52.3% in favor with 30.9% opposed. Regarding trail use in these spaces, 75.7% of respondents supported creating additional trails. When asked what type of trails, 49.2% were in favor of multi-use trails; 26.1%, hiking only; and 11.1%, downhill mountain biking, separating mountain bikers from hikers. 0% indicated downhill trails with berms and obstacles.
- Respondents were asked for their opinions on the use of San Lorenzo Park in a series of seven questions. Only 16.3% wanted to keep the park as is. All questions regarding changes in events or features received favorable responses with the strongest support for hosting more events and programs, expanding facilities and activities, creating a food truck court and renovating the playground. Improved San Lorenzo River access was supported by 62.9% of respondents.
- Other survey responses included:
    - Respondents were neutral on the question of striping tennis courts to accommodate pickleball with 21.1% favoring and 25.9% opposing.
    - There was strong support for more restrooms (79.1%).
    - Many respondents (42.2%) felt that they have sufficient off-leash dog areas near their neighborhood compared to 21.6% who felt they do not.
    - Responses on fencing and locking parks at night were inconclusive with 42.1% having mixed opinions.
- When asked if they would be willing to contribute financially to supporting programs and facilities, 80.2% of the respondents responded favorably.

The Godbe Report can be referenced in Appendix 5.2.

K. 2ND JOINT STUDY SESSION WITH PARKS AND RECREATION COMMISSION AND CITY COUNCIL

On February 7, 2017, a study session was held to receive feedback on the draft Parks Master Plan 2030. Feedback was received prior to the meeting that there were concerns regarding some of the draft recommendations and priorities. The Joint City Council and Parks and Recreation Commission approved a motion to work through identified issues, refine and establish priorities, clarify recommendations through a series of Parks and Recreation Commission meetings and return to Council with the revised plan and action plan for final review and adoption by the summer 2017. Policies would be added to the plan to increase fruit tree plantings. Councilmembers and Commissioners provided feedback on the draft and process.

KEY DIRECTION

CEQA Process

- Review the environmental review process so that there is clarity for the public, City Council, and Commission.
- Place more attention on separating the recreation and open space sections of the plan.
- Environmental review should be done for new trails. Need to ensure that the trails neither restrict wildlife movement across corridors nor degrade habitats.

Implementation Chapter

- Improve the link between the recommendations section and the funding strategies in the PMP. Both chapters should have more continuity to findings and data from the PMP process. Need to map community's future.
- Implementation strategy needs improvement.
- More discussion on how to reach the standards for acreage per capita for parks since SC is short in acreage.
- Important that the long-term plan can change with time.
- Remove cycling from active recreation and place in passive recreation.
- Consider hiring a grant writer for the department.
- Explore an endowment fund.
- Happy to see the Wharf and Civic are separate projects outside of the Parks Master Plan.
- Parks are underfunded. Need to partner with more stakeholders and look at the State's funding models.
- Need to have a firewall between Ranger's budget and the Parks and Recreation Department budget to ensure that programmatic cuts do not affect park services because of an increase in overall spending on the Ranger's budget.
- More strategic about how we seek State funding.
- Look at multiple locations for pickleball. Do not focus on a tournament facility. Concern for converting tennis courts to pickleball courts.
- Teach more youth skateboarding.
- Clarify the goal for Harvey West Pool.
- Create equal access for the public for recreational activities.
- Support for mountain biking in Pogonip but not at the Spring Trail (which is not being recommended in the draft). Supportive of providing more connectivity, such as from Harvey West Park to Pogonip Open Space.
- Off-leash areas near hiking trails help dogs release energy before a hike and the B-40 off-leash dog use area works well and could be considered near the Golf Club Drive to Spring Trail connection in Pogonip Open Space.
- Bike valet for special events.
- Supports community fruit gardens and orchards.
- Look further into the trade-offs and environmental effects of synthetic turf fields.
- Improve the tie-in of the Santa Cruz Riverwalk recommendations.
- More attention needs to be given to Lighthouse Field and the City's intentions.
- Public spaces need to be a shared-use to include all people.
- Interested in linear park to connect East and West Cliff Drives - stretches across the City.

- Focus on health equity and be purposeful. Don't only think about an aging population but also consider our youth. Do the people who access the programs reflect our population?
- Public safety is important. When increasing the Ranger's monitoring, where are populations displaced to?
- Partnerships are an important theme and one could be envisioned for the Pogonip Clubhouse.
- Use existing facilities in a more robust way.
- Mountain biking access will require careful consideration.
- Mountain biking is welcome but not everywhere.
- More money needs to be set aside for restrooms and the purchase of the Beach Flats Community Center.
- Extend the hours of the Harvey West Pool.
- Offer valet bike parking Downtown.
- Consider a linear park on Pacific Avenue with moveable street furniture.
- Improve the relationship between existing master plans and the recommendations.
- Protect our precious resources. New trails may inspire future generations of stewardship but there are also real concerns for erosion and damage to the environment. Biking community needs more self- policing.
- Incorporate comments from the River Summit into the plan.

Conservation and Stewardship Chapter

- Seek more native plant restoration throughout the parks system.
- More natural restoration.
- Find more balance between the community and environment.
- Work with UCSC to improve policies and actions.
- The plan represents the commercialization of the parks system and does not discuss natural restoration sufficiently.

L. COMMUNITY OUTREACH SUMMARY

The community outreach process produced a sampling of information and feedback for the City of Santa Cruz. It created an opportunity for residents to be heard and to offer their views, input, and desires. Staff estimates that more than 1,600 members of the public participated in the process. The information received from both the quantitative data and qualitative input informed the Parks Master Plan 2030 "Recommendations, Goals, Policies and Actions" which will ultimately help meet the needs and wants identified during the process. Additional information was collected after the draft Parks Master Plan 2030 was released to the public.

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SECTION 3.2: EMERGING TRENDS

A. Introduction
B. Demographic Trends
C. Recreation Trends
D. Programming Trends
E. Additional Park & Recreation Trends

A. INTRODUCTION

In order to set goals and make appropriate recommendations for the future development and maintenance of Santa Cruz's parks, open spaces, beaches and facilities, it is critical to understand emerging trends amongst local user groups as well as national trends in parks and recreation.

A variety of resources were referenced to more fully understand the trends in parks and recreation. These include reports from the National Recreation and Park Association, California State Parks, Learning Resources Network, Outdoor Resources Review Group, Outdoor Industry Association, Recreation & Tourism Initiative, relevant online journals, and Roper ASW.

B. DEMOGRAPHIC TRENDS

As discussed in section 2.3 Community Profile, Santa Cruz has a diverse population. Though there is a large percentage of residents aged 18 to 64, there are significant populations in other age groups as well. By anticipating the needs of each age group, resources and efforts can be focused to ensure there are minimal gaps in service to the community.

ADULTS & YOUNG ADULTS

Adults and young adults are actively participating in newer recreational experiences, including extreme sports and adventure sports. They are generally waiting longer to marry and start families, so recreational activities are more friend- and group-oriented than in past generations, where they have been more family-oriented.

Cowell Beach

UNDER 18

The younger generation is becoming more sedentary and solitary due to technology.[1] For future generations, it is important to encourage outdoor recreation for social and health benefits.

Junior Lifeguard Program at Cowell Beach

BABY BOOMER GENERATION

As the Baby Boomer generation retires, they continue to be very active and are especially looking for amenity-rich and meaningful recreation experiences. In particular, they are drawn to conservation and heritage initiatives.[2]

Touring Pogonip Open Space through the Walking Adventure Group Program

SENIORS

Adults aged 65 and older comprise nearly ten percent of the City's population. This population is growing and it will be important to tailor facilities and programs to meet their needs and interests. Seniors are increasingly active, with a particular desire for both pedestrian and bicycle trails. An increase in active seniors may require a necessary expansion in therapeutic recreation and exercise programs.

Line dancing class for seniors at Louden Nelson Community Center

C. RECREATION TRENDS

HEALTH, FITNESS, & LIFE-LONG SPORTS

According to the National Park & Recreation Association, walking, running, biking, and swimming continue to dominate the list of top ten recreational activities. This is in part due to an increased concern for health and fitness. Rather than joining a gym, many are participating in these low-cost individual activities that can start in childhood and continue into adulthood with little financial commitment. These activities are key in the effort to combat childhood obesity as well. Parks and Recreation departments are creating programs and events for both children and adults to provide incentives for exercising.

Pick-up basketball game at Laurel Park

TEAM SPORTS

Another continuing trend is participation in team sports, which also provides an excellent outlet for increased health and fitness. In particular, there is a participation increase in soccer, lacrosse, field hockey, and rugby, while there has been a decrease in participation in softball and baseball.

Scott Kennedy Fields, Depot Park

ADVENTURE SPORTS AND RECREATION

As previously mentioned regarding trends amongst adults and young adults, adventure sports are becoming very popular. In particular, there is a new trend towards extreme and adventure sports. The Outdoor Industry Association noted an increase in the popularity of adventure racing, traditional and off-road triathlons, stand-up paddling, kayak fishing, trail running, kayaking, and mountain biking. To accommodate these new sports, facilities and appropriate programming within existing parks and facilities should be considered. Santa Cruz has been a leader in many of these trends.

Emma McCrary Trail, Pogonip Open Space

D. PROGRAMMING TRENDS

MULTI-GENERATIONAL PROGRAMMING

In the past, parks and recreation programming has often been geared towards younger children. Now there is an emerging trend toward programs and events for all age groups. This includes multi-generational programs and events for families to enjoy collectively as well as more targeted niche programs specifically aimed at teens, adults, and the elderly.[3]

Ping-pong at the Depot Park Freight Building

ENVIRONMENTAL PROGRAMS & EDUCATION

Santa Cruz has been at the forefront of environmental responsibility. And now, with recent droughts and concerns regarding climate change, there continues to be a strong desire for environmental programs and education as well as ensuring that any changes and developments to new and existing parks consider environmental implications. One element of environmental education is the installation of interpretive signage for flora, fauna, and natural processes along trails and waterways – a request that was persistently reiterated by community members and key stakeholders during the outreach process.

Interpretive panel at the Santa Cruz Riverwalk

SPECIAL OUTDOOR EVENTS FACILITIES

The National Recreation and Park Association noted a growing attendance in major special events, such as concerts, festivals, fairs, and parties. To accommodate these events, it is important to have enough group picnic areas, outdoor stages and amphitheaters, and indoor auditoriums with up-to-date equipment that are accessible to all user groups.

Food Truck Event at San Lorenzo Park Benchlands

OUTDOOR EDUCATION

Along with the trend towards health and fitness recreation, there is also a trend towards activities with a learning or educational component. From the environmental standpoint, this corresponds with the previously mentioned interpretive signage. From the recreational perspective, as emerging sports gain popularity, new park and facility users can be recruited by offering instruction and skills classes.

Example of an outdoor classroom for educational programs

COOPERATIVE PROGRAMMING

In order to attract participants, cooperative, consortium based programs should be offered, which allow several communities or organizations to form partnerships to jointly offer programs. These programs can utilize and share the best resources that the communities or organizations can collectively offer. This can eliminate duplicate programming and attract a larger group of participants to each program.

ADAPTIVE & INCLUSIVE PROGRAMMING

Outdoor and adventure programming for persons with disabilities is a growing trend amongst recreation providers. Along with programs tailored towards those with disabilities, programs designed for inclusive participation provide opportunities for those with and without disabilities to recreate side by side. People without disabilities tend to have more positive impressions and greater acceptance of people with disabilities after engaging in inclusive outdoor recreation programs.[4]

E. ADDITIONAL PARK & RECREATION TRENDS

ACCESS

With an increasingly urban population that relies on public transportation and alternative means of transit, such as bicycles, as a primary mode of transport, the development of comprehensive transportation and bicycle trail networks is crucial. Creating direct linkages between parks and facilities will help to maintain and encourage their usage as well.

There is a continuing trend to provide increased park and facility access for those with disabilities. At the most fundamental level, this involves removing existing physical barriers at parks and facilities. But this trend also incorporates increasing opportunities for inclusive participation in recreational activities by providing equipment that is accessible to those of all mental and physical abilities.[5] For instance, playgrounds can integrate play equipment with features that appeal to and are accessible to those with and without disabilities, allowing for inclusive play.

Magical Bridge Playground Palo Alto

MARKETING

The trend in marketing and information distribution is towards utilization of technology, which has become the primary means by which most people gather information about use of parks and facilities as well as programming and special events.[6] This includes having an easily navigable and comprehensive website with maps, brochures, and online registration. Potential park, facility, and program users can be reached by utilizing email newsletters and social media as well.

MANAGEMENT

There are also trends in the management of parks and recreation departments towards smooth, cost efficient operation and streamlined interaction with the public. According to the Learning Resources Network, there is a trend in registration patterns towards people registering in-person and on the day of events.[7] With so many competing options for recreation, people often do not sign up in advance, wanting to leave themselves open to possible alternative opportunities. This inundation of day-of registrants needs to be accommodated with better customer service so that the parks and recreation department's programs can successfully compete for participants.

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[1] California State Parks Planning Division (see reference 1).
[2] California State Parks Planning Division (see reference 1).
[3] Learning Resources Network. (2015). *Top Trends in Recreation Programming, Marketing and Management.* Retrieved from http://www.lern.org/blog/2014/07/07/top-trends-in-recreation-programming-marketing-and-management/
[4] Williams, R., Vogelsong, H., Green, G., and Cordell. K (2004). Outdoor Recreation Participation of People with Mobility Disabilities: Selected Results of the National Survey of Recreation and the Environment. *Journal of Park and Recreation Administration, 22:2,* 85-101. Retrieved from http://srs.fs.usda.gov/trends/pdf/ORDisabilities04.pdf
[5] Williams et al (see reference 6).
[6] Learning Resources Network (see reference 5).
[7] Learning Resources Network (see reference 5).

CHAPTER 4: IMPLEMENTATION

WHERE WE'RE GOING & HOW WE'RE GETTING THERE

4.1 Goals, Policies & Actions
4.2 Asset Inventory & Specific Recommendations
4.3 Funding Strategies
4.4 Ongoing Planning & Updates

Bird’s Eye View of Depot Park, Bicycle Trip Bike Park, and Scott Kennedy Fields

SECTION 4.1: GOALS, POLICIES & ACTIONS

A. Vision
B. Goals from the Santa Cruz General Plan 2030
C. Theme Framework
D. Goals, Policies, & Actions
E. Summary

A. VISION

The Santa Cruz Parks Master Plan 2030 (Parks Master Plan 2030) envisions a quality park system that connects the surrounding greenbelts to the Pacific Ocean, preserves and protects its natural heritage, enhances its cultural and recreational environments, and provides a diversity of experiences that enrich lives and support a healthy community.

B. GOALS FROM THE SANTA CRUZ GENERAL PLAN 2030

The goals from the Parks, Recreation, & Open Space chapter of the City of Santa Cruz General Plan 2030 were referenced continuously during the development of the goals, policies, and actions for the Parks Master Plan 2030 in order to ensure compatibility and comprehensive coverage. Concurrently, the Parks Master Plan 2030 expands upon the City of Santa Cruz General Plan 2030 goals in order to more fully support the Vision statement above. The General Plan 2030 goals are included here for reference:

- **Goal PR1**: Ample, accessible, safe, and well-maintained parks, open space, and active recreational facilities
- **Goal PR2**: High-quality, affordable recreational programs, activities, events, and services for all
- **Goal PR3**: Well managed, clean, and convenient public access to open space lands and coastline
- **Goal PR4**: An integrated system of citywide and regional trails

C. THEME FRAMEWORK

The City developed a framework of six themes for the Parks Master Plan 2030 that act as indicators of a healthy, balanced, and functional parks system.

Grant Park

These themes are used as both a filter and framework for synthesizing the information gathered during the outreach phase into the goals, policies, and actions of the Parks Master Plan 2030. In short, they provide the context for developing goals that align with the City's vision.

THEME 1: DESIGN EXCELLENCE

The City will set a standard of design excellence with the aim of creating an engaging, long-lasting, safe, comfortable, and sustainable park system. By holding the design of the City's parks and facilities to a high standard, assets will attract and retain more users from the community.

THEME 2: PLAY, COMMUNITY HEALTH, & INTERACTION

Parks and public spaces will encourage and support play, health, and interaction. The City will provide places to engage in a multitude of recreational activities, including supporting new trends in recreation. The physical infrastructure of parks and facilities will support and promote public health. Parks will provide opportunities for people to engage in activities together as well as to be active independently.

THEME 3: STEWARDSHIP & SUSTAINABILITY

The City will protect and conserve natural resources while providing opportunities for the community to both support and learn from the natural environment. Impacts from recreational use will be minimized and additional efforts will be undertaken to restore and expand natural habitats.

THEME 4: CONNECTIONS AND ACCESS

The City's network of parks, open spaces, beaches and public spaces will continue to make all assets accessible to residents and visitors of all ages and abilities. A trail system will link the various destinations. Access will be maintained to the open spaces and beaches, and efforts will continue to ensure that use of these areas neither diminishes the quality of the experience nor degrades the environment. The City will continue to seek new opportunities to provide and enhance connections and access for recreation, supporting an active and healthy lifestyle and encouraging the use of alternative modes of transportation across the city.

THEME 5: PARTNERSHIPS

The City will strive to partner with schools, the university, other public agencies, and private service providers to provide recreation and natural restoration services to improve efficiency and coverage. Partnerships will help reduce redundancies within the existing parks system, freeing up resources that can be directed towards assessing and meeting unmet needs.

THEME 6: GOOD GOVERNANCE

In order to practice good governance, the City will be transparent and accountable in its decision-making process, while being responsive to the community's needs and open to community participation. Good governance will aid in promoting the community's confidence in the City to not only expand the parks system, but to also manage, maintain, and improve the existing resources and programs.

D. GOALS, POLICIES, & ACTIONS

The following seven goals were developed during the Parks Master Plan 2030 process to guide the future development and maintenance of the City of Santa Cruz's parks, open spaces, beaches, and recreational facilities. These goals are based on community input, direction from the City Council and Parks & Recreation Commission, and an understanding of current needs as well as emerging trends in recreation. The goals also serve to comprehensively address each of the themes detailed above, and the icon for the applicable theme or themes will be noted in relation to each goal. Ultimately, the implementation of these goals will be achieved through the identified policies and actions enumerated below.

PARKS MASTER PLAN 2030 GOALS

GOAL I. Design

- Provide attractive and sustainably maintained parks and facilities throughout the City.

GOAL II. Distribution

- Provide ample parks and facilities throughout the City.

GOAL III. Facilities

- Provide parks and facilities to meet the existing and emerging needs of residents and visitors of all ages and abilities.

GOAL IV. Conservation & Stewardship

- Protect the City's natural resources, wildlife habitat, and environment.

GOAL V. Safety

- Maintain a safe, clean, and comfortable environment for all park users.

GOAL VI. Connectivity and Access

- Provide an integrated park system with clean, convenient access to parks, open spaces, and the coastline.

GOAL VII. Administration & Management

- Establish, maintain, and operate parks, facilities, and programs in a manner that is cost effective and manageable while engaging the community in a manner that maximizes involvement and support.

GOAL I. DESIGN

Provide attractive and sustainably maintained parks and facilities throughout the City.

Well-designed and engaging parks and facilities attract users and foster community involvement and interaction. Throughout the outreach process, the Santa Cruz community has indicated a desire for improvements in quality, maintenance, and amenities at existing parks and facilities. Some of these improvements are more focused on sustainability, such as conserving resources, creating habitat, and reducing erosion and sedimentation. Other desires focused on creating attractive and interesting parks, facilities, and programs that offer unique and egalitarian access. National trends suggest that park users are looking for more unique experiences and programming is becoming more multi-generational. Feedback received during the outreach process supports these trends.

POLICY A. Design, upgrade, and maintain parks and facilities with sustainable features and green building best management practices.

Use native, drought-tolerant planting that enhances biodiversity

ACTION 1. Use sustainable landscaping design and maintenance practices to conserve water, prevent erosion and run-off, and provide habitat and food sources.

a. Investigate and implement the use of recycled water for irrigation.
b. Update irrigation systems to be weather-based, monitored, and controlled remotely.
c. Continue to conduct landscape audits for all parks, and incorporate results into budgetary decisions for upgrading systems and scheduling irrigation.
d. Replace turf in non-recreational areas with water-conserving landscapes, native plantings, and demonstration gardens. Include educational displays describing the environmental benefits.
e. Select materials and native plants to enhance biodiversity and attract pollinators and birds in parks.
f. Increase the number of trees and tree canopy to increase carbon sequestration, reduce heat island effect, and provide habitat.
g. Expand the dedication planting program to plant more trees.

Solar panels can be installed on facilities

Drinking fountains with water bottle fill

h. Increase the number of bioswales and continue to implement stormwater erosion best management practices to reduce runoff, erosion, and sedimentation.
i. Incorporate edible and medicinal landscaping treatments within parks and establish community gardens and orchards.

ACTION 2. Employ energy conserving practices to reduce energy use and produce clean energy.

a. Install computer controlled, energy-efficient lighting in parks and facilities. Minimize light spillover and wildlife impacts.
b. Install solar products or panels to provide clean energy for lights, new shade structures, or on larger facilities such as Harvey West Pool, the Golf Course Driving Range's deck, and/or the Louden Nelson Community Center.
c. Implement the Climate Action Plan's short-term and long-term projects.

ACTION 3. Use water conserving practices to reduce potable water use.

a. Install additional waterless urinals and low flow fixtures in parks and facilities.
b. Investigate water capture and reuse for large water users such as the DeLaveaga Golf Course.
c. Consider installing composting toilets in remote restrooms.
d. Install recycled water systems in facilities for watering adjacent landscapes.
e. Increase the number of drinking fountains with water bottle fill station features.

POLICY B. Design, renovate, and maintain parks to be attractive and functional, increase longer-term use, optimize space, and enhance the unique identity for each park.

Picnic shelter at San Mateo Shoreline Park

Custom fence and gate at Riverside Gardens

ACTION 1. Enhance man-made and natural settings when renovating parks through the use of complementary materials, colors, and features and the compatible placement, size, and layout for site furnishings, landscaping, pathways, plazas, artwork, and architectural features. Highlight key natural features in the design.

ACTION 2. Consider design features and site furnishings that add character and are not replicated in every other community.

ACTION 3. When feasible, replace asphalt pathways with decorative, permeable, hardscaped pathway surfaces.

ACTION 4. Create colorful and artistic expressions of landscape and garden design.

ACTION 5. Consider the function of landscaping in relation to the surrounding setting.

a. Install native plants in areas abutting open spaces, waterways, or other natural surroundings.
b. Install ornamental plantings along streets, at entrances, along primary pathways, around plazas, or other architectural features.

ACTION 6. Ensure that new parks have at least one street frontage for increased visibility, safety, and access.

ACTION 7. Work with the Arts Commission to incorporate interactive art and interpretive signage to highlight cultural, art, and historic elements within parks. Consider developing an Art in the Parks program.

ACTION 8. Carefully coordinate the site furnishings, plazas, pathways, passive and active recreational features and spaces, and landscaping to create meaningful experiences, minimize conflicts between new and existing uses, and optimize use.

Bench at San Lorenzo Park incorporates art with a function

ACTION 9.	Increase the number of bike parking spaces throughout the parks system.
ACTION 10.	Provide an adequate level of service of restroom facilities and renovate existing restrooms to maintain a clean, safe, inviting appearance. Place restrooms at larger or more extensively used neighborhood parks.
ACTION 11.	Develop and periodically update a site materials, colors, and site furnishings list to ensure continuity in overall park style and design.
ACTION 12.	Maintain a signage program and other features that help maintain a united identity for the parks system as a whole.
ACTION 13.	Increase the replacement of the deteriorating concrete garbage cans with decorative or BearSaver cans to improve appearance and increase recycling.
ACTION 14.	Invest in quality materials and newer designs, technologies, and products that will use less resources over time and ensure that preventative maintenance schedules are followed to maintain their appearance and function.

POLICY C. Improve accessibility for all users to all parks and facilities.

Access ramp to beach

ACTION 1.	Improve access for disabled users. a. Consider improvements to increase beach and open space access for disabled users. b. Increase accessible parking near facility and park entrances and trailheads. c. Consider Universal Design principles when locating new recreational facilities to accommodate use by all users.
ACTION 2.	Consider the needs of seniors in circulation and park design and expand recreational facilities for seniors.
ACTION 3.	Provide fitness facilities for all users and encourage multi-generational play spaces.
ACTION 4.	Seek additional community garden space in higher density or lower income areas.
ACTION 5.	Increase bilingual services, programs, and signage, especially in areas where English may not be the primary language for larger populations of residents.

GOAL II. DISTRIBUTION

Provide ample parks and facilities throughout the City.

All neighborhoods and residents in the City should have equal access to quality parks and facilities. During the outreach process, some residents expressed concern about a lack of parks or facilities within close proximity to their neighborhood. Therefore, as new opportunities arise, the City will look at the distribution of existing parks and facilities. As the following policies and actions illustrate, the City will purchase or lease new property where it is most needed, and explore partnerships to improve opportunities for recreation. National trends indicate an increase in health and fitness sports that are easy and inexpensive to participate in, while the Godbe surveys conducted in the Santa Cruz community showed that walking, hiking, and jogging are three of the most popular activities amongst residents. Additionally, studies find that children under 18 are becoming more sedentary and solitary because of technology, so it is important to encourage outdoor recreation for social and health benefits. To support the national trend and findings of the Godbe surveys as well as empower children to recreate outdoors, it is crucial to provide easy access to nearby parks and facilities.

POLICY A. Distribute recreation amenities evenly throughout the community.

Opportunity to add amenities and furnishings at Round Tree Park

ACTION 1. Continue to seek opportunities to purchase or lease additional parkland: 1) in areas that lack existing parks and amenities in close proximity, 2) larger properties that can accommodate a variety of recreational facilities, 3)underutilized land, 4) higher density growth areas, 5) or properties with significant cultural heritage.

ACTION 2. Explore opportunities for partnerships to use land within or adjacent to the City to help provide facilities to meet unmet needs. Examples include improving the joint-use agreements with the school district to allow public use of outdoor recreational areas during non-school hours, working with UCSC to provide pickleball striping at the tennis courts at 207 Natural Bridges Drive, and partnering with the County to provide recreational facilities on the vacant, adjacent parcel near the lawn bowling facility at San Lorenzo Park.

ACTION 3. Evaluate all lands, regardless of size, for the development of small parks and facilities.

ACTION 4. Improve the Joint Use Agreements with the School District to improve access and more clearly define roles and responsibilities, funding, enforcement, and repair to ensure facilities and play areas remain open and in good condition during agreed upon public use times.

GOAL III. FACILITIES

Provide parks and facilities to meet the existing and emerging needs of residents and visitors of all ages and abilities.

Of equal importance to the quantity and distribution of parks and facilities is the quality of their amenities. These amenities should meet residents' current and anticipated needs, while also providing unique and interesting experiences that encourage repeated use. The following policies reflect feedback from the community outreach process as well as unmet needs identified by the City. Both suggest a need for more sports fields, bike amenities, indoor recreational space, and off-leash dog areas. The City also plans to develop diverse and iconic playgrounds that serve users of all abilities. National studies suggest that adults and young adults are creating new alternative recreational experiences faster than ever before, so it is crucial for parks and facilities to have the flexibility to meet these new and emerging trends in order to best serve the community as a whole. Additionally, the number of seniors will continue to grow, creating an increased desire for facilities and programs that cater to their needs.

POLICY A. **When adding new uses to neighborhood parks, consider how the use meets unmet needs of the community in addition to meeting needs of the surrounding neighborhood.**

POLICY B. **Scale recreational facilities to neighborhood parks that are compatible with the neighborhood character.**

Playground at Trescony Park

ACTION 1. Continue to hold neighborhood meetings to help inform the addition, modification, or removal of recreational facilities.

ACTION 1. Provide neighborhood park uses including, but not limited to, off-leash dog use areas, ball fields, skateboard parks, tennis courts, basketball courts, ping-pong tables, playgrounds and tot-lots, climbing and exercise equipment, slack-lining, pickleball courts, community gardens, pump tracks, bocce courts, disc golf courses, horseshoe pits, picnic areas, sand volleyball courts, when designed to minimize impacts to the surrounding neighborhood.

ACTION 2. Considerations in design should include minimizing potential impacts of light spillover, attenuating noise, and providing appropriate tree screening.

POLICY C. **Consider increasing the scale and uniqueness of each type of recreational facility located in a community park setting. Provide uses and experiences that are not common in neighborhood parks in order to draw use from the whole community.**

POLICY D. **Accommodate the need for more active sports fields for club, league, and casual play.**

Youth club baseball game at Lower DeLaveaga Park

ACTION 1. Conduct an athletic field feasibility study to explore locations and options for additional multi-use field space (i.e. can accommodate soccer, football, lacrosse, rugby, field hockey, baseball, softball, etc.) and the use of synthetic turf to increase the duration of play.

ACTION 2. Explore or expand more cooperative agreements with the Santa Cruz City School district and UC Santa Cruz for the use of sports fields.

ACTION 3. Ensure sports fields have adequate drainage and lighting to increase the duration of play. Carefully consider health, environmental, and long-term costs when determining whether or not to convert grass to synthetic turf fields.

ACTION 4. Expand opportunities for informal sports play.

POLICY E. **Develop playgrounds that meet a broad range of physical, creative, and social needs for all demographics.**

Magical Bridge Playground in Palo Alto is designed and built for children of all abilities

ACTION 1. Renovate and maintain playgrounds to create more unique and interesting play experiences. Incorporate:

a. Universal Design principles so parks and facilities are more inclusive and available to all users.
b. Natural playgrounds (water, rocks, trees, etc.).
c. Interactive playgrounds.
d. Multi-dimensional playgrounds.
e. Themed playgrounds.
f. Sand and water play.
g. Play structures that offer more than one type of play and allow children of varying abilities to play together.
h. Complementary facilities for adults, such as adult play/exercise equipment near playgrounds.

Sensory harp at Magical Bridge Playground

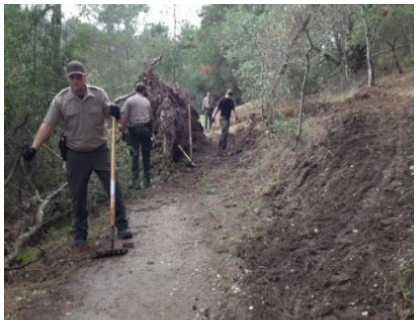
Natural willow branch play structures at Mission Bay Playground in San Francisco

ACTION 2. Assure accessibility and safety on all City playgrounds.

a. Use playground surfacing that meets criteria of accessibility and safety.
b. Consider fencing playgrounds.
c. Provide signage about play equipment and safety rules.
d. Separate tot and school-age play areas.

POLICY F. Enhance trail programs, trails, and infrastructure.

Bridge building and trail maintenance



Emma McCrary Trail

Moore Creek Preserve

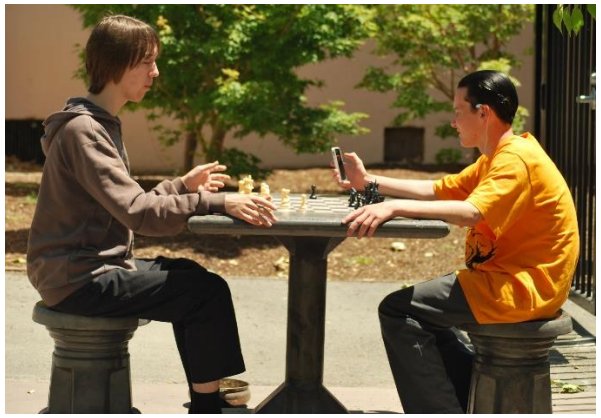
ACTION 1. Develop, improve, and enhance trails to provide for a range of uses.

a. Evaluate new trail uses through a public process to determine if they are appropriate for a specific open space, and help the City provide for a range of trail uses. Collect usage data on existing trails and study impacts to wildlife and habitat to inform the decision-making process.
b. Expand the trail network and connections.
c. Seek partnerships with UCSC, State Parks, non-profits, and private property owners to improve network connectivity, signage and trail designations.
d. Rate and sign trails with the difficultly level, rules, and etiquette and provide wayfinding markers with accurate mileage.
e. Incorporate natural features such as fallen trees or rocks for seating and to block ad-hoc trails.
f. Realign trails or perform design improvements to address run-off, erosion, steepness of grade, and/or use conflict issues.
g. Provide access to areas with scenic views or historical significance.
h. Conduct trail assessments that will inform and help plan for future maintenance projects, grant applications, volunteer efforts. Increase the number of partnerships to help maintain the trails.
i. Create and maintain sustainable design guidelines and maintenance standards for existing trails.
j. Consider creating spurs from multi-use trails to enable mountain bikers to reach more advanced features and terrain to accommodate a variety of skill levels. Consider adding a technical downhill trail with jumps and obstacles for mountain bikers and adequately sign the trailhead with maps and signage indicating features and the difficulty level.

Santa Cruz Museum of Natural History's Nature Ranger Program

ACTION 2.	Provide opportunities for classes, tours, and practice space. a. Seek programming and locations to host children's classes to learn "bike smarts". b. Increase skills clinics for advanced riders. c. Consider working with an outside provider to hold horseback riding classes within an appropriate open space during the summer months. d. Hold more natural and historical interpretive tours and volunteer days.

POLICY G. Accommodate new and emerging trends and satisfy unmet needs.



Outdoor chess and table tennis tables at Louden Nelson Community Center

Seasonal pump track in the San Lorenzo Park benchlands

ACTION 1. Provide activities that improve physical activity and mental health for all ages, abilities, and interests.

a. Provide outdoor game tables such as chess, checkers, table tennis, or foosball.
b. Continue to promote outdoor fitness and health initiatives and increase the distribution and number of outdoor exercise facilities.
c. Seek opportunities for community garden space, particularly on the east side of San Lorenzo River and in the Beach Area.
d. Seek opportunities and partnerships for the use of a walking track.
e. Consider locations for adding climbing wall and slack-lining facilities to be placed in equally distributed locations.
f. Consider adding a tennis court facility on the east side of the San Lorenzo River.
g. Identify a location for a pickleball facility with 6 to 10 courts and/or smaller facilities that can be located in different areas of the City.
h. Increase the number of wildlife interpretive signage and viewing areas.
i. Seek opportunities for the installation of a ropes course in a natural or urban setting.
j. Consider establishing a drone course only after further study demonstrates use of the facility would not result in significant impacts to sensitive habitat areas and wildlife including disturbance or harm to nesting birds. Prohibit recreational use of drones and/or establishment of a recreational drone course within sensitive habitat areas or near wildlife nesting areas that could cause disturbance or harm to breeding or nesting wildlife.

k. Provide spaces for intergenerational programming and activities to increase the interactions between older and younger generations.

l. Develop more bike parks, pump tracks, and jump facilities with features and amenities to meet a variety of skill levels.

ACTION 2. Expand concessions in parks and recreational facilities.

a. Continue to evaluate and monitor locations for mobile food vendors and determine if site furnishings or other amenities can be added to support successful locations.

POLICY H. Upgrade, acquire and develop new community recreational facility buildings to accommodate new and emerging recreational trends and satisfy unmet needs.

Roller derby bout at Kaiser Permanente Arena

ACTION 1. Prioritize upgrading and optimizing existing community recreational facilities.

ACTION 2. Capitalize on opportunities for partnerships and joint-use agreements to develop new community recreational facilities when rare opportunities are presented.

ACTION 3. Expand partnerships and concessionaire agreements to allow for outside providers to provide a recreational service on City land.

ACTION 4. Continue to seek community recreational facilities to host community events and programming. Continue to provide large gathering areas for family celebrations and group functions.

ACTION 5. Consider partnerships to allow for public recreational uses in the permanent Kaiser Permanente Arena during the Santa Cruz Warriors off-season.

a. Evaluate potential Parks and Recreation programming uses, events, designs, and costs during the planning phases of the arena.
b. Explore mechanisms to facilitate Parks and Recreation Department programming to facilitate multi-purpose sports and events throughout the year.

POLICY I. **Seek opportunities to enhance off-leash dog use experiences while minimizing conflicts with other park uses and wildlife.**

Example of fenced off-leash dog area with separate areas for smaller and larger dogs

ACTION 1.	New formal off-leash dog use areas in parks will be completely fenced and located in an underutilized area.
ACTION 2.	Identify a location for a fenced off-leash dog use area for the Lower Westside neighborhood.
ACTION 3.	Provide amenities and features that enhance the experience for dogs and their owners such as drinking fountains, shade structures, seating, picnic tables, and play features.
ACTION 4.	Consider creating separate, smaller facilities for smaller dogs or for dog training to reduce dog conflicts.
ACTION 5.	Increase enforcement of off- leash and dog access laws.
ACTION 6.	Clearly sign rules and etiquette to minimize conflicts. Educate users of the importance of cleaning-up waste to reduce odor impacts to the park and surrounding property owners. Work with the County Animal Shelter to provide animal behavior classes at dog parks.
ACTION 7.	Review the existing day-use access areas for domestic animals onto beaches and open spaces. Consider creating a licensing program to manage off-leash dog use.
ACTION 8.	Consider locations for off-leash dog use near open spaces to allow dogs to release energy before embarking on designated hiking trails.

GOAL IV. CONSERVATION & STEWARDSHIP

Protect the City's natural resources, native wildlife habitats and plant communities, and environment.

Santa Cruz has an incredible wealth of open space and natural resources to manage and protect. During the outreach process, community members expressed a strong desire to preserve existing open spaces. Though the City's natural areas provide the majority of habitat within the City's park system, urban parks can also serve an important role in providing habitat and connectivity across the greater landscape. Many urban parks are located adjacent to open spaces, riparian areas, water bodies, or the coastline. Some species have adapted to human influences and development and find habitat at an urban park or facility, such as a bird nesting under a bridge. Other species may make use of urban parks as migratory habitat or for passage to other habitat areas. A park's location may be important in terms of greater connectivity, enabling wildlife to cross, shelter, drink, and/or feed. It is important to consider the role of urban parks for increasing biodiversity. Restoration plans will help identify, prioritize and implement long-term projects. The provision of recreational facilities within open spaces requires additional consideration to minimize impacts to the environment. National trends suggest an increased interest in environmental programs and education, which will help engender environmental stewardship in current and future generations. As the baby boomer generation retires, they continue to be active and are drawn to conservation causes, so they can be enlisted to help with volunteer and educational efforts.

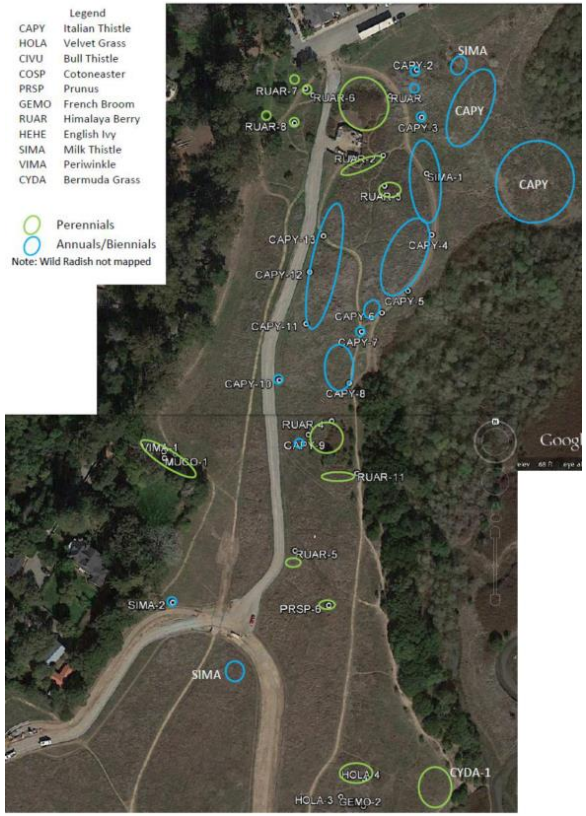
POLICY A. Maintain and enhance natural habitats to increase biodiversity and sustain long-term ecological function.

ACTION 1. Understand and maintain the diversity of native plant communities.

a. Map and describe plant communities; analyze successional trends; and formulate site-specific vegetation management goals, targets, restoration methods, and monitoring protocols for parks and open spaces.
b. Periodically update the inventory of invasive plants and input data into Cal-Mapper, Cal-Flora to help track the spread of invasive plants at a regional level.

ACTION 2. Understand and maintain the diversity of native wildlife.

a. Identify wildlife usage, movement patterns, and habitat features with high value to wildlife and formulate site-specific management goals for parks and open spaces.



Example of invasive weed mapping, Arana Gulch, Area C

Measuring grass height along transect lines to determine if targets were met

b. Inventory critical and sensitive wildlife habitats and develop management strategies for their protection.
c. Collect data to identify how urban parks can be landscaped and contain features to help improve habitat and connectivity across the City for specific species.
d. Consider programs and partnerships to increase the documentation of local wildlife such as through eBird, iNaturalist, Bio Scan, and other wildlife data collection sources to increase the amount of data available for informing management decisions.

ACTION 3. Develop and implement restoration work plans to restore natural processes and control invasive species.

a. Identify habitat specific restoration actions to be implemented within each park/open space, including a yearly schedule and long-term timeline based on existing Master Plan policies and actions. Utilize an adaptive management approach to guide and prioritize specific restoration activities with the goal being the establishment of functional ecosystems. Use SMART principles (specific, measurable, achievable, results-focused, and time-bound) as a framework. Prioritize restoration objectives with the number one priority being the conservation of rare, threatened, or endangered species and their supporting habitats. Undertake projects in areas that would increase public exposure and education. Develop a condensed work plan for each site that is practical to use in the field for maintenance staff and volunteers. Create clear guidelines for City personnel, contractors, and volunteers that reflect the conditions of specific projects and sites to ensure that sensitive resources are not mistakenly damaged during restoration activities.

Cattle grazing at Moore Creek Preserve to restore the coastal terrace prairie and improve habitat for the endangered Ohlone tiger beetle

Partnering with the Santa Cruz Museum of Natural History's Earth Stewards Program to teach students job skills in the natural restoration field

b. Conduct periodic training sessions for City personnel, contractors, and volunteers on best management practices to prevent the entry of invasive plants and maintenance of existing native plants.
c. Seek partnerships with agencies, schools, universities, organizations, and community groups to help learn, fund, perform, or study restoration activities.
d. Maintain an adopt-a-park program and engage and support community members who wish to commit to a longer-term undertaking. Provide guidance and assistance to ensure work is performed in accordance with a restoration plan.
e. During future organizational reviews and strategic planning, consider the creation of an Open Space Maintenance and Restoration Division.
f. Increase the number of large clean-up days to remove waste from illegal camping activities. Continue to provide training to participants to reduce the risk from public hazards. Provide ongoing, steady, monitored maintenance to prevent the large scale build-up of trash. Ensure that clean-up efforts avoid damaging bird nests.
g. Develop a funding strategy for the long-term implementation of the work plans.
h. Seek partnerships to study, enhance, and expand wildlife corridors, increase habitat value, control invasive plant species, and educate the public whenever possible.
i. Work with county, state, and federal agencies to identify and control feral or pest populations that have a negative impact on plants and/or wildlife.

ACTION 4. Improve habitat within urban parks and facilities.

a. Identify and convert non-usable turf fields to native gardens. Base landscaping treatments on appropriate native communities, taking into account geology and other microsite conditions. Create park specific planting lists and incorporate Xerces Society planting recommendations to increase habitat for pollinators.

Community members team-up to remove invasive species at Tyrrell Park

Native planting along the Santa Cruz Riverwalk

b. Consider certifying landscaping through the National Wildlife Federation's Garden for Wildlife Program and post signs to increase awareness of the importance of gardens for butterflies, bees, birds, and other wildlife.
c. Increase the tree canopy and/or provide plants and features that provide habitat value in public right-of-ways, drainage areas, or on other lands managed by the Parks and Recreation Department.
d. Inventory trees and increase the tree canopy to increase bird nesting opportunities, improve air quality, decrease heat island effect, and increase carbon sequestration.
e. Explore the installation of habitat enhancement structures in parks, such as owl boxes near turf fields to help control gophers.

ACTION 5. Use native species occurring naturally on similar sites in ecological restoration projects when feasible.

a. Use seed and cuttings collected from the same geographic area to revegetate or enhance degraded areas.
b. Prevent the spread of *Phytophthora* in city parks and open spaces.
c. Use fill, mulch, plants, and seed mixtures that are free of non-native plants and disease in ecological restoration projects.
d. Work with nurseries to grow native plants needed for ecological restoration projects.
e. Use site appropriate native or sterile plants for erosion control. Do not use invasive, non-native plant species.
f. Use plant material that is ecologically and visually appropriate to the surrounding wild landscape and appropriate to the stage of plant community development at the site.

Downtown Tree Walk

ACTION 6. Maintain and expand tree canopy coverage and manage forest diseases, when necessary, to protect native biological diversity and critical ecosystem functions.

a. Assess impacts and determine strategies to address areas if infested by high priority insects and diseases; utilize best phytosanitary management practices to control the spread of disease and infestations; support research to guide land management decisions; utilize nursery stock from nurseries that implement best management practices and test for *Phytophthora*; and pursue partnerships with public agencies to implement treatments.

b. Complete an inventory to quantify the number of trees on public lands including streets, parks, and open spaces. Increase the City's urban tree canopy by 10% between 2008 and 2020.

c. Promote the Urban Forestry Program to provide new trees for public property, celebrate Arbor Day, and increase the number of neighborhood tree plantings. Coordinate the preservation of trees whenever possible. Expand the Heritage Tree Grant Program.

POLICY B. Manage greenbelt and open spaces for conservation and to minimize recreational use impacts.

The endangered Ohlone tiger beetle

Livestock grazing to control invasive plant species at Neary Lagoon Wildlife Refuge

ACTION 1. Protect and enhance the habitat and populations of special status plant and animal species.

a. Monitor locations and conditions of special status plants and wildlife and their habitats within a park or open space.
b. Conduct surveys for special status plants and wildlife during the appropriate season before significant site-specific development or any unusual anticipated increase in use. Modify the project or use to avoid impacting such plants or wildlife.
c. Ensure resource conservation and environmental sensitivity in project design and construction.
d. Evaluate new uses for potential impacts to watershed, riverine, stream, and riparian environments.
e. Protect areas with special status species from negative human activities and other impacts such as erosion, trampling, and litter. Examples of protective measures include trail rerouting, educational signs, and fencing.
f. Give priority to protection of special status species.
g. Continue to partner with wildlife agencies in managing special status species.

ACTION 2. Protect, maintain and enhance habitat features that are important to native wildlife and native plant communities.

a. Avoid, minimize, or off-set impacts on wildlife and native vegetation when planning trails and other facilities.
b. Revegetate plants native to the specific habitat in buffer/setback areas adjacent to creeks and wetlands.
c. Minimize potential erosion from new trails using sustainable design features and improve existing eroding trails.
d. Monitor the impacts from new improvements to identify remediation solutions and to inform future decision-making.

Volunteers repair erosion on the U-Con Trail, Pogonip Open Space

Youth Trail Crew repairing a puncheon crossing

e. Leave snags and fallen trees in areas where they do not pose a fire or physical hazard, to provide cover and nesting sites for animals, and nursery conditions for forest seedlings.
f. Evaluate the wildlife habitat value associated with human-made structures before altering or removing them and avoid or mitigate any impacts.
g. Discourage human intrusion into sensitive wildlife habitats by appropriate placement of facilities and trails.
h. Identify and eliminate barriers (e.g. remove unnecessary fences, old barbed wire, and other barriers) and provide safe crossings (e.g. protect existing and promote additional wildlife crossings and use wildlife friendly fencing) to enhance wildlife movement.
i. Reduce conflicts between wildlife and humans through notification and education, control of human access and, as a last resort, control of wildlife presence or movement in concert with State and/or Federal agencies.
j. Where consistent with riparian and wetland protection, provide views or low impact access.
k. Evaluate new uses for potential impacts to watershed, riverine, stream, and riparian environments.
l. Work with local and regional agencies to implement strategies to reduce or mitigate impacts of uses and development on the City's watershed lands.
m. Conserve creek, riparian, and wetland resources in accordance with the City-wide Creeks and Wetlands Management Plan, San Lorenzo Urban River Plan, Moore Creek Interim Management Plan, Jessie Street Marsh Management Plan, and the Neary Lagoon Management Plan.
n. In the CEQA review process for new projects, evaluate and mitigate potential impacts to sensitive habitat (including special-status species and nesting birds) for sites located within or adjacent to these areas.

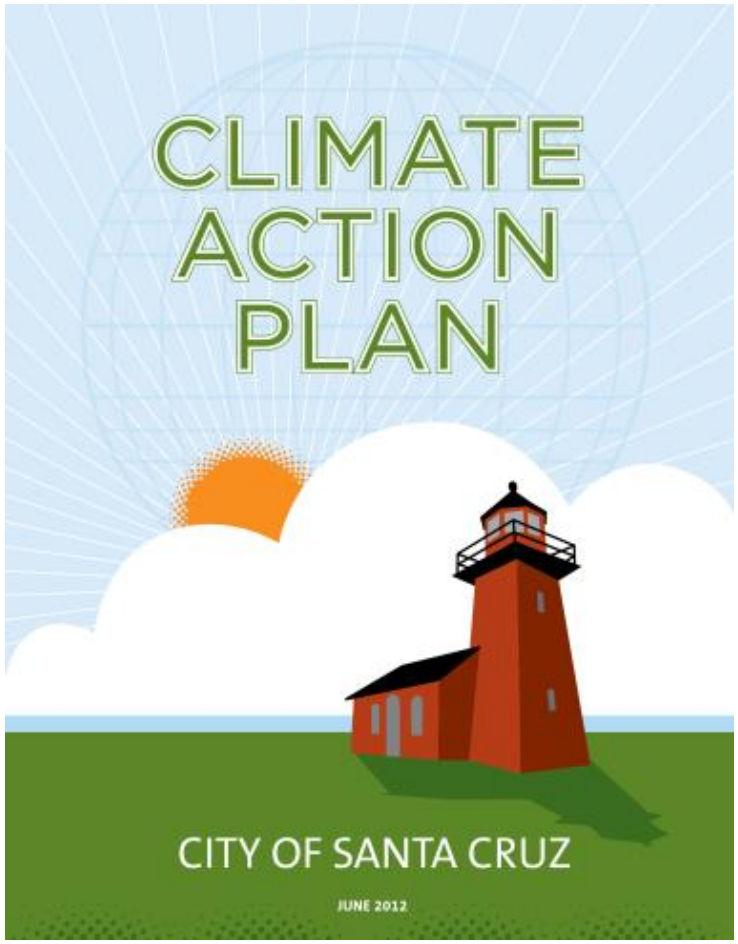
Bioswale near the Cowell Beach parking lot

o. Maintain a trash management policy and continue to install new receptacles designed to prevent trash from subsidizing predator and pest populations (corvids, gulls, rats, raccoons).
p. Continue to conform to the City's Integrated Pest Management Program.
q. Protect coastal roosts and rookeries in the course of activities that could disturb or disrupt breeding or result in loss of habitat, such as construction activities, recreational activities, or special events.
r. Implement site design and erosion control measures for new trails and other facilities in areas subject to high erosion hazards or adjacent to streams and wetlands.

ACTION 3. Protect waterbodies, including creek systems, riparian environments, and wetlands from uses that would degrade their value to native species.

a. Reduce erosion and sedimentation from roads and trails.
b. Increase the number of bioswales to increase percolation, entrap and filter sediments, and reduce stormwater runoff from developed areas.
c. Decrease illegal camping and access to non-designated areas.

POLICY C. Support and seek funding for long-term projects.



ACTION 1.	Continue to partner with the Resources Conservation District to reduce stormwater run-off, sedimentation, and erosion.
ACTION 2.	Pursue reclaimed water, water capture, and water recharge projects to decrease erosion and sedimentation and conserve water.
ACTION 3.	Continue to implement the Climate Action Plan and Climate Adaptation Plan.
ACTION 4.	Continue to improve partnerships with local, state, and federal agencies and organizations to help address regional challenges such as habitat fragmentation, connectivity, global warming, invasive species control, fishery management, and water pollution.
ACTION 5.	Seek grant funding opportunities for specific projects but ensure funding is available to maintain restored areas to prevent issues from remerging after the project is complete.

POLICY D. Provide more environmental education to the public.

Parks & Recreation's Camp Spot Rocks in Neary Lagoon

ACTION 1. Provide youth with environmental education programs.

a. Collaborate with City schools and others on outdoor classroom programs. Special emphasis should be provided in engaging youth in meaningful ways to learn and appreciate the local plants and wildlife. Build wild elements into parks and open spaces, formal and informal play areas, with materials that encourage inquiry and dialogue with nature.

ACTION 2. Provide interpretive programs for the public.

a. Provide more interpretive signage in parks and open spaces and along waterways.
b. Continue the downtown tree walk tour.
c. Consider the development of park docent program.
d. Provide interpretive education programs led by park rangers and/or docents. Partner with organizations and hold classes and interpretive walks.
e. Continue to partner with the Santa Cruz Museum of Natural History to provide interpretive tours within the City's open spaces.

GOAL V. SAFETY

Maintain a safe, clean, and comfortable environment for all park users.

For the community to enjoy the City's parks and utilize their amenities, park users need to feel safe and comfortable. Throughout the outreach process, residents repeatedly provided feedback concerning a perceived lack of safety and cleanliness in the parks and open spaces, which has affected usage of parks and playgrounds. Therefore, the City proposes to improve the safety and cleanliness in the parks by mitigating the impacts of illegal activities through design treatments to help create more visible, navigable, and activated parks. At the same time, increased enforcement of rules and presence of rangers, police, park hosts, and mental health services in parks will help to deter illegal activities.

POLICY A. Mitigate impacts of illegal activities on park use.

Camp clean-up with Rangers

Levee damage caused by illegal camping

ACTION 1. Use defensible space design treatments to deter illegal behaviors.
- a. Increase lighting and visibility in parks and on trails.
- b. Increase visibility into parks by maintaining clear lines of site and eliminating hidden nooks and enclaves.
- c. Activate underutilized spaces by providing additional programming and facilities to encourage lawful uses.
- d. Make parks easily navigable with way-finding elements.
- e. Explore fencing, locking, and temporary closures of areas of concern.

ACTION 2. Explore rules and policies regarding park uses (drones, off-leash dogs, camping, and closures).

ACTION 3. Develop a caretaker or park host program to help care for open spaces and community parks.

ACTION 4. Explore partnerships and programs to provide information and referrals about mental health, drug abuse, and homeless services.

ACTION 5. Increase resources to remove trash and debris from illegal camping.

POLICY B. Increase patrols and enforcement.

Increased park ranger presence in downtown Santa Cruz

ACTION 1. Increase park ranger/police presence and interaction.

a. More patrolling earlier in the morning and later in the evening.
b. More alternative methods of patrol (bikes, motorcycles, etc.).

ACTION 2. Increase enforcement of park rules.

GOAL VI. CONNECTIVITY AND ACCESS

Provide an integrated park system with clean, convenient public access to parks, open spaces, and the coastline.

The network of parks, open spaces, beaches, and trails provide access and connectivity across the City. They provide opportunities for recreation, a buffer from the more urban environment, a means for alternative transportation, and critical natural resources. The beaches and open spaces embody the City's unique sense of place and identity. In many areas of the City, trails provide nearly continuous links between parks, open spaces, and the beaches. National trends indicate a move towards more interconnected park systems through trails, connector parks, and greenways, allowing easier park and facility access to residents of all ages and abilities. A greater emphasis on pedestrian and bicycle pathways also aligns with national trends indicating an increase in the popularity of health and fitness recreation. The City will continue to resolve gaps in the park system through partnerships and land acquisition. Some neighborhoods are disconnected and it is important that all neighborhoods have access to quality parks and facilities as described under Goal II. Distribution.

POLICY A. Continue to integrate, expand, and improve the connective and accessible network of parks, open spaces, and trails.

ACTION 1. Continue to seek opportunities to purchase or lease additional land to enhance recreational corridors and extend network connectivity. Seek properties and improvements that fill gaps within the trail system, expand recreational opportunities along existing corridors, or provide important habitat and wildlife connections.

ACTION 2. Implement the San Lorenzo Urban River Plan and enhance and maintain the recreational value of the riverfront.

ACTION 3. Help develop and implement an integrated design, land-use, recreation, cliff stabilization, and landscape plan for West Cliff and East Cliff Drives to enhance public safety, access, connectivity, preservation, and recreational enjoyment along the coastline.

Monterey Bay Sanctuary Scenic Trail Master Plan

ACTION 4. Support and help implement and maintain the Monterey Bay Sanctuary Scenic Trail multi-use path. Seek opportunities for additional parkland along the corridor. Consider adding complementary features and design treatments at existing parks along the trail such as by placing wayfinding signage and maps, benches, trash receptacles, drinking fountains, picnic areas, shade structures, artwork, or plazas adjacent to the trail.

ACTION 5. Acquire new open space when there are opportunities to increase access and improve public safety and management. If the opportunity presents itself, support the acquisition and management of Lighthouse Field.

ACTION 6. Work with the Public Works Department to help implement the Active Transportation Plan and connect major parks throughout the City with smaller loop options and spur trails that connect to the bike and pedestrian system through the City and to the regional network.

ACTION 7. Support a Felton-Santa Cruz recreational trail and transportation/commuter corridor.

ACTION 8. Provide and maintain trails within parks and appropriate open space areas.

ACTION 9. Develop trailhead locations.

a. Provide well signed trails with maps.
b. Provide parking.

POLICY B. **Protect, maintain, and enhance publicly accessible coastal, riverfront, and open space areas to ensure they maintain a safe, quality appearance. Provide recreational and educational experiences that reflect the unique sense of place and identity of Santa Cruz.**

Multi-use trail project at Arana Gulch Open Sace

ACTION 1.	Ensure staffing-levels are adequate to patrol, maintain, and clean the coastal, riverfront, and open space areas.
ACTION 2.	Evaluate existing and develop new rules, policies, and programs to ensure they promote a safe and clean environment.
ACTION 3.	Ensure existing facilities and site furnishing are updated and new ones are added in a manner that ensures a quality appearance that maintains continuity over time as projects are phased-in.
ACTION 4.	Continue to partner with agencies, organizations, and community members to keep the coastal, riverfront, and open space areas pristine and attractive.
ACTION 5.	Maintain and improve access and the recreational value of the coastal, river front, and open space areas while ensuring that new uses, facilities, or site furnishings do not diminish their intrinsic qualities and natural resources.

GOAL VII. ADMINISTRATION & MANAGEMENT

Establish, maintain, and operate parks, facilities, and programs in a manner that is cost effective and manageable while engaging the community to maximize involvement and support.

Well-managed parks, facilities, and programs attract more use and participation from residents, which helps to generate community support for the parks system. During the outreach process, key stakeholders suggested the need to increase both maintenance staff and park rangers to provide a better experience for park users. In order to increase staffing and accomplish many of the improvements outlined in this Parks Master Plan 2030, a sustainable funding mechanism must be developed. National trends indicate an increase in the use of technology for promoting and registering for programs and events as well as providing basic information to park visitors, so utilizing the City's website and email lists is critical in communicating efficiently and cost-effectively with the public. Technology can help to reduce administrative costs to allow more funds for improvements to parks, facilities, programs, and staffing.

POLICY A. Administer parks and recreation facilities to continue to deliver quality parks and recreation services.

Youth Trail Crew Program and Park rangers

ACTION 1. Develop maintenance and safety standards for parks and facilities and evaluate staffing levels to achieve goals.

a. When acquiring new facilities, consider long-term staffing and maintenance costs.
b. Increase full-time staff to improve park maintenance
c. Increase the number of park rangers to allow more focus on natural resource management, park maintenance, and interpretation in addition to law enforcement and illegal camp clean-ups.
d. Hire a grant writer.

ACTION 2. Work with the Parks and Recreation Commission to establish and maintain annual short-term and long-term priorities for capital improvement projects that are proposed to the City Council. Develop and maintain conditions assessments to help inform the review process which include information on year of installation, maintenance costs and issues, replacement costs or alternatives, safety concerns, and other relevant data.

ACTION 3. Coordinate efforts with CA State Park and other recreation providers to ensure public use areas are adequately maintained.

POLICY B. Continue to improve community outreach and communication.

WebTrac, on the City of Santa Cruz website, allows for online registration

POLICY C. Develop a sustainable funding mechanism for the maintenance and operation of City parks, open space, beaches and facilities.

Friends of Parks & Recreation homepage

ACTION 1. Publicize park programs and facilities.

a. Continue to utilize website for marketing events, programs, and classes.
b. Utilize emerging technologies to publicize events, programs, classes, and park and facility improvements.
c. Consider developing an outdoor tour cell phone application where park users can take tours and learn about the history, environment, and things to do and see when they visit each park and open space.

ACTION 1. Increase funding for parks.

a. Consider a ballot initiative or other alternative financing options to augment Parks and Recreation Department funding.
b. Expand partnerships with private organizations.
c. Develop maintenance agreements with other entities.

ACTION 2. Develop, implement and adopt a parks program and increase volunteer efforts.

ACTION 3. Consider the establishment of a parks endowment fund.

ACTION 4. Consider prioritizing projects which are economic generators and draw use from residents and visitors.

ACTION 5. Utilize and support Friends of Parks and Recreation (FOPAR) to help in their fundraising, scholarship, and funding of smaller special projects to improve the parks system.

ACTION 6. Evaluate fees and use rates to reflect the current costs to provide services. During the fee study, consider the viability of use passes to help offset maintenance costs.

E. SUMMARY

The goals, policies, and action items developed during the Parks Master Plan 2030 process will guide the future development of the City of Santa Cruz's parks, open spaces, beaches, and recreational facilities. Many reflect long-standing goals and others are based on community input, direction from the City Council and Parks & Recreation Commission, and an understanding of current needs as well as emerging trends in recreation, the action items represent the broad spectrum of values, needs, and desires of the Santa Cruz community.

In addition to the overarching goals, policies, and actions just presented, specific recommendations for individual parks, open spaces, beaches and facilities evolved out of the outreach process. The following section, 4.2 Asset Inventory and Specific Facility Recommendations, outlines the recommendations for each park, open space, beaches, or facility in the park system. The general policies and actions in the previous sections would also apply to each of these facilities.

SECTION 4.2: ASSET INVENTORY & SPECIFIC FACILITY RECOMMENDATIONS

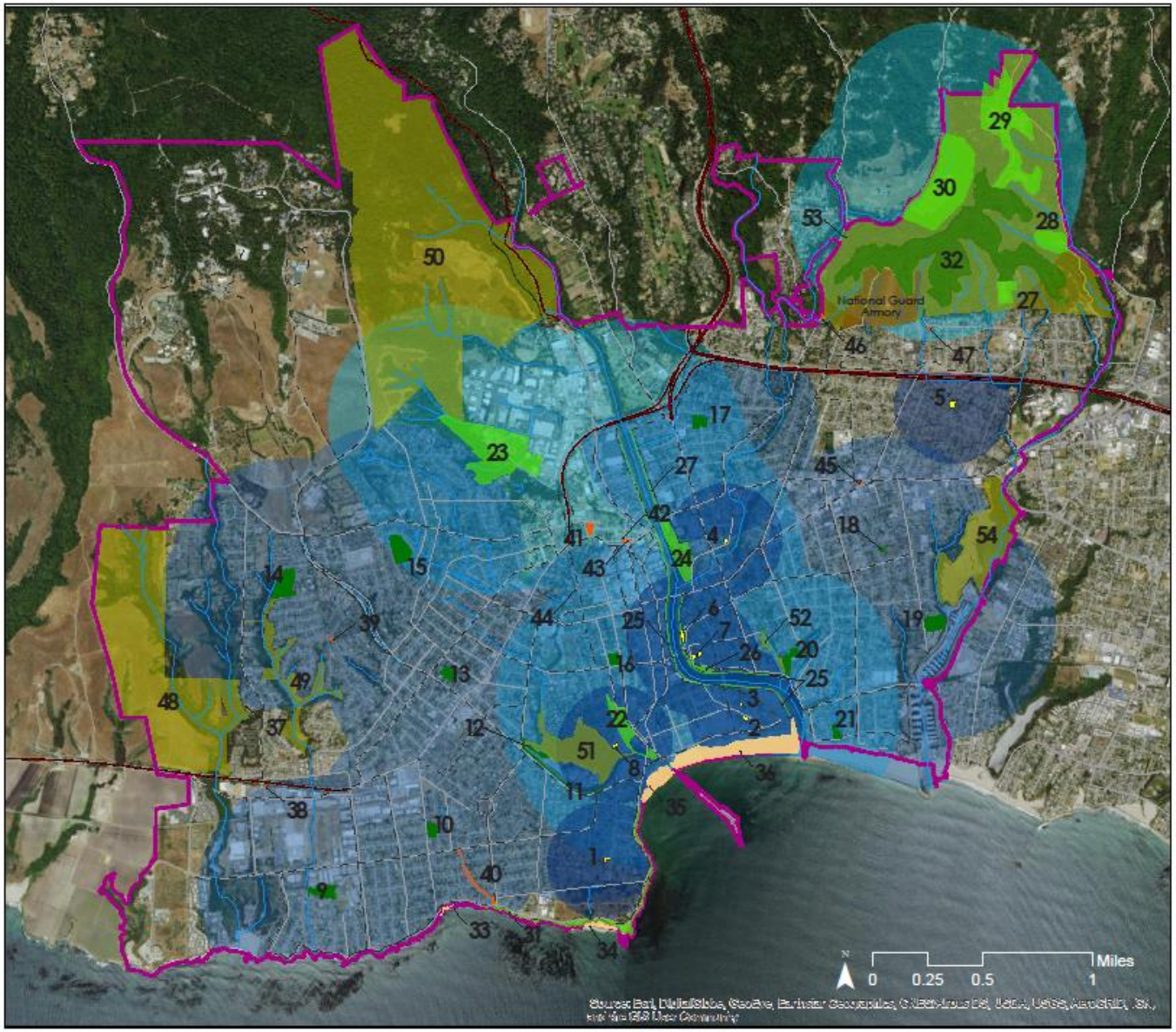
In addition to broader goals for the park system, the *Santa Cruz Parks Master Plan 2030* (Parks Master Plan 2030) has specific recommendations for each location. These recommendations are based on the input received during the community outreach process, input from City staff on current usages and condition of the facility, and opportunities to meet unmet needs of the community.

The following pages contain detailed descriptions of each of the City's assets. Each assessment includes recommendations, location or access point, proposed classification, size, master plan where applicable, a general description, photos and maps, and a table describing and assessing the condition of the asset's features.

For ease of use, the facilities are shown in alphabetical order:

- Arana Gulch Open Space
- Arroyo Seco
- Beach Flats Community Center
- Beach Flats Park
- Bethany Curve
- Branciforte Dog Park
- Carmelita Cottages
- Central Park
- Chestnut Park
- City Hall Complex
- Civic Auditorium
- Cowell & Main Beaches
- DeLaveaga Park – Audrey Stanley Grove
- DeLaveaga Park – DeLaveaga Archery Range
- DeLaveaga Park – DeLaveaga Disc Golf Course
- DeLaveaga Park – DeLaveaga Golf Course and Maintenance Yard
- DeLaveaga Park – DeLaveaga Wilderness Area
- DeLaveaga Park – Lower DeLaveaga Park and George Washington Grove
- DeLaveaga Park – Lower DeLaveaga Park Office
- Depot Freight Building
- Depot Park, Bicycle Trip Bike Park, and Scott Kennedy Fields
- Downtown Santa Cruz
- East Cliff Accent
- El Portal Park
- Frederick Street Park
- Garfield Park
- Grant Park
- Harvey West Park
- Harvey West Park – Harvey West Pool
- Harvey West Park – Kids Kottage and Wagner Cottage
- Harvey West Park – Ranger Station
- Harvey West Park – Scout and Clubhouse
- Its Beach
- Jessie Street Marsh
- John D. Franks Park
- Ken Wormhoudt Skate Park at Mike Fox Park
- La Barranca Park

- Laurel Park
- Lighthouse Avenue Park
- Louden Nelson Community Center
- Mimi de Marta Dog Park
- Mission Plaza Park
- Mitchell's Cove
- Moore Creek Overlook
- Moore Creek Preserve
- Museum of Natural History
- Neary Lagoon Park
- Neary Lagoon Wildlife Refuge
- Ocean View Park
- Pacheco Dog Park
- Parks and Recreation Administration Building
- Parks Maintenance Yard
- Poets Park and Beach Flats Community Garden
- Pogonip Clubhouse
- Pogonip Open Space
- Rincon Park
- Riverside Gardens Park
- Round Tree Park
- San Lorenzo Park
- San Lorenzo Park Lawn Bowling
- Santa Cruz Riverwalk
- Santa Cruz Wharf, Wharf Headquarters, and Maintenance Yard
- Scope Park
- Senior Citizens Opportunity (222 Market Street)
- Sgt. Derby Park
- Star of the Sea Park
- Surfing Museum
- Town Clock
- Trescony Park
- Tyrrell Park
- University Terrace Park
- West Cliff
- Westlake Park
- Westside Pump Track



Existing Park Coverage Map

Neighborhood Parks <1 acre

1: Lighthouse Avenue Park
2: Beach Flats Park
3: Poets Park and Beach Flats Community Garden
4: Central Park
5: John D. Franks Park
6: Mimi de Marta Dog Park
7: Riverside Gardens Park
8: Chestnut Park

Neighborhood Parks ≥1 acre

9: Sgt. Derby Park
10: Garfield Park
11: La Barranca Park
12: Neary Lagoon Park
13: Trescony Park
14: University Terrace Park
15: Westlake Park
16: Laurel Park
17: Grant Park
18: Star of the Sea Park
19: Frederick Street Park
20: Ocean View Park
21: Tyrrell Park

Community Parks

22: Depot Park, Bicycle Trip Bike Park, and Scott Kennedy Fields
23: Harvey West Park
24: San Lorenzo Park
25: San Lorenzo Riverwalk
26: Ken Wormhoudt Skate Park at Mike Fox Park
27: DeLaveaga - Audrey Stanley Grove
28: DeLaveaga - Archery Range
29: DeLaveaga - Disc Golf Course
30: Lower DeLaveaga Park and George Washington Grove
31: West Cliff Drive

Regional Parks

32: DeLaveaga - Golf Course

City Beaches

33: Mitchell's Cove
34: Its Beach
35: Cowell Beach
36: Main Beach

Single Amenity Parks

37: Moore Creek Overlook
38: Westside Pump Track
39: Round Tree Park
40: Bethany Curve
41: Mission Plaza Park
42: Scope Park
43: Town Clock Park
44: Rincon Park
45: El Portal Park
46: Branciforte Dog Park
47: Pacheco Dog Park

Open Space

48: Moore Creek Preserve
49: Arroyo Seco Canyon
50: Pogonip
51: Neary Lagoon Wildlife Refuge
52: Jessie Street Marsh
53: DeLaveaga Wilderness Area
54: Arana Gulch

Park Buffers

0.25 mi. radius on Neighborhood Parks (<1 acre)
0.5 mi. radius on Neighborhood Parks (≥1 acre)
0.5 mi. radius on Community Parks

Arana Gulch Open Space

Location: Mentel Ave. @ Agnes St., Brommer St. @ 7th Ave., and Broadway @ Frederick St.

Proposed Classification: Open Space

Size: 67.7 acres

Master Plan: Arana Gulch Master Plan (2006)

Arana Gulch Open Space was developed to include a multi-use path which connects Brommer Street, Broadway, and Agnes Street. The multi-use path was constructed to be ADA compliant, allowing for members of the public with mobility difficulties to access an open space. Bridges cross Arana Creek and Hagemann Gulch, offering elevated and unique perspectives of the open space. The open space also includes roughly a mile of hiking trails. Interpretive signage was installed to educate visitors about the unique habitat and history of the property. Grazing is conducted onsite to help restore the SC tarplant and coastal prairie. Many visitors enjoy watching the cattle graze. The open space also overlooks the Santa Cruz Harbor. The City has adopted a Habitat Management Plan and works with a technical advisory group to help guide restoration efforts.

Recommendations:

1. Continue to implement the Habitat Management Plan and restore the Santa Cruz tarplant population and coastal prairie, woodland, and riparian areas.
2. Explore the Joint Use Agreement with the Santa Cruz Port District to allow for the public use of the restroom facility near the harbor yard, or explore opportunities to add a porta-potty on the west side of the Hagemann Bridge entrance.
3. Provide educational tours to improve awareness and seek scientific partnerships to inform restoration efforts.

Feature		Condition	Description
Site Access	Parking	Very Good	Off-street parking is provided at the intersection of Broadway and Frederick Street.
	Entrance Sign	Very Good	Three large trailhead signs with trail map.
	Trail	Very Good	Multi-use trail is pervious concrete and hiking trails are bare ground.
Site Furnishings	Benches/Seating	Very Good	Two wood, nine recycled plastic.
	Bike Parking	Very Good	Four U racks.
	Combined Garbage & Recycling	Very Good	Three metal BearSaver cans.
	Interpretive Signs	Very Good	Seven interpretive signs, six steel frames, one large wooden sign.

Arroyo Seco

Location: Access at University Terrace Park and Grandview St. near Escalona Dr.

Proposed Classification: Open Space

Size: 33.94 acres

Master Plan: Meder Canyon Management Plan (1999)

Arroyo Seco Canyon is a natural ravine with an approximately one mile long multi-use path (bike-pedestrian)/maintenance road connecting University Terrace Park to Grandview Street. The top section is paved. Public Works maintains the majority of the property. Parks and Recreation primarily performs vegetation and trail maintenance activities along the lower trail section. In 1980, a concept plan which included rest stops and access improvements was approved. Implementing the plan did not receive support during future neighborhood meetings and the project was not pursued. The Meder Creek Management Plan was developed by Public Works and provides recommendations for maintenance and restoration activities. Recreational improvements could include the removal of invasive plants, formalizing the ad-hoc trail connections from the neighborhoods to the east which connect down to the trail, and providing exercise equipment, benches, and interpretive and park signage. Additional neighborhood input is needed before moving forward.

Recommendations:
Improve connections to lower and adjacent neighborhoods and consider installing benches, exercise equipment, interpretive and park signage, and other small amenities at key locations.

Beach Flats Community Center

Location: 133 Leibrandt Ave.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 2,742 sq. ft.

The community center has a community room, computer lab, classroom, and kitchen. It is operated by the non-profit organization Community Bridges who provides programs and services for summer recreation, environmental education, application assistance, after school programs, advocacy, parent education, and food and nutrition.

Recommendations:
None.

Beach Flats Park

Location: 122 Raymond St.

Proposed Classification: Neighborhood Park

Size: 0.22 acres

Beach Flats Park is one of two small parks serving the Beach Area neighborhood. It is a well-used park located adjacent to the Beach Flats Community Center. The small stage is used for events and parties.

Recommendations:

1. An outdoor table game such as table tennis or foosball could be incorporated into the park. The proximity to the Beach Flats Community Center could allow for ball check-outs. An outdoor table tennis game is popular with community members at Laurel Park, which is adjacent to the Louden Nelson Community Center, and at Garfield Park.
2. Add bicycle parking racks as the park currently has none.
3. The matting of the playground area will require replacement in the 1-2 year timeframe.

Feature		Condition	Description
Recreational Facilities	Playground	Good	One metal structure with slide and swing set with fibar fill.
	Tot-lot	Fair	One structure with swings and bucket swings. Fenced-in with rubber matting (in need of replacement in the 1-2 year timeframe).
Safety and Security	Lighting	Good	Five light poles.
Site Access	Pathway	Good	Concrete.
	Entrance sign	Very good	One metal.
Site Furnishings	Art	Very good	Mural.
	Benches/Seating	Very good	Five metal.
	Drinking fountain	Good	One metal.
	Event electrical hook-ups	Very good	Two hook-ups.
	Garbage	Good	One concrete.
	Recycle	N/A	One toter.
	Picnic tables	Fair	Four wood tables.
	Stage	Good	Small wood stage.

Bethany Curve

Location: Delaware Ave. to West Cliff Dr.

Proposed Classification: Neighborhood Park

Size: 3.4 acres

Bethany Curve is a passive creekside walking trail connecting Delaware Avenue to West Cliff Drive. It contains benches, artwork, and dog play features. The vegetation includes non-native weeds and ice plant. Native, drought tolerant landscaping could be planted along the trail to both beautify the park as well as provide nectar-producing plants for Monarch butterflies which overwinter in the surrounding area. Increasing native habitat could also benefit migrating birds that visit the park. The Parks and Recreation Department can solicit volunteers to help plant and maintain the garden areas. Bethany Curve should be included in the analysis of a West Cliff Drive Master Plan. It is located along West Cliff Drive and midway between the restroom facilities at the State's Lighthouse Field and Natural Bridges State Park and could be evaluated as a potential location for a low-profile restroom facility. Special attention would need to be given to design and the view corridor.

Recommendations:
Include the park in the planning analysis of a West Cliff Drive Master Plan. The park could be beautified by planting native gardens which could improve habitat for migrating birds and Monarch butterflies. The pathways could be renovated. The dog play features could be relocated to an off-leash dog use area.

Feature		Condition	Description
Site Access	Pathway	Fair	Pathway extends from Delaware Ave to West Cliff Dr.
Site Furnishings	Art	Very good	One metal structure.
	Benches/Seating	Fair	Sixteen wooden benches. Most benches are in good condition. Some need refinishing.
	Dog features	Good	One set of steps, one ramp and bridge, and one set of hoops.
	Garbage	Fair	Four small metal cans. Two concrete cans show rust and warping of metal.
	Interpretive signs	Good	One interpretive sign near West Cliff Dr.

Branciforte Dog Park

Location: Creekside Ln. @ Branciforte Dr.

Proposed Classification: Neighborhood Park

Size: 0.22 acres

Branciforte Dog Park is a fenced-in dog park which is next to the Carbonera Sphere and Upper Eastside neighborhoods. The off-leash dog use area is located at the trail head to the Enchanted Trail, DeLaveaga Park, which allows off-leash dog use on the trail below the sand pit area. It is very hot during the summer months and there is full exposure to sunlight.

Recommendations:
Dog play features, shade structures, and seating could be added to enhance the experience for dogs and/or owners.

Feature		Condition	Description
Recreational Facilities	Off-leash dog use	Very good	A fenced off-leash dog use with two tunnel features. Wood chips are used for the surface. No shade structures or trees.
Site Access	Parking	Fair	Dirt parking area.
	Entrance sign	Very good	One metal sign on a wood post.
Site Furnishings	Garbage	N/A	One plastic garbage can.
	Picnic tables	Good	One picnic table.

Carmelita Cottages

Location: 321 Main St.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: N/A

Carmelita Cottages is currently leased to the non-profit organization Santa Cruz Hostel Society. Up to 45 guests can stay in five of the renovated Victorian cottages. More than 10,000 guests stay in the hostel each year. The current lease expires in 2021 and will need to be renewed prior to expiration.

Recommendations:
None.

Central Park

Location: 301 Dakota St.

Proposed Classification: Neighborhood Park

Size: 0.16 acres

Central Park's small size and street frontage limits the type of recreational facilities that can be located there. The park currently has a small landscaped area that is often saturated and prone to flooding during the rainy season due to poor drainage. There is a small playground area with relatively limited features. It could be expanded into the grassy area. Picnic tables, exercise equipment, or other small features could be added to create more opportunities for recreation.

Recommendation:
Improve the playground area and add picnic tables.

Feature		Condition	Description
Recreational Facilities	Playground	Fair	Swings, roundabout, spring toys, small climbing rock feature.
Site Furnishings	Benches/Seating	Very good	Two recycled plastic benches.
	Garbage	Fair	One concrete garbage bin.
	Recycle	N/A	One toter.

Chestnut Park

Location: Southern terminus of Chestnut St.

Proposed Classification: Neighborhood Park

Size: 0.28 acres

Chestnut Park is located at the southeastern edge of Neary Lagoon Wildlife Refuge. The park was upgraded to include new playground equipment, picnic tables, BBQ pits, and a new half-court basketball facility in 2016.

Recommendations:
Add signage.

Feature		Condition	Description
Recreational Facilities	Basketball court	Very good	Half court.
	Playground	Very good	Play structure with slides and fibar fill.
Site Access	Pathway	Very good	Decomposed granite surface.
Site Furnishings	BBQ pits	Very good	Two metal bbq pits.
	Benches/Seating	Very good	Six recycled plastic benches.
	Bike parking	Very good	Nine U racks.
	Drinking fountain	Very good	One metal drinking fountain.
	Garbage & Recycle	Very good	One BearSaver can.
	Picnic tables	Very good	Two recycled plastic tables.

City Hall Complex

Location: 809 Center St.

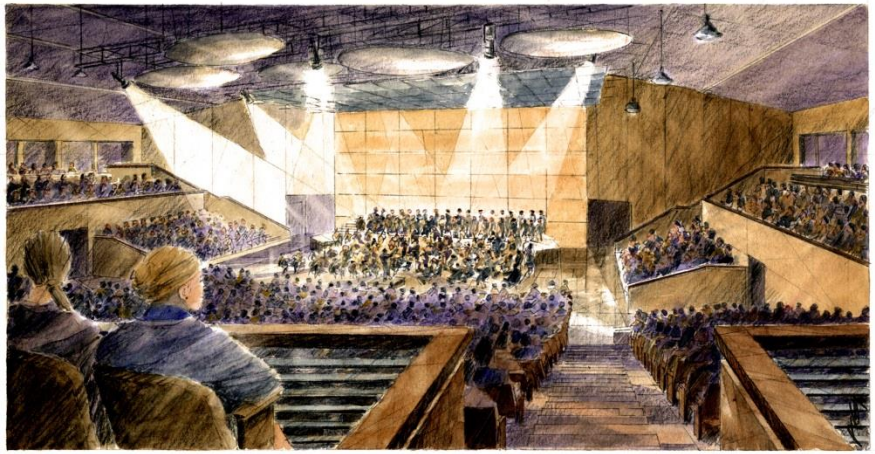
Proposed Classification: Other

Size: N/A

The Parks and Recreation Department maintains the gardens and water fountains for the City Hall complex. Recent improvements have included replacing turf with garden areas and the installation of decomposed granite pathways and decorative rock features.

Recommendations:
None.

Civic Auditorium



Conceptual rendering of the Civic Auditorium as an arts, cultural, and entertainment venue

Location: 307 Church St.

Proposed Classification: Community, Recreational, and Cultural Facility

The Civic Auditorium was opened in 1940 and is a multi-purpose auditorium (34,739 sq. ft.) with a stage and seating for total capacity of 2,021. It is configured with a large flat floor space with 1,105 fixed seats surrounding the floor in a u-shape layout with a stage at one end. Additional seating can be placed on the floor. The facility is used for concerts, sporting events, expos, theatrical performances, movie screenings, conferences, and receptions. It has five primary tenants which include the Cabrillo Festival of Contemporary Music, the Santa Cruz Symphony, the Santa Cruz Ballet Theatre's Nutcracker, the Santa Cruz Follies, and the Santa Cruz Derby Girls. The City conducted a Concept Design Study in 2014 and a Business Planning Study in 2015 which recommended improvements to the building systems and modifications to improve the facility as an arts, cultural, and entertainment venue.

Size: 34,000 sq. ft.

Recommendations:

1. Move forward with the studies recommendations and renovate and operate the facility as an arts, cultural, and entertainment venue.
2. Explore the possibility of setting-up an indoor pickleball league until the Civic Auditorium is renovated.

Cowell & Main Beaches

Location: Beaches to the east and west of the Santa Cruz Wharf

Proposed Classification: Beach

Size: 31 acres

Management Plan: Cowell and Main Beach Management Plan (2014)

Cowell and Main Beaches are popular local and tourist destinations. The proximity to the Santa Cruz Wharf and Santa Cruz Boardwalk create a wide range of recreational activities for visitors to explore. A number of hotels and restaurants support locals and tourism. A small parking area, a Jr. Lifeguard storage building, and restrooms are located at the east end of Cowell Beach. A ramp, stairs, and an ADA accessible walkway provide access down to the beach from the parking area. The Santa Cruz Wharf is located between Cowell and Main Beaches. The Santa Cruz Boardwalk is located along the northern edge of Main Beach and a walkway extends along Beach Street from the Santa Cruz Wharf to the Boardwalk. Restrooms are located next to Ideal Bar and Grill near the entrance to the Wharf. The City's Junior Lifeguard Program uses Cowell Beach and a surf equipment rental concessionaire rents beach recreational items daily during the summer months. Two volleyball courts are located below the Dream Inn on Cowell Beach. Sixteen public volleyball courts are located on Main Beach. The Santa Cruz Seaside Company maintains an additional two volleyball courts on Main Beach. Beach areas are rented for private events. Illegal behavior and safety issues at Cowell Beach prompted the City to implement a beach curfew which limits access from midnight until one hour before sunrise to crossing the dry sand portion of the beach to reach the wet sand portion of the beach and water. The curfew is in effect until 2019. No curfew exists for Main Beach. The high use of the beach during the summer months necessitates the need for the City to operate beach clean-up and grooming on a regular basis. The City continues to study and improve the poor water quality issues at Cowell and Main Beaches.

Recommendations:

1. Continue to improve beach clean-up efforts and create guidelines to direct volunteer efforts.
2. Continue to form partnerships, support volunteer efforts, provide signage, enforce litter laws, invest in equipment, and work on projects that clean-up the beach area, improve water quality, and help provide a safe environment.
3. Improve ADA access to the beach area.
4. Maintain a curfew on Cowell Beach until risk issues for beach goers have been resolved.
5. Consider improving the Junior Lifeguard Headquarters and storage area at Cowell Beach to accommodate growth, improve programming, and store equipment.
6. Consider installing a seasonal tot-lot on Cowell Beach or Main Beach.
7. Renovate the Beach Street restrooms.
8. Consider utilizing the parking area near Cowell Beach for more bike parking and recreational amenities. Seek opportunities for bike valet during the summer to deter theft.
9. Consider improving the layout of the volleyball courts at Main Beach to increase the number of courts and explore seasonally lighting the courts, taking into account light spillover and bird and wildlife concerns in the design recommendations.

DeLaveaga Park – Audrey Stanley Grove

Location: 501 Upper Park Rd.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 5 acres

Audrey Stanley Grove is a 496 seat outdoor amphitheater with a sound booth, ticket booth, and parking area that is located in Upper DeLaveaga Park. Santa Cruz Shakespeare developed the amphitheater in 2016 and leases the space from the City, holding summer performances during June, July, and August. During the off-season, the Parks and Recreation Department will use the space for programming or private rentals during September and October. As part of the project approvals, a trail from the lower neighborhood to Upper DeLaveaga Park near the entrance to the Audrey Stanley Grove was improved in 2017.

Recommendations:

1. Expand the use of the amphitheater for private and public events during the Santa Cruz Shakespeare off-season. Seek opportunities to coordinate receptions and other public events with the Golf Course restaurant.
2. Renegotiate lease before the 2018 season.
3. Explore future opportunities to enhance the utility and comfort as a performance and community space such as by adding permanent restroom facilities, dressing rooms, and small concession areas.

DeLaveaga Park - DeLaveaga Archery Range

Location: Accessed from the Brookwood Dr. entrance to DeLaveaga Park

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 5 acres

The Santa Cruz Archery Club maintains the indoor/outdoor archery range at DeLaveaga Park. A membership to the club is necessary to use the facilities. The outdoor range area includes practice and picnic areas with 28 targets. Target areas offer a variety of skill challenges which are not limited to variations of shooting lines, angles, and distance.

Recommendations:
None.

DeLaveaga Park - DeLaveaga Disc Golf Course

Location: Access from Upper Park Rd.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 40 acres

DeLaveaga Disc Golf Course is a world famous 29-hole disc golf course located in DeLaveaga Park. It is maintained by the Disc Golf Club and tournaments are often held. Erosion control and tree protection need to be improved at this site. Discussions with staff and the club have included the possibility of charging players a fee to play in order to help fund improvements.

Recommendations:
Consider a pay-for-play facility to help improve maintenance and care of the facility, including tree protection and replacement, erosion control, poison oak abatement, invasive weed removal, native plant restoration, and other improvements.

DeLaveaga Park – DeLaveaga Golf Course and Maintenance Yard

Location: 401 Upper Park Rd.

Proposed Classification: Community, Recreational, and Cultural Facility

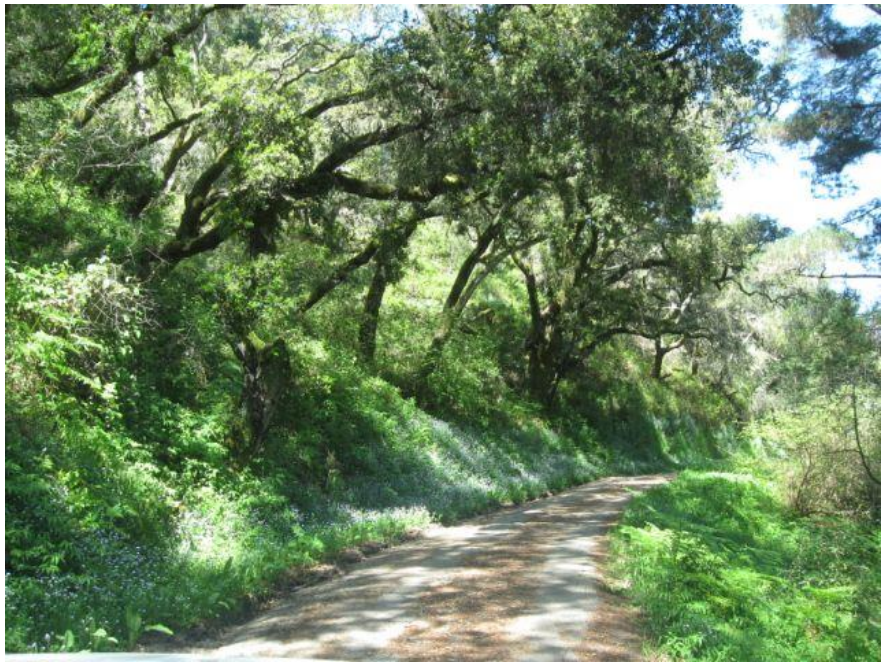
Size: 151 acres

Master Plan: DeLaveaga Golf Course Master Plan (2002)

DeLaveaga Golf Course is an 18-hole golf course. Golf Course facilities include a double-decked driving range with lighting, a BBQ group picnic area, a clubhouse with a banquet facility, and practice greens for putting and chipping. The operations of the golf course, driving range, and restaurant are leased to a concessionaire. The City maintains the golf course and a maintenance yard is located onsite. The City adopted the DeLaveaga Golf Course Master Plan in 2002 which recommends a variety of improvements, including constructing a new clubhouse to accommodate larger events, installing a new irrigation system to conserve water, adding solar to the upper deck of the golf course to provide shade and conserve energy, performing tree management work to reduce dead and diseased trees, redesigning and updating the sand traps, leveling the tees, grading the fairways, increasing the parking areas, and improving the maintenance yard.

Recommendations:
Implement the DeLaveaga Golf Course Master Plan.

DeLaveaga Park - DeLaveaga Wilderness Area



Location: Access from Upper Park Rd., Branciforte Dr., Prospect Hts., and Brookwood Dr.

Proposed Classification: Open Space

Size: 269 acres

Master Plan: DeLaveaga Park Master Plan (1960)

The DeLaveaga Park Wilderness area contains the undeveloped portions of DeLaveaga Park. The area contains multi-use trails that connect the various facilities located within the George Washington Grove, Lower DeLaveaga Park, and the Upper DeLaveaga Park areas. Trail connectivity should be improved throughout the park, and trail linkages will need to avoid crossing the Golf Course which is a large barrier. Improvements could be pursued to link the ad-hoc trails north of Prospect Heights to the Sandpit trail head off of Branciforte Drive to improve connectivity around the park. Easements may need to be granted by the National Guard Armory depending on the trail alignment. A new trail could link to the historic zoo site to the west of Prospect Heights along DeLaveaga Park Drive. A portion of the area is level and is currently fenced. Remnants of the zoo are found in the surrounding hillside. The site could be developed to be a play area with unique features that blend recreation with history, serve the surrounding neighborhood. It could also be a stop along a new multi-use trail. The Wilderness area may also have potential for adding a separate mountain biking trail or skill building area. Arana Creek deposits sediment into the lower portion of the watershed. The City works with the Resource Conservation District to seek grant opportunities for watershed enhancement projects and should continue to pursue these projects.

Recommendations:

1. Consider expanding the multi-use trail network and improve connectivity throughout the park, utilizing existing fire roads and ad-hoc trails.
2. Consider a separate downhill mountain biking facility or skill building area.
3. Consider locating a play area or other recreational use and interpretive signage in the historic zoo area. Link the area to a multi-use trail.
4. Continue to work with Resource Conservation District and implement the Arana Gulch Creek Stormwater Watershed improvement projects.

DeLaveaga Park – Lower DeLaveaga Park and George Washington Grove

Location: Entrances are located on Branciforte Dr. north of Mill Rd.

Proposed Classification: Community Park

Size: 50 acres

Management Plan: DeLaveaga Park Master Plan (1960)

George Washington Grove is located across Branciforte Creek to the north of Lower DeLaveaga Park. George Washington Grove contains a seasonally-opened group picnic area, two bocce ball courts, and restrooms. The restrooms at George Washington Grove are in a poor condition. Parking is sometimes limited for the park and an additional parking area could be located to the north of George Washing Grove. A trail could connect the parking area to the picnic area. Seven reservable picnic areas are located at these parks. Lower DeLaveaga Park has restrooms, two softball fields, a large grass field, a sand volleyball court, two horseshoe pits, and a playground. There is currently no access between the parks, therefore a pedestrian bridge across the creek could allow for more recreational opportunities for park users. Trail improvements and access improvements should be sought to link the Upper Eastside Neighborhood to this park.

Recommendations:

1. Create spillover parking area and construct a pedestrian bridge across Branciforte Creek to connect George Washington Grove to Lower DeLaveaga Park, possibly a replica of the covered bridge. Add interpretive signage describing the unique history of the property and covered bridge which used to be located onsite.
2. Renovate the restrooms at George Washington Grove.
3. Larger scale renovations to the ballfield should evaluate the potential redesign of the dugout, fencing, bleachers, and field goal posts layout and configuration to potentially accommodate more field space within the park. Considerations could also include the meadow area.
4. Consider artificial turf and energy-efficient lighting improvements to conserve resources.
5. Consider as a potential location for pickleball courts.

Feature		Condition	Description
Recreational Facilities	Baseball or softball field	Good	Two softball fields with grass outfields and lighting. Metal bleachers. No scoreboards. Three porta-potties are provided. Small dugouts.
	Bocce ball	Good	Two bocce ball courts are located in George Washington Grove area.
	Horseshoe pits	Good	Two horseshoe pits with backstops next to picnic areas in Lower DeLaveaga Park.
	Large, grass field	Good	Large multi-use field in Lower DeLaveaga Park is relatively level with some gopher holes and bare spots.
	Playground	Good	Includes a couple of climbing structures, slides, and a tire swing. Fibar is used for the playground surfacing.
	Reservable picnic areas	Good	The seven combined picnic areas include 51 large, wooden picnic tables; ten large BBQ pits with a masonry exterior, 16 serving tables. Two include wet bar areas. Drinking fountains are located in or around most of the picnic areas, and most include electric hook-ups. Plastic garbage bins and recyclable toters are placed for trash pick-up.
	Sand volleyball court	Fair	Some of the surrounding edges are taller and limit play for loose balls.
Safety and Security	Lighting	Fair	Lighting is provided in the parking lot at Lower George Washington and next to the group picnic areas. A light is provided at Forty Thieves picnic area.
	Gate and locked at night	Good	Vehicle access gates are located at both park entrances.
Site Access	Pathway	Good	The pathway around the meadow and ball fields is concrete and is in a very good condition. The pathway between the softball fields is decomposed granite and is in a good condition.
	Parking	Fair	Off-street.
	Entrance sign	Good	One wood sign at each entrance.
Site Furnishings	Art	Good	Logger arch historical artifact.
	BBQ pits	Good	Twelve located along the meadow area of Lower DeLaveaga Park, one located in George Washington Grove.
	Benches/Seating	Very good	Two benches near meadow area. Two wood benches and one recycled plastic in grove area.
	Drinking fountain	Fair	Four drinking fountains (not including reservable picnic areas).
	Garbage	Fair	Fourteen combined concrete, six metal, and two plastic trash bins (not including reservable picnic areas).
	Recycle	N/A	Five recyclable toters (not including reservable picnic areas).
	Both	Very good	Twelve BearSaver cans.
	Picnic tables	Fair	A combined four wood and 20 concrete (not including reservable picnic areas.
	Restroom	Poor	The restrooms (one dual facility) in Lower DeLaveaga are in fair condition. The restrooms (one dual facility) at the George Washington grove are in poor condition. Porta-potties are provided at the softball fields.

DeLaveaga Park – Lower DeLaveaga Park Office

Location: Lower DeLaveaga Park

Proposed Classification: Other

Size: 440 sq. ft.

A park office and maintenance shed is located within Lower DeLaveaga Park to help staff maintain the park facilities.

Recommendations:
Additional covered space is needed to protect park tools and equipment.

Depot Freight Building

Location: 119 Center St.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 3,000 ft.

The Depot Freight Building is a historic building that is used for City programming and private rentals. The historic freight building used to be a transportation hub. It is now a large, open room with renovated hardwood floors. The restrooms are only accessible from the outside of the building and serve all of Depot Park. The maximum occupancy of the main room is 100 persons. There is room outside at the rear of the building to place a shed or storage unit to help maintain Depot Park and store items that could help programming of the facility. Table Tennis has become a popular programming activity. Technological upgrades could help to facilitate meetings and trainings. Interior access to the restrooms could improve the use of the facility as a rental space.

Recommendations:

1. Explore the ability to add exterior storage.
2. Upgrade technological capabilities and interior space to help facilitate meetings and trainings.
3. Explore adding interior access to the restrooms.
4. Explore the addition of a kitchenette to improve programming opportunities.

Depot Park, Bicycle Trip Bike Park, & Scott Kennedy Fields

Location: 115 Center St

Proposed Classification: Community Park

Size: 9 acres

Master Plan: Depot Park Master Plan (2001)

The park has an adult soccer field and practice area which can be used as two practice or youth fields. The soccer field receives a lot of use due to the lack of field space in Santa Cruz and the surrounding region. Lights would extend play. The lights would need to be designed to ensure there is minimal spillover to the surrounding homes. Outreach with the surrounding neighborhood should be conducted to discuss any new proposal. The Depot Freight Building contains restrooms which are open to park visitors. The park also contains the only ramped, wooden bicycle park in the area. Bicycle Trip Bike Park's wooden ramps are deteriorating and will need revamping and replacement in the near future. The Parks and Recreation Department has been working with a consultant on the design and replacement of the wooden ramps with metal which will require less maintenance over time. One metal ramp has been installed as a pilot project to test durability. The park contains a large plaza area, picnic tables, artwork, parking, and a small play features. A pathway connects the southern end to Beach Street towards Cowell Beach. The park includes the Monterey Bay National Marine Sanctuary Exploration Center and adjacent parking area. An approximately half acre site at 101 Washington Street (former location of Lighthouse Liquors) was purchased for incorporation into the park and is currently being leased. The City will explore opportunities for the future use of the site.

Recommendations:

1. Continue to revamp the bike park with more durable ramps that require less maintenance.
2. The playground area could be improved to include additional play equipment facilities such as a swing-set.
3. Explore lighting the field to increase usage.
4. Explore new uses for the ½ acre parcel at 101 Washington Street.

Feature		Condition	Description
Recreational Facilities	Bike park	Very poor	Large variety of wooden ramps and technical features.
	Playground	Very good	Variety of small features including teeter totter and a roundabout.
	Soccer field	Very good	One adult artificial turf soccer field w/ small practice area. Field can also be played as two smaller practice or youth fields.
Safety and Security	Lighting	Very good	Lights in park and parking area.
Site Access	Pathway	Very good	Concrete.
	Parking	Very good	Paid parking lots.
	Entrance sign	Very good	Large archway sign at entrance to parking lot.
Site Furnishings	Art	Very good	Metal sculpture of grass.
	Benches/Seating	Very good	Seven recycled plastic benches.
	Bike parking	Very good	Twenty-three u-shaped spaces.
	Drinking fountain	Very good	Two metal drinking fountains. One has a refillable bottle feature.
	Garbage	Very good	Seven garbage cans.
	Recycle	N/A	Toters placed next to each garbage can.
	Picnic tables	Very good	Four picnic tables.
	Plaza	Very good	Concrete plaza with trees, art, benches, and picnic tables incorporated into design.
	Restroom	Poor	Restrooms are located in the Depot Freight Building.

Downtown Santa Cruz

Location: Pacific Ave. and side streets between Mission Ave. and Laurel St.

Size: N/A

Proposed Classification: Other

Downtown is the business and commercial center in Santa Cruz. The Parks and Recreation Department helps maintain the benches, outdoor patio areas, landscaping treatments, drinking fountains, and trees along Pacific Avenue and side streets. The Downtown Recovery Plan recommends the creation of a park on the existing parking lot at 1100 Cedar Street, near the intersection of Union Street and Cedar Street and adjacent to Plaza Lane. The San Lorenzo Urban River Plan and Downtown Recovery Plan include additional recommendations for improving the connection between Downtown to the Santa Cruz Riverwalk. In 2017, a Downtown Ranger Unit was created and helps monitor and address safety concerns while assisting downtown visitors with directions and interpretive information.

Recommendations:

1. Seek opportunities to build parklets, plazas, and mini-parks and improve the connections between Downtown and the Santa Cruz Riverwalk. If opportunities arise, consider the top of parking garages as potential space for locating recreational facilities.
2. Continue to install tree protection fencing.
3. Continue to address public safety concerns.

East Cliff Accent

Location: Southern terminuses of Seabright Ave., 1st Ave., 2nd Ave., 3rd Ave., 4th Ave., and Mariner Park Wy.

Size: N/A

Proposed Classification: Other

East Cliff Accent overlooks Seabright Beach. A walkway extends from Seabright Avenue to 4th Avenue along the bluff. Small parking areas are provided at the southern terminus of 1st and 3rd Avenues, and stairway access to the beach is provided at 3rd Avenue. A small overlook is also provided at the terminus of Mariner Park Way, but it is not connected to the walkway. Erosion has caused issues with the railings and walkways. In 2017, the Public Works Department completed a cliff stabilization project at Mariner Park Way. The Parks and Recreation Department maintains the site furnishings, picks-up trash, monitors the condition of the stairs, and performs minor landscaping maintenance. The coastline is a recreational, natural, and scenic treasure that embodies the City's unique sense of place and identity. A master plan could be created to guide future improvements; help maintain a more cohesive, consistent identity; and improve the long-term coordination and management.

Recommendations:
Partner with other stakeholder departments to develop and implement an integrated design, land-use, recreation, cliff stabilization, and landscape plan for West Cliff and East Cliff Drives to enhance public access, safety, preservation, and recreational enjoyment along the coastline.

Feature		Condition	Description
Site Furnishings	Benches	Fair	Two recycled plastic benches in a very good condition. Five wood benches that are in a fair condition with some minor cracking and/or engraving vandalism.
	Bike parking	Good	Two t-posts. Paint is fading.
	Garbage	Fair	Three BearSaver cans in very good condition. Three concrete in poor condition with warping and rusting metal.

El Portal Park

Location: Soquel Ave. @ Water St.

Proposed Classification: Neighborhood Park

Size: 0.21 acres

El Portal Park is located at the intersection of Water Street and Soquel Avenue. It is not suitable for more active recreational uses but offers a brief reprieve from the streets that surround the park. The location is optimal for landscaping treatments, wayfinding signage, and small gateway features such as art, monuments, or interpretive elements.

Recommendations:
Consider installing artwork or interpretive elements.

Feature		Condition	Description
Site Access	Pathway	Very good	Decomposed granite.
	Entrance sign	Very good	Two metal.
Site Furnishings	Art	Very good	Concrete monument with library plaque.

Frederick Street Park

Location: 168 Frederick St.

Proposed Classification: Neighborhood Park

Size: 3.97 acres

Frederick Street Park is located on a bluff overlooking the Santa Cruz Harbor and Arana Gulch Open Space. It is an extremely popular destination for the Lower Eastside Neighborhood and the overall community. A wooden staircase descends from the park to the harbor. An asphalt pathway connects from Frederick Street to the staircase. The park contains restrooms, a volleyball court, a fenced off-leash dog use area, a playground, a tot-lot, and one of the first skate parks. Picnic tables with BBQ pits are located on the bluff on the eastern side of the park and are popular for small parties and gatherings. The off-leash dog use area was fenced and is one of the largest off-leash dog use areas in the parks system. An obelisk art piece is located near Frederick Street at the southwestern section of the park. Erosion concerns exist along the eastern side of the park and retaining wall improvements will be necessary in the near future. The volleyball court needs some minor improvements.

Recommendations:

1. Drinking fountains need repair.
2. Improvements to the off-leash dog use area could include shade structures, benches, drinking fountains, and pathways.
3. The playground could be expanded and new equipment could be added.
4. The volleyball court could be renovated or replaced. A fence may need to be installed around it to prevent animal waste from entering the sand and make game play more enticing. The area could accommodate one pickleball court with low fencing or a half-court basketball court.
5. Improve the stairs to the harbor by exploring different, more durable options and improving the retaining wall.
6. Install drainage and erosion control in the picnic areas to control erosion and grading issues on the hillside.

Feature		Condition	Description
Recreational Facilities	Large, grass field	Fair	Uneven surfaces, gophers, and sand patches.
	Off-leash dog use	Very good	Large, fenced off-leash dog use area with grass surface. Water spout for dogs.
	Playground	Poor	One large playground with swing and tower/slide features. Fibar fill.
	Sand volleyball court	Poor	Uneven court, Bermuda grass encroaching on sand.
	Skate park	Good	Popular for young kids. Asphalt was recently resurfaced.
	Tot-lot	Very good	Small structure with slide, bucket swing, and sand box.
Safety and Security	Lighting	Good	Six light poles.
Site Access	Pathway	Fair	The new permeable paving and the concrete pathway are very good. The asphalt will need to be resurfaced soon. The d.g. in the front will need to be compacted.
	Entrance sign	Good	One wooden and two metal signs.
Site Furnishings	Art	Poor	The top of the obelisk sculpture has been vandalized and broken off.
	BBQ pits	Fair	One is missing a bottom and needs to be replaced.
	Benches/Seating	Good	One recycled plastic, 18 wood.
	Bike parking	Good	Two bike parking posts.
	Drinking fountain	Poor	Two (one on restroom exterior).
	Garbage	Good	Twelve concrete, one plastic, one metal.
	Recycle	Fair	One toter, two w/slat screen.
	Picnic tables	Poor	Eight wood, one concrete. Wood picnic tables show some damage from rot and bugs.
	Restroom	Good	One dual facility.

Garfield Park

Location: 624 Almar Ave.

Proposed Classification: Neighborhood Park

Size: 1.78 acres

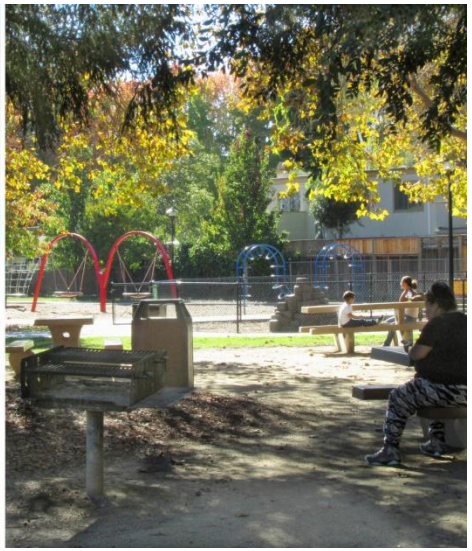
Garfield Park is a very popular park for the lower Westside Neighborhood. It offers a variety of recreational activities including a grass field, picnic tables and BBQ pits, a playground and tot-lot, two table tennis tables, and a full-size basketball court. It is the only park on the Westside of town with BBQ pits, and the picnic areas often host birthdays and other small gatherings.

Recommendations:

1. Drinking fountains need repair.
2. Playgrounds could be upgraded or expanded.
3. A shed could help to improve maintenance of the park.
4. Several trees are causing damage and root pruning or other treatments may be necessary to limit damage.

Feature		Condition	Description
Recreational Facilities	Basketball court	Good	One full-size basketball court.
	Large, grass field	Fair	Grass field has some minor dips.
	Table tennis	Very good	Two concrete table tennis tables were recently installed.
	Playground	Good	One structure with slides. One swing set. One tire swing. Sand fill.
	Tot-lot	Good	One structure with slides. One bucket swing set. Sand fill.
Safety and Security	Lighting	Fair	Lights poles are rusting and need some touch-up work.
Site Access	Pathway	Good	The decomposed granite path needs trim in some areas. Concrete pathway around playground is good.
	Entrance sign	Very good	One wooden engraved sign and four metal signs.
Site Furnishings	Art	Very good	One decorative, painted concrete bench.
	BBQ pits	Good	Three BBQ pits.
	Benches/Seating	Good	Twelve wood, one recycled plastic, and one concrete.
	Bike parking	Very good	One U bike rack.
	Drinking fountain	Poor	One metal.
	Garbage	Fair	Six concrete garbage bins.
	Recycle	Fair	Two recycle bins with slat screens and three toters.
	Picnic tables	Very good	Four concrete tables.
	Restroom	Fair	One dual facility.

Grant Park



Location: 150 Grant St.

Proposed Classification: Neighborhood Park

Size: 2.36 acres

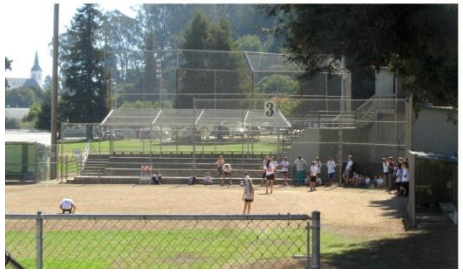
Grant Park provides a variety of recreational activities onsite and is very popular for the Upper Eastside Neighborhood. The park is fenced and locked at night. A small baseball field is sometimes used for youth league practices. A full-size basketball court is used frequently. A bocce ball court is adjacent to a small fenced off-leash dog use area. The restrooms were renovated in 2017. Picnic tables with BBQ pits are located adjacent to the playground and tot-lot areas and are popular on the weekends. A bucket swing for tots could be added as the park receives a lot of use from this age group.

Recommendations:

1. Replace the restrooms with modern facilities in 5-10 years.
2. Add a tot-lot swing.

Feature		Condition	Description
Recreational Facilities	Baseball or softball field	Good	Small baseball field is used for neighborhood play and occasionally for youth league practice.
	Basketball court	Very good	One full-size court.
	Bocce ball	Very good	One bocce ball court.
	Off-leash dog use	Very good	One small fenced off-leash dog use area with grass surface.
	Playground	Very good	One climbing rock, two climbing roundabouts, two swings, one teeter totter. Fibar fill.
	Tot-lot	Very good	One structure with slide, two climbing structures, one small spring toy. Fibar fill.
Safety and Security	Lighting	Good	Seven light poles.
	Gate and locked at night	Very good	Black aluminum wrought iron style fence panels.
Site Access	Pathway	Good	D.G. is in good condition. Concrete in very good condition.
	Entrance sign	Very good	One wood with rock masonry support structures. Three metal.
Site Furnishings	BBQ pits	Good	Three metal.
	Benches/Seating	Good	One artistic bench is very good. One wood bench is very poor w/ major cracking. Three recycled plastic benches are in very good condition.
	Bike parking	Fair	One six-foot rack locked. Should install a more permanent rack.
	Recycle	N/A	Two toters.
	Picnic tables	Good	Ten concrete tables.
	Restroom	Good	One dual facility.

Harvey West Park



Location: 324 Harvey West Blvd.

Proposed Classification: Community Park

Size: 44.77 acres

Harvey West Park is a large community park that is used for a variety of recreational activities, including recreation programming and summer camps, events, sports, and large gatherings. It contains a pump track, athletic fields, reservable picnic areas, a playground and tot-lot, exercise equipment, a sand volleyball court, horseshoe pits, and bocce ball courts. The park hosts large community events. It also contains Community Recreational Facilities which include the Harvey West Pool, Wagner Cottage, Kids Kottage, and Scout and Clubhouse. The Ranger Station and Parks Maintenance Yard are also located on the grounds. Hiking trails connect to the Upper Westside Neighborhood and Pogonip Open Space. A bus stop is located on Harvey West Blvd. Harvey West Park contains six ballfields. The outfield areas are used for soccer and football during the baseball off-season. The overlap between baseball and soccer causes conflicts for practice and overall use. Additionally, wear and tear is a continual issue on the fields as they are extensively used. The ballfield facilities are aging and will require extensive upgrades to bring them up to date.

Recommendations:

1. Harvey West Park is the major sports field complex for the City. Future upgrades should include improvements to drainage, installation of artificial turf to improve the playing time and reduce maintenance costs, renovation and installation of additional bleachers, and upgrades to pitching mounds, scoreboards, lighting, and concession stands. Additionally, movable/collapsible soccer goals would improve the efficiency of setup and use for soccer play.
2. The playground at Harvey West Park serves the general public and youth camps and could be expanded to accommodate more features.
3. A small amphitheater could be added to Wagner Grove to host wedding ceremonies and kids camp activities.

Feature		Condition	Description
Recreational Facilities	Bocce ball	Very good	Two bocce ball courts.
	Exercise equipment	Very good	Four pieces.
	Horseshoe pits	Good	Two horseshoe pits.
	Playground	Good	One large structure w/ slides, swings, tire swing. Sand and rubber matting fill.
	Pump track	Very good	One dirt pump track.
	Reservable picnic areas	Good	Eight reservable picnic areas. Some have sinks and power hook-ups.
	Sand volleyball court	Fair	One volleyball court.
	Tot-lot	Very good	One structure w/ slide and bucket swings. Sand and rubber matting fill.
Safety and Security	Lighting	Good	Parking lot lighting and lighting in Friendship gardens.
	Gate and locked at night	Very good	Vehicle access gates.
Site Access	Pathway	Good	Most of the pathways are in a good condition. Some have some lifting issues.
	Parking	Fair	Off-street parking lot will need to be resurfaced soon.
	Entrance sign	Good	One large wooden
	Trail	Good	Three trails.
Site Furnishings	Art	Poor	One train.
	BBQ pits	Good	Eleven metal and five w/ rock masonry structure.
	Benches/Seating	Good	Six wood and two recycled plastic.
	Bike parking	Good	Two t-posts and five u racks.
	Drinking fountain	Fair	One metal and two concrete.
	Flag pole	Good	One flag pole.
	Garbage	Fair	Six metal, twenty-six concrete.
	Recycle	N/A	Eight toters.
	Both	Very good	Two BearSaver cans.
	Picnic tables	Good	Twenty-one concrete, 55 large wood, and 10 recycled plastic.
	Restrooms	Very good	One main restroom (one dual facility) for all of park. Located next to Field 1.

Ballfield Features	Field(s)	Condition	Description
Backstop	1	Poor	Chainlink.
	2 & 3	Poor and Fair	Chainlink. Field 3 is not tall enough to provide sufficient protection.
	4	Poor	Chainlink backstop showing warping and rust.
	5 & 6	Fair	Wood and chainlink.
Bleachers/Seating	1	Poor	Stepped concrete with wooden planking. Concrete is cracking.
	2 &3	Fair	Stepped concrete with wooden planking.
	4	Fair	Stepped concrete with wooden planking.
	5 & 6	Fair to poor	Metal bleachers. Opportunity to utilize hillside on Field 6 to create amphitheater seating.
Concessions stand	1	Fair	Concessions stand.
	2 &3	Fair	Concessions stand.
	4	Poor	Concessions stand. Rotting of wood and needs interior upgrades.
	5 & 6	Very poor	Wood concessions stand. Rotting wood.
Drinking fountain	1	Very poor	Two stand pipe drinking fountains.
	2 &3	Fair	Two standpipe drinking fountains.
	4	Very poor	Two stand pipe drinking fountains.
	5 & 6	Very poor	Two stand pipe drinking fountains.
Dugouts	1	Very poor	Partially undergrounded dugouts take in water and need to be pumped during rainy season.
	2 &3	Fair	Caged, chainlink dugouts.
	4	Fair	Masonry block dugouts with chainlink fencing.
	5 & 6	Fair	Masonry block dugouts with chainlink fencing.
Lights	1	Fair	Metal poles with metal halide lights.
	2 &3	Poor	Combination of wood and metal posts with metal halide lights. The lighting does not provide complete coverage and there are dark spots on the baseball fields.
	4	Good	Metal poles with metal halide lights.
	5 & 6	Fair	Wood poles with halide lights. The light does not cover soccer field and there are dark spots on the baseball fields.
Restroom/Porta-potty	1	N/A	Use main park restroom.
	2 &3	Very good	Harvey West Park's restrooms (one dual facility) are provided between Fields 2 &3 and Field 1.
	4	N/A	Use main park restroom.
	5 & 6	Poor	Two porta-potties. Restrooms at this side of the park are highly desirable.

Scoreboard	1	Very good	Recently upgraded scoreboard.
	2 &3	Poor	Scoreboard is small and outdated.
	4	Poor	Small and outdated scoreboard.
	5 & 6	Poor	Small and outdated scoreboards.
Scorers Booth	1	Fair	Scorers booth.
	2 &3	Fair	Scorers booth.
	4	Fair	Scorers booth.
	5 & 6	Very poor	Poor lighting, portions of siding and framing needs replacement, and shingles are worn-out.
Trash and Recycle	1	Fair	Two concrete and three metal bins. Two toters.
	2 &3	Poor	Three concrete and five metal garbage bins. Four recycle toters.
	4	Fair	Three concrete and two metal garbage cans. Two recycle toters.
	5 & 6	Poor	Two concrete and two metal bins. One plastic toter.
Turf	1	Poor	Field is worn from overuse.
	2 &3	Very poor	Irrigation and overuse issues.
	4	Fair to poor	Root intrusion. Irrigation system uses different heads than designed for because the heads are no longer manufactured. New heads do not allow for an optimal head-to-head ratio.
	5 & 6	Fair	Irrigation system uses different heads than designed for because the heads are no longer manufactured. New heads do not allow for an optimal head-to-head ratio.

Harvey West Park - Harvey West Pool

Location: 275 Harvey West Blvd.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 3,500 sq. ft. pool house, lap pool with diving area, wading pool

The small pool is leased to a concessionaire. The large pool is open from June through August for open swim. The concessionaire teaches swim lessons in the small pool from March through October. The large pool is available for lap swim, water fitness, and recreational swimming during the summer, and swimming is one of the many activities provided during youth summer camps. The large pool is most often used by families during the summer weekends. The pool does not open until 11 a.m. which does not accommodate morning lap swimming. Pool maintenance and funding are necessary year-round and should the City seek opportunities to increase use and access to the pool. Future studies to increase usage could consider complementary uses such as a fitness center or larger picnic area. Partnerships and cost-sharing opportunities to fund the project should be explored.

Recommendations:
Consider conducting a use and business plan study to improve operations and funding opportunities, identify more comprehensive renovations, and increase community use and continue to seek funding to expand the hours and duration of time the pool remains open for public use during the year.

Harvey West Park – Kids Kottage and Wagner Cottage

Location: 275 Harvey West Blvd.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: Kids Kottage (1,500 sq. ft.) Wagner Cottage (1,000 sq. ft.)

The Kids Kottage is leased to the County Office of Education for an alternative education program during the school year. The City operates summer camp programs in the Kids Kottage during the remainder of the year. Wagner Cottage is used for summer camp programs. Both cottages could use improvements to the restroom facilities. Wagner Cottage has some visible foundation issues. The Kids Kottage has termite issues.

Recommendations:
Improve the restrooms and address the structural issues.

Harvey West Park – Ranger Station

Location: 275 Harvey West Blvd.

Proposed Classification: Other

Size: 1,000 sq. ft.

The Ranger Station houses the Parks Ranger unit. The Ranger Station is not located in a very visible location and the unit has outgrown the small building. Consideration should be given to relocating the Ranger Station to a larger, more visible space. The Ranger Station could be an important informational resource for park visitors. If a more suitable location is found, consideration should be given to relocating the summer camps from Wagner Cottage to the building so that program participants are closer to the program activities and other camp uses.

Recommendations:
Consider relocating the Rangers to a larger, more visible location.

Harvey West Park – Scout and Clubhouse

Location: 326 Evergreen St.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 5,000 sq. ft.

The Harvey West Park Scout and Clubhouse is rented for private use such as weddings, gatherings, and meetings. It is also used for City programming. The clubhouses have seating indoors and outdoors, a deck area, a full kitchen, two barbecue pits, two wet bars, an indoor fireplace, and restrooms. The entryway, kitchen, and patio area could be improved to be more functional and attractive.

Recommendations:
Consider minor renovations to approve the function and appearance, such as by enhancing the entry and patio areas.

Its Beach

Location: Accessed from a stairway to the north of Lighthouse Point

Proposed Classification: Beach

Size: 1.5 acres (City owned)

Its Beach is a popular beach for a variety of beach and ocean oriented recreational purposes. A stairway is provided down to the beach from West Cliff pathway to the north of Lighthouse Point. The City owns approximately 1.5 acres of the beach area and the remainder is owned by the State of California.

Recommendations:
Improve coordination with the State to maintain rules and enforcement.

Jessie Street Marsh

Location: Access from E. Cliff Dr., path from Ocean View Park, and the terminus of Lemos Ave.

Proposed Classification: Open Space

Size: 3.2 acres

Master Plan: Jessie Street Marsh Management Plan (1998)

Jessie Street Marsh is adjacent to Ocean View Park and E. Cliff Drive and currently has an ad-hoc trail that extends from E. Cliff Drive to Lemos Ave. In 1998, the City created the Jessie Street Marsh Management Plan. The plan aims to restore the marsh and improve access. A major component of the plan would be creating a tidal exchange between the fresh water marsh and the San Lorenzo Urban River. The tidal exchange aspect of the plan was determined to be "unbuildable" during plan review by the City's Engineers. The marsh area has been vulnerable to criminal activity. City staff hired an engineering consultant to help redesign the plan to address community desires and concerns about the area. Additional outreach and study will need to be conducted through a public process.

Recommendations:
Improve the connection from the marsh to the Santa Cruz Riverwalk. Hire an engineering consultant to work through design issues and public concerns with the Jessie Street Marsh Management Plan. Discuss potential modifications to the plan through a public process.

John D Franks Park

Location: Marnell Ave. @ Fairmont Ave.

Proposed Classification: Neighborhood Park

Size: 0.48 acres

John D Franks Park is a small but important park because it is the only neighborhood park for the surrounding area. The park contains a grass field, picnic tables, an elliptical piece of exercise equipment, and a playground.

Recommendations:
Consider adding additional picnic tables, play equipment, and fitness equipment.

Feature		Condition	Description
Recreational Facilities	Large, grass field	Fair	Grass field for multi-use. Redwood roots and some minor mounding and dipping.
	Playground	Very good	Recently installed play structure with slides and toddler swings. Fibar surface material.
Safety and Security	Lighting	Good	Two light poles.
Site Access	Pathway	Good	Decomposed granite surface.
	Entrance sign	Very good	Engraved wood. Paint is in good shape.
Site Furnishings	Benches/Seating	Good	Two wooden benches.
	Drinking Fountain	Good	One metal.
	Exercise Equipment	Very good	One elliptical.
	Garbage	Good	One concrete.
	Picnic tables	Good	Two concrete tables.

Ken Wormhoudt Skate Park at Mike Fox Park

Location: 225 San Lorenzo Blvd.

Proposed Classification: Community Park

Size: 1.25 acres

Ken Wormhoudt Skate Park at Mike Fox Park is located along the Santa Cruz Riverwalk and is across the street from Riverside Gardens Park. The skate park is very popular and contains bowls and a street course. Bleachers are located outside of the fencing for spectating. The skate bowl's concrete pool coping is preferred by skaters but also requires continual upkeep and repairs. To the east of the skate park, the park has a multi-use, shared area which includes three painted pickleball courts, a roller hockey practice rink, and a basketball hoop. Fruit trees were planted to the east of the shared-use area as part of a community orchard project. The orchard utilizes an area with limited recreational opportunity and increases access to food while providing opportunities to learn about resource conservation and sustainable growing practices in a public setting. A porta-potty is placed onsite. Lighting could be explored to increase use of the skate park.

Recommendations:

1. Improve pool coping and perform general repairs to the skate park.
2. Consider adding lighting.
3. Increase programming to teach skateboarding.

Feature		Condition	Description
Recreational Facilities	Basketball court	Very good	Half court with asphalt surface.
	Pickleball court	Very good	Three painted courts. Nets need to be installed before play.
	Roller hockey	Very good	One fenced roller hockey practice area w/ plastic dasher boards.
	Skate park	Fair	Concrete pool coping needs repair.
Site Access	Pathway	Fair	Minor cracking near entrance to skate park.
	Parking	N/A	Off-street parking.
	Entrance sign	Very good	Two wood framed with plastic panels.
Site Furnishings	Art	Fair	Photographs of skateboarders in a metal frame with plastic encasement. There is some wear and tear from vandalism remediation. There is also a wave mural on the full pipe.
	Benches/Seating	Good	Aluminum bleachers.
	Bike parking	Very good	Six low profile racks.
	Drinking fountain	Good	One metal drinking fountain.
	Garbage	Fair	One metal with screen.
	Recycle	N/A	One toter.
	Both	Good	Two BearSaver cans.
	Restroom	N/A	Porta-potty with wood screen.

La Barranca Park

Location: California St. to Laguna St.

Proposed Classification: Neighborhood Park

Size: 2.26 acres

La Barranca Park, a linear park with a decomposed granite pathway along Bay Street, offers an opportunity for a casual stroll off of Bay Street. It is primarily landscaped with lawn. Its proximity to the Wastewater Treatment Plant makes it a prime location for a demonstration garden using recycled water.

Recommendations:
Convert the turf areas to a demonstration garden using recycled water.

Feature		Condition	Description
Site Access	Bus stop	N/A	Yes.
	Pathway	Fair	Decomposed granite pathway along Bay St connecting California St to Laguna St.
Site Amenities	Art	Good	Two rocks w/ commemorative plaque and one small rowing sculpture.
	Benches/Seating	Good	Fourteen recycled plastic benches. Most are in good condition. Some show fading and cracking.
	Garbage	Fair	Five concrete cans.
	Interpretive signs	Fair	Five interpretive signs. Most are in good condition.

Laurel Park

Location: 301 Center St.

Proposed Classification: Neighborhood Park

Size: 1.77 acres

Laurel Park is located adjacent to the Louden Nelson Community Center and offers a variety of recreational activities for general use and for recreational programming and events. The park contains a grass field, a chess table, a table tennis table, a playground, and a full-size basketball court painted to accommodate pickleball. Issues with illegal activities have led to a Ranger being posted at the site, and discussions with the neighborhood about whether or not the park should be fenced. Consensus with the neighborhood is necessary before moving forward with a fencing project. The Louden Nelson Community Center has restrooms which are available during open hours. The park is heavily used by teens, seniors, and other groups using the center. It is also an extension of the Louden Nelson Community Center for events put on by Parks and Recreation.

Recommendations:

1. Fencing or decorative gardening displays could provide a barrier between other park uses and the playground area.
2. Parcourse equipment could be installed and incorporated into the senior center or other health-related programming at the Louden Nelson Community Center.
3. Underground electrical connections could be installed to accommodate community events.
4. Volleyball insert sleeves could be installed in the lawn and the community center could check-out nets and balls to allow for volleyball play.
5. Improvements to the garden area could allow for potential senior and teen based gardening programs.

Feature		Condition	Description
Recreational Facilities	Basketball court	Very good	Full-size court is painted to allow for pickleball play.
	Chess table	Good	One outdoor chess table.
	Large, grass field	Good	One grass field for multi-use play and events.
	Pickleball court	Good	Striping on basketball court.
	Table tennis	Very good	Concrete table tennis table.
	Playground	Very good	One bucket seat, one swing set, one structure w/ slide, one large webbed climbing structure. Fibar fill.
Safety and Security	Lighting	Good	Four light poles.
Site Access	Pathway	Very good	Concrete pathway.
Site Furnishings	Art	Very good	The mural on the back of Louden Nelson was recently refurbished.
	Benches/Seating	Good	Concrete bench along b-ball court and playground. Seven wood.
	Bike parking	Good	Two large metal, cork screwed structures.
	Drinking fountain	Good	One metal.
	Garbage	Good	Two concrete.
	Recycle	N/A	Toters are placed near garbage cans.

Lighthouse Avenue Park

Location: Lighthouse Ave. near Oregon St.

Proposed Classification: Neighborhood Park

Size: 0.35 acres

Lighthouse Avenue Park offers a small playground area and eighteen community garden plots. Vandalism and theft has been an issue for the gardeners.

Recommendations:
The playground area could be expanded to offer more features.

Feature		Condition	Description
Recreational Facilities	Community gardens	Poor	Eighteen garden plots. The raised garden beds will need to be updated soon. The decomposed granite surrounding the beds can be weeded and a new layer can be added.
	Playground	Fair	Small structure with slides and rubber matting and a small sand area with digging features.
Site Access	Pathway	Very good	Concrete and brick tiles. Decomposed granite around garden area can be resurfaced.
	Entrance sign	Very Good	Three metal signs. One arbor near Lighthouse Avenue as entrance feature.
Site Furnishings	Benches/Seating	Very good	Three recycled plastic near playground.
	Bike parking	Very good	Three metal bike posts.
	Garbage	Good	One concrete can near playground. Toters are provided in a screened area for the community garden.

Louden Nelson Community Center

Location: 301 Center St.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 20,000 sq. ft.

The Louden Nelson Community Center hosts senior and teen programs and services, recreation classes and programming, rentable rooms, and an auditorium with theater seating and a stage. Programs and classes make use of the adjacent Laurel Park. The Louden Nelson Community Center offers a wide selection of spaces available for rent, including a dance studio, meeting rooms, a banquet room, a kitchen, and an auditorium with a stage and retractable seating.
In 2015, the City received more than $500,000 dollars of grant funding to improve the facility. The grant funded general building improvements such as new boilers, roof repairs, refinished hardwood floors, updated technology, carpeting, fans, and paint. New office space and a conference room were configured in the layout. Appliances and storage space were upgraded in the kitchen. The auditorium was renovated with new seating, refinished hardwood floors, and new media technology and stage lighting.

Recommendations:
Seek additional funds to continue to renovate and update the Louden Nelson Community Center. Examples include remodeling the restrooms and café/kitchen area; installing sound absorbing panels in the classrooms, replacing the hallway doors, installing new window blinds, and updating the marquis, and redesigning the Teen Center exterior yard area.

Mimi De Marta Dog Park

Location: Broadway near Dakota Ave.

Proposed Classification: Neighborhood Park

Size: 0.5 acres

Mimi de Marta Park is a fenced off-leash dog use area with a picnic table adjacent to the Santa Cruz Riverwalk.

Recommendations:
Dog play features and additional seating could be added to enhance the experience for dogs and/or owners.

Feature		Condition	Description
Recreational Facilities	Off-leash dog use	Good	One fenced off-leash dog use area with dirt surface.
Site Furnishings	Drinking fountain	Good	One metal drinking fountain with dog bowl feature.
	Picnic tables	Good	One concrete, one wooden.

Mission Plaza Park

Location: 103 Emmet St.

Proposed Classification: Neighborhood Park

Size: 0.94 acres

Mission Plaza Park is located across the street from the State's Santa Cruz Mission State Historic Park. It contains a plaza with a water fountain, drinking fountain, and benches and the design complements the surrounding setting of the Mission, Holy Cross Catholic Church and School, and Neary-Rodriquez Adobe and State Park. The plaza is used for community events, parties, weddings, and smaller gatherings. Large storm events cause some minor erosion of the decomposed granite pathways. The setting and history do not lend itself to the installation of more active recreational features.

Recommendations:
Interpretive signage should be added to describe the history of the site and surrounding area. The decomposed granite could be updated to a less erosive pathway material. Maintain a clean and safe environment.

Feature		Condition	Description
Safety and Security	Lighting	Good	Two lights near plaza area.
Site Access	Bus stop	N/A	Located on Mission St.
	Pathway	Good	Decomposed paved pathways providing access from street to plaza area. Erosion occurs during large storm events.
	Entrance sign	Good	Three metal signs and one large wood sign with masonry structures.
Site Furnishings	Art	Good	Masonry rock structure with metal plaque to commemorate the Mission.
	Benches/Seating	Good	Seven wooden. Some show minor weathering and paint ware.
	Drinking fountain	Good	One.
	Flag pole	Good	Three flag poles.
	Garbage	Good	One.
	Recycle	N/A	One plastic toter.
	Plaza	Very good	Rose bushes, palm tree, water fountain and benches encircle water fountain.
	Event electrical hook-ups	Very good	Located in multiple locations in park.
	Water fountain	Very good	Masonry rim w/ concrete fountain head

Mitchell's Cove

Location: Beach area accessed from stairwell on West Cliff at the intersection of Sunset Ave. and West Cliff Dr.

Proposed Classification: Beach

Size: 0.4 acres

A stairway from West Cliff path provides access to the beach. Off-leash dog use is allowed before 10 a.m. and after 4 p.m. The beach is popular for beach and surf activities. This beach is the only legal off-leash dog use opportunity on a beach within the City limits. It is also the only off-leash dog use opportunity for the Lower Westside neighborhood. Consideration could be given to this off-leash dog use area if a future program is developed for moderate intensity and to reduce conflicts with general beach usage. Additional enforcement should be pursued to ensure beach goers on this small beach are not inundated with off-leash dog use during times when dog use is not allowed.

Recommendations:
Consider programs and enforcement to ensure that off-leash dog use does not overwhelm the small beach area.

Moore Creek Overlook

Location: Cypress St.

Proposed Classification: Neighborhood Park

Size: 0.12 acres

Moore Creek Overlook offers a scenic overlook of the Moore Creek Preserve and canyon. A concrete pathway encircles a small grass area and three benches overlook the scenic vista.

Recommendations:
None.

Moore Creek Preserve

Location: Accessed from Highway 1 near Shaffer Rd. and the terminus of Meder St. No parking is provided.

Proposed Classification: Open Space

Size: 263.75 acres

Master Plan: Moore Creek Preserve Interim Management Plan

Moore Creek Preserve has nearly three miles of hiking trails (no dogs are allowed) that wind through canyon, forest, and grassland natural settings. Many of the trails overlook the Pacific Ocean. Cattle graze the coastal prairie areas to help restore native plants and the Ohlone Tiger Beetle. Access to the site is limited. Visitors can park on Shaffer Road and cross Highway 1 to enter the southern entrance or park east of Western Drive to walk down Meter Street to enter the northeastern entrance. Highway 1 does not have a crosswalk and a mid-block crossing would likely not be supported by Caltrans at the location. A parking area could be established off of Highway 1 but would likely include retaining walls and other costly improvements. Park signage is worn-out and needs replacement. The signs are not highly visible from the public right-of way at either entrance. Large interpretive signs could help educate visitors on the unique resources and restoration effort. A small metal interpretive sign and four bike posts are located at each entrance.

Recommendations:

1. Consider developing a parking area off of Highway 1 to improve access to the property.
2. Provide more prominent entry signs and install new trail and interpretive signage.
3. Improve cattle grazing fencing.
4. Continue efforts to protect rare and endangered species.
5. Explore opportunities to enhance access and connectivity.

Museum of Natural History

Location: 1305 E. Cliff Dr.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 3,500 sq. ft.

The Museum of Natural History is located at Tyrrell Park. The museum is leased to the Santa Cruz Museum of Natural History which provides services, events, programs, exhibits, and other educational tools to inspire stewardship and connect people to nature and history.

Recommendations:
See Tyrrell Park.

Neary Lagoon Park

Location: 100 California St.

Proposed Classification: Neighborhood Park

Size: 1.27 acres

Neary Lagoon Park is located adjacent to the Neary Lagoon Wildlife Refuge, La Barranca Park, and the Wastewater Treatment Plant. It has two tennis courts, picnic tables, a playground, off-street parking, and restrooms. It is located at one of the three entrances to the Neary Lagoon Wildlife Refuge. The Monterey Bay Scenic Trail is planned on the railway right-of-way that separates Neary Lagoon Park from La Barranca Park.

Recommendations:
Consider lighting the tennis courts.

Feature		Condition	Description
Recreational Facilities	Playground	Very good	One large playground with a variety of features and sand play. Combination of rubber matting and sand surfacing
	Tennis court	Very good	Two tennis courts
Site Access	Pathway	Very good	Concrete
	Parking	Fair	Off-street parking.
	Entrance sign	Good	One entrance sign. It could be moved closer to street for improved visibility.
Site Furnishings	Art	Good	One mural.
	Benches/Seating	Very good	Eight benches.
	Bike parking	Very good	Three u-shaped.
	Drinking fountain	Good	One metal drinking fountain.
	Garbage	Good	Three garbage cans.
	Recycle	Good	One recycle container.
	Combination of garbage and recycling	Very good	One BearSaver saver can.
	Interpretive signs	Good	One panel.
	Picnic tables	Very good	Two picnic tables.
	Restroom	Fair	One restroom (one dual facility).

Neary Lagoon Wildlife Refuge

Location: Access at Neary Lagoon Park, the terminus of Chestnut St, and the terminus of Blackburn St.

Proposed Classification: Open Space

Size: 37 acres

Master Plan: Neary Lagoon Management Plan (1992)

Neary Lagoon Wildlife Refuge offers a boardwalk loop trail where visitors can bird watch and explore a variety of natural habitats such as riparian forest, freshwater marsh, mixed oak woodland, and open water. The floating walkway offers a truly unique experience within the City and region. Interpretive signs provide information about some of the wildlife that inhabit the refuge. An interpretive kiosk and group education area is located at the Chestnut Street entrance. The walkway is also a good connection between the Lower Westside and Downtown neighborhoods. A portion of the floating walkways was renovated in 2016, but there remains much more walkway in need of renovation. The Santa Cruz Museum of Natural History leads educational tours funded by Public Works. A new biological assessment should be conducted to evaluate the invasive species and provide recommendations for parks maintenance activities which consider timing and approach to limit disturbances to wildlife.

Recommendations:

1. Fund the replacement of the floating walkways.
2. Hire a biologist to evaluate parks maintenance activities and timing, and develop recommendations for natural restoration activities.

Feature		Condition	Description
Safety and Security	Gated and locked at night	Good	Gated at all entrances.
Site Access	Pathway	Fair	The new floating walkways are very good. The remaining wooden walkways will need to be replaced in the near future. The asphalt pathways are in need of resurfacing.
	Entrance sign	Good	Three wood signs. Entrance sign on Blackburn Street is small and weathered.
Site Furnishings	Benches/Seating	Very good	Twelve benches/seating areas.
	Bike parking	Very good	Three u-shaped at Blackburn St.
	Garbage	Good	Six garbage cans and one BearSaver can with garbage and recycling.
	Interpretive signs	Fair	Twelve interpretive panels. Some show defacing and fading and need panel replacement.
	Interpretive kiosk	Good	Six more interpretive panels under a shelter structure and seven benches form a group education area.

Ocean View Park

Location: 102 Ocean View Ave.

Proposed Classification: Neighborhood Park

Size: 3.06 acres

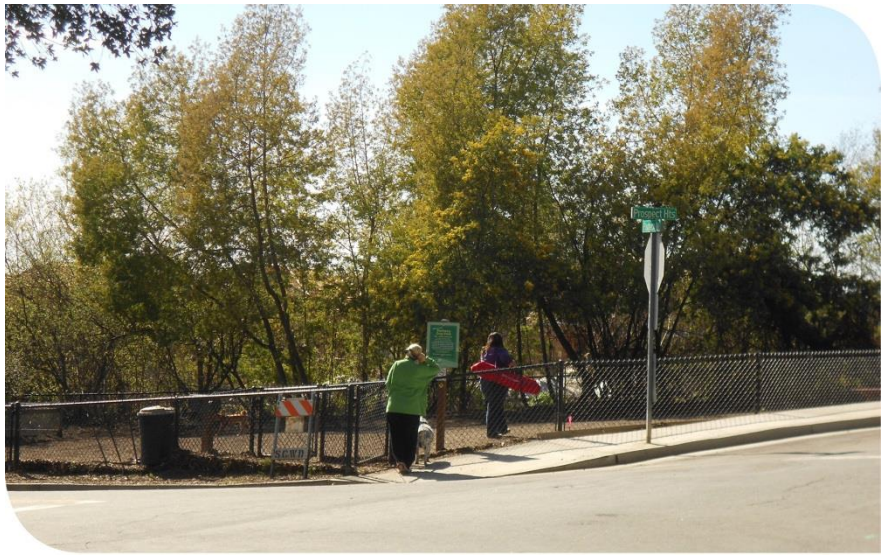
Ocean View Park is a popular family park with picnic tables, playgrounds, long slides and restrooms. Other facilities include a half-court basketball court as well as a grass field which accommodates legal, unfenced off-leash dog use when not being used for other recreational purposes. The proximity of the off-leash dog use area to the picnic, basketball, and playground areas is not optimal and uncontrolled dogs frequently create issues with other park users. Fencing the off-leash dog use area could help improve the situation, but it would also segment the park and limit the amount of activities that can take place. The playground equipment will need to be upgraded soon. Many of the pathways are comprised of decomposed granite. The site has poor drainage and the pathways often become difficult to pass. Replacing the decomposed granite with asphalt or a more decorative material could improve the walkability during the winter months. There is an overlook on the southern side of the park with an impressive view of the Boardwalk and San Lorenzo River. A pathway connects from S. Branciforte Avenue to Ocean View Avenue to E. Cliff Drive and Jessie Street Marsh. The closest crosswalk across E. Cliff Drive to the Santa Cruz Riverwalk is located at Jessie Street.

Recommendations:

1. Consider fencing-in the off-leash dog use area or relocating the off-leash dog use area to another location.
2. Upgrade the playground equipment and surfacing.
3. Create a paved surface road from S. Branciforte Avenue.
4. Add native gardens and more ornamental plantings.

Feature		Condition	Description
Recreational Facilities	Basketball court	Very good	Half court.
	Off-leash dog use	Fair	One off-leash dog use area w/ no fence. Grass field is saturated during winter.
	Playground	Good	One swing set, one large climbing structure, seven long slides. Rubber and fibar fill surfacing. Metal slides will need replacement soon.
	Tot-lot	Good	One structure with slides, bucket swing, and rubber and fibar fill.
Site Access	Pathway	Good	Dirt pathway towards S. Branciforte Ave can be improved. Asphalt is very good. Decomposed granite is in fair condition. Improvements to stairs down to E. Cliff from bluff should be pursued.
	Entrance sign	Very good	Three metal and one wood.
Site Furnishings	Art	Fair	Rock monument. Vandalism needs to be removed.
	Benches/Seating	Good	Thirteen wood benches, three recycled plastic, and five concrete formed benches.
	Drinking fountain	Good	One metal and one on restroom.
	Garbage	Very poor	Seven concrete. Showing rust and warping. Two plastic.
	Recycle	N/A	One toter.
	Picnic tables	Fair	Four concrete.
	Restroom	Good	One dual facility.

Pacheco Dog Park



Location: Pacheco Hts. @ Pacheco Ave.

Proposed Classification: Neighborhood Park

Size: 0.45 acres

Pacheco Dog Park is a popular fenced off-leash dog use area with wood chips as the surface. Wood benches and a picnic table are provided for seating. The park receives a lot of sun exposure and a small oak tree is not mature enough to provide adequate shading. A water spigot is also provided.

Recommendations:
Dog play features, shade structures, seating, or tables could be added to enhance the experience for dogs and/or owners.

Parks and Recreation Administration Building

Location: 323 Church St.

Size: 4,546 sq. ft.

Proposed Classification: Other

The Parks and Recreation Administrative Building is located within City Hall and currently houses the administrative staff for the Parks and Recreation Department. An ADA assessment was recently completed.

Recommendations:
Complete improvements identified within the ADA assessment.

Parks Maintenance Yard

Location: 300 Evergreen St.

Proposed Classification: Other

Size: 2,100 sq. ft. maintenance garage, 2,700 sq. ft. office, a 2,000 sq. ft. open equipment bay, and approximately 1,800 sq. ft. of sheds

The Parks Maintenance Yard is located at 300 Evergreen Street and includes offices and equipment storage and bays for parks maintenance operations.

Recommendations:
None.

Poets Park and Beach Flats Community Garden

Location: 200 Raymond St.

Proposed Classification: Neighborhood Park

Size: 0.13 acres

Poets Park is a small park which includes picnic tables, a drinking fountain, benches, play equipment, community garden plots, and artwork. It is adjacent to the Beach Flats Community Garden which is located on property which is leased by the City from the Santa Cruz Seaside Company. The City is currently searching for a permanent community garden space in the Beach Area neighborhood. A total of thirty-two combined plots are currently located at Poets Park and Beach Flats Community Garden.

Recommendations:
The City will continue to pursue a permanent community garden space for the Beach Area neighborhood.

Feature		Condition	Description
Recreational facilities	Community gardens	Good	Thirty-two combined total garden plots.
	Playground	Very good	Seesaw and climbing roundabout.
Site Access	Pathway	Very good	Concrete.
Site Amenities	Art	Very good	Concrete decorative balls and metal tree sculpture.
	Benches/Seating	Fair	Concrete formed bench shows minor wear and tear from skateboard grinding.
	Garbage	Fair	One concrete.
	Picnic tables	Very good	Two recycled plastic tables.

Pogonip Clubhouse

Location: Accessed from Golf Club Dr.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 8,000 sq. ft.

Master Plan: Pogonip Clubhouse Rehabilitation Plan (2000) and Pogonip Master Plan (1998)

The Pogonip Clubhouse was built in 1911 and was designed as a two-story Craftsman style clubhouse for the Casa del Rey Golf Course. In 1935, it was converted into a Polo Club. After World War II, the club remained a private social club until the 1980s when it was condemned. In 1988, the City acquired Pogonip and initiated efforts to mothball the building. The clubhouse is currently in a dilapidated state and remains closed to public access. The Pogonip Master Plan plans to restore the clubhouse and use it as a staging area for educational programs, a meeting and retreat center, and a site for special events.

Recommendations:

1. Conduct an assessment of the structure's current state and fund short-term mothballing improvements if necessary.
2. Restore and renovate the clubhouse for various uses (events, weddings, community center, winery, etc.).

Pogonip Open Space

Location: Accessed from Harvey West Park, the terminus of Golf Club Dr., Highway 9, Glen Coolidge Dr., and Spring St.

Proposed Classification: Open Space

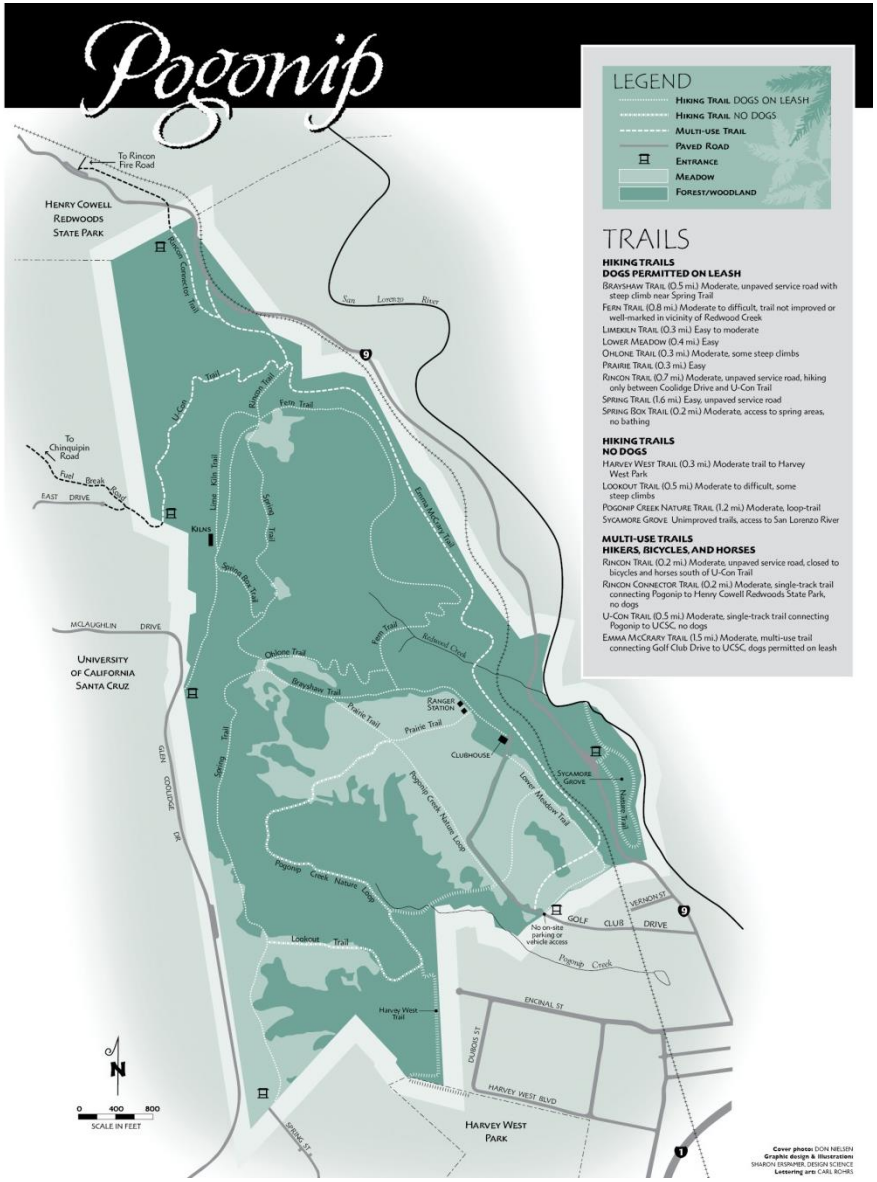
Size: 640 acres

Master Plan: Pogonip Master Plan (1998)

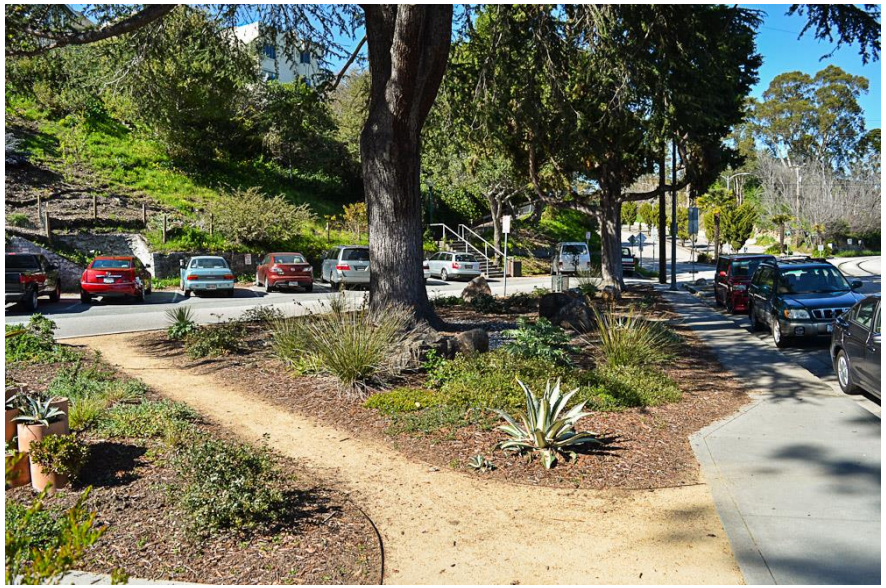
Pogonip Open Space contains approximately eight miles of hiking trails and three miles of multi-use (hiking, biking, and horseback riding) trails that weave through a variety of natural and historic sceneries. The open space is located adjacent to Harvey West Park, UCSC (which includes trails that connect to Wilder Ranch State Park), and Henry Cowell Redwoods State Park. The Emma McCrary Trail was constructed in 2013 with the help of volunteers and has become a very popular tail, especially for mountain biking. The Pogonip Master Plan envisioned a variety of recreational and educational activities for the open space. The Homeless Garden Project will be relocating in Pogonip. The Homeless Garden Project is a non-profit organization that provides programs and training to people who are or have previously been homeless. A 1,500 sq. ft. office/classroom building, parking area and an approximately 9 acre farm will be located in the Lower Main Meadow. The property includes the historic Pogonip Clubhouse which was constructed in 1911 as the Casa del Rey Golf and Country Clubhouse. The clubhouse is currently in a dilapidated condition and is closed-off from public access. The existing Pogonip Master Plan envisioned the restoration of the Pogonip Clubhouse as a staging area for educational programs, a meeting and retreat center, and a site for special events. The former tennis courts are also closed and the swimming pool has been filled-in. The Master Plan recommends replacing the tennis and pool area with event grounds and parking. The Master Plan also planned for an outdoor education camp across Golf Club Drive from the Homeless Garden Project and an interpretive trail through Sycamore Grove. The Sycamore Grove area is located to the east of Highway 9 along the San Lorenzo River and is currently closed as a result of illegal camping issues. No parking is currently provided onsite.

Recommendations:

1. Continue to implement the existing master plan.
   - Restore the Pogonip Clubhouse and use for events. Seek partnerships and grant opportunities to fund renovation.
   - Implement the Sycamore Grove interpretive trail.
   - Consider a caretaker residence or park host onsite.
   - Enhance restoration efforts. Renovate cattle grazing infrastructure and begin grazing. Develop and implement a work plan for invasive species removal and native plant restoration.
   - Install interpretive signage.
   - Construct road, parking lot, infrastructure, and other site improvements.
2. Explore modifications to the existing master plan:
   - Conduct a trails assessment to evaluate existing trail conditions and use issues and identify ways to improve access, recreational enjoyment, and connectivity. The assessment will help inform the determination of whether or not future trail modifications or improvements are appropriate and provide for a range of uses (hiking, horseback riding, mountain biking). As part of the process, the City would create clearer maintenance standards, identify use conflicts and solutions, develop a signage and educational program, assess long-term maintenance costs associated with any future improvements, and evaluate potential environmental impacts and mitigations through the CEQA process.
   - Consider adding a parking area near the Emma McCrary trail on Golf Club Dr. in the meadow immediately to the northwest of the vehicle access gate.



Rincon Park



Location: 601 Chestnut St.

Proposed Classification: Neighborhood Park

Size: 0.06 acres

Rincon Park is a small demonstration garden with pathways.

Recommendations:
None.

Riverside Gardens Park

Location: 258 San Lorenzo Blvd.

Proposed Classification: Neighborhood Park

Size: 0.52 acres

Riverside Gardens Park is the newest park in the system and was opened in 2014. A granitecrete pathway connects from Riverside Avenue to San Lorenzo Boulevard. Along the pathway there are picnic tables, benches, a playground, community garden plots, a small grass field, an arbor, and one piece of exercise equipment. A steel panel fence was specifically designed for the park and each panel was cut with a different floral design pattern. Fruit trees were planted as part of a community orchard project. The orchard is located in an area with limited recreational opportunity and will increase access to food. In addition, it will provide opportunities to learn about resource conservation and sustainable growing practices in a public setting.

Recommendations:
None.

Feature		Condition	Description
Recreational Facilities	Community gardens	Very good	Eleven plots.
	Exercise equipment	Very good	One piece (stairs).
	Playground	Very good	One wooden structure with plastic slides, swings, and bucket swings. Fibar fill.
Safety and Security	Lighting	Very good	Three light poles.
	Gate and locked at night	Very good	Steel panels.
	Security cameras	Very good	One security camera.
Site Access	Pathway	Good	Granitecrete pathway.
	Entrance sign	Very good	Two diecast cut metal signs and two metal park signs.
Site Furnishings	Arbor	Very good	Wooden arbor.
	Benches/Seating	Very good	Five recycled plastic.
	Bike parking	Very good	Two artistic metal bike racks.
	Garbage	Very good	Two metal cans.
	Both	Very good	Two BearSaver cans.
	Picnic tables	Very good	Six concrete tables.

Round Tree Park

Location: 305 Nobel Dr.

Proposed Classification: Neighborhood Park

Size: 0.28 acres

Round Tree Park is a small grass field that is infrequently used. The small size, coupled with public streets bordering three sides of the park, limits the type of recreational facilities that can be located there. There is currently no park signage or site furnishings. Smaller, well-designed recreational opportunities could be added such as an outdoor exercise area, swing set, gazebo, tot-lot, or community garden.

Recommendations:

1. Add park signage.
2. Consider additional recreational opportunities such as an outdoor exercise area, swing set, gazebo, tot-lot, or community garden.

San Lorenzo Park

Location: 137 Dakota Ave.

Proposed Classification: Community Park

Size: 11.12 acres

San Lorenzo Park is located along the eastern edge of the San Lorenzo River and is bordered by Water Street to the north; the Santa Cruz County Government Center, a hotel, and an apartment complex to the east; and Branciforte Creek to the south. The park is connected to downtown by a pedestrian bridge over San Lorenzo River. Public Works recently completed the construction of a pedestrian bridge across Branciforte Creek, linking the park to the Santa Cruz Riverwalk to the South. The benchlands area of the park is located within a flood plain for the river and any development is heavily regulated by the Army Corps of Engineers. San Lorenzo Park hosts multiple events throughout the year and parking is often provided at the County Government Center and in the benchlands area for the events. The park has a playground, a tot-lot, a portable pump track, nine disc golf baskets, the San Lorenzo Lawn Bowling facility, and a pond with a small stage. The play area has been completely fenced-in. The pond is a popular destination to bird watch. However, the pond does not recirculate water and needs to be upgraded. The stage is not frequently incorporated into events at the park. The restrooms are periodically closed as a result of illegal activity which is prevalent at the park. Cameras were installed in the park to create a safer environment and a Ranger is generally stationed at the park.

The park is located adjacent to the river and is in need of renovations and enhancements to create more use and deter misconduct. Consideration should be given to creating a larger draw for additional community use of the park when events are not being held. Future renovations of the park could focus on architectural elements, attractions, event infrastructure, and other improvements that separate the park from other destinations. Future renovation of the park should also consider how to increase usage of the Santa Cruz Riverwalk from neighborhoods along the river and Downtown.

Recommendations:

1. Consider a comprehensive renovation of the park. Examples include upgrading the playground, renovating or removing the pond, adding more colorful gardening displays, providing art, renovating or relocating the restrooms, expanding the number of recreational facilities, installing hidden infrastructure to support events, and constructing functional architectural elements such as entrances, plazas, art, stages, and arbors.
2. Increase programming of the park.
3. Hold more events and concerts in the park.
4. Consider as a location for a permanent or seasonal food truck court.
5. Partner with the County to provide recreational facilities on the parcel of County-owned land immediately to the north of the lawn bowling facility. Recreational facilities could include pickleball courts, exercise equipment, and/or amenities or features that could be incorporated into weddings or events.

Feature		Condition	Description
Recreational Facilities	Disc golf course	Very Good	Nine hole disc golf practice course.
	Large, grass field	Poor	Benchlands has no irrigation.
	Playground	Good	One structure w/ slides, climbing structure, and tire swing with sand and rubber matting. Concrete serpent.
	Pump track	Very good	One fiberglass and wood portable pump track course.
	Tot-lot	Good	Fenced-in with a structure with slides and bucket swings and sand and rubber fills.
Safety and Security	Lighting	Good	Twelve light poles.
	Security cameras	Very Good	Three security cameras on poles.
Site Access	Pathway	Fair	Asphalt and decomposed granite are in fair condition.
	Entrance sign	Good	Nine metal and one wooden entry sign.
Site Furnishings	Benches/Seating	Fair	Five wooden benches in poor condition. Four recycled plastic benches in good condition. One artistically painted concrete bench in a very good condition.
	Bike parking	Very good	Two U racks and eight metal bike posts.
	Drinking fountain	Good	Three metal.
	Flag pole	Very good	One flag pole.
	Garbage	Poor	Eight concrete garbage cans. Rusting and warping.
	Recycle	Fair	One can with slatted screen.
	Both	Very good	Three BearSaver cans.
	Pond and Stage	Poor	Pond does not recirculate water and is prone to pipes breaking. Stage is dated.
	Restroom	Fair	One dual facility.

San Lorenzo Park Lawn Bowling

Location: 137 Dakota St.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 18,000 sq. ft. outdoor lawn bowling area and 1,500 sq. ft. clubhouse

The San Lorenzo Park Lawn Bowling facility is located in San Lorenzo Park and operated by the Santa Cruz Lawn Bowling Club. The world class green was constructed with a well-drained, compacted substrate layer leveled to within 1/8" level for every ten foot of surface where the ball, when rolled upon the surface, travels at a specific speed to meet world standards for tournament play. Reservations or club memberships are required to use the facility. Used by the Santa Cruz Lawn Bowling Club, the clubhouse contains a kitchen and restrooms in addition to meeting space.

Recommendations:
None.

Santa Cruz Riverwalk

Location: Multi-use trail along the San Lorenzo River

Proposed Classification: Other

Size: N/A

Master Plan: San Lorenzo Urban River Plan (2003)

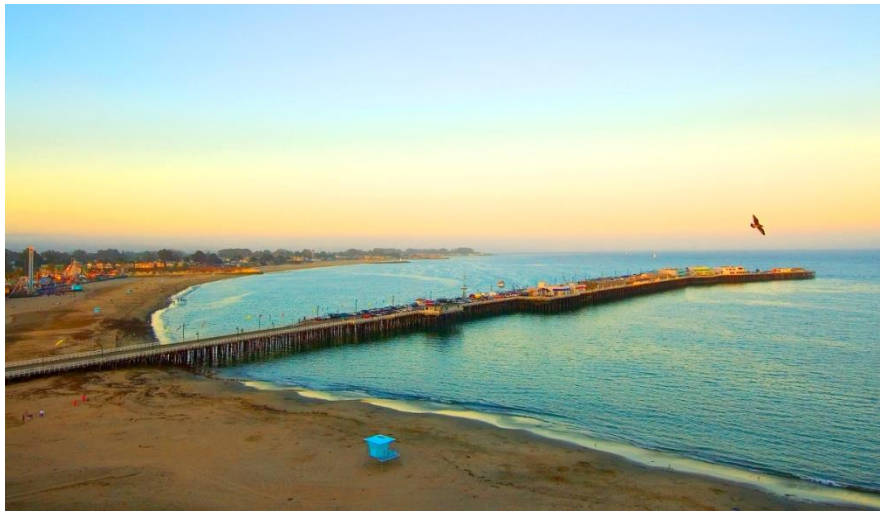
The Santa Cruz Riverwalk is a multi-use trail that encircles the San Lorenzo River south of Highway 1. On the west side of the river, the trail continues under Highway 1 to the Tannery Arts Center. The San Lorenzo Urban River Plan provides a number of recommendations for the locations and designs of plazas, unpaved nature loops, native planting treatments, interpretive signage, bird watching platforms, and art. The plan recognizes that the river is a habitat area for fish and wildlife and a passive recreational area for the enjoyment of the community. The Public Works Department recently added additional lighting along the Riverwalk, as well as exercise equipment on the west side of the river and south of Laurel Street. Exercise equipment is also located on the west side of the river south of Highway 1. Illegal activity, protecting the river and bird habitat, and increasing positive use of the area have been ongoing concerns along the river corridor.

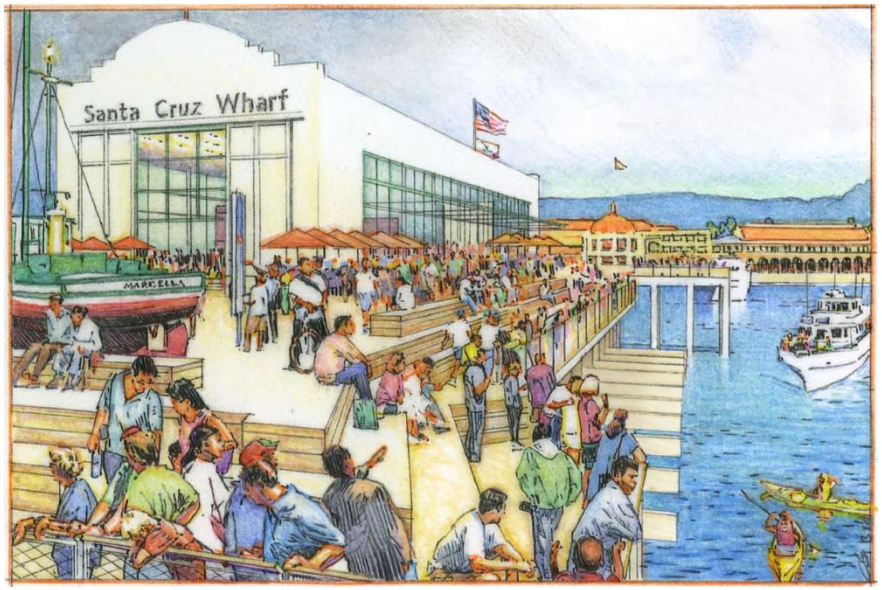
Recommendations:

1. Implement the San Lorenzo Urban River Plan as well as stakeholder recommendations developed through the Santa Cruz Riverwalk Summit and subsequent discussions.
2. Integrate multi-departmental and agency partnerships while enhancing the department's programming and safety efforts.
3. Install or coordinate improvements which include but are not limited to the installation of artwork, site furnishings, infrastructure and recreational amenities.

Feature		Condition	Description
Recreational Facilities	Exercise equipment	Very good	Two locations, nine pieces total.
Safety and Security	Lighting	N/A	Lighting along majority of pathway.
Site Access	Pathway	Fair	The majority is asphalt. Some sections concrete and permeable concrete.
	Entrance sign	Good	Fourteen metal signs.
Site Furnishings	Benches/Seating	Fair	One set of concrete blocks.
	Garbage	Good	Five garbage only BearSaver cans.
	Both	Fair	Twenty BearSaver cans. The majority are in good condition. A few are in fair condition due to wear and tear and continual remediation of vandalism.
	Interpretive Signs	Very good	Three signs.

Santa Cruz Wharf





Rendering from the Santa Cruz Wharf Master Plan Report (2014) of potential improvements and activities at the Bayward end of the Wharf.

Location: Entrance located at the intersection of Beach St. and Pacific Ave.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 8 acres

Master Plan: Santa Cruz Wharf Master Plan (2014)

The Santa Cruz Wharf was constructed in 1914 and, at one-half mile in length, is the longest timber pile-supported pier structure in the United States. The Wharf is a major tourist destination and is popular for wildlife viewing, fishing, boat tours, dining, and shopping. The Parks and Recreation Department operates the Wharf. The Economic Development Department is managing the Santa Cruz Wharf Master Plan process which is currently in the CEQA review process. The Santa Cruz Wharf Master Plan will guide the future restoration and expansion of the facility, and includes polices that recognize the importance of the visual and historic landmark and significance as a recreational, commercial, and open space resource. Among the many recommendations, the plan includes a landmark building, an events pavilion, a gateway entrance, a welcome center, a small boat landing area, and pedestrian and bicycle access along the western side. The Wharf Headquarters is located on the Wharf and the Maintenance Yard is leased from the Regional Transportation Commission and is located near Depot Park. In 2014, the Santa Cruz Green Wharf Project, a partnership between the City, UCSC, and other organizations and community members dedicated to reducing the environmental footprint of the wharf, received the Governor's Environmental and Economic Leadership Award.

Recommendations:

Work with the Planning and Community Development and Economic Development Departments to implement the Wharf Master Plan. Renew the lease for the Wharf Yard and consider facility improvements such as a workshop and storage structure.

Scope Park

Location: Pacific Ave. @ Mission St.

Proposed Classification: Neighborhood Park

Size: 0.1 acres

Scope Park is located across the street from the Town Clock and contains a mural. Scope Park and the Town Clock are gateways to downtown.

Recommendations:
Coordinate with the Arts Commission to restore or paint a new mural.

Senior Citizens Opportunity (222 Market Street)

Location: 222 Market St.

Proposed Classification: Community, Recreational, and Cultural Facility

Size: 5,400 square feet

The community center is leased to Senior Citizens Opportunity to provide senior arts and cultural services. The building has a large multi-use room with a stage at one end along with an adjoining kitchen and another small multi-use room. The City maintains the landscaping and exterior of the building.

Recommendations:
None.

Sgt. Derby Park

Location: 509 Woodland Wy.

Proposed Classification: Neighborhood Park

Size: 3.65 acres

Sgt. Derby Park has a large grass field, one of the first skate parks in California, two tennis courts (six pickleball courts are painted), three disc golf baskets, picnic tables, and a playground. The park does not contain frontage along a public street and is hidden from view behind residences from the public right-of-way on Woodland Avenue to the south. Park access is provided from the street by two narrow unpaved paths located between private residences. A fence was installed by the Santa Cruz City Schools District between Sgt. Derby Park and Natural Bridges School along the eastern property line. Industrial properties are located to the north. Residential properties are located along the west and south. Fence cutting has occurred along the fence-line between the industrial properties and the park for access to the park. There may be an opportunity for a joint-use agreement with the Santa Cruz City Schools District to construct a turf soccer field on their property. The proximity of the park to the recreational facilities is a great opportunity to explore a more detailed joint-use partnership to allow for public use during off-hours. Adjacent to the skate park, the remnants of a volleyball court exist. This court could be converted to another skateboarding area, possibly tailored for less experienced riders or incorporated into the existing skate park. The asphalt pathways are deteriorating and need resurfacing. There is room for expansion next to the adjacent playground to offer more variety for varying age groups. The tennis/pickleball court area could be expanded. A parcourse used to be located at the park and could be reestablished. The park is currently serviced by a porta-potty. Additional use related to more courts or a joint-use partnership for a turf field may necessitate the need for a permanent restroom. The drainage is poor for most of the site. A fenced off-leash dog use area could be located at the site. However, consensus with the surrounding neighbors has not been reached. Many residents do not want the open field segmented with fencing and prefer hours of off-leash dog use to be pursued. Many others have expressed concern that allowing off-leash dog use without a fenced area would create safety and cleanliness issues.

Recommendations:

1. The entrances could be improved to be more inviting, such as with the installation of awnings, landscaping, or other entry features.
2. Improved parking and access could occur through mutual parking agreements with adjacent industrial property owners to create access from Delaware Avenue or the Armory property off of Swift Street.
3. A more defined joint-use agreement with the Santa Cruz City Schools District could be pursued for use of the existing school recreational equipment and the development of an artificial turf field.
4. There is opportunity to expand the skate park and tennis/pickleball facilities to accommodate additional skate and court space.
5. A parcourse could be established along the pathway.
6. The pathways should be resurfaced in the near future.
7. The playground could be expanded to offer more variations for skill and age level.
8. The evaluation of adding a restroom facility should be conducted if facilities are expanded and the park receives a higher level of use.

Feature		Condition	Description
Recreational Facilities	Disc golf	Very good	Three practice baskets.
	Large, grass field	Poor	Large multi-use field. Drainage is poor.
	Pickleball court	Very good	Six pickleball courts are painted on the tennis court for shared use. Requires nets to be brought to the site and installed.
	Playground	Good	One swing set. One playground structure w/ slides and a bucket seat swing set for smaller children. Fibar fill.
	Skate park	Very good	Concrete. Graffiti is prevalent.
	Tennis court	Very Good	Two courts. Painted for shared use with pickleball.
Site Access	Pathway	Very poor	Asphalt needs to be resurfaced.
	Entrance sign	Good	Two wood, four metal signs.
Site Furnishings	Art	Very good	One rock w/ metal plaque and one metal sculpture commemorating Sgt. Derby.
	Benches/Seating	Fair	One wood, four recycled plastic, and two metal.
	Bike parking	Good	One U rack.
	Drinking fountain	Fair	One regular, one with dog bowl.
	Garbage	Fair	Five concrete.
	Recycle	Poor	Two wood slatted shells.
	Picnic tables	Fair	One wood and five concrete.
	Restroom/Porta-Potty	Fair	Screened porta-potty.

Star of the Sea Park

Location: 418 Darwin St.

Proposed Classification: Neighborhood Park

Size: 2.1 acres

Star of the Sea Park is approximately 2.1 acres. The City owns an approximately 1/3 acre parcel along Darwin Street and a joint-use agreement allows use of the adjacent field area which the City maintains. The properties contain very few amenities and the turf area needs enhancement. Additional facilities could be placed at this site. Consideration should be given to provide activities that are not provided at nearby Frederick Street Park. The Parks and Recreation Department could expand the joint use agreement to add signage and a walkway from Frederick Street to encourage more use of the site. Drainage is poor in the field area. The large grass field is large enough to accommodate a youth soccer field. However, this portion of the park is not owned by the City and the joint-use agreement would need to be expanded.

Recommendations:
Explore additional amenity opportunities with the surrounding neighborhood and Star of the Sea Church. The location has limited site furnishings and no recreational facilities. Consideration should be given to providing facilities which are not currently located at Frederick Street Park, which is a few blocks away. Some examples of what could be located there include a community garden and/or orchard, pickleball courts, a basketball court, a soccer field, exercise equipment, play equipment, or a small pump track.

Feature		Condition	Description
Recreational Facilities	Large, grass field	Very poor	Irrigation system needs work, gopher holes, uneven surfaces, and bare patches. Irrigation clock is located behind school's gate and could be relocated to be more accessible to City staff.
Site Access	Pathway	Poor	Decomposed granite, below level of grass and poor appearance.
	Entrance sign	Poor	One wooden near Church parking lot is in good condition. No sign on Darwin St.
Site Furnishings	Garbage	Very poor	Three concrete bins.
	Recycle	Very poor	One wooded w/ slat screening.
	Picnic tables	Very poor	Three (wooden).

Surfing Museum

Location: 701 W. Cliff Dr.

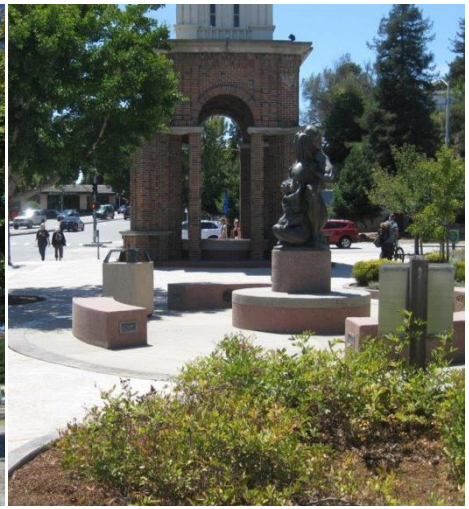
Proposed Classification: Community, Recreational, and Cultural Facility

Size: 630 sq. ft.

Located inside the iconic Mark Abbott Memorial Lighthouse on Lighthouse Point, the Surfing Museum overlooks the renowned surf break Steamer Lane and has a collection of photographs, surfboards, and other interesting artifacts tracing more than 100 years of surfing history in Santa Cruz. The museum shop specializes in surfing books and surfing related items.

Recommendations:
Update the collections. Consider removing the turf and replacing with native plant displays and/or a plaza/gathering area at the rear of the Surfing Museum.

Town Clock



Location: 101 Water St.

Proposed Classification: Neighborhood Park

Size: 0.19 acres

Town Clock is a plaza with benches, art, a water fountain, and is the site of a memorial plaque for the 1989 Loma Prieta Earthquake. The plaza is used as a gathering place and is home to the annual New Year's Eve countdown event.

Recommendations:
None.

Trescony Park

Location: Terminus of Trescony St.

Proposed Classification: Neighborhood Park

Size: 2 acres

Trescony Park has the largest community garden area in the City with fifty-four plots. The park also has a playground, tot-lot, and picnic tables. A pathway extends to Bay Street. A porta-potty could be provided.

Recommendations:

1. Provide a porta-potty.
2. Add signage along Bay Street.
3. Improve concrete pathway.

Feature		Condition	Description
Recreational Facilities	Community gardens	Good	Fifty-four plots.
	Playground	Good	One tower with slide. Fibar fill.
	Tot-lot	Good	One tower with slide. Fibar fill.
Safety and Security	Lighting	Fair	Four light poles.
Site Access	Pathway	Poor	Concrete pathway is not level.
	Entrance sign	Good	One wooden entrance sign, one metal, one wood. No sign on Bay St.
Site Furnishings	Benches/Seating	Good	Four recycled plastic benches.
	Bike parking	Good	One U bike rack.
	Drinking fountain	Good	One metal.
	Garbage	Fair	Two concrete toters used for garden area.
	Recycle	Fair	One recycle bin with slat screening.
	Picnic tables	Fair	Two concrete and one wood.

Tyrrell Park

Location: 1305 E. Cliff Dr.

Proposed Classification: Neighborhood Park

Size: 1.2 acres

Tyrrell Park is a small neighborhood park which contains a small group educational area, a grass field, benches, and a life-size gray whale sculpture. The whale is a popular backdrop for photographs taken by visitors of the Museum of Natural History, which is located onsite. The park is located across E. Cliff Drive from Seabright State Beach, and the surrounding streets receive a high amount of traffic from beach goers. Community members help maintain Pilkington Creek which runs along the eastern edge of the site. Monarch butterfly habitat is located onsite. The Santa Cruz Museum of Natural History has requested minor improvements to create a better connection between the park and the museum's programming and educational classes, including a small trail emphasizing native plants from Santa Cruz; replacement of front lawn with native/drought resistant demonstration gardens; natural art and activity zones where art and play make use of natural materials and kids can search for insects; natural play areas making use of stumps, rocks, and tree trunks; bird boxes and other wildlife enhancements; dark sky lighting to allow for star gazing; bicycle parking, and ADA enhancements. The Parks and Recreation Department is generally supportive of these requests but will need to ensure that future programming and activity areas are complementary, neighborhood-serving, and do not deter park use from neighbors or cause other impacts to the neighborhood.

Recommendations:
Convert landscaping to demonstrative gardens, add habitat features, bike parking, and dark sky lighting, improve ADA access, and rewire and upgrade plaster whale. Work with the Santa Cruz Museum of Natural History and surrounding neighbors to establish guidelines and locations for the outdoor activity and learning areas to ensure they are scaled appropriately for a neighborhood-serving park. The small amphitheater could be programmed with local events.

Feature		Condition	Description
Safety and Security	Lighting	Fair	Two light poles.
Site Access	Pathway	Good	Concrete, asphalt, and pervious concrete are good. Decomposed granite pathways are in fair condition.
Site Furnishings	Amphitheater	Fair	Small concrete amphitheater.
	Art	Fair	One whale.
	Benches/Seating	Good	Two wood showing minor cracking, three wood in very good condition, and one recycled plastic in very good condition.
	Bike parking	Good	Three bike posts.
	Flag pole	Very good	One flag pole.
	Trash and Recycling	Very good	Two BearSaver cans.
	Interpretive signs	Fair	Three plastic panels and one metal.

University Terrace Park

Location: Meder St. @ Nobel Dr.

Proposed Classification: Neighborhood Park

Size: 8.7 acres

University Terrace Park has a playground, large grass field, two tennis courts, picnic tables, and fenced-in off-leash dog use areas (one area is dedicated to dogs less than 25 pounds in size). The park is connected to the Arroyo Seco trail which connects to Grandview Street. The basketball court is popular for pick-up games. Youth soccer leagues occasionally use the field as a practice area. The park is frequently used and currently has a porta-potty. A permanent restroom facility with an attached maintenance shed is a necessary addition. The playground equipment is limited given the size of the park, though the original design planned more play areas. Additional features could be added. A mini soccer field (synthetic) could be added to the large grass area to reduce water use and increase opportunities for pick-up games.

Recommendations:

1. Add a permanent restroom with an attached maintenance shed.
2. Upgrade/add playground equipment for more age groups.
3. Consider a mini soccer field (synthetic).

Feature		Condition	Description
Recreational Facilities	Basketball court	Very good	One basketball court
	Large, grass field	Good	Very large multi-use grass field.
	Off-leash dog use	Good	Very large off-leash dog use area. Surface is dirt and becomes muddy during the rainy season.
	Playground	Good	One play structure with slides and a bucket swing set. Sand and rubber surfacing.
	Tennis court	Very good.	Two tennis courts.
Site Access	Pathway	Fair	Sections of asphalt are un-level from tree rooting and show dryness and crumbling and will need sealing and resurfacing.
	Entrance sign	Very good	Two wood and two metal.
Site Furnishings	Benches/Seating	Good	Seven recycled plastic, six wood, two concrete.
	Bike parking	Good	One four foot long bike rack near playground and two bike posts near Nobel Dr entrance.
	Drinking fountain	Good	Three drinking fountains. Two include a dog bowl feature. Paint chipping on drinking fountain in off-leash dog use area.
	Garbage	Good	Four concrete.
	Recycle	Good	One in recycled plastic, slatted shell.
	Picnic tables	Good	Three concrete, two recycled plastic, and one wood.
	Restroom/Porta-Potty	Fair	Porta-potty with wooden enclosure.

West Cliff

Location: Swanton Blvd. to Bay St.

Proposed Classification: Community Park

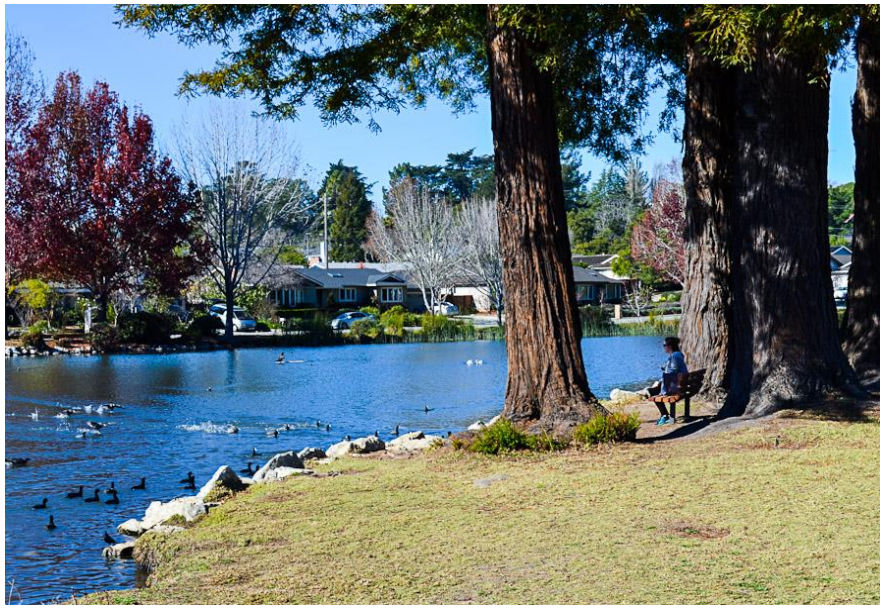
Size: 14.64 acres

West Cliff pathway and accents are located on a coastal bluff along West Cliff Drive, a multi-use path that extends from Natural Bridges State Park to Cowell Beach. Stairs provide access to popular surfing breaks and beaches. Coastal recreation on and around the bluff is abundant and includes but is not limited to ocean and wildlife viewing, relaxing, surfing, swimming, rock fishing, wind surfing, biking, walking, and exercising. The park has benches, landscape accents, a statue, artwork, and one turf field. Surf contests are held at Steamer Lane and marathons are held along the pathway. Multiple surf breaks are located along this section of coastline. The Surfing Museum is located at Lighthouse Point. Lighthouse Point offers an un-paralleled viewing opportunity of surfing. It is sometimes booked for special events such as weddings or food truck events. The pathway has overlook areas that provide opportunities to view sea lions, otters, dolphins, migrating whales, and marine birds. Natural Bridges State Park is located at the Western edge of West Cliff and Lighthouse Field State Park is located across the street from Lighthouse Point. The State Parks provide the only restroom facilities on West Cliff. The State also owns the western half of Its Beach. The Parks and Recreation Department maintains the landscaping, railings, and dirt pathways along the pathway. The proximity to the ocean leads to challenges with erosion and deterioration of infrastructure. As improvements take place over time, the appearance of some of the areas lacks continuity. Ice plant is very aggressive. There are varying opinions about the types of facilities that should be included on West Cliff. Exercise equipment was added to Mitchells Cove and receives regular use. The City Council provided direction to staff to hold off on installing additional recreational facilities until a future plan was in place. The City's Local Coastal Program has a planning item to develop a West Cliff Plan. The coastline is a recreational, natural, and scenic treasure that embodies the City's unique sense of place and identity. A master plan could be created to guide future improvements; help maintain a more cohesive, consistent identity; and improve the long-term coordination and management.

Recommendations:
Partner with other stakeholder departments to develop and implement an integrated design, land-use, recreation, cliff stabilization, and landscape plan for West Cliff and East Cliff Drives to enhance public access, safety, preservation, and recreational enjoyment along the coastline.

Feature		Condition	Description
Recreational Facilities	Exercise equipment	Very good	One dip and one sit-up station.
Safety and Security	Lighting	N/A	Street lights are along W. Cliff Dr.
	Gate and locked at night	N/A	Lighthouse Point Parking lot is gated.
Site Access	Pathway	Very Good to Poor	Asphalt was redone south of David Way. Pavement is eroding and cracking north of David St.
	Parking	N/A	Parking lots and spaces along W. Cliff.
Site Amenities	Art	Very good	One obelisk sculpture, one surfer statue.
	Benches/Seating	Fair	Fifty-nine wooden benches and two recycled plastic benches. Approximately 60 percent of the benches metal supports have deteriorated and will need replacement.
	Bike parking	Good	Ten ft. long bike structure and three U bike racks.
	Drinking fountain	Good	One metal and one metal with bottle feature. Needs to be painted.
	Flag pole	Good	Flag pole is in front of Surfing Museum.
	Garbage	Very good	19 Bearsaver cans for both trash and recycle and five metal cans.
	Recycle	Very good	Three recycle cans in addition to 19 Bearsaver cans for both trash and recycle.
	Both	Good	Eleven BearSaver cans. Some will need to be repainted due to weathering.
	Interpretive signs	Good	Four panels and one brick structure and metal plaque.

Westlake Park



Location: Bradley Dr. @ Spring St.

Proposed Classification: Neighborhood Park

Size: 6.03 acres

Westlake Park is picturesque and offers great opportunities to relax and bird watch. It contains a large grass field, tot-lot and playground equipment, benches, and picnic tables adjacent to a drainage basin which visually looks like a small lake. The park is somewhat hidden within a residential neighborhood. Youth soccer league and UCSC students sometimes use the field for practice. Fishing is allowed for youth 16 years and younger and seniors 65 years and older. Tule growth and the aeration and circulation system require continual maintenance. The pathways currently do not accommodate access around the lake.

Recommendations:

1. This park is a larger neighborhood park within our parks system and a restroom could accommodate visitors who do not live within walking distance to the park which would encourage longer visits.
2. A small walking loop could be installed to allow for visitors to walk around the lake.

Feature		Condition	Description
Recreational Facilities	Fishing	N/A	Allowed for youth sixteen years and younger and seniors 65 years and older.
	Large, grass field	Good	Very large multi-use playing field on east side of park. Sometimes used by youth soccer groups as a practice area.
	Playground	Good	One tower structure w/slides and a swing set. A combination of sand and rubber fill.
Site Access	Pathway	Good	Decomposed granite pathways provide access along the western edge of the lake and to the play structure and picnic tables on the east side of the park.
	Entrance sign	Good	Large, engraved wooden sign and one metal.
Site Furnishings	Benches/Seating	Good	Seven wooden and six recycled plastic.
	Bike parking	Very good	Four metal bike posts.
	Drinking fountain	Good	Two.
	Garbage	Good	Three concrete garbage cans. No recycle.
	Interpretive signs	Good	One wooden and two recycled plastic.

Westside Pump Track

Location: Western Dr. @ Highway 1

Proposed Classification: Neighborhood Park (Leased)

Size: N/A

The Westside Pump Track is located on land the City has leased for a short-term basis. The land will be returned to the property owner when the lease is discontinued.

Recommendations:
Consider asphalt paving of pump track to reduce long-term maintenance needs.

Feature		Condition	Description
Recreational Facilities	Pump track	Very good	The pump track recently underwent a renovation to improve the pumps and berms.
Safety and Security	Gate and locked at night	Very good	New fencing.
Site Access	Pathway	Very good	Entrance to pump track is concrete.
	Entrance sign	Very good	One metal.
Site Furnishings	Benches/Seating	Very good	One metal bleacher.
	Bike parking	Very good	Two bike parking posts.
	Garbage	Very good	One concrete.
	Recycle	Fair	One plastic slatted screen.
	Restroom/Porta-potty	Poor	Unscreened and located in a visible location.

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SECTION 4.3: FUNDING STRATEGIES

A. Introduction
B. City Fiscal Setting
C. Funding Strategies
D. Costs for Future Projects

A. INTRODUCTION

The *Santa Cruz Parks Master Plan 2030* (Parks Master Plan 2030) identifies numerous goal, policies, actions, and recommendation items for implementation, relating not only to specific parks, facilities, open spaces and recreation areas, but also to citywide programs and administration. Full implementation of the Parks Master Plan 2030 will require significant staff and financial resources over the life of the Plan. Given the inherent limitations of the City's financial resources, many implementation projects will need to be prioritized and phased-in in ways that allow for existing staff and budgetary resources to address the projects over time. Furthermore, many of the recommendations are conceptual in detail, and future planning efforts will need to be pursued to flesh out the project-specific details and figure total costs. Finally, costs related to larger, community assets, such as the Santa Cruz Wharf and Civic Auditorium, will require larger funding sources beyond the Department's operating budget or developer fees that are currently collected. That said, this section provides a broader overview of the City's fiscal setting, existing funding strategies, and potential funding strategies that will or could be explored further to help implement components of the plan.

B. CITY FISCAL SETTING

For fiscal year 2017-2018 (FY 2018), the City's total budget is $263.2 million, of which $106.1 million is in the General Fund. The Parks and Recreation Department has a total budget of $17.2 million, of which $14.9 million is funded through the General Fund. In FY 2018, the City has appropriated $47.1 million for capital projects, but unlike prior years, none of these projects are supported with new General Fund monies. The City has identified $299.4 million in unfunded capital projects.

The 2018 budget's fiscal projections anticipate budget shortfalls in the General Fund over the next several fiscal years with a modest recovery beginning in 2022. Despite strong revenue growth, pension, health care, and infrastructure maintenance/replacement costs are increasing. In order to avoid reactive cuts during the shortfall years, it is necessary to reserve revenue now to help the City offset the forecasted deficits.

C. FUNDING STRATEGIES

EXISTING SOURCES

The City has several existing sources of funds to pay for capital projects.

Park Land and Open Space Dedication.

The City requires new residential subdivisions to dedicate land, or pay an in-lieu fee, for parks and open space, as authorized by the Quimby Act (California Government Code Sec. 66477). For subdivisions greater than 50 units, the development is required to either dedicate 4.5 acres per 1,000 population or pay an in-lieu fee. For smaller subdivisions, only the fee is required. The 4.5 acre requirement is divided into two acres for neighborhood parks and 2.5 acres for community parks. The in-lieu fee is set at $3.00/sq. ft. of building space or $4,780 per undeveloped parcel. Use of the fee revenue is restricted to the development of new parks or the rehabilitation of existing parks. Santa Cruz allocates its Quimby Act fee revenue into separate funds representing four quadrants of the City. Fees collected from new residential development within each quadrant must be spent on parks within that quadrant. In the City Budget for Fiscal Year 2018, the four park fee funds are projected to have an ending balance of approximately $800,000.

Park and Recreation Facilities Tax

While the Quimby Act fees are intended primarily to fund acquisition and development of park land, the City has also adopted an excise tax on residential construction to help fund parks and recreation facilities. The

tax, which is paid at the issuance of a building permit, covers development or expansion of all types of residential units, including mobile homes. The tax is charged at the same level as the Quimby Act fees, $3.00 per sq. ft. of new construction. The City has established a separate budgetary fund to account for the excise tax, but as a practical matter the City handles the expenditures of the funds in the same way as it does for the Quimby Act funds. The excise tax revenues are transferred into the four quadrant fee accounts for use on park projects within each of these service areas. Therefore, the fee balance of $800,000 projected for the end of FY 2017-18 indicated above also includes revenues from the excise tax. Future in-lieu fee studies could assess if the quadrant areas could be updated to reflect trends in growth in specific areas of the City and the corresponding impacts on facility needs and demands.

Growth Impacts on Funding

These types of impact fees and taxes on new construction are intended to mitigate the impact of new population growth on the parks and recreation system, although the revenues can be used to upgrade or renovate existing parks to account for usage of those parks by new residents. It has been about ten years since the City established the fee level for the Quimby fees, based on a nexus study completed at that time. With the adoption of the new Parks Master Plan 2030, it would be appropriate to conduct a new nexus study to incorporate current costs for park land acquisition and development. Similarly, the level of the residential tax should be evaluated to determine if the current tax rate adequately addresses the impacts of new development on park facilities.

The level of future revenues from these sources will also depend on the rate of growth Santa Cruz experiences during the life of the Parks Master Plan 2030. The Association of Monterey Bay Area Governments (AMBAG) is the Metropolitan Planning Organization (MPO) for the Santa Cruz region and has prepared growth projections for each jurisdiction to aid in regional transportation and land use planning. AMBAG's most recent projections were adopted in 2014 and cover the 2010 to 2035 time period. These projections show the City of Santa Cruz gaining 6,039 new residential units between 2010 and 2035, of which 4,231 units would occur by 2020. However, as of December 2016, Santa Cruz had added 437 new units since 2010. It is likely the recovery in the housing market from the recession has been much slower than anticipated.

In order to estimate potential future funding available from these City sources, consultant Applied Development Economics (ADE) has prepared a low and high residential growth projection based on the AMBAG data but calibrated to the actual dwelling unit count in Santa Cruz in 2016 (Table 4.3-1). The low projection assumes that the pace of development in the City between 2010 and 2016 continues until 2020 and then follows the AMBAG projections for each of the subsequent five year periods out to 2035. Under this scenario, Santa Cruz would add 2,684 units between 2016 and 2035 but fall short of the total 29,335 units originally projected by AMBAG for 2035. The high projection assumes development activity accelerates and the City does achieve the original AMBAG projection, adding 5,720 new units between 2016 and 2035.

Table 4.3-1 shows both the Quimby Act fees and the residential tax potentially generated in each future five year period. The residential tax would also be levied on residential remodels if they add square footage to the home, but this is not estimated in Table 4.3-1. The low growth scenario would generate about $25.7 million over the 20 year period, while the higher growth scenario would generate $54.8 million. If the City resets the fee and tax levels to account for new costs identified in the Parks Master Plan 2030, the revenues would likely be higher than shown. As such, it appears that these revenues could fund many of the projects. It is important to note that construction costs will escalate each year, so the further out in time projects are completed, the higher the total cost will be. The City's fee and tax levels are not currently set up to escalate each year automatically, so the revenues could fall short of costs over time.

Table 4.3-1 Projected Residential Development and Related Quimby Act Fees and Park and Recreation Tax Revenues

	2016	2020	2025	2030	2035
Projected Housing					
Low – Total Units	23,635	23,954	24,611	25,261	26,319
5- Yr. Growth		319	657	650	1,058
High – Total Units	23,635	25,422	26,515	27,596	29,355
5-Yr Growth		1,787	1,093	1,081	1,759
Low Growth Revenues					
Quimby Fees		$1,524,820	$3,140,460	$3,107,000	$5,057,240
Cumulative		$1,524,820	$4,665,280	$7,772,280	$12,829,520
Residential Tax		$1,531,200	$3,153,600	$3,120,000	$5,078,400
Cumulative		$1,531,200	$4,684,800	$7,804,800	$12,883,200
Combined Total		$3,056,020	$9,350,080	$15,577,080	$25,712,720
High Growth Revenues					
Quimby Fees		$8,541,860	$5,222,592	$5,166,948	$8,410,201
Cumulative		$8,541,860	$13,764,452	$18,931,399	$27,341,600
Residential Tax		$8,577,600	$5,244,443	$5,188,567	$8,445,390
Cumulative		$8,577,600	$13,822,043	$19,010,610	$27,456,000
Combined Total		$17,119,460	$27,586,495	$37,942,009	$54,797,600

ADDITI0NAL FUNDING STRATEGIES

Grant Funding

Similar to most cities, Santa Cruz accesses state and federal grant programs when available to help fund parks and recreation facilities. Periodically, voters of the state have approved park, water and natural resources bonds that the State Department of Parks and Recreation has used to grant funds to local agencies through its Office of Grants and Local Assistance (OGALS). Most recently, a statewide park bond was passed in 2006. Additionally, OGALS administers annual Land & Water Conservation Fund (LWCF) funds from the National Park Service, the Habitat Conservation Fund ($2 million/yr) and the Recreational Trails Program (up to $4 million, depending on Congressional action). The City may also access funds and technical assistance directly from the Federal Government. For example, the United States Fish and Wildlife Service offers a Coastal Program that provides direct technical assistance and financial assistance in the form of cooperative agreements to coastal communities and land owners to restore and protect fish and wildlife habitat on public and private lands.

The City receives Community Development Block Grant (CDBG) funds directly from the Federal Government, which may be used for a variety of purposes such as affordable housing, community facilities or economic development. In the past several years, the City has received between $500,000 and $900,000 per year and has used the funds for the operation of the teen center as well as other capital improvement projects. For large projects it is frequently necessary to assemble several grants from sources which may have different purposes but which can contribute to portions of a larger project. In addition to state and federal grant sources, there are a number of private foundations, major corporations and non-profit groups that offer funding for specific purposes appropriate to the types of projects in the Parks Master Plan 2030. Appendix 9 provides a selected list of such grant programs that have offered funds in the past year. In some cases these programs are offered on an annually recurring basis and sometimes they are one time opportunities, or offered on a less frequent basis. If not already, the City may consider subscribing to a service such as Grantstation Insider (www.grantstation.com) in order to monitor upcoming grant opportunities. However, in general grant funds are limited and usually allocated on a competitive basis, which makes it difficult to incorporate them in specific ways into long-term capital improvement programs.

Potential Additional Funding Sources

The City may consider a variety of other financing mechanisms and funding sources to help close the gap on parks and recreation facilities costs and ongoing operations and maintenance. Some of these programs are most appropriate in relation to major new development projects and others are designed to increase funding from existing

residents and property owners. This latter category usually requires voter approval, but may also include efforts to promote corporate sponsorships and community donations for specific community facilities.

Community Benefits Program

In addition to impact fees, another potential approach to developer funding for recreation facilities would be to establish a community benefits program, in which development bonuses are offered in exchange for developer contributions to desired community facilities, which may include recreation related improvements. This approach would need to be coordinated with the City overall land use and development policies. Typically, allowable community benefits are defined broadly and may include a range of improvements from transportation to affordable housing to specific community facilities. A key aspect of the program is that the City would need to be prepared to offer higher development intensities under certain circumstances than are otherwise allowed by zoning in order to create workable incentives that would induce developers to make community benefit contributions. Such programs are gaining wide acceptance in a number of the areas within the San Francisco Bay Area, but their success depends on a vibrant real estate market where development demand is sufficient to support the higher costs associated with the developer exactions.

Bonds

The City may also consider financing programs that include existing residents and development in the City. With approval of the voters, the City can levy bonds or impose parcel assessments that would raise money both for parks related capital improvements and also for operations and maintenance costs. In his budget message in the FY 2017-18 City Budget, the City Manager mentioned that considerations are underway to seek approval for a "Quality of Life" bond that could help fund improvements to the City's economic, cultural, recreational, and public facilities.

New or Expanded Local Taxes

The City levies a number of local taxes that can be increased with approval of the voters. In the past ten years, voters in the City have approved increases to the sales and use tax, the Transient Occupancy Tax (TOT), and the Utility Users tax. The voters have also approved establishment of water, sewer and refuse franchise taxes and a parcel tax dedicated to protecting public health and wildlife habitat in the San Lorenzo River, the bay and ocean. In addition to these taxes, Santa Cruz also levies an Admission Tax, a Cannabis Tax and a Property Transfer tax. Cities in California have used these types of local taxes to fund parks and recreation services, among other service costs. Taxes used for general purposes are subject to approval by a simple majority of voters while taxes levied for specific purposes require a two-thirds majority vote.

Land-Based Financing

In addition to general obligation or revenue bonds, cities also employ more limited land based financing programs such as Community Facilities Districts (Mello Roos), Landscape and Lighting Districts, special assessment districts, and maintenance assessment districts. These types of financing districts can be established citywide, but more typically are employed for major subdivisions where infrastructure or service costs for the new neighborhood cannot otherwise be funded by developer or city sources. While impact fees can be used only to build new public facilities CFDs and maintenance assessment districts can help fund operations and maintenance costs as well.

Enhanced Infrastructure Financing District (EIFD)

The State legislature recently approved major modifications to a long standing local financing program called an infrastructure financing district. Under the new program, cities may allocate their own property tax increment within an established district to help finance a wide range of public facilities and improvements, including parks and recreation. This is essentially a limited form of redevelopment tax increment financing, but only public agencies that agree to participate would allocate their tax increment to the EIFD. Multiple agencies can participate, however, so for projects of regional significance, such as the

San Lorenzo Riverwalk, the Santa Cruz Wharf and perhaps the Civic Auditorium, the County or other special districts could agree to participate. Establishing an EIFD, however, would mean that tax increment generated as new development occurs and property values rise would be diverted away from the City General Fund, so this mechanism would also need to be considered within the context of the City's overall long-term budget strategy.

Charitable Contributions and Donor Campaigns

The City maintains a budgetary fund for public contributions to the parks system. Citizens and businesses alike often recognize the vital importance of the City's parks and recreation system to the community's quality of life and wish to contribute financially. For major projects, cities often mount donor campaigns, which may include major corporate support, to fund high profile facilities, such as the Civic Auditorium. However, this approach can also be helpful for neighborhood projects as well where the community may be willing to conduct funding raising activities and donate volunteer efforts to provide or maintain a recreation, cultural, or open space amenity in their neighborhood.

D. COSTS FOR FUTURE IMPROVEMENTS

Decisions on priorities for spending will depend on many factors: need, public desires, new trends, safety, compliance with current regulations and codes, infrastructure required, environmental impact, personnel required and available funding. One major factor will be potential costs and funding available to meet that cost. Table 4.3-2 lists typical costs in 2017 dollars that can aid in decision-making as projects move forward. Variations in size, land constraints, permitting requirements, access or condition of existing infrastructure, design, and the need for consulting or contractor services are some of the factors that affect overall project costs. The costs are intended to give a general sense of scale per type of improvement.

Table 4.3-2 Typical Project Costs Per Type of Improvement

	Facility	Description	**Construction Costs in 2017 per square foot or unit costs** including design fees, necessary prep work, contingencies and soft costs	**Approximate Area**	**Unit**	**Total Construction Costs in 2017** including design fees, necessary prep work, contingencies and soft costs
1	**Basic small park Improvements per acre**	Grading, drainage, utilities including connections, paving, planting & irrigation, site furnishings	$650,000	1	acre	$650,000
2	**Basic large parks (over 1 acre) Improvements per acre**	Grading, drainage, utilities including connections, paving, planting & irrigation, site furnishings	$600,000	1	acre	$600,000
3	**Restrooms**					
a.	*Small*	Prefabricated single restroom with sink and toilet. Water supply and sewer, limited storage. Assumes easy access to water and sewer	$1,450	120	sf	$174,000
b.	*Medium*	Prefabricated single stall women, single stall men with urinal. Water supply and sewer. Assumes easy access to water and sewer	$765	600	sf	$459,000
c.	*Large with concessions*	Prefabricated three stall women, one stall men with two urinal, level 3 concessions. Water supply and sewer. Assumes easy access to water and sewer	$1,100	1,070	sf	$1,177,000
4	**Playground**					
	Large					
a.	*Tot Structure*	Some custom structures, platform structure, double tot swing, 3 independent elements, rubberized matting, concrete perimeter curb, fencing, 2 benches	$115	4,000	sf	$460,000
b.	*School age*	Some custom features, large platform structure, 2 swings on single beam, five independent elements, surfacing- half rubberized/half engineered wood fiber, 2 benches, no fencing	$110	6,000	sf	$660,000

Table 4.3-2 Typical Project Costs Per Type of Improvement

	Facility	Description	Construction Costs in 2017 per square foot or unit costs including design fees, necessary prep work, contingencies and soft costs	Approximate Area	Unit	Total Construction Costs in 2017 including design fees, necessary prep work, contingencies and soft costs
	Small					
a.	*Tot Structure*	Small platform structure, double tot swing, 2 independent elements, rubberized matting, concrete perimeter curb, fencing, 2 benches	$110	1,500	sf	$165,000
b.	*School age*	Large platform structure, 2 swings on single beam, five independent elements, surfacing- half rubberized/half engineered wood fiber, 2 benches, no fencing	$102	2,000	sf	$204,000
5	**Multi- use small turf sports field**	140' x 200' irrigated turf, soil prep, portable goals	$2.25	28,000	sf	$63,000
6	**Artificial turf regulation soccer field**	Artificial turf with Brock sub base, drainage, irrigation to cool fields, goals, buffer areas	$40	72,000	sf	$2,880,000
7	**Lighting for soccer field**	Sports field lighting similar to Musco fixtures including transformer, panel, wiring, fixtures	$350,000	1	ea	$350,000
8	**Basketball court**	Full size court including paving, striping, hoops, lighting. 2 benches	$56,000	1	ea	$56,000
9	**Tennis Court**	Double court, asphalt, fenced, net and posts, paving and striping, 2 benches	$81,000	2	ea	$162,000
10	**Bocce Ball**	Wood surround, crushed shell surfacing, 1 bench	$10,000		ea	$10,000
11	**Bike pump track**	concrete structures, fencing	$47.50	8,000	sf	$380,000
12	**Dog Park**	Surfacing- 1/2 decomposed granite paving and 1/2 turf, entry plaza, 6' high fencing, 2 benches, drinking fountain with dog bowl, trash with bag dispenser, shade trees	$303,000	25,000	sf	$303,000
13	**Group Picnic Area**	6 Tables, decomposed granite surfacing, 2 grills, trash, water spigot, (4) trees	$175,000	2,000	sf	$175,000
14	**Picnic Shelter**	20 x 20 prefabricated shelter	$42,000	1	ea	$42,000
15	**Demonstration garden**	Shrub and tree planting, irrigation, signage	$11.20	4,000	sf	$44,800

Table 4.3-2 Typical Project Costs Per Type of Improvement

	Facility	Description	**Construction Costs in 2017 per square foot or unit costs** including design fees, necessary prep work, contingencies and soft costs	**Approximate Area**	**Unit**	**Total Construction Costs in 2017** including design fees, necessary prep work, contingencies and soft costs
16	**Community Garden**	30,000sf garden with raised beds, soil, irrigation, fencing, decomposed granite paths, 175 sf storage building	$455,000	30,000	sf	$455,000
17	**Bicycle Trail Improvements**	8' wide 2" depth asphalt path with 6" road base with 2' decomposed granite shoulders each side	$10	1	lf	$10
18	**Pickleball**					
a.	*Net/court tape*				1	$300
b.	*Court resurfacing*				1	$3,500 - $5,000
c.	*New court construction*					
d.	*Basic*				1	$10,000 - $15,000
e.	*Basic plus lighting/fencing*				1	$20,000 - $35,000
f.	*8 court community complex w/ fencing but no lighting*				8	$110,000 - $150,000
g.	*8 court community complex w/ fencing, lighting and stadium seating*				8	$300,000 +

SECTION 4.4: ONGOING PLANNING & UPDATES

A. Implementation
B. Summary & Conclusions

A. IMPLEMENTATION

The City of Santa Cruz recognizes park, recreational facilities, beaches, and open spaces are essential to the community's quality of life. The *Santa Cruz Parks Master Plan 2030* (Parks Master Plan 2030) is a means to guide future park improvements and to accommodate emerging needs to continue to provide a quality parks system. It is envisioned as a living document that continues to evolve and progress over time. The community profile, existing conditions, emerging trends, and community input received has informed the recommendations in this plan.

As described in the previous chapter, the City is heading into a funding shortfall in the near term. It is necessary to reduce spending now in order to help offset the gap between revenues and expenditures which is projected to begin to close after 2022. The likelihood of funding becoming available for capital projects in the upcoming years is unknown.

It is necessary to set priorities for the implementation of the many action items that evolved out of the community outreach process. Many action items will be ongoing or can be accomplished in a shorter time frame with available resources. Others will require long-term planning. Given the uncertainty of funding streams, it is unnecessary to plot out the step-by-step framework to implement the plan, as the specific steps, costs, and funding allocation will need to change as conditions change.

ACTION PLAN

The guiding priorities need to remain focused to achieve results, and yet flexible enough to address new challenges and to capitalize on new opportunities. An Action Plan will be maintained to help guide broader priorities and actions and will be based on an assessment of the value of specific actions to the parks system, community, and environment. The Action Plan will remain separate but complementary to the Parks Master Plan 2030. It will be updated and maintained with input from the Parks and Recreation Commission and direction from the City Council. The Action Plan will include actions that are the highest priority for the department to pursue. Staff will use the Action Plan to help guide future departmental decision-making, seeking projects and programs to implement components of the plan on an ongoing and incremental basis. One approach is for staff to meet with the Parks and Recreation Commission to discuss the progress, needs, opportunities, and next steps on an annual basis in preparation for the City's annual budget process.

ENVIRONMENTAL IMPACT

Many policies and actions are aimed at improving environmental quality within the parks system. Other actions will require additional study of potential environmental impacts before being implemented. Many of the recommendations are conceptual in detail and additional efforts are necessary to determine if the projects should be pursued. During future processes, additional environmental review may be necessary to ensure that final designs do not create a significant impact to the environment. Additionally, some recommendations involve the consideration of additional recreational opportunities within an open space which has an existing master plan in place. The Parks Master Plan 2030 process identified needs which emerged through the process and opportunities to meet those needs at a community level. The Parks Master Plan 2030 neither replaces nor overrides the existing plans. If future projects are pursued to meet those needs that were not already identified within an existing park master plan, then the master plan for the specific park would need to be amended and CEQA review would be necessary.

MOVING LARGER PROJECTS FORWARD

Funding for actions will require strategic thinking. Many of the recommendations within the Parks Master Plan 2030 have the potential to be funded through grants. However, many grant awards required to be project ready, and efforts will need to be taken to work through project designs and permitting to ensure that the project is competitive. Also, larger projects may require long-term staffing levels and costs which need to be sustainable over time. These projects will likely need to

be postponed until the City's funding levels are more sustainable. Some community assets, such as the Santa Cruz Wharf and Civic Auditorium, will require creative funding strategies which could involve multiple sources and project phasing over time.

RESPONSIVE TO COMMUNITY NEEDS

As the community continues to evolve and parks system improvements are made, it will be necessary to continually update the plan to remain current. The Parks Master Plan 2030 will need to be updated periodically in five-year intervals. These updates will be less comprehensive but should provide a meaningful opportunity to receive feedback from the community and reassess the condition of the parks. A larger, more comprehensive update should occur concurrently or shortly after the next General Plan update.

The long-term funding strategy will need to be updated to reflect changes in the conditions to ensure that priorities can be realigned and could include:

- Review of existing City financing and facility development
- Future demand and capital improvement costs
- Maintenance and operations costs
- Changes or adaptations to the City's approach to cost mitigation
- Funding alternatives
- Financing strategies
- Maintenance contracts and agreements
- Update Park-in – lieu Fee Schedule

B. SUMMARY & CONCLUSIONS

This document should serve as a planning tool for decision-making regarding recreation in the City of Santa Cruz. Timely updates to the document and the process are necessary to reflect the community's changing needs and desires.

ABOUT US

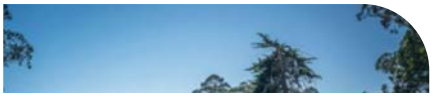
Current Projects

County Parks is constantly working to improve our parks, coastal access points, trails and facilities to maximize community benefit, recreational opportunity, and stewardship of natural resources! Parks projects include grant applications, master plans, environmental review and design and construction of capital projects including new playgrounds, restrooms, trails and other park amenities!

Due to COVID-19, information on this page is subject to change.
Please check for updates.

COVID-19 UPDATES

Projects Underway at County Parks



Moran Lake County Park ↗

County Parks is working with a consultant team to prepare a restoration and public access plan for Moran Lake County Park. The project will evaluate and continue with previous draft park improvement plans prepared by the Redevelopment Agency in 2010 and include community outreach and development and assessment of restoration goals as well as public access improvements at the park. The planning project is funded in part by the State Coastal Conservancy, including funding from Prop 1, and is expected to be completed by the end of 2023!

Community Meetings were completed at the park in summer 2021:
Thursday, August 19, 2021 3PM – 6PM
Sunday, August 22, 2021 11AM – 2PM

Comments received at community meetings and through the online survey were summarized and shared with the Parks and Recreation Commission on October 4, 2021. To attend this meeting via video conference, or to see the agenda packet containing the written summary before or after the meeting, use this link.

Join the project email list for updates. Previous Park Plans & Studies:

- 2010 Draft Moran Lake County Park Site Plan for Moran PDF
- 2010 Moran Lake Monarch Butterfly Habitat Management Plan PDF
- 2005 Moran Lake Water Quality Study & Conceptual Restoration Plan PDF

Chanticleer Avenue County Park ↗

Chanticleer Avenue County Park is a 4.5-acre neighborhood park in the Live Oak community. Construction of phase 1 is complete. The park opened on January 18th, 2020. During fall 2020 Parks staff held a series of community meetings to get input on phase 2 park improvements at Chanticleer Park to include in the Prop 68 Statewide Park Program application. Based on the input received at these meetings, the Draft Phase 2 Site Plan has been developed.

- Chanticleer County Park Draft Phase 2 Site Plan PDF

Hidden Beach County Park ↗

Hidden Beach County Park has two upcoming improvements: playground replacement and the installation of a permanent restroom. The County Parks Department is working with consulting firm SSA Landscape Architects to design a permanent restroom facility at the park. The restroom will be accessible to people with mobility impairments and provide flush toilets and running water for handwashing. Preliminary planning has the facility sited between the existing playground and the service road.

Live Oak Library Annex at Simpkins Swim Center

The Live Oak Library Annex vision is to provide multi-use learning spaces accessible to all. Specific goals include creating a learning environment which serves all ages and provides gathering spaces which encourage intergenerational activities, provide learning facilities not available at the Existing Live Oak Library branch that are free to the public, locate the facility in a central location accessible to the Live Oak Community, design the facility to function in partnership with other community organizations maximizing the opportunities for collaborative and engaging programming as well as providing the most efficient use of resources and personnel.

- Community Meeting Presentation (English) PDF
- Community Meeting Presentation (Spanish) PDF

Completed Projects ↗

View some of our recently completed projects!

Contact Us

Phone: (831) 454-7901

Monday – Friday 9:00 AM to 4:00 PM, except holidays

Email: parksinfo@scparks.com

Our physical office is open, but staff availability is limited as most staff members are working remotely.

979 17th Avenue, Santa Cruz, CA 95062

Monday-Friday, 9:00 a.m. - 4:00 p.m.

(831) 454-7901

parksinfo@scparks.com

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Pogonip

ADDRESS:
501 and 410 Golf Club Drive

HOURS OF OPERATION:
Summer (April through October) Sunrise to 7pm
Winter (November through March) Sunrise to 4pm

TRAILS: The Pogonip trail system totals approximately 11.5 miles; 3 of those mile are multi-use open to hikers, bicyclists and equestrians. In the northernmost portion of Pogonip, a multi-use trail (approximately one mile in length) is open hikers, bicyclists and equestrians. This multi-use trail provides a connection between Henry Cowell Redwoods State Park, Pogonip, and the upper UCSC campus. Along the eastern boundary of Pogonip is the Emma McCrary Trail open to hikers, bicyclists, dogs on leash and equestrians. This trail can be accesses from Golf Club Dr or at the southern terminus of the UCon Trail. Bicycles and horses are prohibited on all other trails. Bicyclists must ride responsibly and at a safe speed. Please obey all trail signs. Spring trail is not open to mountain biking.

Here is your **Trail Map!**

IMPORTANT UPDATE:

Homeless Garden Relocation:

The Parks and Recreation Department is at the initiation stage of a Pogonip Master Plan Amendment process to allow for the Homeless Garden Project's 9.5 acre Pogonip Farm and Garden to be relocated to the Upper Main Meadow, Pogonip Open Space (near the historic Pogonip Clubhouse). There will be numerous opportunities for community members to provide input during the process, including community meetings, environmental review, and public hearings. Stay up-to-date on the project here.

DOG REGULATIONS: On trails where dogs are permitted, dogs must be on a leash at all times. Please be courteous and clean up after your pet. Dogs are prohibited on trails in sensitive habitat areas. Refer to the Pogonip trail map for more information.

PROHIBITED ACTIVITIES: Smoking, fires, camping, alcohol, littering, wood gathering, collection of plants or animals, archery/hunting.

PARKING/ENTRANCES: No on-site parking

- **Golf Club Drive On**- street parking on Golf Club Drive between the trestle & HWY 9
  (Hiking only/Dogs on leash)
- **Harvey West Park** - Trailhead near Friendship Garden
  (Hiking only/No dogs)
- **Spring Street** - Limited parking on residential street
  (Hiking on/Dogs on leash)
- **UCSC Upper Campus** - Fuel Break Road - Multi-Use Trail Entrance
  (Hiking, Bicycles and Horses permitted/No Dogs)
- **Henry Cowell State Park** - Rincon Connector Trail - Multi-Use Trail Entrance (Hiking, Bicycles and Horses permitted/No Dogs)

Highlights

A scenic 640-acre expanse of open meadows, woodlands and creeks., A multi-use trail (approximately 1 mile) is open to bicyclists and equestrians in the northernmost portion of Pogonip. This multi-use trail provides a connection between Henry Cowell Redwoods State Park, Pogonip, and UC Santa Cruz campus lands. Bicycles and horses are prohibited on all other trails in Pogonip.

Pogonip has several walk-in entrances. There is no on-site parking. Visitors may park on Golf Club Drive just to the west of Highway 9 and walk to the main entrance gate. There is also parking in the vicinity of the Harvey West Park entrance to Pogonip. Parking is limited in the residential neighborhood adjacent to the Spring Street entrance.

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Cycles of Change

Pogonip is an inspiring retreat of natural beauty. Its habitat is of special value given its proximity to the urban center of Santa Cruz. Over the past 150 years much of the landscape has been altered by human influence; it is far from being a pristine remnant of untouched wilderness. But as a testament to the resilience of nature perhaps, Pogonip survives as an enchanting refuge. Today, the park is protected as one of the City's Greenbelt properties; purchased in 1988 with funding from the CALPAW State Bond Act.

Back to top

A Habitat for Wildlife

The predominant woodlands at Pogonip are mixed evergreen forest (oak, madrone, bay and conifers) and upland redwood forest (redwood and Douglas fir). Stands of coast live oak also occur in smaller areas within the meadows. California's northernmost stand of Central Coast Cottonwood/Sycamore riparian woodland occurs along the San Lorenzo River in the area known as Sycamore Grove.

A prominent feature within Pogonip, the Main Meadow is dominated by non-native grassland species though remnants of coastal terrace prairie still exist. Prairie habitat also occurs in smaller expanses in the northern reaches of Pogonip. Most of the rare and unique plant and wildlife species found at Pogonip are associated with coastal terrace prairie, including Santa Cruz clover (Trifolium buckwestorium), San Francisco popcorn flower (Plagiobothrys diffusus), and the rare, brilliant green-colored Ohlone tiger beetle.

Though the days of bear and antelope are gone, wildlife still exists in abundance at Pogonip. In the grasslands and prairies, there are black-tailed jack rabbits, California ground squirrels, Botta's pocket gophers, California voles and black-tailed deer. The smaller mammals provide prey for raptors, coyote, fox and bobcat. Both forested areas and grasslands are used by many bat species. Mountains lions have also been reported in Pogonip, particularly in the northern areas and upper ridges.

Numerous birds, both resident and migrating species, are found at Pogonip. A few of those observed include owls, western bluebird, American robin, western meadowlark, chestnut-backed chickadee, acorn woodpeckers, sparrows and the raptors; white-tailed kite and red-tail hawk.

Amphibians and reptiles are also numerous. The alligator lizard, western fence lizard and garter snake are commonly found in the grasslands while the redwood forests provide habitat for the Pacific giant salamander, California newt and the popular UCSC mascot, the banana slug.

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A Glimpse into the Past

In addition to natural history, Pogonip has a human history. Our Bay and Coast region was home to Ohlone triblets for 5,000 years before the arrival of Europeans. Few survived beyond the era of the founding of the Santa Cruz Mission in 1791 and its control by Mexico in the early 1800s. Their dramatic decline is believed to have been hastened by several epidemics and persecution from immigrants. It is likely Native Americans relied upon the resources found within Pogonip but no prehistoric sites have been identified.

Although the park is sometimes perceived by visitors as undisturbed, logging production in the mid-1800s resulted in the massive loss of old growth redwoods. Only three virgin redwoods remain in Pogonip today.

In addition to lumber, redwood logs were used to fuel kilns in the conversion of limestone to lime, an ingredient in mortar and plaster. Segments of Rincon Trail and Spring Trail are believed to have been originally constructed as part of the road connecting the timber areas, limestone quarries, and limekilns. The limestone kilns are still intact and the roadbed is visible at several locations.

Pogonip was once part of the extensive Cowell Ranch, originally purchased for its lime and timber resources. Portions of the ranch were converted to livestock operations as the lumber was depleted and demand for lime declined by the turn of the century. In 1961, the western portion of the ranch was sold to the University of California and the remaining acreage eventually became known as Pogonip.

Time brought change to Pogonip. After the construction of the landmark clubhouse and the greens, the Casa del Rey Club and Golf Links was opened in 1912. When competition from other courses led to the closure of the course by the 1930s, the area was then transformed into popular polo fields. The Pogonip Social and Polo Club soon became internationally known, visited by movie stars and world caliber polo players. The Polo Club was especially noteworthy due to Dorothy Deming Wheeler and the winning women's polo team. Dorothy Wheeler ensured the polo club was not restricted to men, and Santa Cruz became one of the few areas where coed games were accepted.

World War II brought an end to polo at Pogonip and for a short time the facilities served as a rehabilitation site for service men. The Pogonip Club reopened in 1948 as a private social organization. Today, the clubhouse is structurally unsafe and closed to the public.

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Additional Info

http://hilltromper.com/article/pogonip

List of All County Parks

-click to get directions-

Abbott Square - 110 Cooper St, Santa Cruz

Aldridge Lane Park - 20 Aldridge Lane, Corralitos

Anna Jean Cummings Park - 461 Old San Jose Rd, Soquel

Aptos Village Park - 100 Aptos Creek Road, Aptos

Ben Lomond Park - 9525 Mill Street, Ben Lomond

Bert Scott Estate - 301 Eagle Ridge, Watsonville

Brommer Street Park - 1451 30th Avenue, Live Oak

Chanticleer Park - 1975 Chanticleer Ave, Live Oak

Coffee Lane Park - End of Coffee Lane, Live Oak

Davenport Landing - Highway 1, Davenport

Dolphin/Sumner Beach - Dolphin/Sumner Intersection, Aptos

The Farm Park - Northwest corner of Soquel Drive and Cunnison Lane

Felt Street Park- 1904 Felt Street, Live Oak

Felton Covered Bridge - Graham Hill Rd at Mount Hermon Rd, Felton

Floral Park - 656 38th Avenue, Live Oak

Freedom Lake - located along Freedom Blvd in Freedom, CA

Greyhound Rock - Highway 1, Davenport

Heart of Soquel - 4740 Soquel Drive behind Soquel Village Post Office

Hestwood Park - 1230 Harper Street, Santa Cruz

Hidden Beach Park - End of Cliff Drive, Aptos

Highlands Park - 8500 Highway 9 Ben Lomond, CA

Jose Avenue Park - 1435 Jose Ave, Live Oak

Mesa Village Park - 790 Green Valley Road, Watsonville

Michael Gray Memorial Field - 3650 Graham Hill Road, Felton

Miller Property - located along Kings Creek Road in Boulder Creek

Moran Lake Park - East Cliff Drive by 26th Avenue, Live Oak

Old Jail/Octagon - 118 Cooper St, Santa Cruz

Pace Family Wilderness - located along Newell Creek Road in Boulder Creek

Pajaro Dunes - Shell Road, Watsonville

Pinto Lake Park - 757 Green Valley Road, Watsonville

Place Del Mer - East of Hillview Way in Watsonville

Pleasure Point Park - Pleasure Point Dr. and East Cliff Dr, Capitola

Polo Grounds - 2255 Huntington Avenue, Aptos

Quail Hollow Ranch - 800 Quail Hollow Road, Felton

Richard Vessey - Victory Ln./Maplethorpe, Soquel

Santa Cruz Gardens - Katherine Lane, Santa Cruz

Scott Creek Beach - Highway 1, Davenport

Scott Park - 3101 Freedom Blvd, Watsonville

Seacliff Village Park (McGregor) - 120 Canterbury Dr., Aptos

Seascape Park - End of Sumner Ave, Aptos

Simpkins Family Swim Center - 979 17th Avenue, Santa Cruz

Soquel Lions - Main/E. Walnut, Soquel

Sunny Cove Beach - End of Johans Beach Drive and Sunny Cove Drive Veteran's Building

Twin Lakes Park - 520 7th Avenue, Live Oak

Valencia Hall - 2555 Valencia Road, Aptos

Wilder Hall - 9527 Mill St, Ben Lomond

Willowbrook Park - 2950 Willowbrook Lane, Soquel

Winkle Farm - 3201 Winkle Ave.

Veteran's Memorial Building - 846 Front Street, Santa Cruz

Santa Cruz County Department of Parks, Open Space and Cultural Services
979 17th Avenue, Santa Cruz, CA 95062
General Information (Monday-Friday, 9:00 a.m. - 4:00 p.m.)
Phone: (831) 454-7901 • PRCweb@santacruzcounty.us

SHARE

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Santa Cruz County Parks

	Ballfields	Basketball	Beach Access	Comm. Room	Dog Park	Hiking	Horseshoe Pit	Parking	Picnicking	Play Element	Restrooms	Skate Park	Soccer	Swimming	Tennis	Volleyball	Public Art
Aldridge Lane		*					*	*	*	*	*				*		
A.J. Cummings	*					*		*	*	*	*		*				*
Aptos				*				*	*		*						*
Ben Lomond		*							*	*	*						
Brommer Street	*	*						*	*	*	*				*		*
Coffee Lane		*						*	*	*							
Felton Covered Bridge								*	*	*	*					*	*
Floral									*	*							*
Freedom Lake																	
Hestwood									*	*	*						*
Hidden Beach			*					*	*	*	*						
Highlands	*			*		*		*	*	*	*	*	*		*	*	
Jose Ave.		*					*	*	*	*	*	*				*	*
Mesa Village		*							*	*	*						
Michael Grey	*							*	*		*						
Moran Lake			*			*		*	*		*						
Pinto Lake	*				*	*		*	*	*	*		*				
Polo Grounds	*				*			*	*		*		*				*
Quail Hollow Ranch				*		*		*	*		*						
Richard Vessey									*	*	*						
Santa Cruz Gardens										*							
Scott								*	*	*	*					*	
Seascape			*					*	*	*	*						*
Simpkins Swim Center				*				*			*			*			*
Soquel Lions									*	*	*						
Twin Lakes		*							*	*	*				*		*
Valencia Hall				*													
Willowbrook		*							*	*	*				*		*
Winkle Farm									*	*							

Revised October 2010

SANTA CRUZ COUNTY DOG PARKS

Polo Grounds County Park,
2255 Huntington Dr., Aptos

Pinto Lake County Park,
757 Green Valley Rd., Watsonville

Dog parks can be a great place for you and your dog to enjoy, but there are rules to follow and etiquette to respect.

Use the poop bag dispensers and pick up after your pet.

Obey the **Leash Law** until you have brought your dog inside the enclosed dog park area.

Dogs must be at least 4 months old.

Dogs must be vaccinated, and you should carry your dog's rabies certificate with you.

Please exercise caution when bringing small children inside the dog park.

Don't pick up another dog without the owner's consent.

Don't bring an aggressive or unsocialized dog into the dog park area.

Please, no dogs in heat.

COUNTY OF SANTA CRUZ
Parks, Open Space & Cultural Services
979 17th Avenue
Santa Cruz, CA 95062

COUNTY OF SANTA CRUZ DEPARTMENT OF
PARKS, OPEN SPACE AND CULTURAL SERVICES

A DOG OWNER'S GUIDE

to enjoying the parks of Santa Cruz County

Santa Cruz County
Department of Parks, Open Space and Cultural Services

979 17th Avenue
Santa Cruz, CA 95062
831-454-7901
www.scparks.com

WHY SHOULD YOU BOTHER TO LEASH YOUR DOG?

IT'S THE LAW!

The fines for an unleashed dog can be over $240, depending on the charges that may be included for violation of one or more of the following:

- Dog is not on a leash;
- Dog harasses, kills or maims deer, birds, or other wildlife protected by law;
- Requirements for licensing, vaccination, and display of tags not followed;
- Dog is not spayed or neutered;
- Dog waste not properly disposed of.

LEASHING YOUR DOG CAN HELP PREVENT A VARIETY OF ISSUES!

- An unleashed dog may dart into traffic causing an accident.

Fact: Unleashed dogs cause over 1,500 car accidents and fatalities per year. Drivers trying to avoid hitting an unleashed dog end up paying the price simply because the dog was not responsibly handled.

- Dogs trespass from the park onto private property.
- Protects you from costly medical bills, should your dog harm a child or jump up on a frail or elderly person, causing injury.
- Fighting with other dogs; a loose dog can be difficult to restrain.
- Court bills: lawsuits can arise from a dog biting someone and it may be required that the dog be euthanized.

- Protects the environment from dogs harassing, killing or maiming wildlife.
- A dog may be lost or stolen.
- It's the right thing to do! While an owner likes their dog, others may not.

Leashed dogs are allowed in all county parks and beaches, ***except*** *for Quail Hollow Ranch and Scott Creek Beach.* These areas have sensitive habitats and dogs are prohibited.

To prevent children from coming into contact with feces and urine, ***dogs are not allowed in playground areas or athletic fields.***

For information about the many animal services provided in Santa Cruz County please call the Santa Cruz County Animal Services Authority at (831) 454-7303.

THE 3 SIMPLE RULES = IT'S THE LAW!

1 - License Your Dog

License your dog for your dog's protection. If an Animal Control Officer finds a licensed dog, they have a commitment to reunite the owner with the dog. A license tells an officer that a dog has a home and is not a stray.

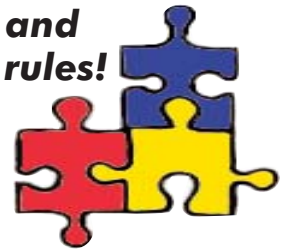
2 - Leash Your Dog

Leashing your dog protects everyone, and can help prevent many problems and costly bills. Dogs must be leashed in all County-owned parks and beaches, unless the dog is in a specified, fenced dog area.

3 - Leave No Unpleasant Waste

Always carry a dog bag; dog waste is your responsibility. When you fail to clean up after your dog, it affects the experience of other park visitors and their pets. The waste left may have parasites that can spread disease to other dogs and to people. We all know what an unpleasant experience it is to step in dog waste! Left on the ground, dog waste can be transported by rain and washed into storm drains. Remember, storm drains are not connected to any type of treatment plant and flow directly into our streams, lakes, and bays.

Put the pieces together and follow the rules!



SANTA CRUZ COUNTY PARKS STRATEGIC PLAN

FINAL
AUGUST 6TH, 2018

FORWARD

County of Santa Cruz

DEPARTMENT OF PARKS, OPEN SPACE & CULTURAL SERVICES

979 17TH AVENUE, SANTA CRUZ, CA 95062

(831) 454-7901 FAX: (831) 454-7940 TDD: (831) 454-7978

JEFF GAFFNEY
DIRECTOR

Dear Friends and Partners,

The Santa Cruz County Parks Department is pleased to present to you our first Strategic Plan. This document represents a year-long process of assessment, inquiry, and outreach to our community, partner organizations, public officials, staff, and supporters. We are proud of the comprehensive and collaborative nature of the document as well as the process which created it.

Our goal was twofold: first, provide a ten-year roadmap for the department that will assist us in adapting and growing our support for a healthy, connected, and culturally vibrant Santa Cruz County. Second, to create a resource for understanding of what we do and how we serve the community, as well as guidance for partnering and collaboration.

The premise of this document is that our system of parks, open spaces, beaches, and recreation and cultural services represent one of our county's most valuable investments. The department's primary role is to ensure that this investment is well-managed, relevant and accessible to all, regardless of age, cultural background, physical ability, or income. We also must see that it is preserved and enhanced for generations to come.

Thank you for your contribution and dedication to our amazing park system and the public value we provide. We hope you will find this plan useful; it is the beginning of a relationship and an open conversation about community priorities.

Sincerely,

Jeff Gaffney
Parks Director

The Mission of the Santa Cruz County Parks, Open Space and Cultural Services is to provide safe, well designed and maintained parks and a wide variety of recreational and cultural opportunities for our diverse community

ACKNOWLEDGEMENTS

This plan would not have been possible without the assistance and participation of a great number of individuals. We would like to thank all the members of the public who participated in the public process that created this Strategic Plan, and to all the staff and volunteers who contributed.

Working Group Members:
- Dena Loijos
- Mariah Roberts
- Jim Rapoza
- Tess Fitzgerald
- Judy Stabile
- Terry Corwin
- Melodye Sereno
- Brad Blachly
- Isabelle Kornberg
- Micaela Lopez

Parks and Recreation Commission Members:
- Mariah Roberts
- Kate Minott
- Alexandra Sibille
- Steven Bennett
- Jim Rapoza

Strategic Plan Project Team:
- Jeff Gaffney, Parks Director
- Kim Namba, Administrative Services Manager
- Will Fourt, Park Planner
- Jessica Wolf, Program Coordinator

With Consultant:
- Meetings that Matter

Strategic Plan Pyramid

VISION

A healthy and vibrant county where everyone is able to be active, explore, learn, play and connect, and where our diverse natural and cultural resources are celebrated and protected for generations to come.

VALUES

Well-Being • Stewardship • Equity

MISSION

Provide safe, well-designed and maintained parks and a wide variety of recreational and cultural opportunities for our diverse community.

GUIDING PRINCIPLES OF SERVICE

Service-Oriented • Fiscally-Responsible • Collaborative • Adaptive • Results-Focused

GOALS

1 *GREAT FACILITIES*
Maintain and Enhance the Quality and Accessibility of Parks Facilities for Outstanding Visitor Experience

2 *STRONG ORGANIZATION*
Ensure Organizational Effectiveness and Fiscal Stability for Long-Term Community Benefit

3 *AWESOME PROGRAMS*
Provide Recreational and Cultural Programs to Strengthen and Engage Local Communities

4 *EFFECTIVE STEWARDSHIP*
Steward and Protect Open Spaces and Natural, Cultural and Historical Resources for the Enjoyment of Current and Future Generations

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PART I:
THE COUNTY PARKS STRATEGIC PLAN

CHAPTER 1: INTRODUCTION

This Strategic Plan represents the first comprehensive and collaborative planning effort between the County Parks Department and the local community in Santa Cruz County. The Strategic Plan seeks to articulate the vision and strategic priorities for the future of the County Parks system in a ten-year timeframe. The vision and priorities established through this process reflect the strong value that Santa Cruz County places on parks, coastal access, open space, programs and the events and activities that bring us together as a community.

The Strategic Plan addresses the County's existing park system, including its strengths and challenges, and identifies the necessary areas of improvement to remain responsive to the changing needs of our community. Ultimately, the plan will serve as the basis for future department work plans (operational plans) and as a roadmap for the department.

OUR VISION FOR THE FUTURE:

A healthy and vibrant county where everyone is able to be active, explore, learn, play and connect, and where our diverse natural and cultural resources are celebrated and protected for generations to come.

WHY A STRATEGIC PLAN?

The Santa Cruz County Department of Parks, Open Space and Cultural Services (County Parks Department or County Parks) has grown in both the size of its holdings and its importance in the lives of county residents since its inception in 1979. Over the course of the last 38 years, the department has undergone many changes, while the County Parks system has grown into a large network of parks, open spaces, facilities, trails and coastal access points throughout the unincorporated portions of the county.

Some highlights of the department's history:

- **1979 - 2002**: Established in 1979, the County Parks system grew for two decades in the number of parks, programs and employees. By 2002 there were 55 County Parks facilities, parks and coastal access points.
- **2002 - 2011**: The number of full time permanent budgeted department staff positions declined from 68 funded full time or equivalent staff positions in 2002/03 to only 35 in 2011/12, along with a decline in program offerings. At the same time, the number of park facilities steadily increased.
- **2011 - 2014**: In the wake of the economic downturn, the Parks Department was temporarily dissolved into the County Department of Public Works from 2011 to 2014.

- **2014 - 2018**: Some limited additional funding for County Parks was established through the passing of Measure F in 2014. The County Parks Department was re-established as an independent department in 2014 and a new director was hired in 2015.

The Parks Department provides both local and regional parks and programs. Santa Cruz County is unique in having such a large portion of the population living outside of incorporated cities (about 130,000 people, or 49 percent according to the 2010 Census). The County Parks Department provides typical county regional parks and open spaces serving the entire county population. The Department also has a role similar to a city parks department in providing local neighborhood and community parks and event facilities in these unincorporated areas, despite having a smaller relative tax apportionment and ability to leverage funding than other counties and cities (see Chapter 7 for more explanation).

Working within the current framework of the County's General Plan, the County Parks Strategic Plan represents the current vision of the community, and identifies opportunities for leveraging funding and resources to move the department towards this vision. The Strategic Plan does not create or change any County policy, but provides a framework to assist us in working more effectively within existing policies.

HOW THE STRATEGIC PLAN WILL BE USED

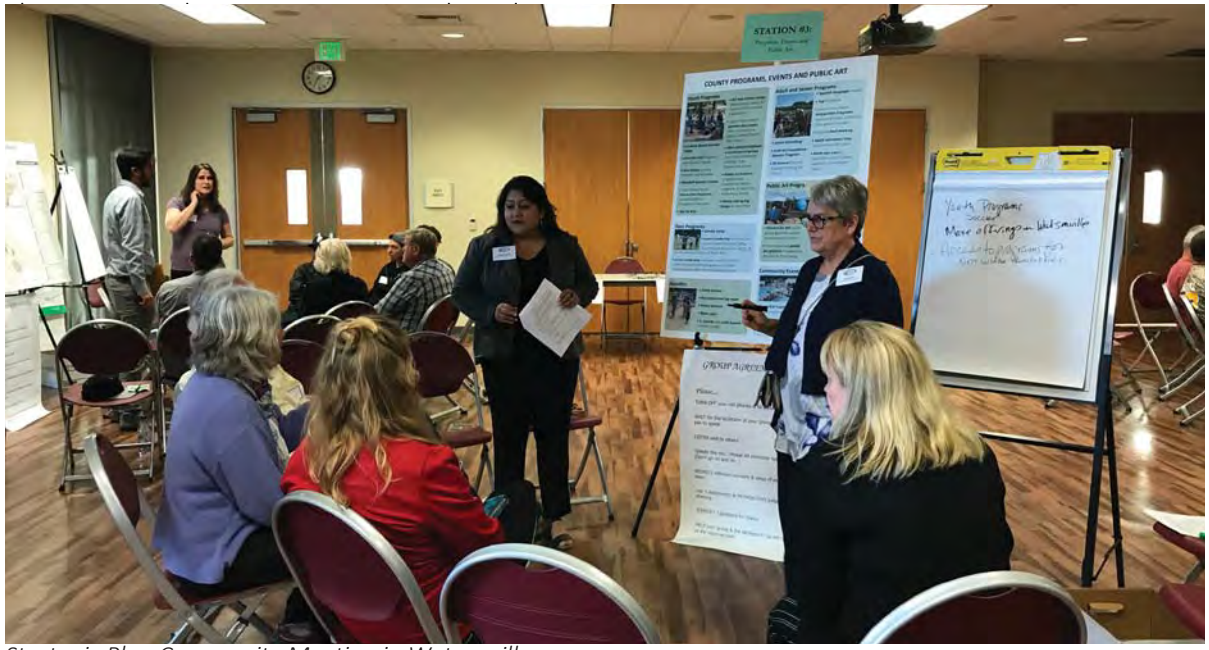
This document consolidates background information, community feedback, key findings and other information that was used to develop the vision, values, goals, objectives and strategies contained in this Strategic Plan. County Parks has gained a wealth of information about the community and the environment through this process, and this summary will be used by staff, community stakeholders, the County Administrative Office, and the Board of Supervisors as the County moves forward to carry out the vision outlined in this Strategic Plan. Much of this information will be referenced or serve as a jumping-off point for strategic decision-making. Additionally, this Strategic Plan will serve as the basis for future operational plans for the department, which will contain performance measures, more time-specific priorities, and detailed actions to implement the Strategic Plan and achieve our goals.

Simpkins Family Swim Center in Live Oak

RELATIONSHIP TO THE COUNTYWIDE STRATEGIC PLAN 2018-2024

The County Administrative Office developed its first-ever countywide strategic plan in 2018. This plan establishes a common vision and set of goals that will be implemented by all the County departments and will contain broad, inter-departmental goals. The goals and objectives in the County Parks Strategic Plan will work together and align with the countywide goals, while being more specific to the provision of parks and recreation in the county.

The Parks Department is not the only County department to undergo its own strategic planning process. Under the direction of our County's new Chief Administrative Officer, all County departments will be asked to develop plans and to align those plans with the overarching County plan.



Strategic Plan Community Meeting in Watsonville

STRATEGIC PLAN VOCABULARY

Throughout the Strategic Plan, the following terms will be used frequently and have a specific meaning within the context of this Strategic Plan.

Vision: A brief statement articulating the desired future state, describing ***why*** the department does the work that it does.

Values: Core ***motivators*** reflecting community ideals that drive the work of the Parks Department and relate directly to the vision.

Mission: A brief statement describing ***what*** the department does.

Goals: Broad statements of ***how*** we pursue our vision.

Objectives: Specific ***ways*** we plan to achieve our goals and impact our community.

Strategies: The ***approach*** we plan to take to achieve our objectives.

CHAPTER 2: VISION, MISSION AND VALUES

VISION

The vision for the future of Santa Cruz County Parks describes the desired end state of the work that we do and articulates the biggest 'why' for the County Parks Department's existence. Our vision statement was created with extensive input from the staff, the community, and partners during the Strategic Plan process.

MISSION

The County Parks mission states what the department does to serve the community. The mission statement was adopted for the department prior to this Strategic Plan process, and represents the department's most essential purpose.

OUR VISION:

A healthy and vibrant county where everyone is able to be active, explore, learn, play and connect, and where our diverse natural and cultural resources are celebrated and protected for generations to come.

OUR MISSION:

The Mission of the Santa Cruz County Parks, Open Space and Cultural Services is to provide safe, well designed and maintained parks and a wide variety of recreational and cultural opportunities for our diverse community.

VALUES

The values listed in this section represent the core motivators that drive the work of the Parks Department to serve the community, as identified through the strategic planning process. The values directly support the new Parks Department vision and have been used to identify and define department priorities and our goals and objectives in the Strategic Plan.

The three core values are ***Well-Being, Stewardship and Equity.***

WELL-BEING

Creating a happier and healthier Santa Cruz County and improving quality of life by promoting physical activity, safe and welcoming public spaces, positive community interactions, and relief from everyday stress.

STEWARDSHIP

Sustaining natural systems and conserving resources throughout the parks system for future generations, including education and learning opportunities, and chances for people to appreciate and connect with the natural world.

EQUITY

Serving communities throughout the county with a focus on those most in need, to ensure that parks and programming are inclusive, welcoming and accessible to all.

Aptos Village County Park

Parks Department Core Values

GUIDING PRINCIPLES OF SERVICE

The following principles describe the strong value the parks department places on ***service.*** These principles were identified by staff and the community during the strategic planning process, and reflect how the department operates to increase the values of well-being, stewardship, and equity.

Service-Oriented: We work as a team to provide a consistent high level of service to our community.

Fiscally-Responsible: We allocate and use resources responsibly and pursue sustainable funding that meets the needs of the system of parks and parks services.

Collaborative: The department works together with other agencies, organizations, businesses, volunteers, community members and staff to provide the highest possible level of service and to create new opportunities.

Adaptive: The department remains nimble and creative as it responds and adapts its parks and programs to the changing needs of the community.

Results-focused: We establish community driven goals, measure our performance, and communicate with the public our progress in meeting long-range goals in support of community well-being, stewardship and equity.

CHAPTER 3: GOALS, OBJECTIVES AND STRATEGIES

For the purposes of articulating the vision of the Parks Department, specific means for implementing the plan are described through Strategic Plan goals, objectives and strategies. These means are intended to describe the direction and priorities for the department for the next 10 years. These statements respond to the key issues and themes that emerged during the strategic planning outreach process.

Definitions for goals, objectives and strategies are described in the text box to the right. A summary table of goals and objectives is shown in Table 1. Strategic goals are not ranked and are numbered only for reference. Note that these strategies do not include specific measurable actions. Actions to implement the Strategic Plan will be developed in future operational plans for the department (see Chapter 4).

Objectives and strategies are organized into categories of "core" and "stretch." These categories illustrate what the department can pursue with existing staffing and resources, and what will require additional resources, according to definitions on the right.

All the goals, objectives, and strategies were developed with extensive input from the community and staff as part of the strategic planning process.

Goals:
Broad statements of how we pursue our vision

Objectives:
Specific ways we plan to achieve our goals and impact our community

Core Objectives:
Objectives that: 1) are essential to the Department's existence and function, 2) may be pursued with existing staffing and resources, and 3) have been core areas of focus for the department in the past.

Stretch Objectives:
Objectives that: 1) have been identified as important by the community, 2) will require us to leverage new resources and to increase department capacity, and 3) expand the services provided by the Department

Strategies:
The approach we plan to take to achieve our objectives

Miller Property County Park in Boulder Creek

COUNTY PARKS STRATEGIC GOALS AND OBJECTIVES

Goal 1: Great Facilities

MAINTAIN AND ENHANCE THE QUALITY AND ACCESSIBILITY OF PARKS FACILITIES FOR OUTSTANDING VISITOR EXPERIENCE

CORE OBJECTIVES:

1.1 Maintain and update parks facilities, and the accessibility of parks facilities, to a consistent standard

1.2 Ensure safety and cleanliness of parks facilities

STRETCH OBJECTIVES:

1.3 Increase accessibility of parks facilities to people of all abilities, ages, backgrounds and financial resources

1.4 Create and implement a plan to address deferred maintenance throughout the parks system

1.5 Upgrade parks in alignment with parks master plans and add additional parks facilities in underserved areas

Goal 2: Strong Organization

ENSURE ORGANIZATIONAL EFFECTIVENESS AND FISCAL STABILITY FOR LONG-TERM COMMUNITY BENEFIT

CORE OBJECTIVES:

2.1 Ensure department efficiency and effectiveness

2.2 Invest in staff development and promote innovation and excellence in service

2.3 Develop sources of sustained funding for operations and enhanced services

STRETCH OBJECTIVES:

2.4 Institute improved systems for departmental management and operations planning

2.5 Lead and partner with other departments, agencies and organizations to better serve the community

Goal 3: Awesome Programs

PROVIDE RECREATIONAL AND CULTURAL PROGRAMS TO STRENGTHEN AND ENGAGE LOCAL COMMUNITIES

CORE OBJECTIVES:

3.1 Provide recreational programs and events to meet community needs

3.2 Cultivate the arts and strengthen the culture of the county through public art programs and events

3.3 Conduct community outreach and offer regular opportunities for diverse groups to engage with and learn about their county parks department

STRETCH OBJECTIVES:

3.4 Provide additional recreational programs and events to address areas of unmet need

3.5 Enhance our support of local families and youth by expanding after school and summer offerings

3.6: Increase the department's understanding of parks customers through increased outreach, data collection and research

Goal 4: Effective Stewardship

STEWARD AND PROTECT OPEN SPACES AND NATURAL, CULTURAL AND HISTORICAL RESOURCES FOR THE ENJOYMENT OF CURRENT AND FUTURE GENERATIONS

CORE OBJECTIVES:

4.1 Partner with other agencies, organizations, and land owners in an integrated regional approach to resource management

4.2 Protect cultural and historical resources throughout the parks system

4.3 Provide interpretive programs and opportunities to increase awareness and appreciation of natural, cultural and historical resources

4.4 Provide opportunities for volunteers in parks, facilities and programs

STRETCH OBJECTIVES:

4.5 Establish a natural resources and open space management program in the parks department to maximize environmental benefits throughout the parks system

4.6 Increase interpretive programs and opportunities to increase awareness and appreciation of all natural, cultural and historical resources

4.7 Increase volunteer opportunities in parks, facilities and programs

Table 1: Summary of Goals and Objectives

GOAL 1: GREAT FACILITIES

MAINTAIN AND ENHANCE THE QUALITY AND ACCESSIBILITY OF PARKS FACILITIES FOR OUTSTANDING VISITOR EXPERIENCE

CORE OBJECTIVES

OBJECTIVE 1.1: MAINTAIN AND UPDATE PARKS FACILITIES, AND THE ACCESSIBILITY OF PARKS FACILITIES, TO A CONSISTENT STANDARD

STRATEGIES:

a. Continue to establish consistent park maintenance standards and staff levels throughout the parks system

b. Determine and communicate staffing needs based on department goals and the number of properties, facilities and programs, and pursue appropriate staff levels

c. Assess the anticipated operational costs for potential new parks projects and budget for projected staffing levels and maintenance costs

d. Regularly inventory and prioritize system-wide needs for deferred maintenance projects

e. Continue to increase accessibility of parks to all people as parks are upgraded

OBJECTIVE 1.2: ENSURE SAFETY AND CLEANLINESS OF PARKS FACILITIES

STRATEGIES:

a. Pursue resources to increase professional staff presence in parks

b. Increase volunteer presence in parks under direction of staff

c. Engage community and volunteers in supporting safe and clean parks

d. Partner with law enforcement to enhance security in parks and facilities

e. Improve and expand system for tracking and responding to citizen reports of maintenance and safety issues

f. Increase staff input in identifying and prioritizing maintenance needs

STRETCH OBJECTIVES

OBJECTIVE 1.3: INCREASE THE ACCESSIBILITY OF PARKS FACILITIES TO PEOPLE OF ALL ABILITIES, AGES, BACKGROUNDS AND FINANCIAL RESOURCES

STRATEGIES:

a. Conduct physical accessibility assessments of existing parks facilities, identifying and prioritizing needed improvements

b. Increase relevance of parks to youth and aging populations and to families with young children, and ensure that all demographics are served by parks

OBJECTIVE 1.4: CREATE AND IMPLEMENT A PLAN TO ADDRESS DEFERRED MAINTENANCE THROUGHOUT THE PARKS SYSTEM

STRATEGIES:

a. Identify needs and determine priority projects

b. Develop budget and timeframes for deferred maintenance projects, and identify potential funding sources

c. Secure funding for deferred maintenance

d. Implement the deferred maintenance plan in stages to maintain investments in parks

e. Anticipate and schedule upgrades as projects are completed

OBJECTIVE 1.5: UPGRADE PARKS IN ALIGNMENT WITH PARKS MASTER PLANS AND ADD ADDITIONAL PARKS FACILITIES IN UNDERSERVED AREAS

STRATEGIES:

a. Inventory and develop a system to prioritize planned park projects

a. With input from the community, identify new park uses for existing parklands, including both active and passive recreation opportunities

b. Pursue park acquisitions in areas that lack access to parks

c. Pursue resources to develop additional amenities to serve the community

GOAL 2: STRONG ORGANIZATION

ENSURE ORGANIZATIONAL EFFECTIVENESS AND FISCAL STABILITY FOR LONG-TERM COMMUNITY BENEFIT

CORE OBJECTIVES

OBJECTIVE 2.1: ENSURE DEPARTMENT EFFICIENCY AND EFFECTIVENESS

STRATEGIES:

a. Provide exceptional customer service to park users and the wider community
b. Provide resources and systems to ensure effective staff communication throughout the department
c. Engage and deploy volunteers effectively to augment departmental capacity
d. Upgrade technology where it makes the most difference to staff effectiveness
e. Regularly survey staff regarding department priorities and effectiveness, and solicit ideas for improving department functionality

OBJECTIVE 2.2: INVEST IN STAFF DEVELOPMENT AND PROMOTE INNOVATION AND EXCELLENCE IN SERVICE

STRATEGIES:

a. Create and maintain a variety of opportunities for staff training and leadership development
b. Encourage collaboration across the department and promote ways for staff to learn from each other and share expertise
c. Increase regular communication between staff and supervisors
d. Track and recognize staff performance
e. Pursue opportunities for networking and staff development with other agencies

OBJECTIVE 2.3: DEVELOP SOURCES OF SUSTAINED FUNDING FOR OPERATIONS AND ENHANCED SERVICES

STRATEGIES:

a. Pursue new opportunities for revenue generation
b. Collaborate for the creation of a parks funding measure or other sustainable source of park funding
c. Evaluate park dedication fees and update as needed
d. Work with the County Administrative Office and Board of Supervisors to assess department operations and capital projects budgets and secure adequate funds

STRETCH OBJECTIVES

OBJECTIVE 2.4: INSTITUTE IMPROVED SYSTEMS FOR DEPARTMENTAL MANAGEMENT AND OPERATIONS PLANNING

STRATEGIES:

a. Develop metrics and performance measures for Strategic Plan Objectives and share compelling data with stakeholders and potential funders
b. Develop and annually update an Operational Plan, integrated with the Capital Improvement Program and department budget
c. Regularly track and report progress on Strategic Plan Objectives and Strategies through implementation of the department's strategic management cycle
d. Work to align the Parks Department's Strategic Plan with the County's Strategic Plan

OBJECTIVE 2.5: LEAD AND PARTNER WITH OTHER DEPARTMENTS, AGENCIES AND ORGANIZATIONS TO BETTER SERVE THE COMMUNITY

STRATEGIES:

a. Partner with other public land owners to provide increased recreational access to existing public open spaces
b. Partner with school districts, land trusts, non-profit groups, community organizations, and public agencies to provide additional public access to existing facilities
c. Collaborate to develop an interagency vision for the countywide network of trails

GOAL 3: AWESOME PROGRAMS

PROVIDE RECREATIONAL AND CULTURAL PROGRAMS TO STRENGTHEN AND ENGAGE LOCAL COMMUNITIES

CORE OBJECTIVES

OBJECTIVE 3.1: PROVIDE RECREATIONAL PROGRAMS AND EVENTS TO MEET COMMUNITY NEEDS

STRATEGIES:

a. Continue to offer free and low-cost programs and events to the community

b. Sponsor and co-sponsor a variety of events for families & diverse audiences

c. Promote program scholarships offered by non-profit partner organizations based on individuals' financial need

OBJECTIVE 3.2: CULTIVATE THE ARTS AND STRENGTHEN THE CULTURE OF THE COUNTY THROUGH PUBLIC ART PROGRAMS AND EVENTS

STRATEGIES:

a. Continue to work with the County Arts Commission and partners to: a) fund arts programs, b) include public art components in public projects, c) provide art in public spaces, d) develop new public art programs and e) conserve existing public art

b. Continue to offer opportunities to engage in rich, hands-on arts curriculum through arts-based summer camps and class offerings

OBJECTIVE 3.3: CONDUCT COMMUNITY OUTREACH AND OFFER REGULAR OPPORTUNITIES FOR DIVERSE GROUPS TO ENGAGE WITH AND LEARN ABOUT THEIR COUNTY PARKS DEPARTMENT

STRATEGIES:

a. Conduct meaningful outreach to the county's diverse communities to increase access to and knowledge of parks facilities and programming

b. Regularly engage community members and other agencies and organizations in assessing community needs

STRETCH OBJECTIVES

OBJECTIVE 3.4: PROVIDE NEW AND INNOVATIVE RECREATIONAL PROGRAMS AND EVENTS THAT ADDRESS AREAS OF UNMET NEED

STRATEGIES:

a. Regularly assess needs and inventory priorities for classes, programs, and events, especially in underserved areas

b. Pursue partnerships and develop programs where most needed

c. Add additional programming targeted to and relevant for high-need and underserved groups

d. Increase relevance of programs to youth, elders, and families with young children, and ensure that all demographics are served by programs

OBJECTIVE 3.5: ENHANCE OUR SUPPORT OF LOCAL FAMILIES AND YOUTH BY EXPANDING AFTER SCHOOL AND SUMMER OFFERINGS

STRATEGIES:

a. Pursue resources for expanding programs and classes for youth, especially in underserved areas

b. Regularly survey youth, parents, teachers and school administrators to identify current gaps in services and areas of unmet need

c. Partner with other agencies and non-profits to expand the cultural, recreational, educational and interpretive program options available to families and youth countywide

d. Expand the Junior Volunteer Program and Junior Lifeguard programs to support job and life skills development and opportunities for mentoring

OBJECTIVE 3.6: INCREASE THE DEPARTMENT'S UNDERSTANDING OF PARKS CUSTOMERS THROUGH INCREASED OUTREACH, DATA COLLECTION AND RESEARCH

STRATEGIES:

e. Conduct an equity analysis including a survey to help the department focus on key areas of need

f. Regularly conduct surveys of park and program users to determine how parks facilities and programs are used and how they can be improved

GOAL 4: EFFECTIVE STEWARDSHIP

STEWARD AND PROTECT OPEN SPACES AND NATURAL, CULTURAL AND HISTORICAL RESOURCES FOR THE ENJOYMENT OF CURRENT AND FUTURE GENERATIONS

CORE OBJECTIVES

OBJECTIVE 4.1: PARTNER WITH OTHER AGENCIES, ORGANIZATIONS, AND LAND OWNERS IN AN INTEGRATED REGIONAL APPROACH TO RESOURCE MANAGEMENT

STRATEGIES:

a. Regularly meet with local conservation partners to assess opportunities to lead and/or provide support for stewardship projects

b. Provide ongoing educational and interpretive opportunities related to natural resources

OBJECTIVE 4.2: PROTECT CULTURAL AND HISTORICAL RESOURCES THROUGHOUT THE PARKS SYSTEM

STRATEGIES:

a. Inventory and assess priority projects to enhance preservation of cultural and historical resources in the parks system

OBJECTIVE 4.3: PROVIDE INTERPRETIVE PROGRAMS AND OPPORTUNITIES TO INCREASE AWARENESS AND APPRECIATION OF NATURAL, CULTURAL AND HISTORICAL RESOURCES

STRATEGIES:

a. Continue to provide interpretive programs led by staff and volunteers in the parks system

b. Continue to provide interpretive signage and information with all appropriate new parks projects

OBJECTIVE 4.4: PROVIDE OPPORTUNITIES FOR VOLUNTEERS IN PARKS, FACILITIES AND PROGRAMS

STRATEGIES:

a. Provide a variety of types of opportunities for volunteering in the parks system

b. Establish regional and neighborhood-based Adopt-A-Park programs to encourage community engagement in parks

STRETCH OBJECTIVES

OBJECTIVE 4.5: ESTABLISH A NATURAL RESOURCES AND OPEN SPACE MANAGEMENT PROGRAM IN THE PARKS DEPARTMENT TO MAXIMIZE ENVIRONMENTAL BENEFITS THROUGHOUT THE PARKS SYSTEM

STRATEGIES:

a. Pursue additional resources to increase department's available expertise, staff capacity, and leadership in natural resource management projects on park properties

b. Create a natural resources program with staff and volunteers dedicated to developing and implementing resource management goals

c. Create a parks natural resources management plan to improve ecological outcomes and pursue multiple long-term environmental benefits

OBJECTIVE 4.6: INCREASE INTERPRETIVE PROGRAMS AND OPPORTUNITIES TO ENHANCE AWARENESS AND APPRECIATION OF ALL NATURAL, CULTURAL AND HISTORICAL RESOURCES

STRATEGIES:

a. Develop an interpretive plan for the parks system

b. Pursue resources to increase interpretive staff presence at appropriate parks throughout the county to run programs, manage volunteers, and engage with park users

c. Develop additional interpretive facilities and amenities throughout the parks system

OBJECTIVE 4.7: INCREASE VOLUNTEER OPPORTUNITIES IN PARKS, FACILITIES AND PROGRAMS

STRATEGIES:

a. Grow the volunteer and intern programs to provide experiential learning opportunities and promote land stewardship throughout the parks system

b. Increase involvement, collaboration, communication and coordination with "friends of" groups to pursue the department mission

CHAPTER 4: PLAN IMPLEMENTATION

DEPARTMENT STRATEGIC MANAGEMENT SYSTEM & OPERATIONAL PLANNING

THE STRATEGIC MANAGEMENT SYSTEM

Implementing the Strategic Plan will require future cooperation and planning. The strategic management cycle illustrates how the plan will be implemented (Figures 1 and 2) including the phases of planning, implementing and monitoring, evaluating, and adjusting. These phases will help keep the department on track with the Strategic Plan goals, will set regular times to engage the community, and will help continually improve efficiency and effectiveness.

The Strategic Plan lays the groundwork and sets the framework for future operational plans which will serve to implement the Strategic Plan and help manage department staff work plans and budgets. Together, the Strategic Plan and these future operational plans make up this strategic management system. This is the framework for managing the department and steering us towards our vision and the realization of our Strategic Plan goals.

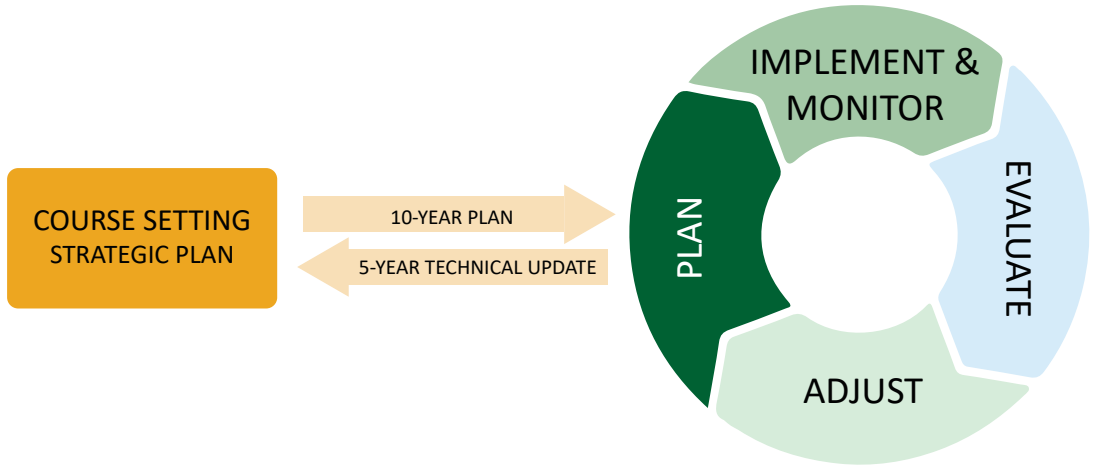
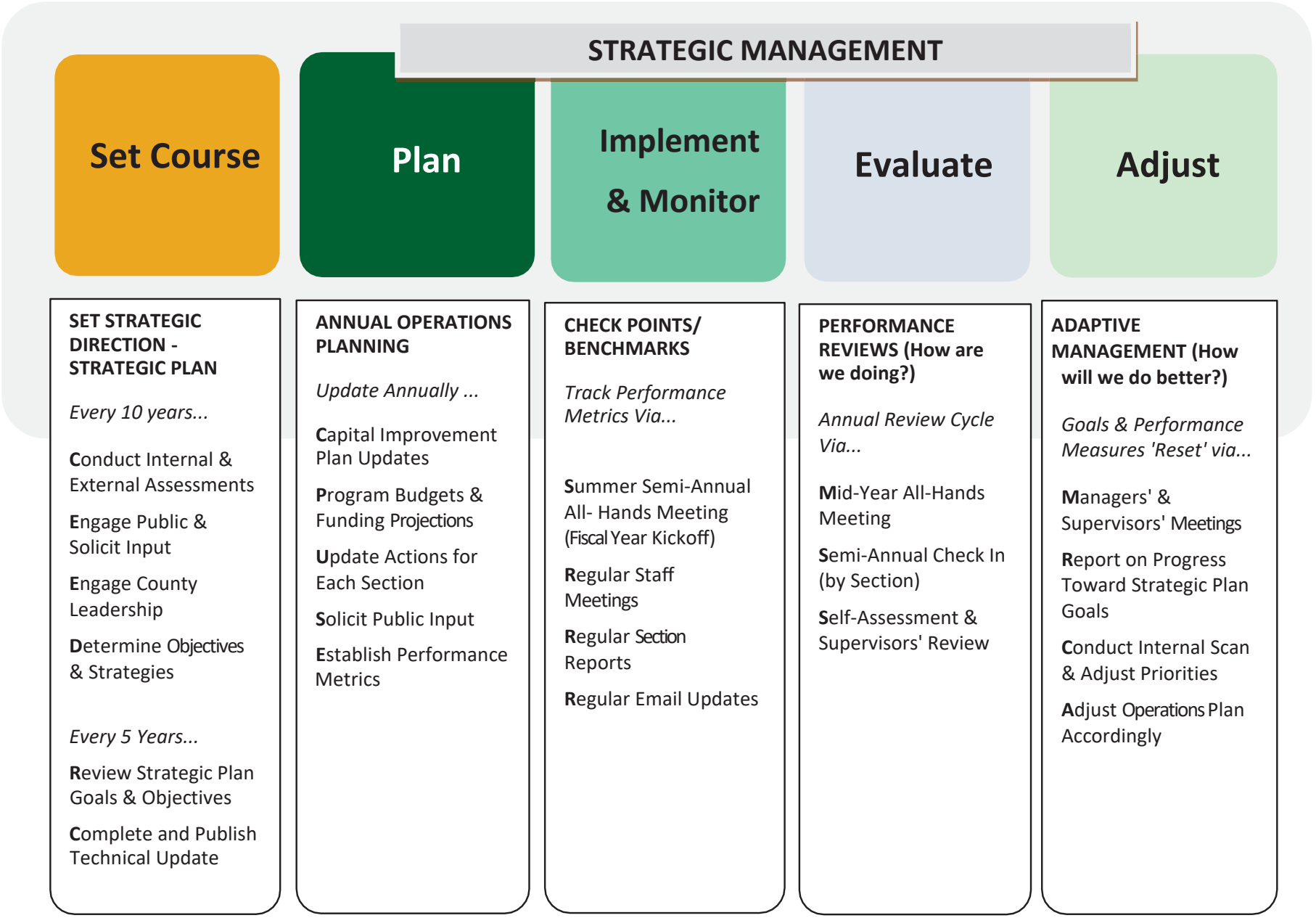


Figure 1: Strategic Improvement Cycle

Figure 2: Strategic Management System



THE OPERATIONAL PLAN

The Operational Plan is a tool we will use to implement this Strategic Plan. The Operational Plan will be updated regularly and will identify shorter-term (1-2 year) actions that will flow from Strategic Plan goals and objectives and support department priorities. Each operational plan will identify the concrete steps that the County Parks Department will take to assign resources and staff toward achieving the strategic priorities and goals laid out in the Strategic Plan.

The heart of these operational plans will be the formulation and tracking of actions and performance measures. Operational plan actions are specific, measurable, achievable steps to be taken to implement Strategic Plan objectives. In each operational plan, priority will be given to specific actions that further multiple goals and objectives identified in the Strategic Plan. Performance measures will be established and tracked on an annual basis.

CRITERIA FOR PRIORITIZING ACTIONS

With finite staffing levels and budget, the Parks Department must prioritize. In order to determine which actions take priority, the following set of criteria will be used to maximize the potential to achieve the goals, objectives and strategies in this Strategic Plan. Since each goal and objective will require additional resources and needs to build on additional progress, the emphasis is on actions that set the stage and overcome initial barriers, enabling the department to work towards multiple Strategic Plan goals.

Actions should address the following criteria:

1. Lay the groundwork for implementing the long-term goals
2. Work towards fulfilling multiple goals and objectives as identified in the Strategic Plan
3. Create additional resources and enable pursuit of additional goals and objectives identified in the Strategic Plan
4. Be readily achievable in the short-term, with existing funding and staff levels.
5. Capitalize on previous momentum and continue previous progress

THE STRATEGIC PLAN WILL EVOLVE

Over the 10-year horizon for the County Parks Strategic Plan, the priorities and context will evolve in response to changing circumstances. To succeed, we must revisit our Strategic Plan goals regularly and refine our course by adjusting the actions in the Operational Plan. Every five years, the Strategic Plan should undergo a technical update to ensure that the priorities articulated reflect the changing environment, economy, and department and community needs.

KEYS TO MAKING PROGRESS

Mesa Village County Park

FOCUSING

Priority Actions for the first Operational Plan have been selected based on the criteria stated above, as applied to the goals, objectives and strategies included in this Strategic Plan. Based on this approach, the first and highest priorities identified for the Parks Department include the following:

1. Clearly articulate the funding needs of the department through creation of a deferred maintenance plan (Objective 1.4), a system to prioritize capital projects (Objective 1.5), and an assessment of appropriate staff levels needed to operate and maintain the existing parks system (Objective 1.1).

2. Pursue additional funding for the department through potential collaboration on a funding measure, working with the Board of Supervisors and County Administrative Office on department budget allocations, pursuing additional revenue sources, and evaluating park dedication fees (Objective 2.3).

3. Develop metrics and performance measures with the first operational plan (Objective 2.4) for Strategic Plan goals and objectives, and begin to share compelling data with stakeholders and potential funders.

We hope that the focus objectives named here will help the Parks Department achieve the goals, objectives and strategies identified in this Strategic Plan by increasing the capacity and organization of the department.

FUTURE FUNDING

The improvement and growth of the County Parks Department will require investment. This investment is expected to yield a wide range of recreational, environment and socio-economic returns to the community. To realize the goals articulated in this plan, additional department resources and revenue must be pursued.

Before other goals and objectives can be realized, we will need to first develop sources of sustained funding for operational and enhanced services (Objective 2.3). Strategies to meet that objective are detailed below.

Scotts Creek County Beach

Willowbrook Park in Soquel

PURSUE NEW OPPORTUNITIES FOR REVENUE GENERATION

The County Parks Department currently generates revenue through user fees and reservations of facilities. There may be future opportunities to generate new revenue sources through increased services such as providing additional facilities available for reservation.

COLLABORATE FOR THE CREATION OF A PARKS FUNDING MEASURE OR OTHER SUSTAINABLE SOURCE OF PARK FUNDING

The County Parks Department is not the only agency providing parks and recreation services in the county, and is not the only agency that requires additional funding to meet community needs for parks and recreation. Working together, the various parks agencies and the community may pursue a ballot measure to fund parks in the county. This could be in the form of a dedicated parcel tax or a sales tax, which could be used to fund projects identified by the community as important, and could help us implement the goals and objectives of this Strategic Plan. The Parks Department could also individually pursue a ballot measure to secure a sustainable funding source for County Parks.

EVALUATE PARK DEDICATION FEES AND UPDATE AS NEEDED

The Park Dedication Fees are required for residential development in the unincorporated county, and are used locally to provide additional park facilities proportionally to serve increased demand resulting from new development. Fees are based on the standard provision of acres of parkland for every 1,000 new residents, and fees are adopted by the Board through resolution. These fees were last evaluated and updated based on market conditions in 1998, and should be assessed for appropriate levels for current economic conditions.

WORK WITH COUNTY ADMINISTRATIVE OFFICE AND BOARD OF SUPERVISORS TO ASSESS DEPARTMENT OPERATIONS AND CAPITAL PROJECTS BUDGETS AND SECURE ADEQUATE FUNDS

The largest source of funding for the County Parks Department is the County General Fund. The General Fund contribution to the department budget has decreased from its pre-recession level, while operational costs and the size and demands on the County Parks system have increased. The Parks Department should work cooperatively with the Board of Supervisors and the County Administrative Office to develop a sustainable source of revenue that is commensurate with the long term needs identified in this plan.

THE NEED FOR COMMUNITY PARTNERSHIPS

This Strategic Plan represents a collaborative vision developed with the Parks Department and the community at large. The County Parks Department cannot implement the goals of this plan alone. Realizing this vision will require the leadership of other organizations and agencies as well as increased participation and support from the community. New partnerships will be needed to pursue strategies identified in this plan that will improve the County Parks system, and that the community sees as important, but which are currently outside the scope of the department to implement (such as improving neighborhood bike and pedestrian infrastructure and connections to parks). Community support will be especially important to help us generate new resources and additional funding, as many goals of this plan simply will not be realized without it.

By focusing on collaboration and partnership, this department intends to foster and to amplify the leadership and innovation in this community, to implement this plan, and to support community values. Working together, County Parks will strive to create a healthier and more vibrant Santa Cruz County for all.

Volunteers at Quail Hollow Ranch County Park

PART II:
THE COUNTY PARKS DEPARTMENT

CHAPTER 5: THE PARKS NETWORK AND SERVICES

SANTA CRUZ COUNTY'S PARKS & OPEN SPACE NETWORK

The County Parks Department is one of several entities that provide parks, open space, cultural services and recreation facilities and programs in the county, along with several other public agencies, organizations, and private landholders. Together, these various entities provide a network of parks and open space that serves the entire county. Generally, local urban-type neighborhood and community parks are provided by the cities, County Parks, and the four park and recreation districts. Larger regional-serving parks are provided by State Parks, County Parks, and other entities. Local park-provider jurisdictional lines are shown in Figure 3. Parklands and protected lands are shown in Figure 4.

COUNTY PARKS

Generally, the County Parks Department provides two broad categories of services: local neighborhood and community parks and programs in the unincorporated portions of the county (areas outside one of the four city limits), and larger regional-serving parks and facilities that serve the entire county. In Santa Cruz County, there are many urban neighborhoods that are not within a city limit, including the communities of Live Oak, Soquel, and Aptos, and the County provides neighborhood parks in these areas.

CITY PARKS

There are four incorporated cities in the county, including Capitola, Santa Cruz, Scotts Valley and Watsonville. Each of these four cities has their own city parks department providing local neighborhood-serving parks and recreation services within that city's limits.

INDEPENDENT RECREATION AND PARK DISTRICTS

The four independent park and recreation districts of Alba, Boulder Creek, La Selva Beach and Opal Cliffs are responsible for providing local neighborhood and community parks to urban and rural neighborhoods within their independent jurisdiction boundaries.

OTHER PARKS AND OPEN SPACE AGENCIES & LANDHOLDERS

In addition to the local parks provided by the County Parks Department, the four city parks departments, and the four recreation and park districts, California State Parks also provides several large parks and beaches in the county. State Parks provide important recreational opportunities for local county residents as well.

There are also recreational facilities and open space provided by other agencies in the county including local school districts, the Bureau of Land Management, the California Department of Fish and Wildlife, the City of Santa Cruz Water Department, the San Lorenzo Valley Water District, the Land Trust of Santa Cruz County, and the Midpeninsula Regional Open Space District.

Figure 3: Neighborhood-Park-Providing Jurisdictions

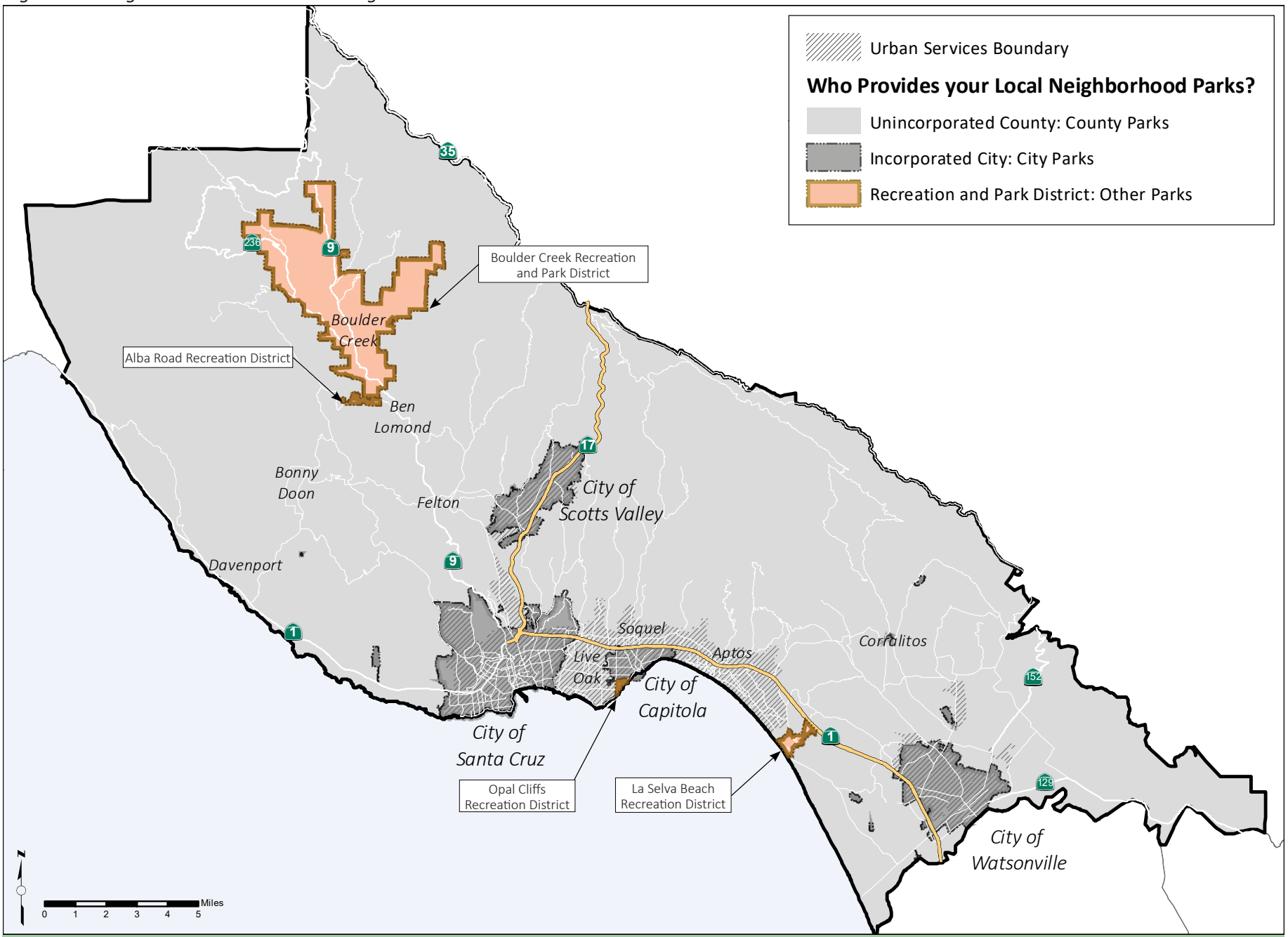
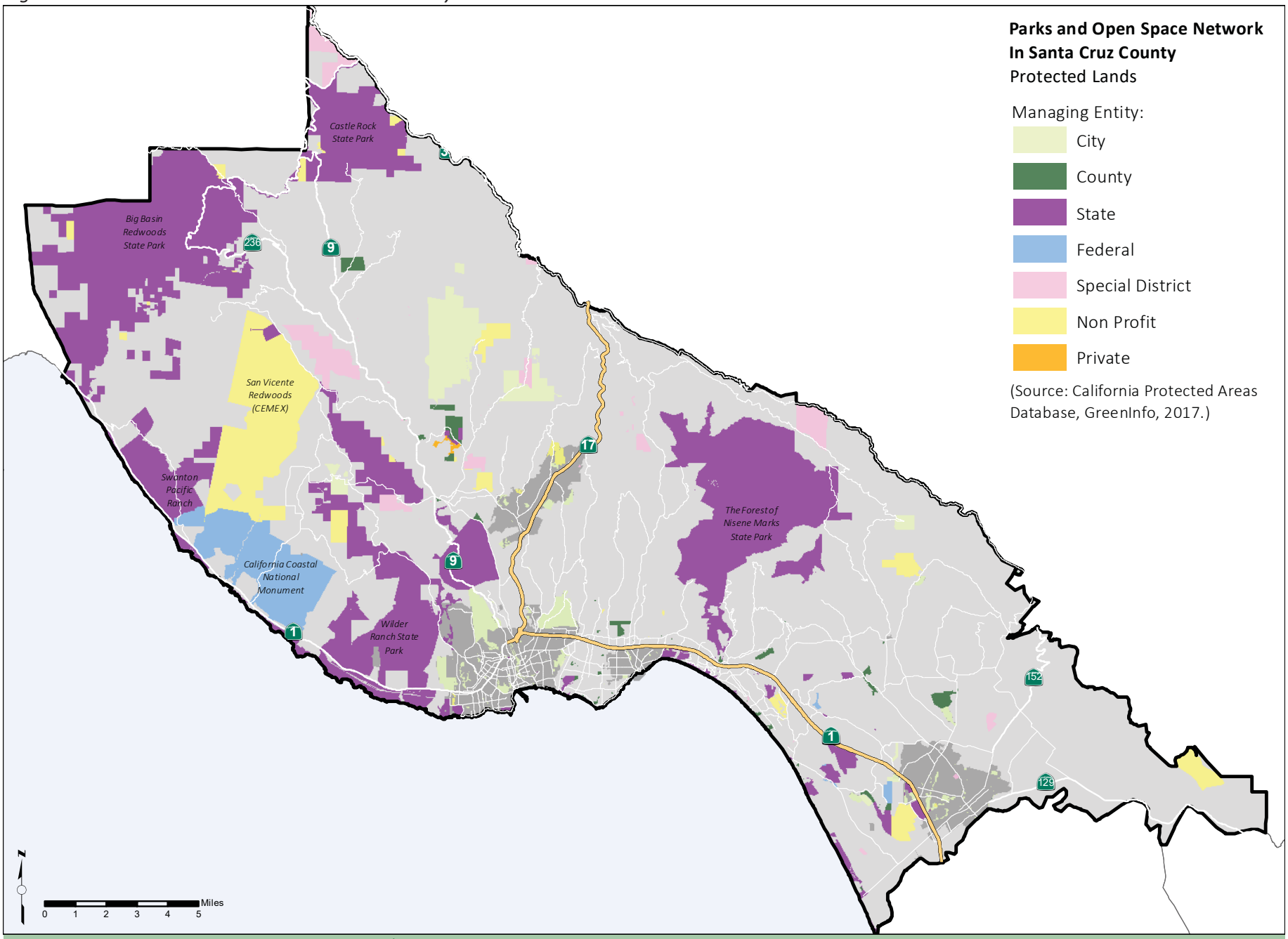


Figure 4: Protected Lands in Santa Cruz County



Today the County Parks Department manages:

- 1,593 acres of parkland including 883 acres of parks and 710 acres of open space
- 38 neighborhood, community, regional or rural parks
- 27 coastal access points
- 23 playgrounds
- 6 parks with sports fields
- 8 parks with basketball courts
- 5 parks with tennis courts
- 5 parks with community rooms
- 1 regional swim center with aquatics and fitness programs and special events throughout the year. Swim Center visits exceed 180,000 per year
- Recreational, cultural and youth programs throughout the unincorporated county
- 4 parks with wedding event facilities

COUNTY PARKS SERVICES

Since 1979, the County Parks Department has managed a diverse parks system including neighborhood, community, regional, and rural parks, coastal access points, trails, and cultural and recreational programs and activities for all ages throughout the unincorporated county. County Parks facilities' locations and amenities are shown in Figure 5.

The County Parks Department also provides financial support to community arts and recreational programs provided by other organizations such as the Museum of Art and History, the Davenport Teen Center and local school district facilities and programs in various locations around the county.

The Parks Department provides the following services.

Seascape County Park in Aptos

Photo by Mary Chavez

REGIONAL PARKS

Regional parks, located throughout the county, include Quail Hollow Ranch in the San Lorenzo Valley, Polo Grounds in Aptos, and Pinto Lake in Watsonville. These parks and their facilities have unique geographic features, draw people from a wide area, and provide a wide variety of public amenities such as trails, sports fields, dog parks, and rental facilities.

NEIGHBORHOOD AND COMMUNITY PARKS

Among the County's 29 neighborhood and community parks are Highlands Park in Ben Lomond, Brommer Park in Live Oak, Seascape Park in Aptos, and Aldridge Lane in Corralitos. These parks serve the surrounding communities and provide amenities such as places to picnic and hold gatherings, play structures for children to explore, benches to rest on, community art for visitors to enjoy, community gardens, skate parks and bike pump tracks, and facilities for community events and weddings.

SIMPKINS FAMILY SWIM CENTER

The Swim Center, also a regional park, is located in Live Oak. Among the aquatic programs offered are swim lessons, recreation and lap swim, water exercise, and water polo, as well as the popular Pool Jr. Guards and Little Guards summer camps. It is the primary public pool in the area and provides services for every age group 363 days a year.

COMMUNITY EVENTS

The County Parks Department puts on events such as the Parks & Rex pool party, where dogs can take a dip in the pool, the Holiday Art & Craft Faire and the Floating Pumpkin Patch.

TEEN PROGRAMS

Zombie Camp (pictured), for ages 11-14, is held at Aptos Park. Teens can gain valuable job skills while having fun by volunteering as a Junior Leader at County Parks youth summer camps, as well as assisting with after-school programs.

COASTAL ACCESS POINTS

Coastal access points include Scott Creek Beach near Davenport, Sunny Cove Beach in Live Oak, and Hidden Beach in Aptos. County Parks, together with State Parks and other entities, provides and maintains coastal access points in the unincorporated portions of the county. These coastal access points sometimes include restroom facilities, trash receptacles, natural plantings, and infrastructure such as stairs and fencing to protect sensitive areas and species.

YOUTH PROGRAMS

School-age youth can enjoy a variety of camps and programs, including Nature Adventure and Science Sleuths at Quail Hollow Ranch, Kreative Kids at Wilder Hall, and art and science camps at Aptos Park. Afterschool programs are held at Mar Vista Elementary and La Selva Beach clubhouse.

ADULT AND SENIOR PROGRAMS

Programs for adults and seniors include local day trips (pictured, trip to Harley Farms), water and dry-land exercise classes at the Swim Center, Spanish language and tap classes, interpretive hikes and workshops at Quail Hollow Ranch, and a popular Mall Walk Program.

ARTS

The Percent for the Arts Program, art exhibitions at the Government Center, Artist of the Year, and Outside the Box are just a few of County Parks art-related programs. Arts programming for youth is provided through summer camps and is integrated into parks after school programs. County Parks-sponsored public art can be enjoyed at locations throughout Santa Cruz County. The department also supports the Arts Council and the Museum of Art and History.

Jose Avenue County Park in Live Oak

Recreational Trip to Suisun Marsh Natural History Cruise

Mar Vista Kinder Enrichment Program

DEPARTMENT STRUCTURE & STAFFING

The County Parks Department is made up of five sections with distinct functions.

ADMINISTRATION AND RESERVATIONS

Administration staff provides support and customer service to all Parks staff and customers, and oversees the department budget, finances, human resources, and office operations. Reservations staff administers the use and rental of all park buildings, beaches and park sites; manages concessionaires and the rentals of private houses in county park sites; provides oversight of community gardens and horse-boarding facilities; and works closely with maintenance staff to maximize the use and enjoyment of public facilities.

AQUATICS

Aquatics staff manages the Simpkins Family Swim Center and the extensive aquatics programs offered there. Swim Center visits exceed 180,000 a year. Staff continues to develop new program opportunities to meet the needs of the community and increase participation at the Swim Center.

MAINTENANCE AND OPERATIONS

Maintenance staff provides maintenance to all park locations, beaches and facilities. In addition, staff maintains the landscaping around all County government facilities. A partial list of responsibilities include mowing, minor construction projects, trash pick-up, restoration of natural resources, building maintenance, and pool maintenance at the Simpkins Family Swim Center. Maintenance staff also assists Reservations staff in preparation, set up and clean up for events.

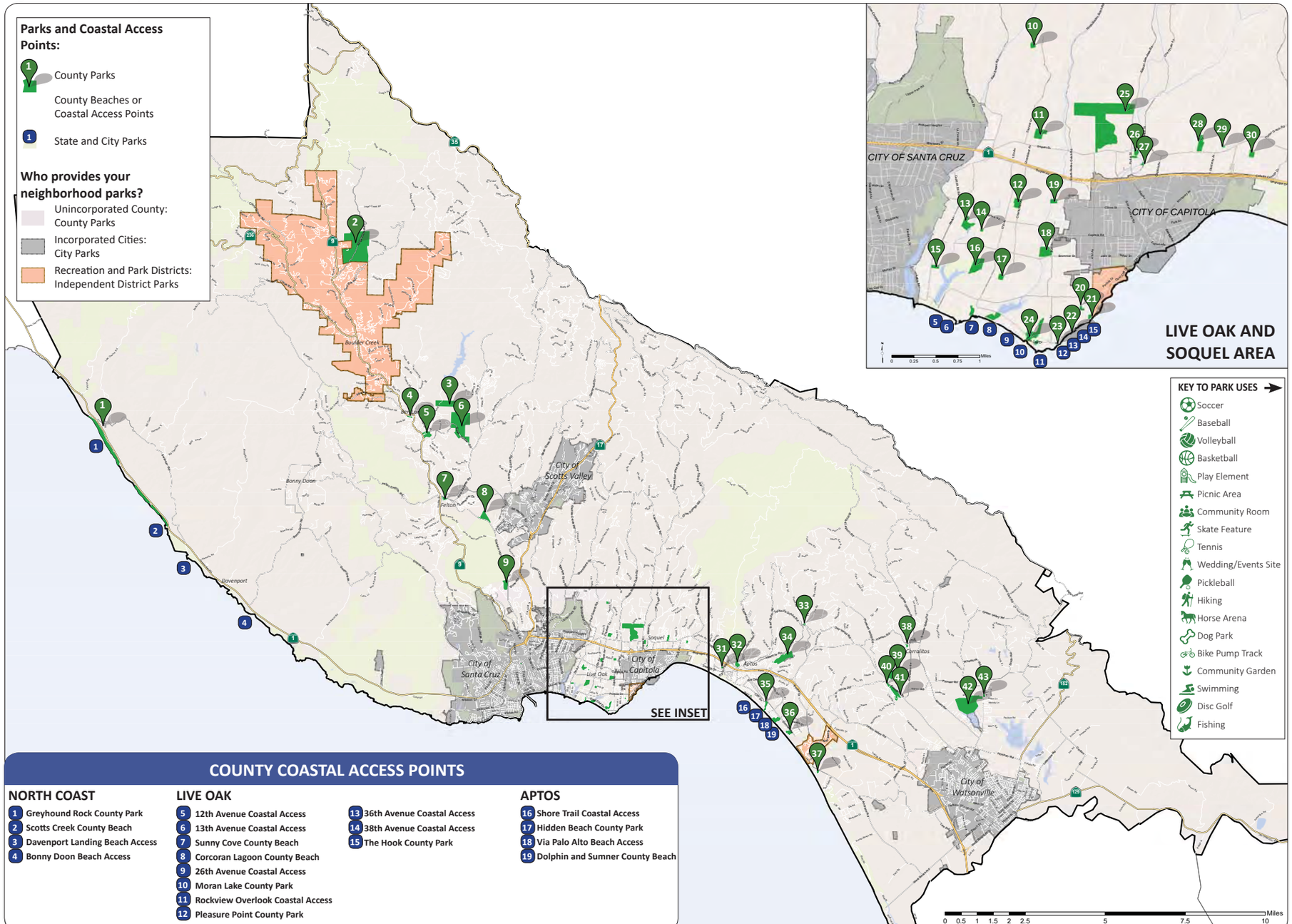
PLANNING AND DEVELOPMENT

Planning staff oversees the implementation of the Parks Capital Improvement Program (CIP) projects, develops plans and studies for components of the County Parks system, and oversees park construction projects. The Planning and Development section works with specialists from a variety of disciplines and members of the public to develop short, medium and long term plans such as feasibility studies, acquisition studies, park master plans, environmental review documents, design and construction documents, and permits for park projects. Staff leads the submission and administration of grant applications for County Parks projects. The planning section also reviews plans for projects led by other agencies for potential impacts on the County Parks system.

RECREATION & CULTURAL SERVICES

Recreational Program staff administers an extensive list of programs including youth programs, interpretive nature programs centered at Quail Hollow Ranch, adult and senior programs, cultural services and arts programs. Recreation and Cultural Services staff also conducts annual special events, such as the Holiday Art and Craft Fair.

Figure 5: County Parks, Facilities, and Coastal Access Points



COUNTY COASTAL ACCESS POINTS

NORTH COAST

1. Greyhound Rock County Park
2. Scotts Creek County Beach
3. Davenport Landing Beach Access
4. Bonny Doon Beach Access

LIVE OAK

5. 12th Avenue Coastal Access
6. 13th Avenue Coastal Access
7. Sunny Cove County Beach
8. Corcoran Lagoon County Beach
9. 26th Avenue Coastal Access
10. Moran Lake County Park
11. Rockview Overlook Coastal Access
12. Pleasure Point County Park
13. 36th Avenue Coastal Access
14. 38th Avenue Coastal Access
15. The Hook County Park

APTOS

16. Shore Trail Coastal Access
17. Hidden Beach County Park
18. Via Palo Alto Beach Access
19. Dolphin and Sumner County Beach

COUNTY PARKS AND USES

NORTH COAST

1. Greyhound Rock

SAN LORENZO VALLEY

2. Miller Property
3. Pace Property (Currently no public access)
4. Ben Lomond Park
5. Highlands Park
6. Quail Hollow Ranch
7. Felton Covered Bridge
8. Michael Gray Field
9. Graham Hill Showgrounds

LIVE OAK/UNINCORPORATED SANTA CRUZ

10. Santa Cruz Gardens
11. Winkle Farm
12. Chanticleer
13. Jose Avenue
14. Hestwood
15. Twin Lakes
16. Simpkins Family Swim Center
17. Felt Street
18. Brommer
19. Coffee Lane
20. Floral
21. The Hook
22. East Cliff Parkway
23. Pleasure Point
24. Moran Lake

SOQUEL

25. Anna Jean Cummings
26. Heart of Soquel
27. Soquel Lions
28. The Farm
29. Richard Vessey
30. Willowbrook

APTOS

31. Seacliff Village
32. Aptos Village
33. Valencia Hall
34. Polo Grounds
35. Hidden Beach
36. Seascape
37. Place De Mer

WATSONVILLE AND CORRALITOS

38. Aldridge Lane
39. Bert Scott Estate (currently no public access)
40. Scott Park
41. Freedom Lake
42. Pinto Lake
43. Mesa Village

CHAPTER 6: OVERSIGHT AND FUNDING

PUBLIC OVERSIGHT

As with all County departments, the Parks Department is overseen by the Board of Supervisors. In addition, it is supported by two Commissions: the Arts Commission and the Parks and Recreation Commission. These commissions are appointed by the Board of Supervisors, make recommendations to the Board of Supervisors for park-related actions, and assist in coordinating between the public, the department, and the Board.

THE PARKS AND RECREATION COMMISSION

The mission of the Santa Cruz County Parks and Recreation Commission is to advise and support the Board of Supervisors in its work to provide excellent and accessible parks, open spaces, recreational programs and facilities that promote health and enhance the quality of life for all.

THE ARTS COMMISSION

The mission of the Santa Cruz County Arts Commission is to promote, expand and plan for the cultural life of Santa Cruz County and to bring artists and arts organizations together with government for the benefit of all residents of the county.

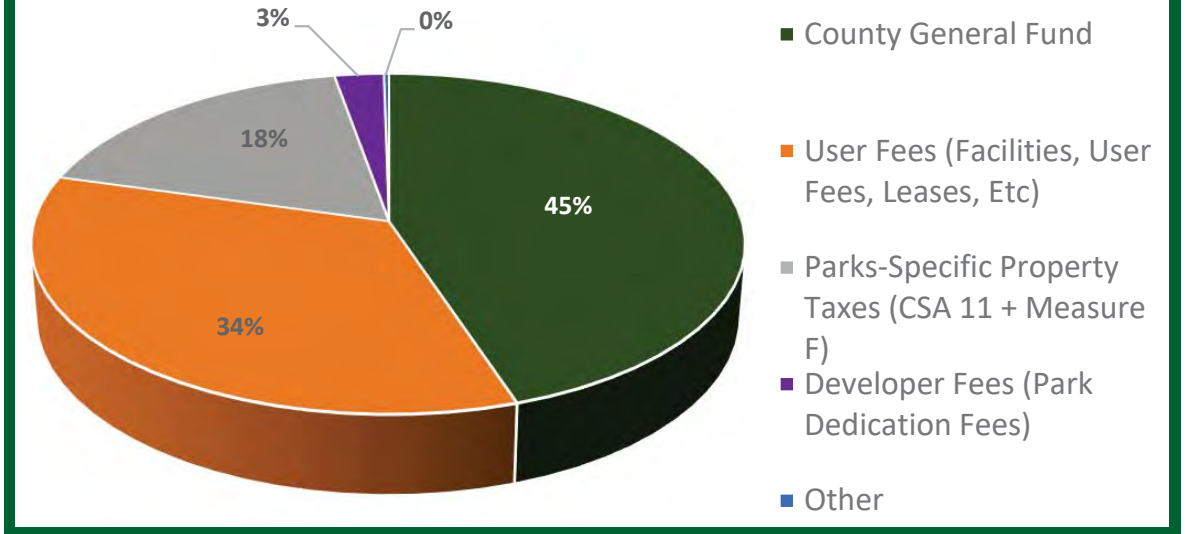


Figure 6: Parks Revenue Sources in Fiscal Year 2016/17

DEPARTMENT FUNDING

County Parks funding comes from a variety of sources including the County General Fund, property taxes, recreation and park facility user fees, grants, and developer fees (for capital projects only) as shown in Figure 6. The amount of each of these sources varies by year depending on specific grants and several other factors. Property tax money includes funds associated with County Service Area (CSA) 11, which exists to provide funding specifically for County Parks.

Generally, the budget can be divided into two categories. First, the operating budget includes the costs associated with operations and maintenance of the existing parks facilities and programs. Second, the capital projects budget includes costs associated with the acquisition of new park properties, development of new or additional park facilities on park properties, and deferred maintenance.

The Parks Department budget, including both the operating budget and the capital projects budget, has not remained proportional to the growing size, demands and costs of operating the parks system (see Figure 7).

OPERATING BUDGET

The sources of funds used for department operations generally include the County General Fund, park user fees, CSA 11, and Measure F.

The overall department operating budget decreased with the recession in 2008, and has only recently (in 2015/16) returned to the pre-2008 level. Additionally, costs associated with staff, supplies and services have increased over the same time period. To illustrate both of these points, Figure 7 shows that there were 68 funded full time or equivalent staff positions in 2002/03, and only 46 in 2016/17. While staff numbers have decreased, the number of parks and facilities for which the department is responsible has increased from 55 in 2002/03 to 64 in 2016/17.

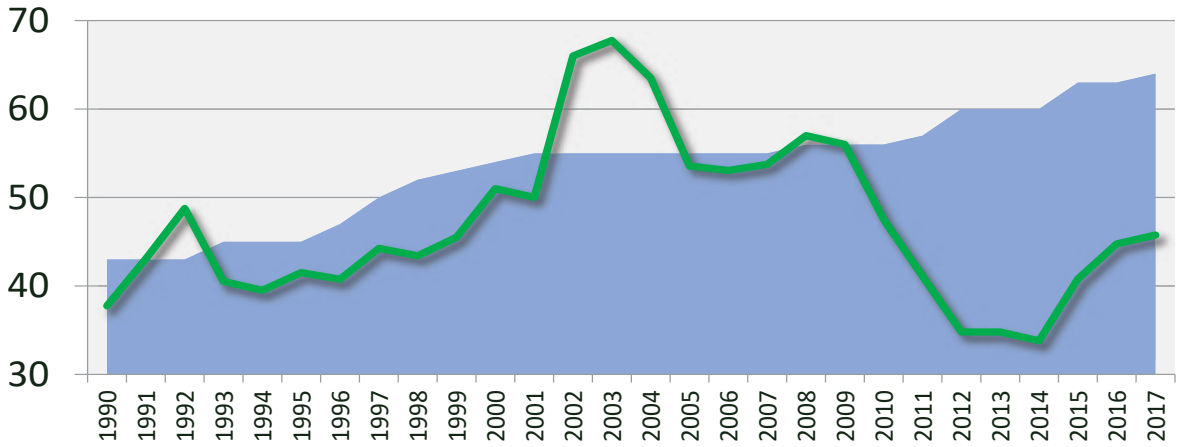
COUNTY GENERAL FUND CONTRIBUTION

Each fiscal year, the County Board of Supervisors approves the department budget which includes a contribution from the County General Fund. This General Fund contribution generally has increased slightly each year proportionate to rising costs of operating the department. However, in the economic downturn of 2008, with the fiscal crisis and the dissolving of the County Parks Department into the Department of Public Works, the General Fund contribution to the Parks Department was reduced significantly, from $4.3 million in 2007/08 to $2.1 million in 2012/13. Although the total operating budget has partially recovered – due to increasing program participation, user fees and Measure F – in 2016/17 the General Fund contribution was $3.7 million, and has still not returned to pre-recession levels.

COUNTY SERVICE AREA 11

County Service Area (CSA) 11 is a special district that covers the entire unincorporated county (outside the four cities) except areas that are within one of the four distinct recreation and park districts. This service area was created in 1971 to provide additional property tax funds in an effort to address the gap between needed parks services and available funding. This relatively small fund has been essential to the department in maintaining the most important

Figure 7: Number of Parks and Number of Parks Department Staff



Valencia Hall

department services. Because the Santa Cruz County Parks Department provides an urban level of service in some areas while collecting proportionally fewer taxes than a city, this was a necessary step.

MEASURE F

Measure F was approved by the voters of CSA 11 in 2014, to include a specific per-parcel property tax within CSA 11 that provides a small additional amount of funding to the County Parks Department. Measure F provides less than 4 percent of the annual department budget.

CAPITAL PROJECTS BUDGET

There is no consistent source of funding allocated to capital projects in the County Parks system for upgrades to park infrastructure, deferred maintenance, planning and construction of new park uses and facilities, and acquisition of new park properties. These types of projects must be funded through unique combinations of funding sources such as grants, park dedication (developer) fees, one-time individual funding sources such as property sales, and public-private funding partnerships.

The Hook County Park at Pleasure Point

REDEVELOPMENT AGENCY

Throughout the past 30 years, the Redevelopment Agency provided the largest amount of capital funding for parks projects. Since the agency was dissolved in 2011, this source of funding is no longer available for development of the County Parks system. Redevelopment Agency funding was only available for parks within the Redevelopment Project Area, which included Live Oak and Soquel. The parks throughout the rest of the County Parks system were not eligible to receive these significant contributions of capital project funds.

PARK DEDICATION FEES

New residential development in the unincorporated portions of the county requires either dedication of new public park land or paying an in-lieu fee to offset additional demand for parks created by the residential development. In-lieu fees go to the County Parks Department and are used to fund capital projects or acquisition of new parkland. The intent of these funds is to allow the parks system to grow proportionally with the increased demand created by new residential development. These fees have not been adjusted to reflect inflation or the increase in property values since 1998.

CHAPTER 7: KEY CHALLENGES

A number of key challenges face this county and this department. Understanding these challenges is critical to creating a way forward that is strategic, holistic, and proactive, rather than reactive. Understanding these challenges will also help the department focus on the big picture rather than responding individually to specific circumstances in a way that is at best piecemeal or partial. The following issues have been identified by staff during the strategic planning process.

LARGE URBANIZED UNINCORPORATED AREAS

The passage of Proposition 13 in 1978 locked in the apportionment rate for each county in California in addition to establishing a maximum property tax rate of one percent statewide. The apportionment rate determines the percentage of property taxes that go to the County as opposed to other local agencies such as cities and special districts. Since that time, Santa Cruz County has been locked into a lower property tax apportionment, on average 13 cents of each tax dollar, than many other counties and cities in California, some of which may receive about twice that for each tax dollar. At the same time, about half (49%) of Santa Cruz County's population lives in the unincorporated area (e.g. outside the cities of Capitola, Scotts Valley, Santa Cruz or Watsonville) compared to the median of 19% living in unincorporated areas in all California counties with populations over 200,000. This means that our parks facilities experience high use and many urban-type challenges, and that the County Parks Department is responsible for providing more urban-type parks than would typically be provided by a county. At the same time, the County has fewer financial resources to meet those challenges.

DECLINE IN AVAILABLE FUNDING

In the wake of the economic downturn of 2008, available funding for parks and services was reduced dramatically in favor of directing funds toward other essential services such as fire and policing. The General Fund contribution to the department has still not returned to pre-recession levels, while costs have risen. Despite passage of Measure F in 2014, staffing has still not returned to pre-2008 levels despite significant new demands on the department such as new properties and facilities. The number of funded full time or equivalent staff positions has dropped from 68 in 2002/03, to 41 in 2015, and is up only to 46 in 2016/17 (see Figure 7). In addition, in response to our state's budget crisis,

The Shore Trail in Aptos

in 2011 California's Redevelopment Agencies were shuttered. Redevelopment was previously the primary funding source for almost all parks development and capital projects in the Redevelopment Area of Live Oak and Soquel. The only other source of funding currently available to help us meet community demand for new or improved parks and facilities is Park Dedication Fees, and these haven't been adjusted for inflation since 1998 and are limited due to the small amount of new development in the county.

DEFERRED MAINTENANCE

The Parks Department estimates that there are approximately $100 million in deferred maintenance projects needed to address critical or primary maintenance needs within the County Parks system. These deferred maintenance projects include critical upkeep and routine maintenance such as roof replacements, repairs to the Simpkins Family Swim Center, and replacement of facilities such as playground equipment that has reached the end of its usable lifespan. There is a strong potential for 'cascading' effects and permanent negative impacts if we don't address these issues in the near term.

COUNTY LAND AND HOUSING COSTS

Santa Cruz County is now one of the least affordable places to live in the world based on median house price and median household income.[1] Considering the cost of living there's a great need for low and no-cost programs and facility access. Many residents are housing insecure, and a growing number are currently experiencing homelessness. Impacts of increased homelessness on parks include use of parks property to meet basic human needs (for sleeping, bathing, storage, etc.), which puts additional environmental and maintenance demands on parks-owned facilities and open spaces. Additionally, the high cost of land means it is much more expensive to purchase and develop new parks facilities.

CHANGING DEMOGRAPHICS

The demographics and needs of the community in our county continually evolve, causing changes in the demands on the parks system. The parks system must continually adjust its services as needed to meet these changing demographics. Most significantly, over the past two decades, the county's median age has increased and the percentage of the population identifying as Latino has increased.[2] These two demographic groups, as well as other groups, may be disproportionally underserved by the parks system. Each community has unique needs, and the department strives to understand and address these needs as they continue to evolve.

PARK ACCESS CHALLENGES

Transportation difficulties exacerbate County Parks' challenges in providing accessible park facilities and programs throughout the county. The county's population is spread out, with many residents commuting long distances to jobs. There are few functional alternatives to private automobile use for residents and visitors to access many of the county parks. The one primary transportation corridor is narrow and heavily impacted. This increases the cost of doing business in a number of important ways such as increased construction and shipping costs, and increased travel time for parks field staff who travel between facilities. Transportation challenges also increase the need to provide local parks within close proximity to all neighborhoods, to make parks more accessible to more people.

Felton Covered Bridge County Park

1. 13th Annual Demographia International Housing Affordability Survey, 2017.

2 "Profile of General Population and Housing Characteristics: 2010," for Santa Cruz County, US Census, 2017.

PART III:
CREATING THE PLAN

CHAPTER 8:
PROJECT APPROACH

The Strategic Plan was developed through a collaborative process that sought to be both geographically and culturally inclusive. Input was solicited through meetings with staff, community members and the Strategic Plan Working Group. Generally, the process is illustrated in Figure 8, and includes outreach, visioning and goal-setting.

GUIDANCE & OVERSIGHT

The Strategic Plan was instigated and the process was led by a Strategic Planning Team which consisted of two lead project designers from the department along with parks leadership. In addition, a Strategic Plan Working group was formed in December of 2016 for the distinct purpose of helping with the County Parks Strategic Plan process. It was composed of ten outside members of varying backgrounds with diverse interests, expertise, experience and partnerships. A list of Working Group members is included in the Acknowledgements section at the beginning of this document.

The Working Group met periodically, for a total of six times over the course of developing the Strategic Plan, to review and give input into all Strategic Plan materials and project phases. This review included project outreach and public engagement, creation of the parks vision and values, and the framing of the goals and objectives for the department. The Working Group also helped implement the public meetings.

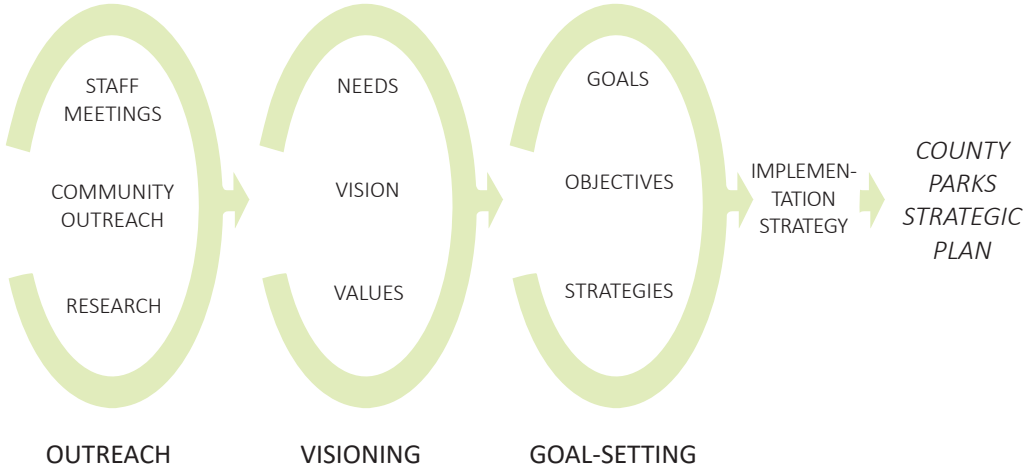


Figure 8: Strategic Plan Flow Chart

STAFF INVOLVEMENT

In Spring 2017 the Parks Department hosted a series of three meetings for staff across the department to solicit their input and engage them in the strategic planning process. Each meeting drew a mix of attendees from various sections, and a total 48 staff members provided input. Ultimately, all sections of the department were represented: maintenance and operations, recreation and cultural services, administration and reservations, aquatics, and planning and development.

These initial meetings included a series of visioning and brainstorming exercises aimed at gathering ideas on how the department can improve and evolve to meet the needs of the community and continue to be a great place to work. Through this process we sought also to identify what changes were needed to both enhance the department's ability to serve the public and to improve job satisfaction for Parks employees.

These meetings generated a wide range of specific ideas and feedback – all of which have been valuable to this process and will be important to the department in future planning. Staff input was synthesized and used to populate a large graphic (see Figure 10 in Chapter 9).

Just as staff input was vital to developing the Parks Vision and Values, it contributed foundationally to establishing the department's priorities. An additional 'All-Hands' meeting took place later in the process to generate specific goals and objectives for the Strategic Plan.

Internal feedback about what is missing, and what can improve the department will continue to be gathered on a regular basis from staff as part of the new Strategic Improvement Cycle.

COMMUNITY INVOLVEMENT

Community input was an integral part of the Strategic Plan process. The people that live in Santa Cruz County care deeply about their parks system; in total over 1,000 people participated in the Strategic Plan process through completing online surveys, attending one or more of the community meetings about the project, or providing comments or feedback in other ways. Strategic Plan outreach included engagement of County communications staff, Board of Supervisors' staff, department staff and members of the Strategic Plan Working Group for assistance in personally contacting various groups of stakeholders, key community organizations and interested community members to solicit their input via the survey and to publicize the community meetings.

Our personal outreach included over 5,000 people at over 200 local organizations with a wide geographic and demographic reach with materials in English and Spanish. Feedback from the community members was the most important consideration in developing each component of the Strategic Plan.

Strategic Plan Staff Meeting

STAKEHOLDER OUTREACH/ONLINE SURVEY

As part of the outreach process, the Parks Department created an open online survey and distributed it widely through the official County website, on Nextdoor in neighborhoods throughout the county, and personal contacts via our distribution lists. The survey was available in both English and Spanish for anyone interested in giving input from April 8 through June 2, 2017. In that time, 802 people responded to the survey. The survey was not intended to statistically represent the county; rather, it was made available to anyone who wanted to participate. Survey responses were completed from all parts of the county.

Figure 9: Words used in the responses to the survey about favorite aspects of Santa Cruz County Parks

Survey objectives included:

- Gauge general knowledge of the County Parks system and inform survey respondents about County Parks' services
- Assess satisfaction with existing County Parks system
- Determine people's priorities for types of improvements to the County Parks system
- Learn generally how survey respondents use, and would like to use, parks facilities, coastal access points, and programs
- Hear people's perceptions of gaps in services/facilities
- Involve the community and help people feel invested in the Strategic Plan process, and in the future of the Parks Department

COMMUNITY MEETINGS

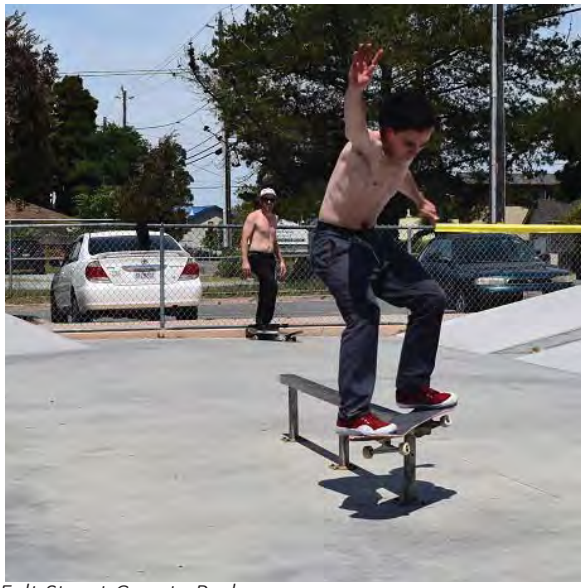
The heart of the engagement process was a series of five community meetings throughout the county on the topic of vision and priorities for the department's Strategic Plan. Over 190 people participated in these meetings, and participants shared a variety of perspectives on their vision and values and their goals for the department. Meetings were held in Ben Lomond, Watsonville, Davenport, Aptos and Live Oak.

The meetings were publicized through individual letters and emails to over 200 stakeholder groups and their membership, publishing in each of the Board of Supervisors' newsletters, posting on both the County's and the Parks Department's website and social media, posting on Nextdoor, posting in the Parks Activity Guide and at parks and community bulletins, distributing flyers to school districts where feasible, and a press release which generated several articles in local media. Outreach materials were provided in English and Spanish.

Community meetings included about an hour and fifteen minutes for public comments. Participants were split into four groups for the comment period, and each group rotated through a series of four stations. Each station was facilitated by staff and/or volunteers and focused on one of four topics, including vision and values, parks and facilities, programs and events, and priorities. Facilitators asked a series of prompts and led a series of exercises with each small group, and all comments were recorded. Spanish translation services were available at each meeting.

Strategic Plan Community Meeting in Live Oak

Polo Grounds County Park in Aptos



Felt Street County Park

CHAPTER 9: KEY FINDINGS

KEY DEPARTMENT NEEDS

Community members and parks staff have provided significant contributions during the Strategic Plan process, describing the needs of the parks system and the needs of the department. Funding constraints are a key limiting factor in the ability to meet these needs. For a discussion on needed funding, see Chapters 6 and 7. This chapter summarizes key findings from staff and the community that identifies the needs for the County Parks Department. These needs form the basis for the development of the goals, objectives and strategies in Chapter 3.

All staff members in the County Parks Department were given the opportunity to give input into the strategic planning process through an initial series of three staff meetings, additional written comments and interviews, and as part of a follow-up mid-year 'All-Hands' meeting, where they were able to prioritize their ideas on ways to improve the department's functioning.

In the course of the initial internal strategic planning meetings, staff was asked to consider both the internal needs of the department and what the community most wants and needs—from the perspective of those who are on-the-ground directly serving the public.

DEPARTMENT NEEDS

Parks staff identified the following most important staff needs:

- **More financial resources to maintain the growing number of parks and facilities:** It has been increasingly challenging for the small number of staff—particularly maintenance staff—to do their jobs while being given increasingly more responsibilities with less time.

- **More training and support:** Staff sees great value in participating in training to develop new skills as well as cross-train and share knowledge within the department. These opportunities could increase staff capacity and efficiency, allow for personal growth and career advancement, and allow the department to retain skilled employees with experience and knowledge.

- **Improved internal communication:** Increasing and improving communications between parks management and staff, and between individual parks staff members, has been a consistent key need raised by staff as part of this process. Ideas for improving communication include technological upgrades for staff such as email and network access, as well as improved communications planning and disseminating information throughout the department.

COMMUNITY NEEDS

Parks staff considered the most important community needs as follows:

- Safe, clean and well-maintained parks facilities
- More programs for youth, especially in underserved communities
- Expanded volunteer opportunities and community involvement
- Better awareness of what the Parks Department offers

The input collected in the course of these meeting was used to fill in a large graphic summarizing the key themes and ideas received from staff (see Figure 10).

Many of the specific actions identified as priorities at the internal staff meetings will be incorporated into our first operational plan and will continue to be referenced as the department moves forward.

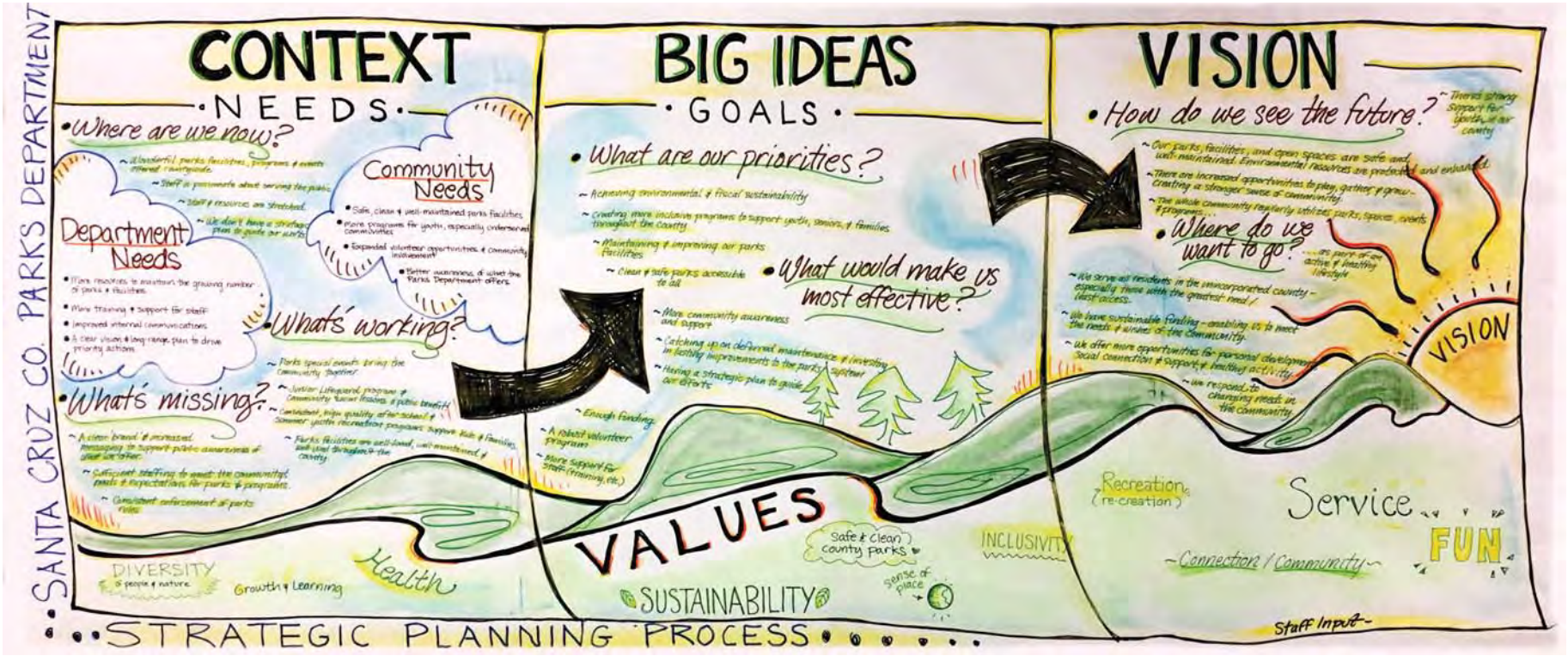


Figure 10: Key Themes and Ideas Received from Staff

Highlights from Graphic Text (Figure 10)

CONTEXT
Needs

Where are we now?

- Wonderful parks facilities, programs & events offered countywide
- Staff is passionate about serving the public
- Staff & resources are stretched

What's working?

- Parks special events bring the community together
- Junior Lifeguard program and community swim lessons a real public benefit
- Consistent, high quality after school & summer youth recreation programs support kids & families
- Parks facilities are well-loved, well-maintained (for the most part) & well-used throughout the county

What's missing?

- Sufficient staffing to meet the community's needs & expectations for parks & programs
- Consistent enforcement of parks rules

BIG IDEAS
Goals

What are our priorities?

- Achieving environmental & fiscal sustainability
- Creating more inclusive programs to support youth, seniors & families throughout the county
- Maintaining & improving our parks facilities
- Clean & safe parks accessible to all

What would make us most effective?

- More community awareness & support
- Catching up on deferred maintenance & investing in lasting improvements to the parks system
- Having a strategic plan to guide our efforts
- Having a robust volunteer program
- More support for staff development

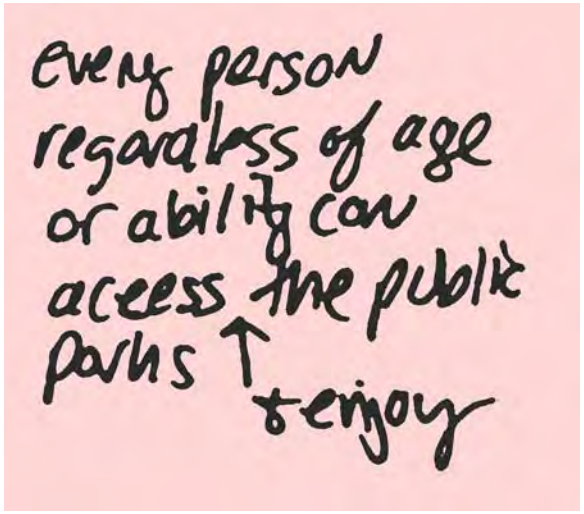
VISION

How do we see the future?

- Our parks, facilities & open spaces are safe & well-maintained. Environmental resources are protected & enhanced
- There are increased opportunities to play, gather & grow – creating a stronger sense of community
- The whole community regularly accesses/utilizes our parks, outdoor spaces, events & programs… as part of an active & healthy lifestyle
- There's strong support for all youth in our County of Santa Cruz

Where do we want to go?

- We serve all residents in the unincorporated county—especially those with the greatest need/least access
- We have sustainable funding—enabling us to meet the needs & wishes of the community… while maintaining what we have
- County residents have more opportunities for personal development, social connection & support & healthy activity
- We respond to changing needs in the community



Vision Statement from Public Meeting

COMMUNITY RESPONSE

The outreach process provided valuable insight into community needs that could be addressed by the County Parks Department. It also clarified priorities and hopes for the future of parks in the county.

In the community conversations, five general themes emerged as being important to community members. These themes include 1) the quality of park experience; 2) opportunities for outdoor recreation; 3) stewardship and protection of open space and natural, cultural and historical resources; 4) accessibility of parks and programs; and 5) engagement of the local community. Generally, these themes are well represented by the number of comments, as shown in Figure 11. However, the most common theme overall was engagement of the local community, which included interest from the community in topics such as programs, outreach, volunteers, events and educational opportunities. Themes are explained below, and the most prominent themes, topics, and comments are summarized in Table 2.

QUALITY OF PARK EXPERIENCE

The community consistently emphasized the need for maintaining and improving the quality of the existing park experience for park visitors. Essential to a positive park experience, things like improving ***safety*** for park users, improving the ***cleanliness*** and availability of restrooms, and ***maintaining aging parks infrastructure*** are of upmost importance. Community members also expressed a need for allocating additional and consistent levels of resources to the parks system to allow improvements and consistent levels of service in times of economic downturn.

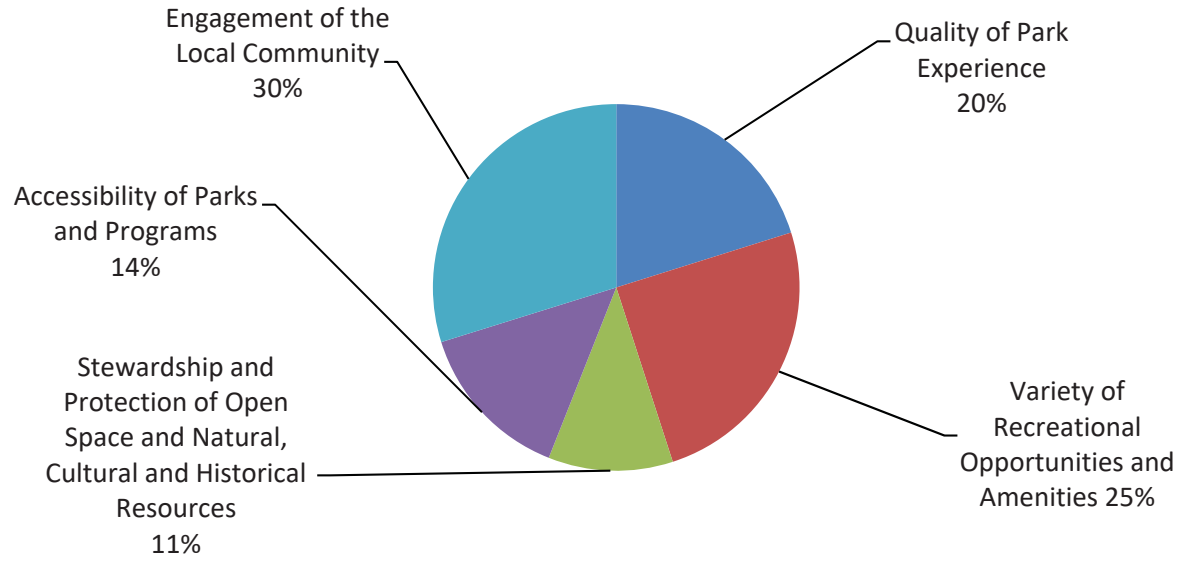
VARIETY OF RECREATIONAL OPPORTUNITIES AND AMENITIES

The parks system needs to provide adequate and appropriate opportunities for both active and passive recreation, and common outdoor spaces and facilities for group activities. Community members expressed a need for a variety of specific activities and new facilities they wished to see within the parks system. These facilities and uses included ***sports facilities, trails, community centers, natural open areas, places to take dogs, additional amenities for youth,*** and other types of parks uses. The range of suggestions reflects the community's diverse needs and their vision for what a healthy lifestyle and improved quality of live mean to them.

STEWARDSHIP AND PROTECTION OF OPEN SPACE AND NATURAL, CULTURAL AND HISTORICAL RESOURCES

Santa Cruz County residents feel strongly about the importance of protecting the natural environment and cultural and historical resources. Particularly, in the parks system, there is a need to ***preserve natural open space*** and to balance the development of recreational facilities with the protection of the environment. There also is a need to improve the ***management*** of natural areas and to restore and enhance natural habitats within the parks system. There is a strong desire to preserve our historical and cultural buildings, sites, landscapes and resources.

Figure 11: Percent of topics raised in comments during public meetings



Greyhound Rock County Park

ACCESSIBILITY OF PARKS AND PROGRAMS

People find accessibility of parks and programs to all people and geographic areas in the county to be a key need. Many comments related to increasing ***equity in park and program distribution*** and access. Another consistent topic is ***universal access*** to facilities for people with various types of abilities. Improving ***connections*** between and to parks to make them more accessible to local neighborhoods is another key need.

ENGAGEMENT OF THE LOCAL COMMUNITY

Locals expressed a desire for more opportunities to engage with and learn about the Parks Department, the parks system and parks programs. The department needs to increase ***outreach*** about offerings, and especially outreach to ***underrepresented communities***. People would like to see more programs, events and volunteer opportunities in the parks and to have better and more accessible information about these opportunities. This would increase individuals' and the community's connection to the parks system. Educational opportunities and particularly ***interpretive programs*** and facilities are important throughout the parks system.

REGIONAL DIFFERENCES

There are specific needs and unique gaps in the park network in each part of the county, and in each of the five meetings, topics that were most important to participants varied. Prominent themes by region are summarized in more detail in Appendix 2.

Table 2: Key Needs Summary

THEME: ***QUALITY*** OF PARK EXPERIENCE

PROMINENT TOPICS:

Safety of park users

Cleanliness of park restrooms and facilities

Local stewardship of parks

Updating and maintaining aging park infrastructure

Adequate and sustainable funding for parks system

Working with other park agencies to provide consistent facilities, hours and regulations

OTHER FREQUENT COMMENTS:

Keeping park facilities operational

Upgrading park facilities to accommodate increases in use

Enforcing park rules

Appropriate resources for maintenance and operations of existing facilities

Consistent park funds that are not significantly reduced in times of economic downturn such as the recession of 2008

Restroom and Concession Building at Polo Grounds County Park in Aptos

THEME: VARIETY OF RECREATIONAL ***OPPORTUNITIES*** AND AMENITIES

PROMINENT TOPICS:

Providing a variety of types of community-serving park amenities

Adapting to provide opportunities for current and future trends in recreation

Opportunities for active and healthy lifestyles

Shared Pickleball, Tennis and Basketball Courts at Brommer County Park in Live Oak

Adding new uses and improvements to existing park properties

Opportunities for people to access open spaces and natural landscapes in the parks system

Partnering with other parks agencies to provide new facilities

OTHER FREQUENT COMMENTS:

Additional sports facilities such as soccer, baseball and softball fields, and basketball, tennis and pickleball courts

Additional pool facilities and programs in underserved areas

Additional trail connections for all types of trail users

Spaces to take dogs

Community centers for programs and events

Youth facilities such as bike jumps and pump tracks, skate parks, adventure courses and climbing walls

Joint use agreements with schools and other agencies to provide public access to park-like facilities during off hours

Table 2: Key Needs Summary (Continued)

THEME:

STEWARDSHIP AND PROTECTION OF OPEN SPACE AND NATURAL, CULTURAL AND HISTORICAL RESOURCES

PROMINENT TOPICS:

Balancing the development of recreational facilities with protection and enhancement of natural, cultural and historical resources

Functional habitat for native flora and fauna

Protecting sensitive biological communities

Protecting natural open spaces in parks

Working with other park agencies to provide consistent facilities, hours and regulations

OTHER FREQUENT COMMENTS:

Connectivity between open spaces and natural areas to maximize benefits to wildlife

Conserving long-term viability of the variety of ecosystems within the county

Allowing natural biological processes to occur and biological systems to adapt to future conditions

Pinto Lake Regional County Park in Watsonville

THEME:

ACCESSIBILITY OF PARKS AND PROGRAMS

Future Site of LEO's Haven, an Inclusive Playground at Chanticleer County Park

PROMINENT TOPICS:

Equitable opportunities for access to parks and programs for all county residents and people with varying economic resources

Universal accessibility to built infrastructure for people of all abilities

Additional neighborhood parks within walking distance of people's homes, especially in underserved areas

Increasing youth programs and bringing them to new locations

OTHER FREQUENT COMMENTS:

Safe pedestrian and bicycle routes to access parks

Public transportation to parks and programs

Signs and materials in both English and Spanish

Shuttle services or other forms of transportation to people who need it to access parks and programs

THEME:

ENGAGEMENT OF THE LOCAL COMMUNITY

PROMINENT TOPICS:

Outreach to all demographics, particularly underrepresented communities

More volunteer opportunities

Additional programs and events

Partnering with community organizations and local cities

Educational opportunities

OTHER FREQUENT COMMENTS:

Relevant publicity of parks, programs and events

Coordination with school districts in publicizing parks and programs

Events for families with activities for multiple age groups

Interpretive programs

Working with neighbors and being respectful to local residents

Strategic Plan Community Meeting in Watsonville

Santa Cruz County Parks
979 17th Avenue
Santa Cruz CA, 95062
Ph: (831) 454-7901 – Fax (831) 454-7940
www.scparks.com

Adopt-A-Beach Permit Application

Please print all information

Thank you for your participation in the Adopt-A-Beach program. Please review this packet, then fill out and sign the application. When the application has been approved, you will receive written confirmation.

Applicant/ Contact Person: _____

Organization Name (if applicable): _____

Address _____

City _____ State _____ Zip Code_____

Day Phone (_____)_____ Cell Phone (_____)_____

Email Address _____ Fax (_____)_____

Requested beach or beach access location(s):

_____

Requested beach clean-up date(s) and times:

_____

Requested materials and quantity needed for beach clean-up (trash and/or recycle bags, gloves, etc.):

_____

Please return the following documentation to the Facilities office after the beach clean-up:

___ Adopt-A-Beach Group Participation Agreement and Indemnification Form (if applicable)
___ Adopt-A-Beach Waiver of Liability and Express Assumption of Risk
(to be signed by all participants, or parent/guardian if under 18)

For more information about the California Coastal Commission's Adopt-A-Beach program, please refer to their website: www.coastal.ca.gov/publiced/aab/aab1.html. Save Our SHores provides additional information about local beach cleanups on their website: http://saveourshores.org/volunteer/adopt-a-beach/.

Disclaimer:

The undersigned states: The information I have provided to Parks is true and correct; If this Permit is issued to a group or entity, I am the authorized representative of the group or entity, and I am empowered to make this agreement on its behalf; I have received a copy of the Terms and Conditions and Assumption, Waiver, and Indemnity documents, and have read and understand them. Both individually and on behalf of the group or entity, I agree to them, and will comply with them as well as all laws and ordinances of the County of Santa Cruz, the State of California, and the United States.

_____ _____
Permitee Signature Date

Department Use Only

Parks Department Approval: _____
Confirmed Date: _____ Contract #_____

ADOPT-A-BEACH GROUP PARTICIPATION AGREEMENT

AND INDEMNIFICATION FORM

WHEREAS_____, and the California

(Group/School Name)

Adopt-A-Beach Program recognize the need and the desirability of litter-free beaches; and

WHEREAS, the California Adopt-A-Beach Program recognizes our group as an adopting school or organization for _____, and

(Adopted Beach)

WHEREAS, our group recognizes the potentially hazardous nature of beach cleanup activities, and desires to protect the health and safety of ie cleanup participants:

Now, therefore, our group agrees to inform cleanup participants of safe methods to use in carrying our beach cleaning activities; and

FURTHER, _____

(Name of Participating Group/School)

agrees to indemnify and hold harmless, the State of California, the California Coastal Commission, the California State Parks, the California State Parks Foundation, all other organizers or sponsors or property owners involved in the Adopt-A-Beach program, and any of their respective employees, officers, agents, or assigns (hereafter collectively referred to as "Released Parties") from any claim of liability for personal injury, property damage, or wrongful death, arising out of, or connected with the group's participation in Adopt-A-Beach activities however caused, including but not limited to the negligence of the released parties, whether passive or active.

FURTHER, our group is aware that during the scheduled beach cleanups, volunteers from outside our groups may be assigned to our group's section of beach, and

FURTHER, our group accepts the responsibility of caring for the beach and promoting awareness in our community of the problems caused by marine debris and the need for protecting coastal and ocean resources for a period of one year, beginning _____, 20 _____, with cleanups scheduled on the following dates:

1st _____ 2nd _____ 3rd _____

Signed_____

(Authorized Group Leader/School Official)

GENERAL INFORMATION

Name of Group _____

Contact Person _____

Address _____

Phone (w) _____ (h) _____

Approximate number of people in the group _____

Beach Manager _____

ADOPT-A-BEACH WAIVER OF LIABILITY AND EXPRESS ASSUMPTION OF RISK

(PLEASE READ CAREFULLY)

I, _____, HEREBY CERTIFY THAT IAM AWARE OF THE INHERENT HAZARDS OF A BEACH CLEANUP.

I agree as follows: 1. I am volunteering my services for the Adopt-A-Beach program ("the Event") on a voluntary basis without ant of payment of any kind; 2. I will perform assigned tasks that are within my physical capability to the best of my ability, and I will not undertake tasks that are beyond my ability; 3. I am familiar with the safe operation and use of equipment and tools that I may utilize in connection with this volunteer activity, and I will not undertake to use any equipment or tools with which I am unfamiliar or do not know how to operate safely; 4. I acknowledge that I have received and read appropriate instruction regarding this Event, including appropriate safety and emergency procedures, and that I fully understand those instructions and that I agree, after proper inspection, to use only the supplies, tools and equipment provided by the Event organizers; 5. 1 will perform only those tasks assigned, observe all safety rules, and use care in the performance of my assignments; 6. I specifically acknowledge that I am engaging in this activity as a volunteer, at my own request and risk, and not as a State of California or Foundation employee, agent, official, officer or representative, and further acknowledge that I am not entitled to any compensation, benefit or insurance coverage from the State of California, the Department of Parks and Recreation, the California Coastal Commission, the California State Parks Foundation, the County of Santa Cruz Parks, or any Event promoter or sponsor, nor will I make any such claim,

I understand and agree that neither the State of California, California Coastal Commission, California Department of Parks and Recreation, California State Parks Foundation, the County of Santa Cruz Parks, nor any other organizers or promoters or sponsors or property owners involved in this event, nor any of their respective employees, officers, agents or assigns, (hereinafter collectively referred to as "Released Parties"), may be held liable or responsible in any way for any injury, death or other damages to me or my family, heirs, or assigns that may occur as a result of my participation in this activity, or as a result of product liability or the negligence of any party, including Released Parties, whether passive or active.

I understand that cleaning up beaches and waterfront areas involves certain inherent risks, 'including but not limited to, the risks of possible injury, infection or loss of life as a result of contact with needles, condoms, metal objects, burning embers or other hazardous materials found on the bench, or from over-exertion or environmental conditions. Despite these risks, I still choose to proceed in such activity. I know of no physical limitation which should keep me from undertaking the activities associated with this Event. In Consideration for being allowed to participate in this activity, I hereby personally assume all risks in connection with the Event for any harm, injury or damage that may befall me as a participant, including all risks connected therewith, whether foreseen or unforeseen. I further save and hold harmless said activity and Released Parties from any claim or lawsuit for personal injury, property damage, or wrongful death, by me, my fa state, heirs, or assigns, arising out of participation in this activity, including both claims arising during the activity and after I complete the activity.

If I should become injured while participating in the Event, I authorize any physician or surgeon licensed in the State of California to perform emergency or surgical treatment as in his or her sole judgment may be necessary. I further declare that I am eighteen and legally competent to sign this liability release, or that I have acquired the written consent of my parent or guardian. I understand that the terms herein are contractual and not a mere recital, that this instrument is a legally binding, and that I have signed this document of my own, free act.

BY THIS INSTRUMENT I DO HEREBY EXEMPT AND RELEASE ALL "RELEASED PARTIES," AS DEFINED ABOVE, FROM ALL LIABILITY OR RESPONSIBILITY WHATSOEVER FOR PERSONAL INJURY, PROPERTY DAMAGE OR WRONGFUL DEATH, HOWEVER CAUSED, INCLUDING NEGLIGENCE OF THE RELEASED PARTIES, WHETHER PASSIVE OR ACTIVE.

I HAVE FULLY INFORMED MYSELF OF THE CONTENTS OF THIS LIABILITY RELEASE AND ASSUMPTION OF RISK BY READING IT BEFORE I SIGNED IT ON BEHALF OF MYSELF AND MY HEIRS.

_____	_____	_____	_____
Spelling of Participant's Name	Date	Address	Phone
_____		_____	
Signature of Participant		Address	

IF PARTICIPANT IS UNDER 18, THE PARENT(S) (OR GUARDIAN(S), IF ANY) MUST SIGN.

The above participant has my permission to participate in the Adopt-A-Beach program. I have read and agree to the provisions stated above. I know of no health limitations which may restrict this volunteer's participation in this activity.

_____	_____	_____	_____
Signature of Parent(s) or Legal Guardian(s)	Date	Phone	Address
_____	_____	_____	_____
Signature of Parent(s) or Legal Guardian(s)	Date	Phone	Address

Santa Cruz County Parks
979 17th Avenue
Santa Cruz CA, 95062
Ph: (831) 454-7901 – Fax (831) 454-7940
www.scparks.com

Outdoor Facility Conditions of Use

Hours: Parks facilities may be reserved daily between 10:00 AM - Dusk. Outdoor facilities must be reserved for a minimum of 2 hours Monday through Friday, and 8 hours Saturday, Sunday and Holidays. The hourly rate may be applied to reservations made within 21 days of the desired date.

Reservations: Reservations are made on a first come, first served basis and can be made up to one year in advance. Minors are not eligible to reserve facilities. Full payment is required when the reservation is made.

Alcohol: Alcohol consumption is not permitted in the County Parks outdoor facilities.

Sound Permit: Public address systems, electronic equipment, live music and amplification are subject to certain restrictions determined by individual facilities. A Sound Permit is required for any event using these devices.

Time Limits: Entrance to the facility is limited to the time approved on the permit. If time limits are exceeded, the permittee will be charged an overtime rate of 1-1/2 times the hourly rental rate.

Cancellations: Reservations may be cancelled in person or in writing not less than 14 days prior to the scheduled event, with a permit processing fee of $100.00 or 50% of the permit fee, whichever is less. Cancellations of less than 14 days receive no refund of fees. Refunds are not given for inclement weather.

Damage: Permittee is responsible for damage or injury to County facilities and equipment. Damage or injury not covered by the amount of the deposit will be invoiced. Labor to repair the facility is charged at current maintenance staff hourly rate. Bills unpaid after 30 days are sent to collections.

Set-up and Clean-up: Permittee is responsible for set-up and clean up of the premises. Please leave facilities and grounds free of debris and other refuse from use. Trash and recyclables must be placed in appropriate containers. The facility must be restored to pre-use conditions.

Decorating: Poster tape and florist wire are the only fasteners permitted. No staples, tacks, nails, or stakes longer than 6 inches please! Release of balloons, birds or butterflies is prohibited by Parks policy. Biodegradable confetti only; no rice throwing.

Activities for Minors: Groups comprised predominately of participants under 21 years of age must be chaperoned at a ratio of one adult (over 21 years) to 12 minors.

No Overnight Storage: If you choose to bring rental equipment, you must arrange for it to be delivered and removed the same day as your reservation.

Flammable Materials: Flammable materials, including candles, are not permitted. Fuels and hazardous materials are not permitted in the park buildings and facilities. Fires must be confined to fireplaces and barbecue areas.

Smoking: Smoking and tobacco products are prohibited in Santa Cruz County Parks.

Checks and Charge Backs: Credit card charge backs and checks returned for insufficient funds will be charged at the current processing fee. Please note that credit cards are charged by Santa Cruz County.

Changes to the Permit: Any changes to the permit must be made in writing by the permittee only. Changes may result in a change in the permit fee. Date changes are subject to a $50.00 change of date fee. No changes will be made with less than one week notice.

Sub-Lease: Permittee shall not assign or sub-lease any portion of the premises, or any rights under approved permit, without prior written approval of the Department.

Special Conditions: For large, special or unique events, the department may require Permittee to provide additional services, including security, traffic control, first aid services, fire control, special trash collection, and sanitary facilities beyond those available by the Department.

Concessions: The County reserves sole right to control all concessions in and about department buildings and park facilities through separate agreements. Please inquire about concessions agreements if you are planning on selling items or food in the Parks.

Insurance Requirements: Groups charging admission and/or selling alcoholic beverages must furnish the department with a Certificate of General Liability and Property Damage Insurance (one million dollars per occurrence) holding the County as additionally insured. The department may also require insurance for activities that it deems to be high risk.

Deposits: Deposits may be required. If facilities are left in pre-use conditions, the full deposit will be returned. If facility/equipment is damaged, costs to return facility to pre-use condition will be subtracted from the deposit. Refunds will be mailed approximately four weeks following the event.

Public Use: You are reserving a space at a County Park and the park will remain open for use by others. At some parks there may be other events happening at the same time as yours.

Lost Items: The Parks Department is not responsible for items left.

Thank You For Choosing Santa Cruz County Parks

ASSUMPTION OF LIABILITY, WAIVER and INDEMNITY

1. ASSUMPTION OF LIABILITY

Permitee, whether individual, group, or entity, is solely responsible for any and all liabilities to persons or property resulting from use of the Park Facility, including damage to any County property or structures. Permittee will indemnify, defend and hold harmless the County of Santa Cruz, its elected and appointed Boards, Commisions, Officers, Agents, and Employees from any claims, suits, losses or damages for injury to persons or property arising from or connected to this use of the Park Facility.

2. AGREEMENT TO ABIDE BY TERMS AND CONDITIONS

Permittee, whether individual, group, or entity, represents that he/she/it has read these Terms and Conditions, agrees to make them known to persons attending the function or activity, and agrees that no violation of such shall be allowed to occur on the premises or facilities. Permittee understands that permission to use of the Park Facility is contingent upon compliance with these Rules and Regulations (Terms and Conditions) and that permission may be revoked at any time upon failure of persons attending the function or activity to fully comply with these Rules and Regulations (Terms and Conditions).

3. PERMITTEE, OR REPRESENTATIVE, TO BE PRESENT

Permittee, or the group or entity individual named in the Permit, will be present during the entire period of use of the facility.

Coastal Access

NORTH COUNTY:
Greyhound Rock(pictured above) - On HWY1 north of Scott Creek, it has a paved pedestrian access to beach, picnic tables, a large parking lot, memorial benches and a disabled accessible view platform.
Scott Creek Beach - Snowy Plover nesting habitat area.
Davenport Landing(pictured above) - Disabled accessible ramp to beach and restrooms, improved shoulder parking.
Bonny Doon - On HWY1 where Bonny Doon Road ends it has 45 parking spaces, a bus stop and an improved trail head.

MID COUNTY:
Pleasure Point - At the end of 41st Ave "The Hook" is a popular surfing spot, it has picnic tables, a parking lot and restrooms.
Rockview Drive - Near end of 30th Ave, has a picnic table.
12th Avenue - Has coastal stairway.
13th Avenue - Has coastal stairway.
20th Avenue - Has coastal stairway.
21st - 23rd Avenue - Access only
26th Avenue - Access only
35th Avenue - Has coastal stairway.
38th Avenue - Has coastal stairway.

SOUTH COUNTY:
Hidden Beach- Also a park, has paved pedestrian access to beach.
Via Concha Ave. - Has coastal stairway.
Via Gaviota Ave. - Has coastal stairway.
Via Palo Alto Ave. - Has coastal stairway.
Dolphin at Sumner - One of the most beautiful access spots, this access trail leads under a train tressel to a stairway leading to the beach.

Garden Plots

Garden plots are located at Jose Avenue Park, Felt Street Park, the future park site of Chanticleer Park, which are located in Live Oak, and The Farm Park in Soquel. Garden plot contracts are annual and currently cost (effective July 1, 2018) $65 resident / $70 non-resident for the year (fees are subject to change). Availability varies per park. If there are no garden plots currently available to rent, your name can be added to a waitlist and will be selected in the order of sign-up in the Spring as plots become available. Email waitlist requests may be sent to reservations@scparks.com which should include your name, address and contact information. When new community garden parks open we will select from a lottery of the existing waitlist. Our brochure is attached below for more information.

Garden Plot Brochure

Santa Cruz County Department of Parks, Open Space and Cultural Services
979 17th Avenue, Santa Cruz, CA 95062
General Information (Monday-Friday, 9:00 a.m. - 4:00 p.m.)
Phone: (831) 454-7901 • PRCweb@santacruzcounty.us

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Surf Schools

Learn to surf in iconic Pleasure Point!

Santa Cruz County Parks is pleased to offer surf lessons through the Surf School Concessionaire Program, where you can learn to surf with permitted, professional, local surf schools.

Club Ed
www.club-ed.com
(831) 464-0177
surf@club-ed.com

Richard Schmidt Surf School Inc.
www.richardschmidt.com
(831) 423-0928
surf@richardschmidt.com

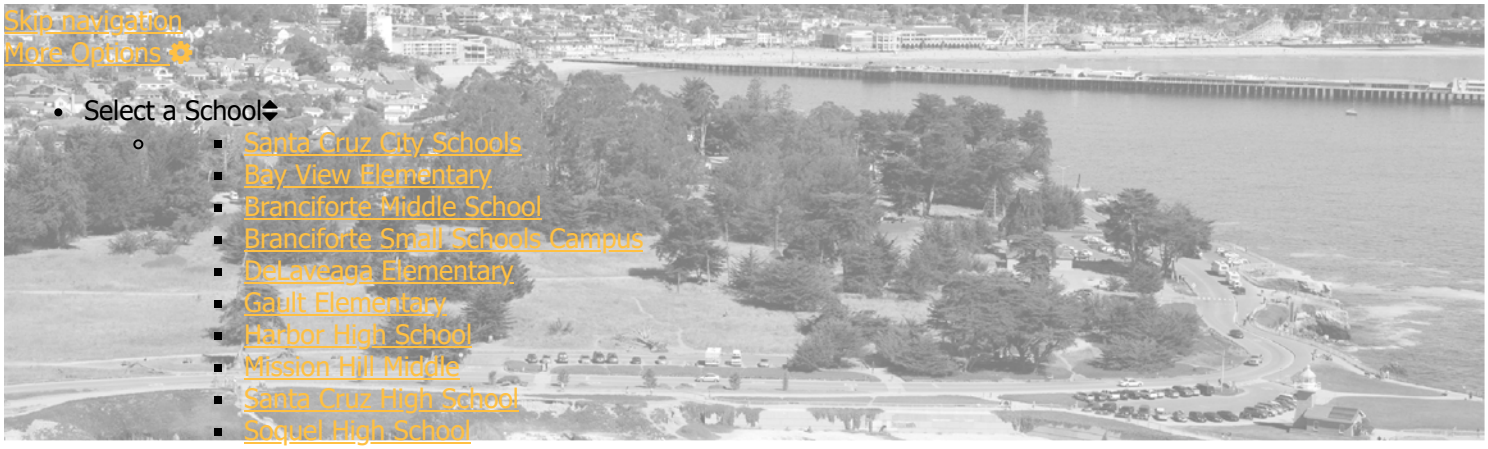
Surf School Santa Cruz
www.surfschoolsantacruz.com
(831) 428-3647
bud@surfschoolsantacruz.com

Surf School Concessionaire Program
East Cliff Parkway in Live Oak

A permit is required to conduct surf instruction at designated beaches and coastal access points along East Cliff Parkway at Pleasure Point, 36th Avenue, 38th Avenue, and The Hook, per Santa Cruz County Code Section 10.80.010.

The three permitted surf schools provide services that preserve public safety, maximize recreational use by all beach visitors, and maintain quality surfing instruction opportunities for the public.

All surf schools are required to have their students and instructors wear colored uniform shirts or vests while conducting surf school instruction. Permitted surf school with their vest colors are as



SANTA CRUZ CITY SCHOOLS

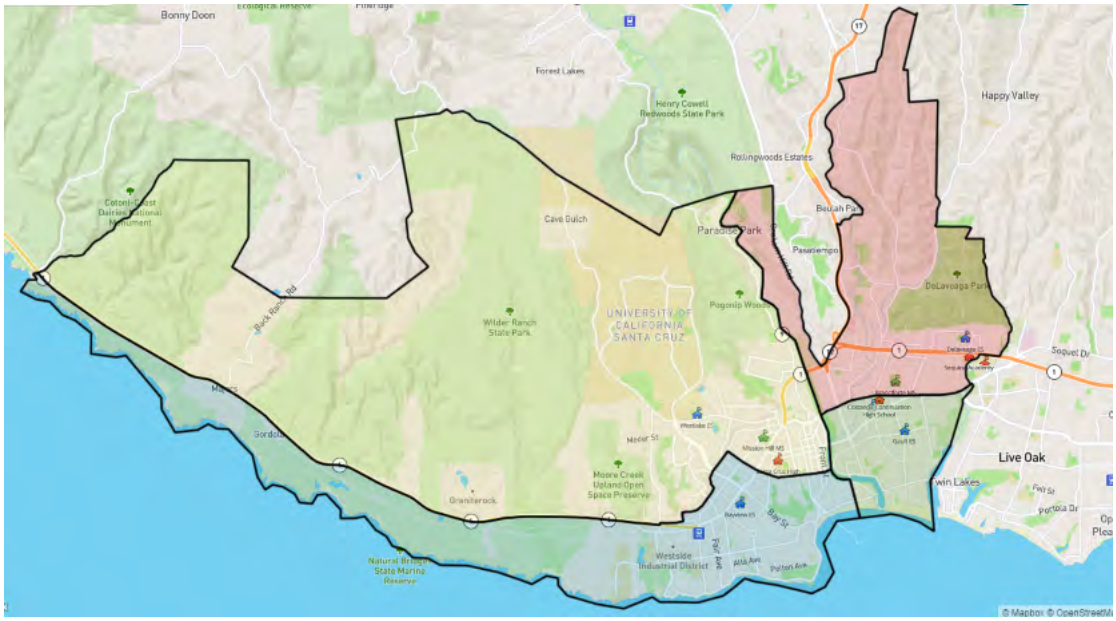
133 Mission Street Suite 100
Santa Cruz, CA 95060
Phone (831) 429-3410 | Fax (831) 429-3439

District Boundary Maps

To find your neighborhood school, please use My School Locator

New Elementary Boundary Map 2020

To determine your neighborhood elementary school, please visit My School Locator



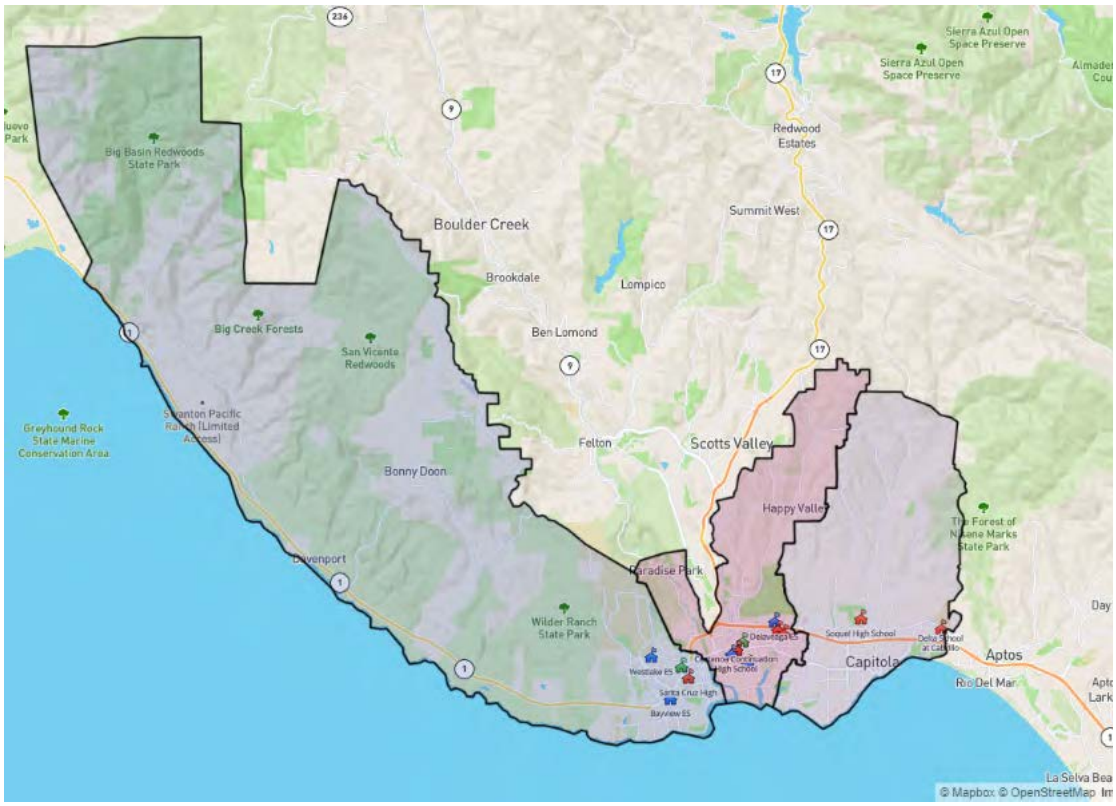
Middle School Boundary Map

To determine your neighborhood middle school, please visit My School Locator

High School Boundary Map

To determine your neighborhood high school, please visit My

School Locator



Santa Cruz City Schools does not discriminate on the basis of race, color, national origin, sex, age, or disability in admission to its programs, services, or activities, in access to them, in treatment of individuals, or in any aspect of their operations. The lack of English language skills shall not be a barrier to admission or participation in the district's activities and programs. Santa Cruz City Schools also does not discriminate in its hiring or employment practices.

Our vision is to create and support a learning environment that challenges and enables students to achieve their highest potential.

Santa Cruz City Schools

133 Mission Street Suite 100
Santa Cruz, CA 95060
Phone (831) 429-3410 | Fax (831) 429-3439

Website by SchoolMessenger Presence. © 2021 West Corporation. All rights reserved.

Santa Cruz City Schools

532 Center Street, Santa Cruz, California 95060, ...

MY SCHOOL LOCATOR

Showing Results for:

532 Center Street, Santa Cruz, California 95060, United States

Explore the map:

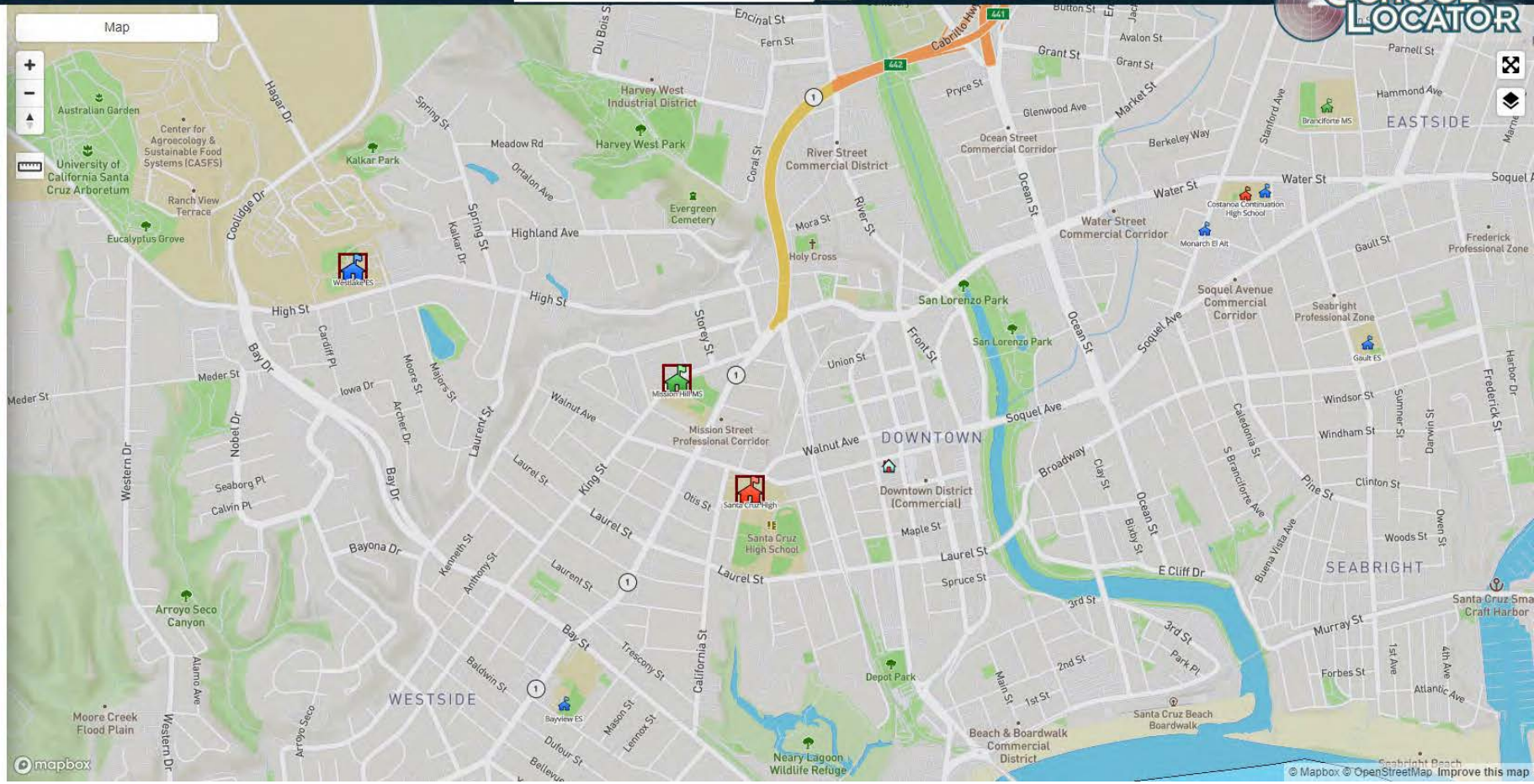
Top Left side Controls:

Top Right side Controls:

Browse assigned Schools:
Click on a school below to popup info on the map

- Westlake ES (K - 5)
  1000 High Street
  Santa Cruz, CA 95060
- Mission Hill MS (6 - 8)
  425 King Street
  Santa Cruz, CA 95060
- Santa Cruz High (9 - 12)
  415 Walnut Avenue
  Santa Cruz, CA 95060

Legend:
Elementary Middle High



Santa Cruz City Schools

532 Center Street, Santa Cruz, California 95060, ...

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Showing Results for:

532 Center Street, Santa Cruz, California 95060, United States

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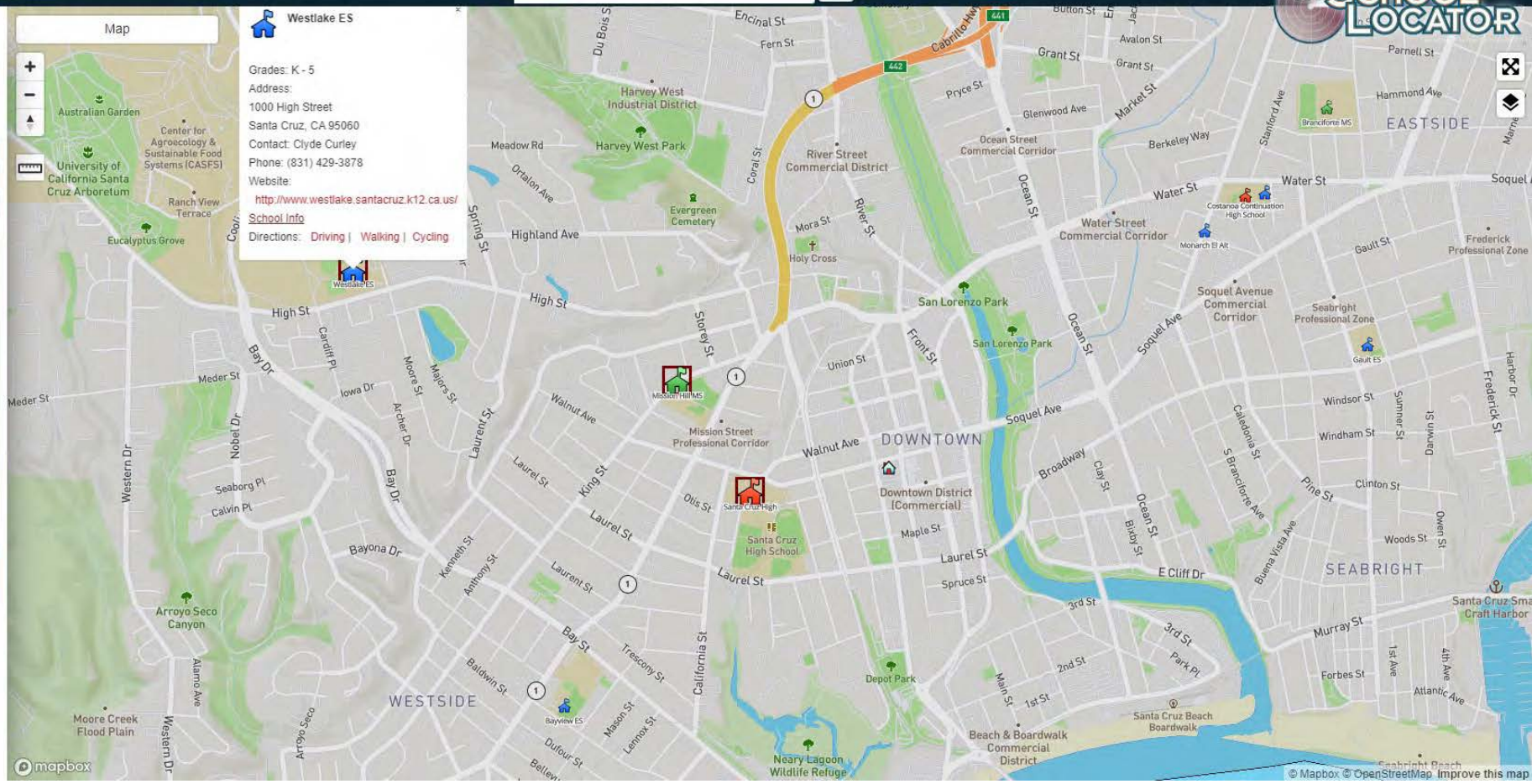
  Santa Cruz, CA 95060
- Santa Cruz High (9 - 12)
  415 Walnut Avenue
  Santa Cruz, CA 95060

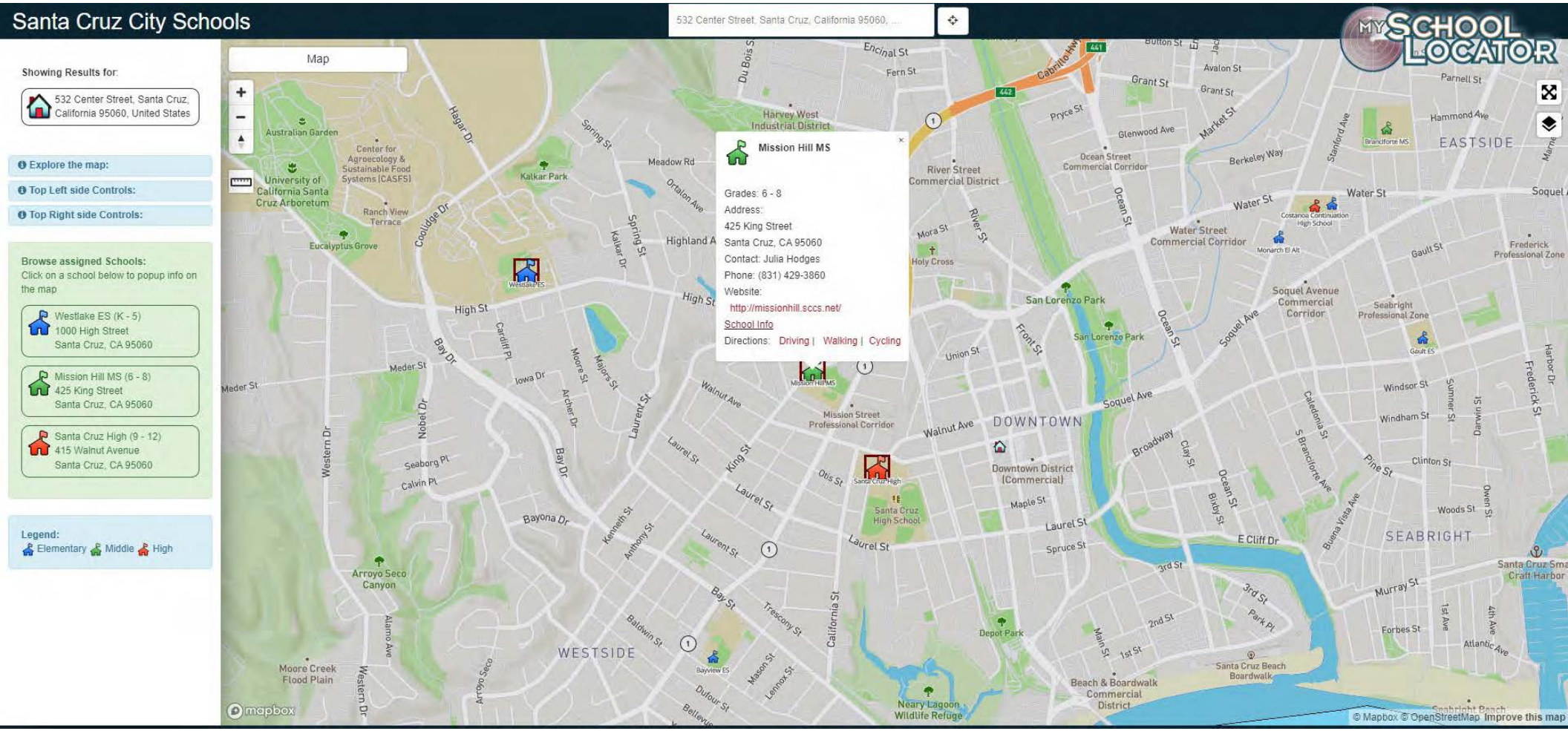
Legend:
Elementary Middle High

Map

Westlake ES

Grades: K - 5
Address:
1000 High Street
Santa Cruz, CA 95060
Contact: Clyde Curley
Phone: (831) 429-3878
Website:
http://www.westlake.santacruz.k12.ca.us/
School Info
Directions: Driving | Walking | Cycling




Santa Cruz City Schools
532 Center Street, Santa Cruz, California 95060, ...
MY SCHOOL LOCATOR
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Mission Hill MS (6 - 8)
425 King Street
Santa Cruz, CA 95060
Santa Cruz High (9 - 12)
415 Walnut Avenue
Santa Cruz, CA 95060
Legend:
Elementary Middle High
Map
Mission Hill MS
Grades: 6 - 8
Address:
425 King Street
Santa Cruz, CA 95060
Contact: Julia Hodges
Phone: (831) 429-3860
Website:
http://missionhill.sccs.net/
School Info
Directions: Driving | Walking | Cycling
DOWNTOWN
WESTSIDE
EASTSIDE
SEABRIGHT
Harvey West Industrial District
River Street Commercial District
Ocean Street Commercial Corridor
Water Street Commercial Corridor
Soquel Avenue Commercial Corridor
Seabright Professional Zone
Mission Street Professional Corridor
Downtown District (Commercial)
Beach & Boardwalk Commercial District
Frederick Professional Zone
Santa Cruz High School
Westlake ES
Mission Hill MS
Bayview ES
Costanoa Continuation High School
Monarch El Alt
Branciforte MS
Gault ES
Holy Cross
San Lorenzo Park
Depot Park
Santa Cruz Beach Boardwalk
Neary Lagoon Wildlife Refuge
Arroyo Seco Canyon
Moore Creek Flood Plain
Kalkar Park
Eucalyptus Grove
University of California Santa Cruz Arboretum
Australian Garden
Center for Agroecology & Sustainable Food Systems (CASFS)
Ranch View Terrace
Meadow Rd
Highland A
High St
Meder St
Walnut Ave
Laurel St
Soquel Ave
Water St
Union St
Front St
Ocean St
River St
Broadway
Pine St
Clinton St
Windsor St
Windham St
Maple St
Spruce St
E Cliff Dr
Murray St
Forbes St
Park Pl
Main St
Bay St
Bay Dr
Western Dr
Nobel Dr
Seaborg Pl
Calvin Pl
Bayona Dr
Kenneth St
Anthony St
Trescony St
California St
Baldwin St
Mason St
Lennox St
Dufour St
Bellevue
Hagar Dr
Spring St
Coolidge Dr
Kalkar Dr
Ortalon Ave
Cardiff Pl
Iowa Dr
Moore St
Majors St
Archer Dr
Otis St
Alamo Ave
Arroyo Seco
Du Bois St
Encinal St
Fern St
Cabrillo Hwy
Grant St
Pryce St
Glenwood Ave
Market St
Berkeley Way
Stanford Ave
Hammond Ave
Parnell St
Avalon St
Gault St
Soquel
Harbor Dr
Frederick St
Sumner St
Owen St
Woods St
1st Ave
4th Ave
Atlantic Ave
Caledonia St
S Branciforte Ave
Buena Vista Ave
Clay St
Bixby St
Ocean St
Water St
Mora St
Santa Cruz Small Craft Harbor
Seabright Beach
mapbox
© Mapbox © OpenStreetMap Improve this map

Santa Cruz City Schools

532 Center Street, Santa Cruz, California 95060, ...

MY SCHOOL LOCATOR

Showing Results for:

532 Center Street, Santa Cruz, California 95060, United States

Explore the map:

Top Left side Controls:

Top Right side Controls:

Browse assigned Schools:
Click on a school below to popup info on the map

- Westlake ES (K - 5)
  1000 High Street
  Santa Cruz, CA 95060
- Mission Hill MS (6 - 8)
  425 King Street
  Santa Cruz, CA 95060
- Santa Cruz High (9 - 12)
  415 Walnut Avenue
  Santa Cruz, CA 95060

Legend:
Elementary Middle High

Map

Santa Cruz High

Grades: 9 - 12
Address:
415 Walnut Avenue
Santa Cruz, CA 95060
Contact: Karen Edmonds
Phone: (831) 429-3960
Website:
http://schs.sccs.net/
School Info
Directions: Driving | Walking | Cycling

Resource Recovery - Garbage/ Recycling/ Sweeping

Resource Recovery collection rates are based on the refuse container size (volume) and the frequency of collection.

Current Collection Rates and Services

Sign up for refuse service here

Resource Recovery and Recycling Organizational Chart 2014 [PDF]

- Residential Services -**Learn about all the services included in your Garbage Bill-** (PDF)
- Business Services
- Resource Recovery Facility/Land ll/Recycling Center
- Recycling and Waste Reduction/Recycle guide, videos

- Electronic Waste (e-Waste)
- Household Hazardous Wastes
- Organics Diversion Programs

Helpful guides, brochures and newsletters:

Refuse & Recycling Newsletter 2022 [PDF]

EASY Curbside Recycling Guide [PDF]

Complete Curbside Recycling Guide [PDF]

Household Hazardous Waste [PDF]

Carpet Recycling Brochure [PDF]

Motor Oil Recycling Guide

Resource Recovery Facility

General Information about the Dimeo Lane Resource Recovery Facility

The **Resource Recovery Facility (RRF)** includes a sanitary landfill, recycling center, yard waste drop-off, construction & demolition (C&D) drop-off and Household Hazardous Waste Drop-Off.

Location:
The City of Santa Cruz Resource Recovery Facility and Recycling Center is located at 605 Dimeo Lane, 3 miles north of the City limits off of Highway 1.

The RRF is open to City of Santa Cruz residents and businesses. North County residents may use the facility but must pay a 28% surcharge above the established rates. ID is required.

Residents of the City of Santa Cruz who need to self-haul materials from their home to the landfill must be prepared to provide proof of residency (driver's license and municipal utility bill or similar document with a City address) to the gate house attendant.

Businesses hauling materials which were generated within the City of Santa Cruz may use the RRF/landfill. Businesses must be prepared to provide proof that the materials came from within the City limits. A typical way to provide proof would be to present a signed and dated letter or contract from the property owner or manager where the materials were generated, indicating that the business has been hired to haul those materials.

Hours:

The Resource Recovery Facility and Recycling Center are open Monday through Saturday 7:30 a.m. to 3:30 p.m. and closed on Sundays, and the following holidays:

Days and times RRF is closed

Closed	Sundays
Closed	Thanksgiving Day
Closed	12 noon • December 24 (Christmas Eve)
Closed	December 25 (Christmas Day)
Closed	12 noon • December 31 (New Year's Eve)
Closed	January 1 (New Year's Day)

FEES: Current RRF rate schedule: Resource Recovery Facility Fees **[PDF]**

Note: City residents and businesses are permitted to use the County of Santa Cruz-Buena Vista Landfill and Ben Lomond Transfer Station. A surcharge of 28% will be added to regular county disposal fees. City residents may drop-off "non-fee" recyclable material without charge and use Household Hazardous Waste Drop-off centers at County facilities.

Treated Wood Waste (TWW)

On August 31, 2021, Governor Newsom signed Assembly Bill 332 and the bill takes effect immediately. AB332 adopts new Alternative Management Standards (AMS) for treated wood waste that are codified in Health and Safety Code section 25230. As a result of the chaptering of the bill, all treated wood waste variances issued by DTSC since March 2021 are now inoperative and have no further effect. The variances are no longer necessary because they have been replaced by the AMS. The new AMS are similar to the rules that applied under the variance program, except that no variance is required.

Assembly Bill 332 (AB 332) restores the alternative management standards for treated wood waste. As a result variances are no longer needed for disposal facilities, handlers, and generators of treated wood waste. A link to the new statute language is found below:

- AB 332 Text

Fact Sheet and Other Information

DTSC has developed a fact sheet to help generators and handlers understand what the new requirements are for the alternative management standards for treated wood waste. A link to the new fact sheet and list of landfills approved to accept TWW are found below:

- Requirements for Generators and Handlers of Treated Wood Waste – September 2021 Fact Sheet
- List of Landfills approved by the Waterboard to accept TWW- The City of Santa Cruz Landfill is on the list approved by the Waterboard

For Questions on Treated Wood Waste: Call 831-420-6108

Household Hazardous Waste - Drop-Off Center:
Household Hazardous Waste is accepted only on Saturdays from 7:30 a.m. to 3:30 p.m.

Trash Disposal

The City operates and maintains the sanitary landfill for use by City refuse operations and private individuals and businesses. The City ensures that the landfill meets all state and federal regulatory requirements, and operates and performs field maintenance on equipment and pumps used at the landfill.

Recycling Center Processing

The City operates and maintains the recycling drop-off and processing center at the Dimeo Lane Resource Recovery Facility. Recyclable items such as mixed paper, cardboard, plastic, metal, glass, used oil, E waste and appliances are accepted, sorted and processed. All recycled material is sold to commercial markets.

Recycling Center - Drop Off

Yard Waste

Mattress Recycling

Carpet Recycling [PDF]

Household Hazardous Waste [PDF]

Questions?

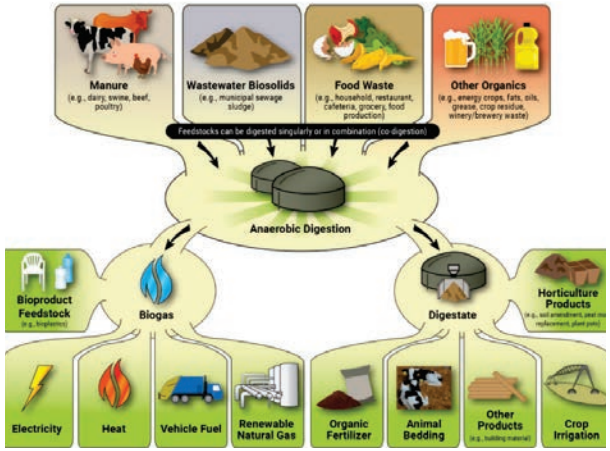
- For questions regarding curbside recycling or trash collection call City of Santa Cruz Customer Service at 831-420-5220 or email.

For more information please contact:

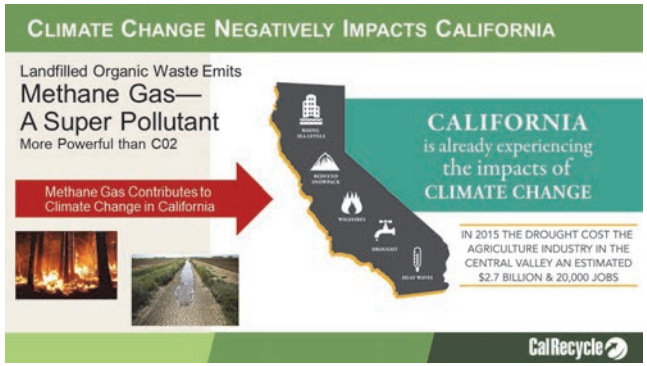
Superintendent of Resource Recovery Facility
831-420-6273

Why Do We Need Mandatory Organics Recycling?

An important part of California's efforts to protect the environment is to increase the diversion of organic materials away from landfills and toward the production of value-added products such as compost, fertilizers, and biofuels.



By using organics for compost, energy creation, and recovering edible food for hungry community members, we are helping to slow the impacts of climate change.



Have Questions?

Resource Recovery Staff are available to assist you in the following ways.

- Identify opportunities that ensure your business is in full compliance with these state-required mandates.
- Help you find compatible food recovery organizations.
- Provide employee training & signage
- Conduct a waste audit to ensure you have the appropriate level of service.

Call or Email Resource Recovery
(831) 420-5377
Organics@cityofsantacruz.com

More Information

City of Santa Cruz: Resource Recovery
https://www.cityofsantacruz.com/organics

State Level: CalRecycle
Mandatory Recycling:
https://www.calrecycle.ca.gov/recycle/commercial

Mandatory Organics :
https://www.calrecycle.ca.gov/Recycle/Commercial/Organics/

To sign-up for organics collection service: Contact Customer Service at (831) 420-5220 or at scmu@cityofsantacruz.com.

CITY OF SANTA CRUZ

State Mandated Recycling and Organics Compliance Guide For Businesses

RECYCLING LAWS

AB 341-*Mandatory Commercial Recycling*

Requires all commercial businesses and public entities that generate two cubic yards or more of waste per week to have a recycling collection program in place.

AB 1826- *Mandatory Organics Recycling*

requires businesses that generate two cubic yards or more of commercial solid waste per week (total for trash, recycling, and organics) a specified amount of organic waste per week to arrange for organic waste recycling services for that waste.

AB 827- *Customer Access to Recycling*

This bill Requires commercial waste and organics generators to provide customers access to a recycling bin or an organic waste recycling bin to collect materials purchased on the premises.

Keeping recyclable and compostable materials out of the garbage is an excellent first step toward cost savings and improved operational efficiency.

SB 1383- *California's Short-Lived Climate Pollutants Reduction Strategy*

Goes into effect January 1, 2022, and builds on AB1826. It Requires every business and resident in California to separate and divert organics, including food scraps, from the landfill. The State's goal is to reduce organics disposal by 75% and recover and redirect 20% of edible food currently landfilled by 2025.

Next Steps for your business

- **Subscribe** to the organic waste collection service offered by the City. Resource Recovery Staff are available to assist you in determining the appropriate level of service.

- **Educate and Sort**- Businesses shall annually provide information to employees, contractors, tenants, and customers about waste diversion requirements and about the proper sorting of waste. Businesses must prohibit their employees from placing organic waste and recyclables in the wrong bins.

- **Monitor Contamination**- Businesses are responsible for making sure that their organic waste and recycling is sorted properly by performing regular inspection of their recycling and organics bins for contamination, and reminding employees about proper sorting.

SB1383 requirements beginning January 1, 2022 for "Tier 1" Commercial Food Generators.

"Tier 1" Commercial Edible Food Generators" defined as supermarkets, grocery stores with 10,000+ square feet, food distributors or, wholesale food vendors

- **Recover and Redirect** the maximum amount of Edible Food to organizations that work to feed people. will need to work with Food Recovery Organizations to comply with the following:
- **Establish written agreements/contracts** with Food Recovery Establishments to record, report, and track recovered and redirected food.

"Tier 2 Commercial Edible Food Generators" who do not fall into the Tier 1 definition will be required to comply with edible food recovery regulations on January 1, 2024.

For assistance with the above requirements or to find out if you are a Tier 1 or Tier 2 commercial food generator, please call Waste Reduction staff at 831-420-5991.

While the requirements of SB1383 are State mandated, the City is required to enforce compliance. Therefore, penalties for noncompliance may apply.

Wastewater System

Our short video provides an important reminder to help prevent unsanitary sewer overflows during the current pandemic and always: in English; en español.

Our **Santa Cruz Wastewater Treatment Facility** provides quality of life service to the community while helping to reduce the City's carbon footprint and protecting the environment as demonstrated in this video. We welcome you to a 2020 virtual tour of our facility led by our Operations staff in English or español. You can also learn more about us in our latest edition of Neighborhood News.

The Santa Cruz Wastewater Treatment Facility is proud to have been awarded 2020 Collection System of the Year (Small) from the California Wastewater Environment Association-Monterey Bay Section. Previous honors include 2013 Best in State Plant of the Year (Medium) and four 2017 California Water Environment Association-Monterey Bay Section awards: Overall Plant of the Year, Plant of the Year (Medium), Collections Person of the Year and Operator of the Year. We received second place for California Wastewater Environment Association 2017 Best in State Plant of the Year (Medium).

Santa Cruz Plant Honored as Best Wastewater Treatment Facility in California. This award honors exceptional California treatment plants and collection systems. It is based on a review of infrastructure, management practices and compliance records.

We have also been honored for our energy-saving achievements:
EPA Recognizes Santa Cruz Wastewater Treatment Facility for Its Green Power Accomplishments

The history and processes of the Wastewater Treatment Facility and our use of recycled wastewater are outlined in this presentation by Public Works Director Mark Dettle.

Purpose and Functions (37 Employees)
Organization chart [PDF]

Wastewater Treatment Facility
Operates and maintains a regional wastewater treatment and disposal facility. Wastewater treatment and ocean outfall disposal are provided for the City of Santa Cruz and the Santa Cruz County Sanitation District (includes Live Oak, Capitola, Soquel and Aptos). Ocean outfall disposal is provided for the City of Scotts Valley.

Wastewater Source Control
Provides inspection, sampling and monitoring of business and industrial establishments to limit discharge of harmful constituents into the sanitary sewer system and storm drain system. Issues wastewater discharge permits to industrial discharges. Issues citations and levies fines for code violations. This program is a requirement of the State of California and U.S. Environmental Protection Agency.

The City of Santa Cruz has been treating sewage at the Wastewater Treatment Facility near Neary Lagoon and disposing of the effluent in the ocean since 1928. Treatment capacity has been expanded several times to accommodate the growth of the city and the addition of flows from the Santa Cruz County Sanitation District. The current rated design capacity is 17 MGD (millions of gallons per day) and with an average daily flow of less than 10 MGD. Design for wet weather flow is 81 MGD.

Pure Water Soquel Project: The City of Santa Cruz Wastewater Treatment Facility continues to expand its production and use of recycled water through a regional partnership which will provide source water to the Pure Water Soquel Project.

The project will provide a reliable supplemental water supply for the community and prevent seawater from contaminating groundwater. It includes the installation of about eight miles of pipeline under various streets between Santa Cruz and Aptos. These pipelines will carry recycled water from our regional Santa Cruz Wastewater Treatment Facility to the Chanticleer Water Purification Center (to be built) in the Live Oak area; and, will carry purified water from the new Center to three Seawater Intrusion Prevention (SWIP) wells where it will be pumped into the groundwater basin.

This project will also provide an increased capacity to produce Title 22 tertiary water at the Wastewater Treatment Facility. Read more.

Major Accomplishments Over the Last 5 Years:

- WWTF Energy and Environmental Summary

- Completion of 50 Kw photovoltaic system
- Integration of 1.3 megawatt cogeneration system into facility power grid
- Implementation of staffing reorganization to optimize plant efficiency
- Adoption of revised Sewer Use Ordinance
- Adoption of Storm Water Ordinance
- Adoption of Extended Producers Responsibility Ordinance

Wastewater Treatment Facility brochure: Page 1 - Page 2

Information on Sewer Rates and Sewer Rate Table

Water Pollution Control Facility Annual Reports

2019 [PDF] 2015 [PDF] 2011 [PDF] Archives 2006-10

Pretreatment Program Annual Reports

2019 [PDF] 2015 [PDF] Archives 2006-10

California Integrated Water Quality System Reports

Annual Dye Study Report 2016 [PDF]
Annual Dye Study Report 2013 [PDF]

Additional Reports are filed online at the **Electronic Self-Monitoring Report** website of the California Integrated Water Quality System. You can find the reports that have been filed at this web link:

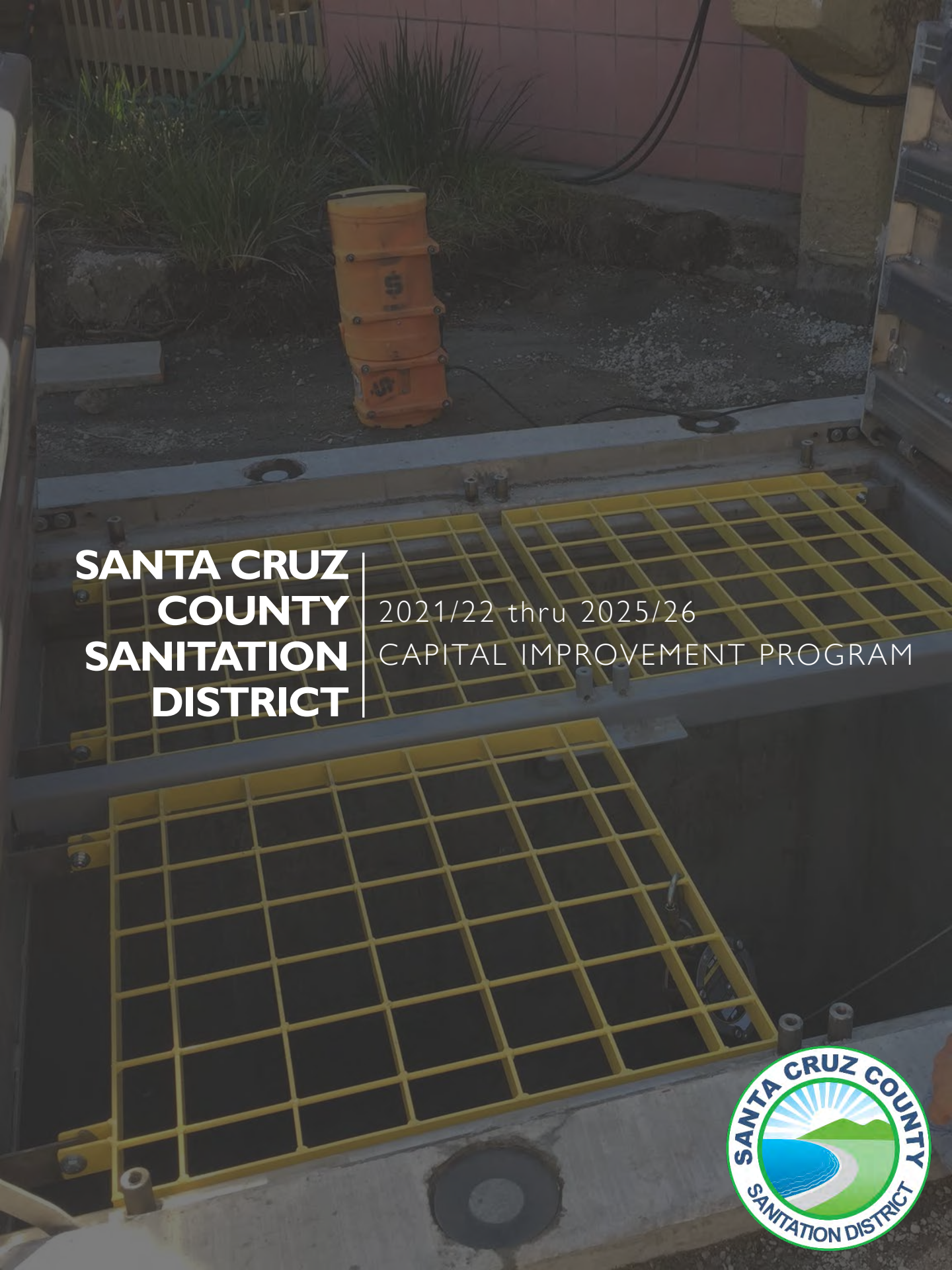
For more information contact:

Anne Hogan
Wastewater System Manager
831-420-5425
831-420-6489 (fax)
email

SANTA CRUZ COUNTY SANITATION DISTRICT

2021/22 thru 2025/26

CAPITAL IMPROVEMENT PROGRAM



SANTA CRUZ COUNTY SANITATION DISTRICT

2021/22 thru 2025/26

CAPITAL IMPROVEMENT PROGRAM

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INTRODUCTION

2021/22 thru 2025/26
CAPITAL IMPROVEMENT PROGRAM

SANTA CRUZ COUNTY SANITATION DISTRICT

SANTA CRUZ COUNTY SANITATION DISTRICT
701 OCEAN STREET, SUITE 410 · SANTA CRUZ, CA · 95060-4073
(831) 454-2160 · FAX (831) 454-2089 · TDD: (831) 454-2123 · WWW.SCCSD.US
MATT MACHADO, DISTRICT ENGINEER

INTRODUCTION

The purpose of this Capital Improvement Program is to identify and prioritize needs and project costs, under the direction of the Santa Cruz County Sanitation District's Board of Directors, for planned improvements to the infrastructure that will serve the District's ratepayers in an efficient and cost-effective manner throughout the next five-plus years of growth and change.

Worn out and antiquated facilities must be repaired or replaced in a timely manner in order to protect public health and safety. This report will help identify and describe specific sanitary sewer projects for pump stations, transmission lines and collector lines which are planned to take place over the next five-plus years, along with their estimated project costs. It will help prevent sudden shifts in the debt service requirements, inform the Board and the public about future projects, provide coordination with other County projects, and plan budget allocations for the identified capital needs. This report may also aide the District in obtaining grants and may improve the District's credit rating.

FACTS ABOUT UNDERGROUND CONSTRUCTION

Underground construction is complex and costly compared to other types of construction. According to the U. S. National Committee on Tunneling Technology, Subcommittee on Management of Major Underground Construction Projects, in their executive presentation, "Recommendations for Better Management of Major Underground Construction Projects," they state that "Among today's most complicated and costly large projects are those being built underground...because geotechnical considerations assume greater importance than in other types of construction, and because the nature of underground work requires special equipment, techniques, and skills."[1] Because of this, in 1976, three Federal agencies requested that the National Research Council obtain a set of guidelines that could be used to address the problems of underground construction.

Underground construction is quite unique among the different types of construction projects, mainly due to the fact that you cannot see, ahead of time, the exact conditions that you will be encountering during the construction of the project. You can't physically see if there are underground waterways, huge rocks, underground utilities, buried structures, or soft or hard soil conditions.

Prior to construction, various measures are typically used to investigate what may be hidden underground; however, it is nearly impossible and not cost effective to test every square inch of the project area, thus large rocks, underground streams, undocumented utilities, old septic tanks, tree roots, old contaminated soil, gases and other noxious waste, unsuitable soils, and other surprises often show up and lead to contract change orders and increased costs to deal with the obstacle or condition. From the time of testing to the time of actual construction, soil conditions may change appreciably[2]. Thus, economic risk, geotechnical uncertainties, and complex technologies are inherent in underground projects.[3]

In addition, there is high wear and tear on equipment when having to bore or cut through rock, especially rock with high uniaxial compressive strength. This is illustrated in one project where the average strength of the rock was about 120 Megapascals and the average penetration rate was less than 1 meter/hour, sometimes going as slow as 0.36 meter/hour.[3] The average cutter life was far less (37.3 cubic meters[4]/disc) than desired (100 cubic meters/disc) and cutter replacement led to a long downtime, contributing to higher costs and delays.

Even when an underground construction project is well-planned at its inception, conditions and requirements change during execution. The key to a project's ultimate success is the identification and management of risks during construction.[5]

1. U. S. National Committee on Tunneling Technology, Subcommittee on Management of Major Underground Construction Projects, in their executive presentation, "Recommendations for Better Management of Major Underground Construction Projects
2. Problems of Underground Construction in a Dense Urban Setting.
3. Rock Mechanics in Underground Construction, at the 2006 International Society of Rock Mechanics* International Symposium
4. Contracting Practices for the Underground Construction of the Superconducting Super Collider.
5. Problems in Underground Construction: Lessons learned and Methods Developed for Success (M. Petrov and P. Galloway, 2004)

BOARD OF DIRECTORS

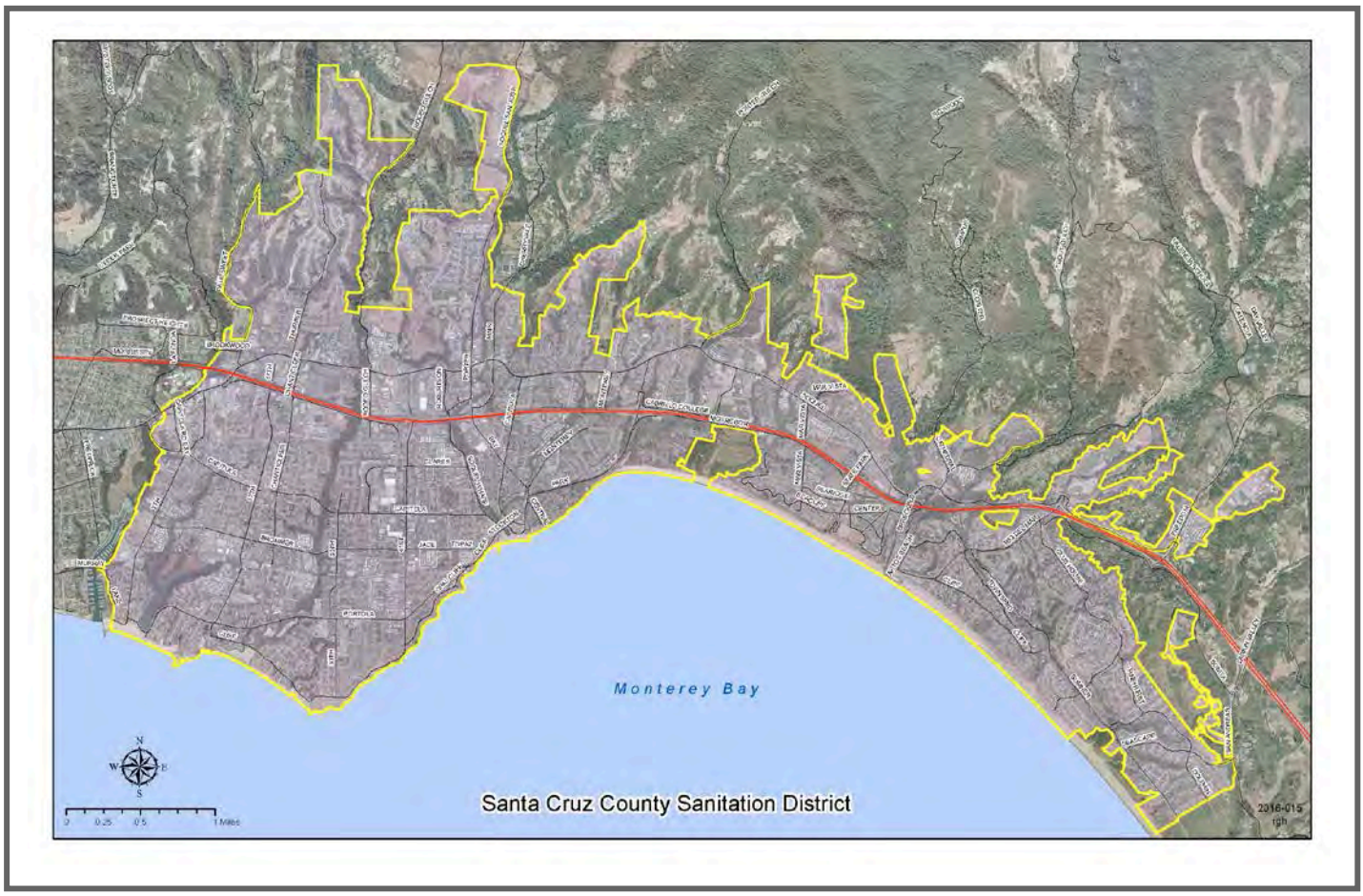
The Santa Cruz County Sanitation District Board of Directors is comprised of three members plus one alternate:

- The County Supervisor from the Branciforte - Soquel (1st) District;
- The County Supervisor from the Aptos (2nd) District;
- A member of the Capitola City Council, plus an alternate.

The Chairperson of the Board is a member of the Capitola City Council. The Vice-Chairperson is the 1st District representative during even-numbered years and the 2nd District representative during odd-numbered years.

The current Board consists of the following elected officials:

- **Chairperson:** **Jacques Bertrand, City of Capitola**
- **Director:** **Manu Koenig, 1st District Supervisor**
- **Director:** **Zach Friend, 2nd District Supervisor**
- **City Alternate:** **Sam Storey, City of Capitola**



DISTRICT PERSONNEL

Current District personnel include the following:

- District Engineer – Matt Machado
- Assistant District Engineer – Kent Edler
- Assistant Director of Administrative Services – Kim Moore
- District Counsel – Justin Graham
- Sanitation Engineer – Ashleigh Trujillo
- Water/Wastewater Operations Manager – Beatriz Barranco
- Environmental Programs Coordinator – Monica Tomlinson
- Construction Manager – Carisa Duran
- District Secretary – Terra Prestwich
- Deputy Secretary (part-time) – Andrea Gifford

ENVIRONMENTAL COMPLIANCE UNIT

HISTORY & PURPOSE

2021/22 thru 2025/26
CAPITAL IMPROVEMENT PROGRAM

Alley South of Bennet Sewer Project

HISTORY AND PURPOSE OF THE DISTRICT

The Santa Cruz County Sanitation District was formed as an autonomous district under the State of California, on May 9, 1973, and encompasses the community of Live Oak, the City of Capitola and portions of the communities of Aptos and Soquel. It previously consisted of three separate districts: Aptos Sanitation District, Capitola Sanitation District, and East Cliff Sanitation District. At the time of formation, it was one of the largest of its type in the State and had the highest per capita assessed valuation of any Sanitation District.

The objectives of the formation were to:

- Merge resources to pay for improvements in order to be in compliance with federal orders to clean up the quality of wastewater discharged into the Pacific Ocean.

- Shut down individual sewage treatment facilities and build a sewage transmission line, from Aptos to the City of Santa Cruz's treatment facility at Neary Lagoon in the City of Santa Cruz.

- Join with the City of Santa Cruz in tripling the capacity of the City treatment facility and build a new outfall line into the Pacific Ocean.

- Secure a favorable bond rate (the larger District allowed bonds to sell at one-fourth to one-half percent lower interest rates than if they were issued by individual Districts).

The purpose of the District is to construct and maintain pipelines transporting waste from the District to the Santa Cruz City Wastewater Treatment Facility, located at Neary Lagoon, as well as to provide instruction, services, and monitoring for environmental compliance. To accomplish this last item, the District's Environmental Compliance Unit conducts programs to educate residents, professionals, and business owners about the proper use of their sewer and drainage systems in order to help preserve their own, as well as the District's, facilities and to help protect the environment.

REVENUE STUDY & BUDGET

Cliff Drive Sewer Trench Repair Project

2021/22 thru 2025/26
CAPITAL IMPROVEMENT PROGRAM

SANTA CRUZ COUNTY SANITATION DISTRICT

CAPITAL IMPROVEMENT BUDGET PROGRAM

Unlike the Capital Improvement Program, the Capital Improvement Budget normally only includes the current fiscal year's projects and is prepared each year as part of the overall budget of the District.

The Santa Cruz County Sanitation District funds its capital improvement projects through collection of sewer service fees, grants, bond sales, and various state and federal loan programs.

Of the thirty-two capital improvements planned for the 2021/22 thru 2025/26 fiscal years, the most significant are the Arana Trunkline Replacement; Valencia Creek Sewer Relocation; D.A. Porath Valve Replacement and Emergency Bypass; Rodeo Pump Station Capacity Upgrade; Upper and Lower Rodeo Trunkline Replacements; East Cliff, Portola, and Richmond Drives Sewer Replacement; Capitola Village Sewer Rehabilitation; Rio Del Mar Sewer Rehabilitation – Phase 2; Santa Cruz Harbor Area Sewer Rehabilitation – Phase 2; Soquel Village Sewer Rehabilitation – Phase 2; Townsend Area Sewer Rehabilitation; and the Arana Pump Station Relocation. Additionally, the Santa Cruz Harbor Transmission Main project will be a significant project when the City of Santa Cruz retrofits the Murray Street Bridge in the next couple of years.

Significant pipe rehabilitation/replacement projects recently completed include the Soquel Pump Station Force Main Replacement; 41st Avenue at Soquel Drive Sewer Rehabilitation; and Cliff Drive Area Sewer Rehabilitation. Together these projects installed approximately 11,040 linear feet of new sewer force main and 3,600 linear feet of gravity sewer main. The Soquel Pump Station project was completed. New pumps, programmable logic controllers (PLCs), and valves were purchased to replace aging equipment at various pump stations.

For a more in-depth study of the District's financial outlook, attached is the 2021/22 Revenue Study prepared by Hornberger Engineering, which includes a projection of revenue requirements through the year 2023/24 fiscal year.

Also attached is the District's budget for the 2021/22 fiscal year. This budget is based on the sewer service charge rates which were adopted by the District's Board on May 20, 2021. The budget has expected expenditures and contingencies of $55.0 million and reserves of $4.5 million for a total of $59.5 million. This includes expenditures of $23.3 million in operating expenses ($6.6 million of which is for the District's share of operating expenses at the City of Santa Cruz's wastewater treatment plant and ocean outfall), $1.5 million in loan payments, $3.2 million in wastewater capital improvement projects, and $27.0 million in construction improvement projects.

Cliff Drive Sewer Rehabilitation Project

2021-22 REVENUE STUDY

2021/22 thru 2025/26
CAPITAL IMPROVEMENT PROGRAM

SANTA CRUZ COUNTY SANITATION DISTRICT

SANTA CRUZ COUNTY SANITATION DISTRICT

2021/22 REVENUE STUDY

February 2021

Hornberger Engineering
San Jose, California

2661 Thrasher Lane • San Jose, CA • 95125 • (408) 264-5029

February 18, 2021

Mr. Matt Machado, P.E.
District Engineer
Santa Cruz County Sanitation District
701 Ocean Street
Santa Cruz, CA 95060

Subject: Santa Cruz County Sanitation District
2021/22 Revenue Study

Dear Mr. Machado,

We are pleased to submit this three-year program of sewer service charges for the Santa Cruz County Sanitation District. The purpose of this study is to incorporate the latest costs associated with the District's projects and programs and to project revenue requirements for the years 2021/22 through 2023/24. The study is based on the projected capital costs, operation and maintenance expenses and customer information prepared by the District staff.

As a result of this study, the overall fee increase for fiscal year 2021/22 is 4.0%. Approximately two-thirds of this increase, or 2.6%, is due a significant reduction in nonresidential revenue in 2020. The remaining 1.6% is due to increased costs. Proposed fee increases for the individual user groups are shown in the following table.

We appreciate this opportunity to prepare this three-year program for the Santa Cruz County Sanitation District. Please do not hesitate to contact me if you have any questions or would like any additional information.

Sincerely,

Hornberger Engineering

Gary Hornberger

Gary Hornberger

2661 Thrasher Lane • San Jose, CA • 95125 • (408) 264-5029

SANTA CRUZ COUNTY SANITATION DISTRICT
PROPOSED 2021/22 FEE INCREASES

User Group	Proposed 2021/22 Fees		Existing 2020/21 Fees		2021/22 Increases
	Flat Fee ($/year)	Volume Fee ($/HCF)	Flat Fee ($/year)	Volume Fee ($/HCF)	Change (%)
Single Family	$880.92		$846.96		4.0%
Townhomes & Condominiums	$762.48		$731.76		4.2%
Multiple Family	$762.48		$731.76		4.2%
Mobile Homes	$655.80		$628.20		4.4%
Bakeries/Donut Shops	$372.48	$12.01	$351.36	$12.10	-0.1%
Restaurants/Catering	$372.48	$12.01	$351.36	$12.10	-0.1%
Food Processing	$372.48	$13.74	$351.36	$13.95	-1.4%
Funeral Parlor/Mortuary	$372.48	$13.74	$351.36	$13.95	
Other Businesses	$372.48	$9.32	$351.36	$8.97	4.5%
Schools (Sr. High ADA Basis) (1)	$372.48	$36.30	$351.36	$34.80	4.3%
Schools (Sr. High Usage Basis)	$372.48	$9.05	$351.36	$8.68	4.3%
Schools (Elem. & Jr. High ADA Basis) (1)	$372.48	$24.17	$351.36	$23.17	4.4%
Schools (Elem. & Jr. High Usage Basis)	$372.48	$9.05	$351.36	$8.68	4.4%
Junior Colleges (2)	$372.48	$31.96	$351.36	$30.63	4.3%
State Parks	$372.48	$9.05	$351.36	$8.68	4.7%
Dominican Hospital	$372.48	$9.66	$351.36	$9.36	3.2%
Chaminade	$372.48	$12.13	$351.36	$12.13	0.0%
Overall Increase					4.0%

(1) Volume Rate = $/ADA/year
(2) Volume Rate = $/FTES/year

SANTA CRUZ COUNTY SANITATION DISTRICT
2021/22 REVENUE STUDY
February 2021

Introduction

The Santa Cruz County Sanitation District will require approximately 4% to 5% annual increases in revenue from fees for sewer service in the next three fiscal years, 2021/22 through 2023/24. The overall fee increase for 2021/22 developed in this study is 4.0%. These increases are primarily related to the loss of nonresidential revenue, increased capital projects at the wastewater treatment plant operated by the City of Santa Cruz, the District's capital program and general inflation.

The District staff has reviewed connection charge revenue, capital outlay needs, operation and maintenance expenses, debt service and miscellaneous revenues for the next three fiscal years. Based on this updated information, proposed fees for sewer service in 2021/22 through 2023/24 have been calculated. The development of these fees is discussed in the following sections.

Requirements for Sewer Service Fees

The District's fees for sewer service are subject to the requirements contained in the Revenue Program Guidelines issued by the California State Water Resources Control Board. This is a condition of the State and Federal grants and loans received by the District.

The Guidelines require that fees for sewer service be designed to recover adequate revenues for the operation and maintenance of the District's facilities. In addition, each user and user class must pay its proportional share of those costs, based on its proportional contribution to the total wastewater loadings from all users. The District's sewer service fees have been reviewed by the State staff and are in compliance with the Guidelines.

The District's fees are also subject to the requirements of Proposition 218. This proposition, passed in 1996, requires that fees shall not exceed the proportional cost of service attributable to any parcel.

Customer Revenue

The projected revenue received for sewer service under the current 2020/21 fees has decreased by $708,000, as shown in Table 1. This is a combination of a $2,000 increase in residential revenue and a $710,000 decrease in nonresidential revenue. The most significant usage reductions in 2020 were for restaurants, which were down 29%, and Other Businesses, which were down 14%. This decrease in customer revenue has the effect of increasing the proposed 2021/22 sewer service fees by 2.6%.

Table 1
Customer Revenue at Current 2020/21 Fees

Year	Residential Revenue ($/year)	Nonresidential Revenue ($/year)	Total Revenue ($/year)
2020/21	$22,859,000	$4,893,000	$27,752,000
2021/22	$22,861,000	$4,183,000	$27,044,000
Difference	$2,000 0.0%	($710,000) (14.5%)	($708,000) (2.6%)

Connection Charge Revenue

Actual connection charge revenue for the first seven months of 2020/21 was $139,000. Based on the current year, connection charge revenues of $200,000 annually have been projected for 2021/22 and 2022/23. An increase to $250,000 has been projected for the following years when the current moratorium is lifted.

Capital Improvement Program Funding

Connection charge revenue and contributions from rates are used to fund the District's Capital Improvement Program projects that are not funded by loans or grants. The funding for 2021/22 is $5,498,000. This will be generated by $200,000 in connection charge revenue and $5,298,000 in sewer service fees. The funding for those projects in the three years of the study period is show in Table 2. The projects included in this program are listed in Table 3. Existing fund balances will be used for the additional costs of these projects.

Table 2
Capital Improvement Program Funding

Item	Annual Capital Improvement Program Funding		
	2021/22 ($/year)	2022/23 ($/year)	2023/24 ($/year)
Connection Charge Revenue	$200,000	$200,000	$250,000
Contribution from Rates	$5,298,000	$3,942,000	$3,494,000
Capital Improvement Program Funding	$5,498,000	$4,142,000	$3,744,000

Table 3
District Funded Capital Improvement Program

Project	2021/22	2022/23	2023/24
East Cliff, Portola, & Richmond Drives	$649,000		
Valencia Creek Sewer Relocation		$371,393	
Lower Rodeo Trunkline		$325,000	
Esplanade Pump Station			$400,000
Pump Station Repair/Modifications (Rodeo PS)		$1,032,200	
Upper Rodeo Trunkline Replacement		$1,100,000	
East Cliff Trans. Main Replacement at Murray St. Bridge	$1,800,000		
Arana Trunkline	$500,000		
Cabrillo Park Sewer Replacement Project Phases 1 & 2			$1,510,000
D.A Porath Facility Improvements	$600,000	$600,000	$600,000
Butterfly Habitat Management	$10,000	$10,000	$10,000
Transmission Line Inspection	$100,000	$100,000	$100,000
SCADA System Improvements	$150,000	$150,000	$150,000
Pump Station Sewage Level Monitoring	$50,000	$50,000	$50,000
Cathodic Protection	$100,000	$100,000	$100,000
Road Repairs	$50,000	$50,000	$50,000
2021 Pipe Rehabilitation	$800,000		
Capitola Pump Station improvements	$200,000		
Aptos Esplanade PS Valve Replacements		$400,000	
Arana Pump Station		$300,000	$1,175,000
Soquel Force Main Inspection	$20,000		
2023 Pipe Rehabilitation			$1,000,000
Contigencies	$300,000	$300,000	$300,000
Total District Funded Capital Projects	$5,329,000	$4,888,593	$5,445,000

Operation and Maintenance Expenses

The projected operation and maintenance expenses include treatment costs paid to the City of Santa Cruz and the District's expenses for pump station and collection line maintenance, engineering, source control and fixed assets.

As shown in Table 4, projected treatment expenses have decreased from those used in the 2020/21 fees. The District's share of treatment operations costs has increased by $141,000 due to inflation and a slight increase in the percentage of total operation expenses allocated to the District. The decrease in capital expenses allocated to the District is due a reduction of major capital improvement projects at the treatment plant in 2021/22. Significant increases in projects at the treatment plant are projected for the following two years. These projects are shown in Table 5. The District's 8/17 share of capital projects has decreased by $1,117,000. The total decrease in City treatment costs for 2020/21 is $976,000.

Table 4
2020/21 City Treatment Expenses

Year	Operations ($/year)	Capital ($/year)	Total ($/year)
2020/21	$5,434,000	$1,663,000	$7,097,000
2021/22	$5,575,000	$546,000	$6,121,000
Difference	$141,000 2.6%	($1,117,000) (67.2%)	($976,000) (13.8%)

As shown in Table 6, the District's O&M expense projections for the next fiscal year have decreased by $165,000 from those used in the 2020/21 fees. This includes increases of 1.8%, or $245,000, in operating costs and $410,000 decrease in routine capital expenses.

Table 5
Treatment Plant Capital Improvement Program

Project	2021/22	2022/23	202/24
Equipment Replacement	$500,000	$1,000,000	$1,000,000
Neary Mitigation CIP	$0	$250,000	$250,000
Upgrade Digester Equipment (1)	($200,000)	$500,000	
Water Piping Rehabilitation			
WWTP Electrical System	$500,000	$500,000	
Modernize Lab	$300,000	$500,000	$500,000
WWTP Infrastructure and Major Equipment	$500,000	$1,500,000	$4,000,000
Total Treatment Plant Capital Projects	$1,600,000	$4,250,000	$5,750,000

(1) Project cost reduced from $500,000 in 2020/21 to $300,000 in 2021/22.

Table 6
2020/21 District Operation and Maintenance Expenses

Year	Operations ($/year)	Capital ($/year)	Total ($/year)
2020/21	$13,377,000	$1,755,000	$15,132,000
2021/22	$13,622,000	$1,345,000	$14,967,000
Difference	$245,000 **1.8%**	($410,000) **(23.4%)**	($165,000) **(1.1%)**

Debt Service

The District currently has three projects funded by loans. These include $12 million for the Aptos Transmission Relocation Project and $5 million for the Soquel Creek, Pump Station Force Main, which are funded by State Revolving Fund (SRF) loans. The Capitola/Jewel Box Sewer project is funded by a $7 million California Infrastructure and Economic Development Bank (IBank) loan.

As developed in the ten-year financing plan, the District will apply for a series of low cost SRF and IBank loans to fund five additional projects over the study period, shown in Table 7. The projected interest rates are 0.9% for SRF loans and 2.50% for IBank loans with terms of 30 years.

In addition, the District will be participating in IBank loans for two projects at the treatment plant. These include a $3.5 million loan for the Ultraviolet System Replacement and a $20 million loan for the Electrical System Upgrade. The District will pay 8/17 of the debt service for those loans.

The proposed debt service for all the District's loans over the next three fiscal years is shown in Table 8.

Table 7
District Loan Funded Capital Improvement Program

Project	2021/22	2022/23	2023/24
East Cliff, Portola, & Richmond Dr. (IBank)	$4,300,000		
Valencia Creek Sewer Relocation (SRF)	$2,154,000		
Upper Rodeo Gulch Trunkline (IBank)		$7,750,000	
Arana Trunkline (IBank)	$2,500,000		
Arena Pump Station (Ibank)			$3,700,000
Total Loan Funded Projects	$8,954,000	$7,750,000	$3,700,000

Table 8
District Debt Service

Item	Annual Debt Service		
	2021/22 ($/year)	2022/23 ($/year)	2023/24 ($/year)
SRF Loan - Aptos Transmission Project	$790,000	$790,000	$790,000
SRF Loan - Soquel Creek Pump Station	$201,000	$217,000	$217,000
SRF Loan - Valencia Creek Sewer Relocation		$164,000	$82,000
IBank Loan - Capitola/Jewel Box	$405,000	$404,000	$403,000
IBank Loans - Four New Projects		$345,000	$739,000
Treatment Plant Ultraviolet System Replacement	$83,000	$83,000	$83,000
Treatment Plant Electrical System Upgrade		$212,000	$475,000
Total Debt Service	$1,479,000	$2,215,000	$2,789,000

Revenue Trust Interest Income

The District uses the investment income received in the Revenue Trust Fund to fund a portion of its operating expenses every year. This reduces the total revenues required from fees for sewer service. Based on actual earnings, the projected annual interest income for 2021/22 and the following years is $120,000.

Reserve Fund

The District's Reserve Fund will have a balance of $4,000,000 at the beginning of 2021/22. The District's plan is to continue annual increases of $100,000 over the next ten years, which will bring the balance to $4,300,000 by the end of 2023/24. This amount will be recovered annually in the sewer service fees.

Total Revenues

Projected revenues required for 2021/22 through 2023/24 from fees for sewer service are shown in Table 9. The total revenue required in 2021/22 is $28,126,000, which will require an overall fee increase of $1,081,000 or 4.0%. The increase includes $708,000 for the loss of customer revenue (2.6%) and $373,000 for increased costs (1.4%).

Table 9
Total Revenue Requirements

Item	2021/22 ($/year)	2022/23 ($/year)	2023/24 ($/year)
Capital Improvement Funding	$5,298,000	$3,942,000	$3,494,000
Debt Service	$1,479,000	$2,215,000	$2,789,000
City Treatment	$6,121,000	$7,852,000	$8,769,000
District O&M	$14,967,000	$15,248,000	$15,667,000
Reserve Fund	$100,000	$100,000	$100,000
Revenue Collection Expense	$281,000	$295,000	$310,000
Interest Earnings	($120,000)	($120,000)	($120,000)
Total Revenue Requirement	$28,126,000	$29,532,000	$31,009,000
Fee Increase	4.0%	5.0%	5.0%

Sewer Service Fees

The proposed 2021/22 fees for sewer service, based on decreased customer usage and total revenue requirements, are shown in Table 10. The overall 2021/22 fee increase is 4.0%. Residential increases are in the range of 4.0% to 4.4%.

Nonresidential fee increases vary based on customer size and strength of wastewater discharged. Restaurants, which have high strength wastewater, will have almost no increases. Pollutant costs are a significant portion of their fees and those costs are reduced as total City treatment costs have been reduced in 2021/22. Slight reductions for other high strength customers are similar. These customers will receive higher than average fee increases in the following years as treatment costs increase.

A three-year fee program for the study period is shown in Table 11. This table includes adopted fees since 1991/92 and proposed increases through 2023/24.

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Table 10
Proposed 2021/22 Fees

User Group	Proposed 2021/22 Fees		Existing 2020/21 Fees		2021/22 Increases		
	Flat Fee ($/year)	Volume Fee ($/HCF)	Flat Fee ($/year)	Volume Fee ($/HCF)	Flat Fee ($/year)	Volume Fee ($/HCF)	Change (%)
Single Family	$880.92		$846.96		$33.96		4.0%
Townhomes & Condominiums	$762.48		$731.76		$30.72		4.2%
Multiple Family	$762.48		$731.76		$30.72		4.2%
Mobile Homes	$655.80		$628.20		$27.60		4.4%
Bakeries/Donut Shops	$372.48	$12.01	$351.36	$12.10	$21.12	($0.09)	-0.1%
Restaurants/Catering	$372.48	$12.01	$351.36	$12.10	$21.12	($0.09)	-0.1%
Food Processing	$372.48	$13.74	$351.36	$13.95	$21.12	($0.21)	-1.4%
Funeral Parlor/Mortuary	$372.48	$13.74	$351.36	$13.95	$21.12	($0.21)	
Other Businesses	$372.48	$9.32	$351.36	$8.97	$21.12	$0.35	4.5%
Schools (Sr. High ADA Basis)	$372.48	$36.30	$351.36	$34.80	$21.12	$1.50	4.3%
Schools (Sr. High Usage Basis)	$372.48	$9.05	$351.36	$8.68	$21.12	$0.37	4.3%
Schools (Elem. & Jr. High ADA Basis)	$372.48	$24.17	$351.36	$23.17	$21.12	$1.00	4.4%
Schools (Elem. & Jr. High Usage Basis)	$372.48	$9.05	$351.36	$8.68	$21.12	$0.37	4.4%
Junior Colleges (FTES Basis)	$372.48	$31.96	$351.36	$30.63	$21.12	$1.33	4.3%
State Parks	$372.48	$9.05	$351.36	$8.68	$21.12	$0.37	4.7%
Dominican Hospital	$372.48	$9.66	$351.36	$9.36	$21.12	$0.30	3.2%
Chaminade	$372.48	$12.13	$351.36	$12.13	$21.12	$0.00	0.0%
Overall Increase							4.0%

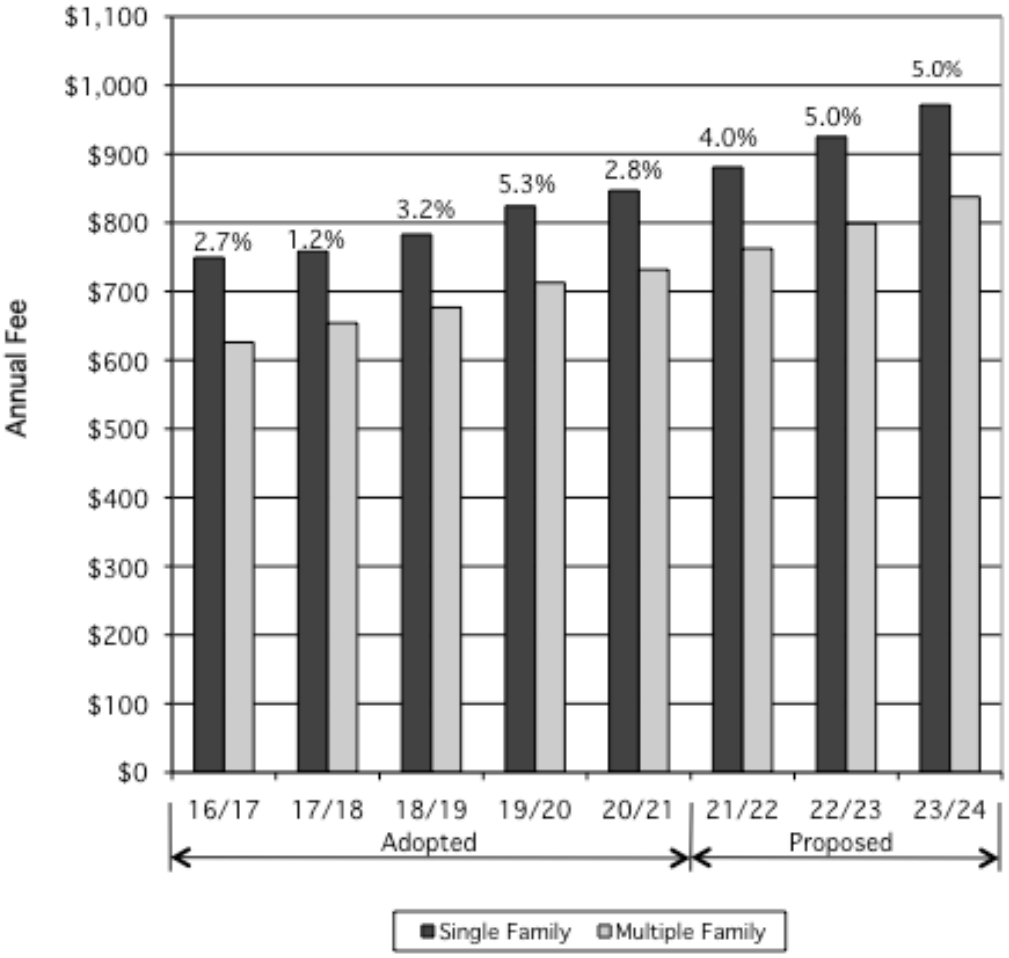
Summary

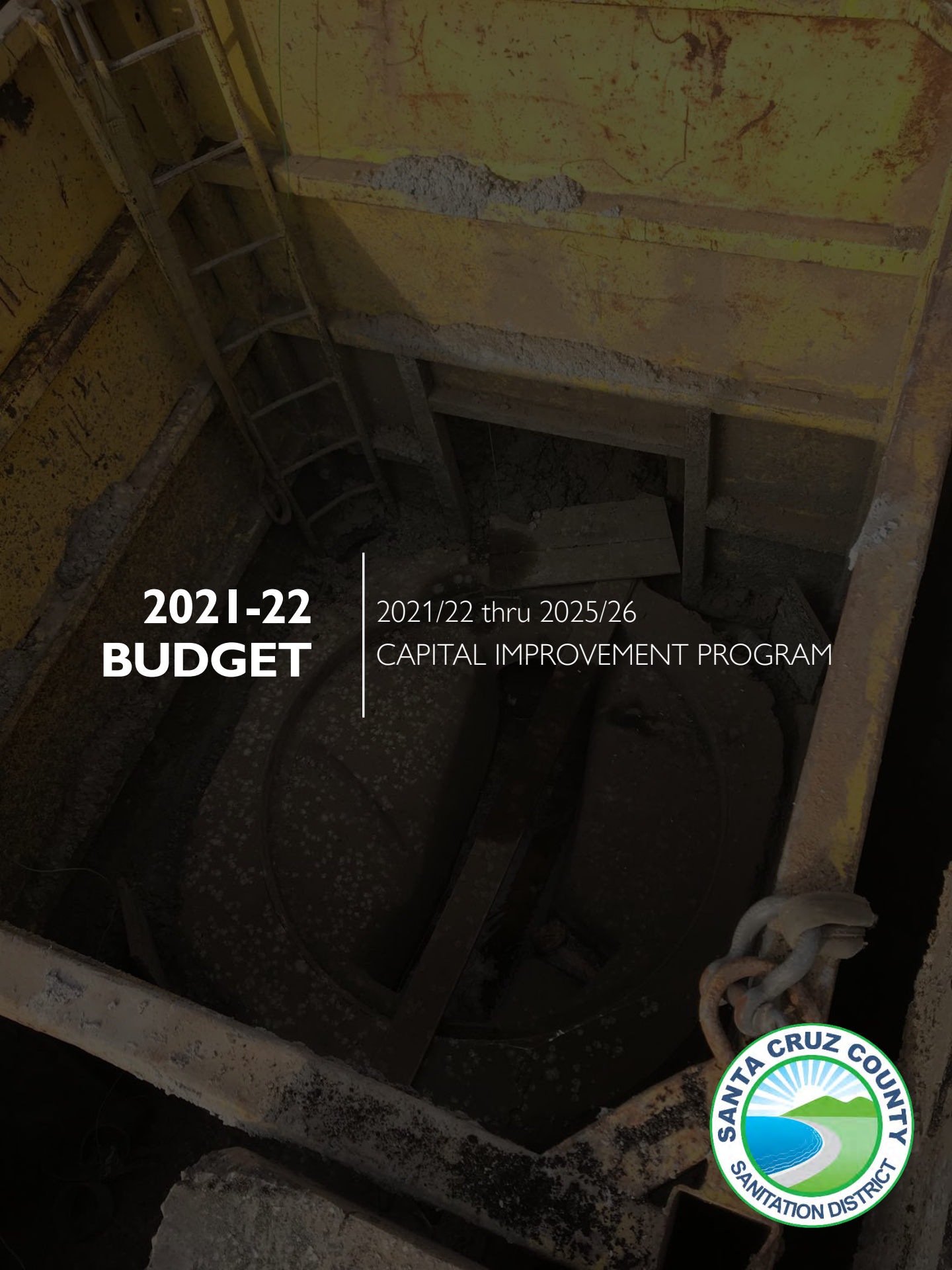
The overall projected increase in fees for sewer service for fiscal year 2021/22 is 4.0%. The annual increases for the following two years are 5.0%. These increases reflect reduced customer usage, additional debt service, treatment plant operating costs and capital improvements and District operating costs and capital improvements. The proposed single family and multiple family annual fees are shown in Figure 1. Future fee increases are dependent upon the magnitude of treatment and collection operating costs, general inflationary trends, interest rates and customer usage.

Table 11
Three-Year Fee Program

Fiscal Year	Average Increase					
	Single Family	Multiple Family	Mobile Home	Average Other Business	Average Restaurant	Elementary School
	5.2 HCF/mo.	4.2 HCF/mo.	3.3 HCF/mo.	12 HCF/mo.	44 HCF/mo.	632 HCF/yr.
Adopted						
1991/92	27.1%	23.9%	23.9%			
1992/93	4.2%	13.5%	13.5%	4.5%	8.2%	0.4%
1993/94	22.4%	35.7%	35.7%	25.9%	30.3%	19.4%
1994/95	5.6%	5.4%	5.4%	5.9%	9.5%	5.5%
1995/96	5.3%	5.7%	5.7%	5.5%	-1.1%	5.9%
1996/97	4.4%	4.3%	4.3%	3.5%	9.6%	-25.8%
1997/98	3.1%	2.1%	2.1%	2.6%	12.5%	-2.0%
1998/99	2.9%	3.3%	3.3%	2.6%	2.2%	1.7%
1999/00	2.9%	3.3%	3.3%	3.2%	0.3%	2.1%
2000/01	4.7%	3.9%	3.9%	4.9%	7.9%	6.3%
2001/02	3.3%	3.0%	3.0%	3.8%	4.7%	4.0%
2002/03	9.8%	20.6%	-5.4%	-1.1%	-2.3%	-1.1%
2003/04	4.1%	4.1%	4.0%	4.6%	3.4%	5.1%
2004/05	4.9%	5.1%	5.3%	4.6%	3.7%	4.3%
2005/06	3.7%	1.2%	6.8%	5.7%	1.6%	4.9%
2006/07	2.3%	2.3%	2.5%	2.2%	-1.1%	2.7%
2007/08	3.2%	2.9%	2.6%	3.1%	6.5%	3.2%
2008/09	1.3%	0.9%	2.5%	7.2%	10.0%	7.8%
2009/10	5.2%	5.1%	5.0%	5.0%	4.3%	-30.6%
2010/11	4.2%	4.0%	4.0%	3.9%	5.5%	4.3%
2011/12	1.6%	3.9%	4.3%	11.0%	10.7%	10.6%
2012/13	3.7%	3.7%	3.7%	3.4%	2.0%	4.0%
2013/14	2.7%	2.8%	2.9%	2.0%	2.6%	2.0%
2014/15	0.2%	1.5%	3.9%	8.3%	9.9%	8.2%
2015/16	4.8%	4.9%	5.0%	2.3%	1.3%	2.4%
2016/17	2.7%	2.7%	2.7%	3.1%	1.1%	3.9%
2017/18	1.2%	4.5%	3.6%	8.7%	7.2%	9.3%
2018/19	3.3%	3.5%	3.7%	5.2%	0.7%	3.4%
2019/20	5.3%	5.3%	5.4%	5.2%	2.0%	5.7%
2020/21	2.8%	2.7%	2.6%	1.3%	2.2%	2.4%
Proposed						
2021/22	4.0%	4.2%	4.4%	4.3%	-0.4%	4.4%
2022/23	5.0%	4.8%	4.4%	4.5%	10.7%	4.3%
2023/24	5.0%	4.9%	4.7%	4.8%	7.5%	4.7%

Figure 1
Annual Residential Fees





2021-22 BUDGET

2021/22 thru 2025/26
CAPITAL IMPROVEMENT PROGRAM

SANTA CRUZ COUNTY SANITATION DISTRICT

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SANTA CRUZ COUNTY SANITATION DISTRICT
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MATT MACHADO, DISTRICT ENGINEER

AGENDA DATE: OCTOBER 21, 2021

BOARD OF DIRECTORS
SANTA CRUZ COUNTY SANITATION DISTRICT
701 Ocean Street, Room 410
Santa Cruz, California 95060

SUBJECT: ADOPTION OF 2021-22 FINAL BUDGET

Members of the Board:

Attached is the Santa Cruz County Sanitation District Final Budget for the 2021-22 fiscal year. This budget has been adjusted to include the fiscal year 2020-21 year-end revenues, expenditures and fund balances.

Minor adjustments from the Proposed Budget, presented to the Board in June, to the Final Budget, were made based on year-end expenditure data for the 2020-21 fiscal year. Significant adjustments are summarized in the following tables.

625175 OPERATING FUND – FIXED ASSETS (50/175)

BUDGET NO.	ITEM	2020-21 ADOPTED	2020-21 ACTUAL	2021-22 RECOMMENDED	2021-22 ADOPTED	EXPLANATION
53246	Motorized Valves	$300,000	$0	$300,000	$407,761	2020-21 valve purchases will be paid for in this fiscal year.
53357	PLC Upgrade	$100,000	$0	$200,000	$282,260	2020-21 PLC purchases will be paid for in this fiscal year.
53358	VFD Replacements	$200,000	$0	$150,000	$289,471	2020-21 VFD purchases will be paid for in this fiscal year.
53359	Pumps	$400,000	$0	$0	$228,246	2020-21 pump purchases will be paid for in this fiscal year.
53361	PS Grinders	$165,000	$0	$150,000	$418,536	2020-21 grinder purchases will be paid for in this fiscal year.
53292	Fleet Pickups	$0	$53,822	$80,000	$230,000	Additional trucks are needed for Operations staff.
53293	Ford F250 Pickups	$269,851	$176,448	$0	$107,413	2020-21 truck purchase will be paid for in this fiscal year.
53354	Flush Truck Reel	$40,000	$0	$0	$40,000	2020-21 flush truck reel purchase will be paid for in this fiscal year.

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136409 SCCSD CONSTRUCTION IMPROVEMENT FUND (50/185)

BUDGET NO.	ITEM	2020-21 ACTUAL	2021-22 RECOMMENDED	2021-22 ADOPTED	EXPLANATION
53601	Rio Sands Sewer Rehab	$3,154	$440,000	$665,000	This increase is due to increases in construction costs and better understanding of the project scope.
53602	Cliff Drive Sewer Trench Repair	$338,533	$630,000	$570,000	This decrease is due to the project being completed with only minimal change orders.
53603	Eddy Lane Sewer Relocations	$5,015	$435,000	$880,000	This increase is due to added scope due to deteriorated sewers in the project area.
53604	Rodriquez Street Sewer Rehabilitation	$4,678	$800,000	$660,000	This decrease is due to a portion of the sewer main work being completed as part of a separate project.
53812	Minor Projects	$39,257	$309,314	$717,552	Additional fund balance in 2020-21 allows an increase here for any small or emergency projects that may arise this fiscal year.
53817	Consulting Engineering Services	$67,949	$400,000	$967,848	This increase is due to a contract budgeted in 2020-21 that will be paid out in this fiscal year.
53824	Cabrillo Park Sewer Replacement	$474,955	$0	$188,953	This increase is due to a design contract for the Phase 2 project budgeted in 2020-21 that will be paid out in this fiscal year.
53854	2021 Pipe Rehabilitation	$1,461	$1,160,000	$1,000,000	This decrease is due to the actual bid price for the project being lower than anticipated.
53881	East Cliff, Portola & Richmond Drives Sewer Replacement	($1,123)	$4,949,000	$5,345,696	This increase is due to added scope due to deteriorated sewers in the project area.
53892	Arana Trunkline Replacement	$339,437	$3,000,000	$3,188,326	This increase is due to design work contracted in 2020-21 that will be paid out in this fiscal year.

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It is therefore recommended that the Board of Directors take the following actions:

1. Approve the 2021-22 Final Budget as presented; and

2. Adopt the attached resolution adopting the Final Budget.

Yours truly,

DocuSigned by:
5BBA0C4145C48C...

MATT MACHADO
District Engineer

AT:tlp/B2360.docx

Attachments:
Resolution Adopting Final Budget
Final 2021-22 Budget
Board letter of May 20, 2021

Copy to:
Mark Dettle, Director, City of Santa Cruz, Public Works
Auditor Controller
Business Services

Adopted by the Board of Directors, SCCSD on October 21, 2021

ATTEST: _____ Secretary

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BEFORE THE BOARD OF DIRECTORS
OF THE SANTA CRUZ COUNTY SANITATION DISTRICT
SANTA CRUZ COUNTY, CALIFORNIA

RESOLUTION NO. 21-10

On the motion of Director STOREY duly seconded by Director FRIEND the following resolution is adopted:

RESOLUTION ADOPTING FINAL BUDGET

WHEREAS, the Board of Directors of the Santa Cruz County Sanitation District held a public hearing on its proposed budget on June 10, 2021, after duly published notice, and

WHEREAS, said hearings have been terminated, during which time all additions and deletions to the proposed budget for 2021-22 were made or authorized, and

NOW THEREFORE, IT IS HEREBY RESOLVED the final budget of the Santa Cruz County Sanitation District for which the Board of Directors is the governing board, for the fiscal year 2021-22 be and is hereby adopted by reference to the attached final budget.

BE IT FURTHER RESOLVED that the District Engineer is authorized, as follows, to approve changes in equipment classification of fixed asset acquisitions as to quantity, type, and cost as long as the original total budget unit amounts approved by the Board of Directors are not exceeded:

1. Substitution or other items shall be limited to items of original appropriation of $1,000 or less with a substitution cost not to exceed a unit cost of $1,000.

2. Original items unit cost can be increased up to 15 percent provided that appropriation savings are available within the expenditure subobject. Changes in items costing more than that will continue to be approved by the Board of Directors regardless of amount.

BE IT FURTHER RESOLVED that the means of financing the expenditure programs will be by monies derived from revenue to accrue and fund balance available, and they are attached hereto and made a part hereof (on file with the District Secretary).

PASSED AND ADOPTED by the Board of Directors of the Santa Cruz County Sanitation District this 21st day of October, 2021, by the following vote:

AYES: DIRECTORS STOREY AND FRIEND
NOES: NONE
ABSENT: DIRECTORS KOENIG AND BERTRAND

DocuSigned by:
Zach Friend
2C437165727F4FD...
Vice Chairperson of said Board

ATTEST: _____
Deputy Secretary of said Board

Approved as to Form:
DocuSigned by:
Justin Graham
40E85ACDEDAB42D...
District Counsel

Distribution: Auditor-Controller; Business Services; Sanitation Engineer

State of California)
County of Santa Cruz)

I the undersigned Secretary of the Board of Directors of the Santa Cruz County Sanitation District, County of Santa Cruz, State of California, do hereby certify that the foregoing is a true and correct copy of an resolution passed and adopted by said Board and entered in the Minutes of said Board.

In witness whereof, I have hereunto set my hand and affixed the seal of the said Board on October 25, 2021

Signed: _____

SANTA CRUZ COUNTY SANITATION DISTRICT

2021-22 FINAL BUDGET

625175 SCCSD OPERATING FUND (50/175)

The Operating Fund is responsible for funding the expenses for the general operations of the District. No sewer connection fee revenue can be used to fund these operations pursuant to State guidelines.

EXPENDITURES:				19/20 Actual	20/21 Actual	21/22 Recommended	21/22 Adopted	% Change
P53173	62330	SCCSD-Sewage Treatment - City Of Santa Cruz	Engr	5,195,313	8,284,813	6,600,000	6,600,000	0%
Maintenance and Operations:								
P53107	62330	Public Outreach	Opns	83,201	60,138	55,700	55,700	0%
P53110	62330	Permit Reviews	Opns	23,904	18,450	6,510	6,510	0%
P53113	62330	Spill Response-Private Prop	Opns	16,163	7,185	10,000	10,000	0%
P53115	62330	Spill Response-Main Sewer Spill	Opns	117,755	4,528	30,000	30,000	0%
P53128	62330	Pump Stations	Opns	1,961,728	1,997,982	2,040,000	2,040,000	0%
P53130	62330	Collection System	Opns	2,304,307	1,931,652	2,549,336	2,549,336	0%
P53132	62330	East Cliff Facility	Opns	1,767,404	1,571,692	1,695,013	1,695,013	0%
P53133	62330	Electrical	Opns	1,782,260	1,648,274	1,800,000	1,800,000	0%
P53136	62330	Sulfide Control	Opns	1,155,776	1,504,594	1,550,000	1,550,000	0%
P53138	62330	Utilities	Opns	716,402	667,586	750,000	750,000	0%
P53140	62330	Tree Trimming	Opns	45,869	70,384	110,000	110,000	0%
P53142	62330	Source Control Lab Work	Opns	17,669	23,504	35,000	35,000	0%
P53174	62330	Source Control Program	Opns	560,295	477,487	506,389	506,389	0%
P53190	62330	Infiltration/Inflow Reduction	Both	4,873	-	-	-	0%
P53193	62330	Green Business Program	Opns	40,443	87,863	120,000	120,000	0%
P53194	62330	Operations Lab Work	Opns	6,812	20,375	27,000	27,000	0%
P53195	62330	Annual Cathodic Protection Testing & Repairs	Opns	13,710	16,005	53,923	53,923	0%
P53198	62330	Permit Fees	Opns	44,823	41,569	46,000	46,000	0%
P53342	62330	Hidden Beach Pump Station Recovery	Opns	83,155	-	-	-	0%
P53343	62330	Soquel Pump Station Recovery	Opns	9,747	-	-	-	0%
P53344	62330	East Cliff Emergency Repair	Opns	24,132	-	-	-	0%
P53346	62330	PSPS Response (PG&E)	Opns	53,829	-	-	-	0%
P53352	62330	M&O Training	Opns	-	-	25,000	25,000	0%
P53363	62330	Tranmission Line Inspection	Opns	358,579	81,585	-	-	0%
P53364	62330	heat-related power outages	Opns	358,579	15,621	-	-	0%
Engineering:								
Various	62330	Permit Reviews	Engr	6,489	7,350	-	-	0%
P53259	62330	SCCSD Encroachment Permits	Engr	8,128	2,677	7,500	7,500	0%
P53164	62330	General Engineering	Engr	1,695,264	1,631,493	1,834,000	1,834,000	0%
P53168	62330	Service Charge Administration	Engr	30,640	15,039	50,000	50,000	0%
Salaries and Wages:							-	
P53102	62330	Salaries-Secretaries	Engr	194,469	224,030	263,353	263,353	0%
P53104	62330	Salaries-Directors	Engr	4,427	6,075	5,000	5,000	0%
Miscellaneous:							-	
P53105	62330	Printing & Mailing	Engr	21,554	23,199	26,000	26,000	0%
P53106	62330	Office Expenses	Engr	13,273	14,460	11,200	11,200	0%
P53108	62330	Telephone & Communications	Engr	21,613	35,892	22,000	22,000	0%
P53170	62330	Accounting & Audit Fees	Engr	16,479	6,674	16,000	16,000	0%
P53178	62330	Legal Costs & Fees	Engr	97,206	82,587	130,000	130,000	0%
P53171	62330	IRWM Coordination	Engr	-	11,250	11,250	11,250	0%
P53188	62330	Codification Of Ordinances	Engr	1,409	-	7,500	7,500	0%
P53165	62330	SSMP	Opns	-	-	12,000	12,000	0%
P53196	62330	Revenue Study	Engr	16,685	16,538	30,000	30,000	0%
Computers:							-	
P53180	62330	Systems & Programming	MIS	68,649	29,777	50,000	50,000	0%
P53186	62330	Computers-Software	MIS	85,943	76,395	120,000	120,000	0%
P53192	62330	Computers-Facility Computer Mapping	MIS	26,486	65,950	60,000	60,000	0%
Routine Equipment Repair & Replacement:							-	
P53152	62330	East Cliff Pump Station and Line Equip	Opns	175,342	109,811	200,000	200,000	0%
Fixed Assets:							-	
See Pg2	86204	Equipment		207,979	70,840	945,000	1,771,274	87%
See Pg2	86209	Mobile Equipment		194,603	732,751	280,000	577,413	106%
Contingencies:							-	
P53499	98700	Contingencies		-	-	50,000	50,000	0%
TOTAL EXPENDITURES				19,274,785	21,694,076	22,140,674	23,264,362	5%
SOURCE OF FUNDS:								
	34400	Fund Balance		(283,613)	2,375,342	-	786,488	0%
	41322	Plan Checking Fees		12,837	30,373	5,000	5,000	0%
	42047	Other Charges Current Services		32,485	32,303	3,000	3,000	0%
	42384	Other Revenues, Transfers and Adjustments		-	1,400	1,000	1,000	0%
	42462	Transfer from Revenue Trust		19,629,377	19,929,446	22,131,674	22,468,873	2%
AVAILABLE FUNDS				19,391,087	22,368,864	22,140,674	23,264,362	5%

Engr = Engineering
Opns = Operations
Both = Engineering & Operations
MIS = Management Information Services

625175 SCCSD OPERATING FUND - SCHEDULE OF FIXED ASSETS

		Equipment			19/20 Actual	20/21 Actual	21/22 Recommended	21/22 Adopted
P53226	86204	Emergency Diesel Generators (4)	R	Opns	971	-	80,000	80,000
P53240	86204	Network Equipment	R	MIS	15,464	-	20,000	20,000
P53246	86204	Motorized Valves	N	Opns	156,863	-	300,000	407,761
P53256	86204	Radios	R	Opns	-	-	10,000	10,000
P53258	86204	Cameras -TV'ing Sewer Mains	R	Opns	34,681	36,095	-	-
P53267	86204	Mixers	R	Opns	-	34,746	-	-
P53356	86204	Flowmeter Replacements	R	Opns	-	-	35,000	35,000
P53357	86204	PLC Upgrades	R	Opns	-	-	200,000	282,260
P53358	86204	VFD Replacements	R	Opns	-	-	150,000	289,471
P53359	86204	Pumps	R	Opns	-	-	-	228,246
P53361	86204	PS Grinders	R	Opns	-	-	150,000	418,536
Subtotal					207,979	70,840	945,000	1,771,274
Mobile Equipment								
P53293	86209	Ford F250 Pickups	R	Opns	43,067	176,448	-	107,413
P53299	86209	Dump Truck	R	Opns	151,537	-	-	-
P53282	86209	4WD Truck	R	Opns	-	61,481	-	-
P53285	86209	Truck(s) with Boom	R	Opns		-	200,000	200,000
P53292	86209	Fleet Pickups	R	Engr	-	53,822	80,000	230,000
P53279	86209	Combonation Vacuum Truck	N	Opns	-	406,105	-	-
P53353	86209	Fleet - Vehicle	R	Opns	-	34,895	-	-
P53354	86209	Flush Truck Reel	R	Opns	-	-	-	40,000
Subtotal					194,603	732,751	280,000	577,413
TOTAL					402,582	803,592	1,225,000	2,348,687

N = New
R = Replacement
E = Existing

625195 SCCSD WASTEWATER CAPITAL IMPROVEMENT FUND (50/195)

The Wastewater Capital Improvement fund is required by the provisions of the Clean Water Grants we accepted to build the East Cliff and Aptos Transmission Projects. The fund receives cash, which represents the depreciation on the facilities constructed with Clean Water grant funds. These funds are accumulated so that the facilities can be repaired or reconditioned to insure continued use.

				19/20	20/21	21/22	21/22	
EXPENDITURES:				Actual	Actual	Recommended	Adopted	% Change
P54002	86110	DA Porath - Facility Improvements	Opns	32,653	177,901	1,473,000	1,474,229	0%
P54004	86110	DA Porath - Butterfly Habitat Plan	Engr	-	-	10,000	10,000	0%
P54005	86110	Transmission Line Inspection	Both	338,520	-	200,000	200,000	0%
P54018	86110	Flow Meter Replacement & Repairs	Opns	(1,737)	-	-	-	0%
P54023	86110	SCADA System Improvements	Opns	-	144,348	150,000	150,000	0%
P54038	86110	Pump Station Sewage Level Monitoring Imprvmnt	Opns	-	-	50,000	50,000	0%
P54041	86110	Concrete Repairs at Various Pump Stations	Engr	25,526	(10,073)	-	4,759	0%
P54046	86110	Hidden Beach Pump Station Manhole Rehabilitation	Engr	53,572	-	-	-	0%
P54048	86110	Santa Cruz Harbor Transmission Main Rehabilitation	Engr	284,357	129,787	1,100,000	1,215,323	10%
P54051	86110	Soquel Pump Station Force Main Replacement	Engr	4,929,402	2,450,333	-	123,742	0%
P54054	86110	Wet Weather Retention Basin	Engr	-	554	-	-	0%
P54058	86110	Capitola / Jewel Box Sewer Improvements	Engr	7,906	3,082	-	-	0%
P54059	86110	Hidden Beach Way Sewer Extension	Engr	328	-	-	-	0%
P54062	86110	E. Cliff Trans Secondary Forcemain Feasibility Study	Engr	4,534	1,009	-	-	0%
P54099	86110	Wastewater Capital Reserves	Engr	(16,497)	-	200,000	200,000	0%
P54101	86110	DA Porath Modular Building	Engr	-	322,340	-	-	0%
P54102	86110	Soquel Force Main Building	Engr	-	-	20,000	20,000	0%
P54050	90000	Operating Transfer out to Const Imp Fund	Engr	-	-	-	-	0%
TOTAL EXPENDITURES				5,658,563	3,219,282	3,203,000	3,448,053	8%
SOURCE OF FUNDS:								
	34400	Fund Balance		2,414,399	2,364,398	1,253,474	1,288,619	3%
	40877	SWRCB Prop 84 - Soquel P.S. (P54051)		1,160,140	514,482		302,109	0%
	42506	Loan Proceeds - Soquel P.S. (P54051)		2,634,637	1,625,319		740,044	0%
	42462	Transfer from Revenue Trust Fund		1,813,785	3,703	1,949,526	1,117,281	-43%
AVAILABLE FUNDS				8,022,961	4,507,902	3,203,000	3,448,053	8%

136409 SCCSD CONSTRUCTION IMPROVEMENT FUND (50/185)

The Construction Improvement Fund was established to construct needed improvements in the District.

				19/20	20/21	21/22	21/22	
EXPENDITURES:				Actual	Actual	Recommended	Adopted	% Change
P53600	86110	Bennett Rd Sewer Rehab	Engr	-	67,494	-	-	0%
P53601	86110	Rio Sands Sewer Rehab	Engr	-	3,154	440,000	665,000	51%
P53602	86110	Cliff Drive Sewer Trench Rep	Engr	-	338,553	630,000	570,000	-10%
P53603	86110	Eddy Lane Sewer Relocations	Engr	-	5,015	435,000	880,000	102%
P53604	86110	Rodriguez Street Sewer Rehab	Engr	-	4,678	800,000	660,000	-18%
P53802	86110	Pump Station Repair/Modifications	Opns	98,876	131,919	-	-	0%
P53803	86110	Jewel Box Sewer Replacement	Engr	4,632,517	(62,177)	-	-	0%
P53804	86110	Cathodic Protection Construction	Opns	-	-	100,000	100,000	0%
P53809	86110	Arana P.S. Reconstruction	Engr	37,916	7,711	-	-	0%
P53810	86110	Schwan Pump Station Generator Room	Engr	375,924	34,625	-	-	0%
P53811	86110	2019 Pipe Rehabilitation	Engr	948,585	-	-	-	0%
P53826	86110	2020 Pipe Rehabilitation	Engr	21,606	1,736,234	-	-	0%
P53812	86110	Minor Projects	Engr	281,695	39,257	309,314	717,552	132%
P53813	86110	Electrical Panel Upgrades At Various Pump Stations	Opns	-	119,250	-	-	0%
P53816	86110	Arana Trunkline Emergency Repair	Engr	973	9,064	-	-	0%
P53817	86110	Consulting Engineering Services	Engr	(11,544)	67,949	400,000	967,848	142%
P53824	86110	Cabrillo Park Sewer Replacement	Engr	198,391	474,955	-	188,953	0%
P53827	86110	Lower Rodeo Trunkline	Engr	1,069	123	5,400,000	5,400,000	0%
P53829	86110	Rio Del Mar Sewer Rehabilitation	Engr	8,570	663,458	-	-	0%
P53831	86110	East SC Harbor Sewer Rehab	Engr	4,585	152,968	-	-	0%
P53832	86110	Mansfield St. Sewer Emergency	Engr	4,824	-	-	-	0%
P53837	86110	Cliff Dr. Area Sewer Rehab	Engr	2,338	1,172,163	-	-	0%
P53840	86110	Road/Trench Repairs	Engr	-	2,003	50,000	50,000	0%
P53842	86110	Capitola Avenue - Beverly to Bay	Engr	772,938	239,568	-	-	0%
P53845	86110	Cliff Drive Emergency Repair	Engr	421,568	-	-	-	0%
P53846	86110	Ewell Ave Manhole Replacement	Engr	-	11,610	-	-	0%
P53850	86110	Seascape Golf Man Hole Relocate	Engr	4,288	389,663	-	-	0%
P53853	86110	41St @ Soquel Dr Sewer Rehab	Engr	1,368	905,051	-	-	0%
P53854	86110	2021 Pipe Rehabilitation	Engr	-	1,461	1,160,000	1,000,000	-14%
P53870	86110	Valencia Creek Sewer Relocation	Engr	48,941	17,940	2,088,000	2,088,000	0%
P53876	86110	Upper Rodeo Gulch Trunkline & Soquel Sewer Bridge Repl	Engr	174,853	225,103	5,000,000	5,000,000	0%
P53877	86110	Searidge Drive Sewer	Engr	255	(170)	-	-	0%
P53881	86110	East Cliff, Portola & Richmond Drives Sewer Replacement	Engr	1,684	(1,123)	4,949,000	5,345,696	8%
P53884	86110	Trunkline Right Of Way	Opns	1,613	28,125	-	-	0%
P53890	86110	Capitola Pump Station Pumps, Motors & Controls	Engr	-	-	200,000	200,000	0%
P53892	86110	Arana Trunkline Replacement	Engr	162,067	339,437	3,000,000	3,188,326	6%
P53997	74425	Interest Expense (Valencia and Jewel Box)	Engr	239,427	103,133	-	-	0%
P53999	98700	Contingencies		-	-	-	-	0%
TOTAL EXPENDITURES				8,435,325	7,228,197	24,961,314	27,021,375	8%
SOURCE OF FUNDS:								
	34400	Fund Balance		6,295,427	(1,659,017)	2,055,199	5,161,850	151%
	42384	Other Revenue			173,765			0%
	42506	Loan Proceeds - SRF for Valencia (53870)		-	-	1,763,000	1,393,000	-21%
	42506	Loan Proceeds - Ibank for Jewel Box (P53803)		-	6,930,000	2,204,720	-	-100%
	42506	Loan Proceeds - Bond Financing			-	17,000,000	17,000,000	0%
	42462	Transfer from WasteWater Cap Improvement Fund		-	-			0%
	42462	Transfer from Revenue Trust		2,722,441	6,945,299	1,938,395	3,466,525	79%
AVAILABLE FUNDS				9,017,867	12,390,047	24,961,314	27,021,375	8%

625177 SCCSD CLEAN WATER STATE REVOLVING FUND DEBT SERVICE FUND (50/177)

This fund was established during the 2011/12 fiscal year to receive the transfers from the Revenue Trust for the p of principle and interest to repay the money borrowed through the Clean Water State Revolving Fund.

For Finance Agreement No. 09-848-550-0, the total amount borrowed was $11,981,910 and the principal balance June 30, 2020 was $8,106,842. This debt will be retired in 2032.

EXPENDITURES:			19/20 Actual	20/21 Actual	21/22 Recommended	21/22 Adopted
54610	74110	Principal	573,309	587,642	602,333	602,333
54611	74310	Interest	213,391	198,968	187,980	187,980
TOTAL EXPENDITURES			786,700	786,610	790,313	790,313
SOURCE OF FUNDS:						
	34400	Fund Balance	8,281	578,869	8,281	588,655
	40430	Interest	5,559	3,013	2,000	2,000
	42462	Transfer from Revenue Trust	778,419	205,741	780,032	199,658
AVAILABLE FUNDS			792,260	787,623	790,313	790,313

For Finance Agreement No. D17-01046, the total amount to be borrowed is $5,000,000 and the principal balance June 30, 2020 was $2,365,363. This debt will be retired in 2032.

EXPENDITURES:			19/20 Actual	20/21 Actual	21/22 Recommended	21/22 Recommended
54610	74110	Principal	-		138,160	138,160
54611	74310	Interest	1,949	-	129,453	129,453
TOTAL EXPENDITURES			1,949	-	267,613	267,613
SOURCE OF FUNDS:						
	34400	Fund Balance	-	-	-	71,990
	40430	Interest	-	-	2,000	2,000
	42462	Transfer from Revenue Trust	1,949	71,990	265,613	193,623
AVAILABLE FUNDS			1,949	71,990	267,613	267,613

625179 SCCSD CALIFORNIA INFRASTRUCTURE & ECONOMIC DEVELOPMENT BANK DEBT SERVICE FUND (50/179)

This fund was established during the 2019/20 fiscal year to receive the transfers from the Revenue Trust for the payment of principal and interest on the money borrowed through a California Infrastructure and Economic Development Bank loan. The total amount borrowed is budgeted to be $7M with loan distributions to occur in FY21. Payments of principle will begin iAugust of 2021 and the debt will be retired in 2048.

		EXPENDITURES:	19/20 Actual	20/21 Actual	21/22 Recommended	21/22 Adopted
54610	74110	Principal - Jewel Box Loan		144,025	149,009	149,009
54611	74310	Interest - Jewel Box Loan	239,427	131,544	258,483	258,483
54611	74310	Annual Fee		21,000	21,000	21,000
TOTAL EXPENDITURES			239,427	296,569	428,492	428,492
		SOURCE OF FUNDS:				
	34400	Fund Balance (Restricted)		-	-	252,801
	40430	Interest		592	-	-
	42462	Transfer from Revenue Trust	239,427	404,753	428,492	175,691
AVAILABLE FUNDS			239,427	405,345	428,492	428,492

625178 SCCSD CLEAN WATER STATE REVOLVING FUND DEBT RESERVE FUND (50/178)

This fund was established during the 2020/21 fiscal year as a condition of the Clean Water State Revolving Fund, Finance Agreement No. D17-01046. The agreement requires the District to establish a Restricted Reserve Fund equal to one year's debt service. The total amount to be borrowed is estimated to be $5,000,00 and the principal balance on June 30, 2020 was $2,634,637. Payments on the debt will be begin one year from completion of construction of the Soquel Pump Station . The debt will be retired in 30 years.

EXPENDITURES:		19/20 Actual	20/21 Actual	20/21 Recommended	21/22 Adopted
	Reserves	-	218,000	218,300	-
		-	-	-	-
			-	-	-
TOTAL EXPENDITURES		-	218,000	218,300	-

SOURCE OF FUNDS:					
34400	Fund Balance (Restricted)	-	-	218,250	218,469
40430	Interest	-	469	300	300
42462	Transfer from Revenue Trust	-	218,000	218,000	-
AVAILABLE FUNDS		-	218,469	436,550	218,769

625205 SCCSD REVENUE TRUST (50/205)

The Revenue Trust was created to receive the general revenue for Santa Cruz County Sanitation District. It makes payments to the Debt Service, Operating, Wastewater Capital Improvement and Construction Improvement Funds as needed to fund those activities.

		EXPENDITURES:	19/20 Actual	20/21 Actual	20/21 Recommended	21/22 Adopted	% Change
Transfers to:							
54500	90000	Operating Fund (625175)	19,629,377	19,929,446	22,131,674	22,468,873	2%
54500	90000	Wastewater Capital Improvement Fund (625195)	1,813,785	3,703	1,949,526	1,117,281	-43%
54500	90000	Construction Improvement Fund (136409)	2,722,441	6,945,299	1,938,395	3,466,525	79%
54500	90000	Clean Water State Revolving Fund loan (625177)	778,419	205,741	780,032	199,658	-74%
54500	90000	Clean Water State Revolving Fund loan (625177 - Soquel Pun	1,949	71,990	265,613	193,623	-27%
54500	90000	iBank Debt Service Fund (625179)	239,427	404,753	428,492	175,691	-59%
New	90000	SWRCB - Valencia Debt Service Fund (New)					0%
54500	90000	Clean Water State Revolving Fund Debt Reserve (625178)		218,000	218,000	-	-100%
TOTAL EXPENDITURES			25,185,399	27,778,933	27,711,732	27,621,651	0%
SOURCE OF FUNDS (FOR TRANSFERS):							
	34400	Beginning Fund Balance (Unrestricted)	3,659,894	3,705,097	219,962	3,556,911	1517%
		Revenues					
	40430	Interest	201,305	88,024	120,000	120,000	0%
	41842	Connection Fees	260,000	264,563	200,000	200,000	0%
	41866	Sewer Service Charges	26,793,000	27,278,010	27,844,740	27,844,740	0%
	42384	Other Revenues	-	150	-	-	0%
		Revenues Subtotal	27,254,305	27,630,747	28,164,740	28,164,740	-
SOURCE OF FUNDS SUBTOTAL			30,914,199	31,335,844	28,384,702	31,721,651	12%
		Reserves	-	-	(4,100,000)	(4,100,000)	0%
AVAILABLE FUNDS			30,914,199	31,335,844	24,284,702	27,621,651	14%

SANTA CRUZ COUNTY SANITATION DISTRICT
ADOPTED BUDGET 2021/2022

.

USES OF FUNDS		**21/22 Adopted**
Expenditures		
625175	Operating Fund	23,264,362
625195	Wastewater Capital Impr Projects	3,248,053
136409	Construction Improvement Fund	27,021,375
625177	Clean Water State Revovling Fund DS	1,057,926
625179	iBank - Jewel Box DS	428,492
	Total Expenditures	55,020,207
Reserves		
625195	Wastewater Capital Improvement	200,000
625178	SWRCB - Soquel Pump Station - Reserve	218,769
625205	Revenue Trust	4,100,000
	Total Reserves	4,518,769
TOTAL EXPENDITURES AND RESERVES		59,538,976
SOURCES OF FUNDS		
Fund Balances		
625175	Operating Fund	786,488
625195	Wastewater Capital Improvement	1,288,619
136409	Construction Improvement Fund	5,161,850
625177	Clean Water State Revolving Fund DS	660,645
625179	iBank - Jewel Box DS	252,801
625178	SWRCB - Soquel Pump Station - Reserve	218,469
625205	Revenue Trust	3,556,911
	Total Fund Balance	11,925,783
Revenues		
625175	Plan Checking Fees	5,000
625175	Other Charges Current Services	3,000
625175	Other Revenues, Transfers and Adjustments	1,000
625195	SRF Prop 40 & Prop 50 Grants	302,109
625195	Loan Proceeds	740,044
136409	Loan Proceeds	1,393,000
136409	Loan Proceeds - Bond Financiing	17,000,000
625177	Interest	2,000
New	Interest	2,000
625178	Interest	300
625205	Interest	120,000
625205	Connection Fees	200,000
625205	Sewer Service Charges	27,844,740
	Total Revenues	47,613,193
TOTAL FUND BALANCES AND REVENUES		59,538,976
DIFF THIS SCHEDULE		0

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SANTA CRUZ COUNTY SANITATION DISTRICT
701 OCEAN STREET, SUITE 410 · SANTA CRUZ, CA · 95060-4073
(831) 454-2160 · FAX (831) 454-2089 · TDD: (831) 454-2123 · WWW.SCCSD.US
MATT MACHADO, DISTRICT ENGINEER

AGENDA DATE: MAY 20, 2021

Accepted by the Board of Directors, SCCSD on May 20, 2021
ATTEST: _____ Secretary

BOARD OF DIRECTORS
SANTA CRUZ COUNTY SANITATION DISTRICT
701 Ocean Street, Room 410
Santa Cruz, California 95060

SUBJECT: PROPOSED 2021-22 SANTA CRUZ COUNTY SANITATION DISTRICT BUDGET

Members of the Board:

Attached for the Boards review is the proposed District budget for the 2021-22 fiscal year. The budget is based on raising the sewer service charge rates 4.0%. The proposed budget has expected expenditures and contingencies of $51,491,406 million and reserves of $4,518,000 million for a total of $56,109,406 million. This includes expenditures of $22,140,674 million in operating expenses (including $6.6 million for the District's share of operating the City of Santa Cruz wastewater treatment plant and capital improvements at the plant), $1,486,418 million in loan payments, $3,003,000 million in wastewater capital improvement projects, and $24,961,314 million in construction improvement projects.

The following projects are among those proposed to be under construction in 2021-22 or are currently under construction during these last months of 2020-21:

1) Cliff Drive Sewer Trench Repair
2) 2021 Sewer Pipe Rehabilitation Project (District-wide)
3) Rio Sands Sewer Rehabilitation
4) Eddy Lane Sewer Relocation
5) Rodriquez Street Sewer Rehabilitation
6) Lower Rodeo Trunkline Rehabilitation and Pump Station Upgrade
7) Upper Rodeo Gulch Trunkline & Soquel Sewer Bridge Sewer Replacement
8) East Cliff, Portola, & Richmond Drives Sewer Replacement
9) Valencia Creek Sewer Relocation
10) Arana Trunkline Replacement

The District staff proposes obtaining $17.0 million in bonds to cover the improvements to the Lower Rodeo Trunkline Rehabilitation and Pump Station Upgrade; Upper Rodeo Gulch Trunkline; East Cliff, Portola, & Richmond Drives Sewer Replacement; and Arana Trunkline Replacement projects. The District is in the final stages of securing a $1 to $2 million loan from the State Water Resources Control Board's State Revolving fund for the Valencia Creek Sewer Relocation project. The resulting debt service on these loans is similar to that presented in this fiscal year's rate study by Hornberger Engineering.

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FIXED ASSETS

This year's proposed fixed assets budget includes funding for a portable diesel generator, network equipment, motorized valves, and pump station grinders. The proposed budget includes funding for a boom truck with a crane for the electrical crew and two fleet pickup trucks to replace aging equipment.

OVERHEAD

The department overhead of 12.5 percent includes administrative service salaries within the Public Works Department (personnel, fiscal, safety, MIS, and clerical) and executive salaries for staff providing oversight of the District as well as County Overhead (A-87 Cost Plan). The County overhead charges allocate the cost related to central support departments such as County Counsel, Personnel Department, Auditor-Controller-Treasurer-Tax Collector, Purchasing, and other miscellaneous departments that provide a direct service to the District, as well as general costs for such items as facilities management, building use allowance, communications, and warehouse storage. There is also a 22.9 percent Division overhead that pays for insurance, training, salaries not billable to specific projects, and other indirect costs.

The following budgetary items reflect significant differences between the current and proposed budget amounts (see explanation below):

625175 OPERATING FUND (50/175)

BUDGET NO.	ITEM	2019-20 ACTUAL	2020-21 ADOPTED	2021-22 RECOMMENDED	EXPLANATION
53173	City of Santa Cruz Treatment Costs	$5,195,312	$6,400,000	$6,600,000	This increase is due to new capital improvement projects at the City's treatment plant.
53136	Sulfide Control	$1,155,776	$1,233,000	$1,550,000	This increase is for odor control and corrosion services
53140	Tree Trimming	$45,869	$75,027	$110,000	The project number combines tree and brush clearing expenses under tree trimming.
53142	Source Control Lab Work	$17,669	$26,250	$35,000	Additional sampling and laboratory testing is required to reexamine local limit discharges from significant industrial users.
53196	Revenue Study	$16,685	$20,000	$30,000	This increase will pay for a residential flow study, along with the regular rate study.

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625175 OPERATING FUND (50/175) CONTINUED

BUDGET NO.	ITEM	2019-20 ACTUAL	2020-21 ADOPTED	2021-22 RECOMMENDED	EXPLANATION
53226	Emergency Diesel Generators	$971	$8,018	$80,000	A new portable generator is required to replace aging equipment.
53357	PLC Upgrades	$0	$100,000	$200,000	The pump stations require programmable logic controller upgrades.
53285	F550 Truck with Boom	$0	$0	$200,000	A new boom truck with a crane is needed for the electrical crew.
53293	F250 Pickups	$0	$0	$80,000	Operations requires two fleet truck to replace aging equipment.

625195 SCCSD WASTEWATER CAPITAL IMPROVEMENT FUND (50/195)

BUDGET NO.	ITEM	2019-20 ACTUAL	2020-21 ADOPTED	2021-22 RECOMMENDED	EXPLANATION
54002	D.A. Porath Lode St. Facility Improvements	$32,653	$1,167,347	$1,473,000	These funds are for the D.A Porath Facility Improvements, including consultation with an architectural firm for office improvements.
54048	Santa Cruz Harbor Transmission Main Rehabilitation	$284,357	$250,000	$1,100,000	Nearly 95% of the design for this project was completed in 2020-21 and District funds will be required to cover a portion of the construction not covered by the City's FHWA grant.

136409 SCCSD CONSTRUCTION IMPROVEMENT FUND (50/185)

BUDGET NO.	ITEM	2019-20 ACTUAL	2020-21 ADOPTED	2021-22 RECOMMENDED	EXPLANATION
53601	Rio Sands Sewer Rehabilitation	$0	$0	$440,000	These funds would continue to fund the repair and replacement of deteriorating pipes identified in Rio Del Mar.
53602	Cliff Drive Sewer Trench Repair	$0	$0	$630,000	These funds would be used to construct the trench repairs required prior to the Measure D paving project.

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136409 SCCSD CONSTRUCTION IMPROVEMENT FUND (50/185) CONTINUED

BUDGET NO.	ITEM	2019-20 ACTUAL	2020-21 ADOPTED	2021-22 RECOMMENDED	EXPLANATION
53603	Eddy Lane Sewer Relocation	$0	$0	$435,000	These funds would be used to relocate a broken sewer main.
53604	Rodriquez Street Sewer Rehabilitation	$0	$0	$800,000	These funds would be used to fund the repair and replacement of deteriorating pipes identified in Rodriquez Street.
53804	Cathodic Protection Construction	$0	$0	$100,000	Repairs to components of the rectifiers and test sites are required.
53827	Lower Rodeo Gulch Trunkline Replacement	$1,069	$20,000	$5,400,000	These funds would be for construction in 2022 to upsize the trunk line and increase capacity at the Rodeo Pump Station.
53854	2021 Pipe Rehabilitation	$0	$2,500,000	$1,160,000	These funds would continue to fund the repair and replacement of deteriorating pipes throughout the District.
53876	Upper Rodeo Gulch Trunkline	$174,853	$600,000	$5,000,000	These funds would be for construction in 2022 to reduce infiltration in the trunk line.
53881	East Cliff, Portola & Richmond Sewer Replacement	$1,684	$4,300,000	$4,949,000	Rather than occurring in 2021, construction to replace deteriorated sewer mains in East Cliff Drive are planned for 2022.
53890	Capitola Pump Station Pumps, Motors, & Controls	$0	$0	$200,000	Aging pumps will be replaced in the coming fiscal year.
53892	Arana Trunkline Replacement	$162,067	$3,800,000	$3,000,000	Rather than occurring in 2021, construction to replace deteriorated sewer mains along Arana Gulch will occur in 2022.

The final budget hearing is set for 4:45 p.m., Thursday, June 10, 2021. This public hearing will employ a hybrid meeting format that combines face-to-face and virtual (Zoom video/audio-conferencing) meeting components. The District is mindful of the need to provide a variety of methods for the public to receive information and provide input, while meeting public health guidelines and protecting vulnerable populations. The attached Notice of Public Hearing will be published in the Santa Cruz Sentinel 15 days and 7 days prior to the budget hearing.

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It is therefore recommended that the Board of Directors accept this proposed budget and direct the District Secretary to publish the Notice of Public Hearing.

Yours truly,

DocuSigned by:
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MATT MACHADO
District Engineer

AT:tlp/B2314.docx
Attachment

Copy to: Mark Dettle, Director, City of Santa Cruz, Public Works

Hidden Beach Pump Station

DESCRIPTION OF FACILITIES

2021/22 thru 2025/26
CAPITAL IMPROVEMENT PROGRAM

SANTA CRUZ COUNTY SANITATION DISTRICT

DESCRIPTION OF FACILITIES

The Santa Cruz County Sanitation District (SCCSD) maintains 234 miles of sanitary sewer pipeline (220 miles of gravity lines, which use gravity to move the sewage along, and 14 miles of force main, which is pressurized), 4,780 manholes and 35 sanitary sewer pump stations. The District serves a population of 72,200 with approximately 36,000 sewer lateral connections.

The D. A. Porath Sanitation Facility is the District's main pump station and is the location of the Board of Directors' in-person meetings. It is located at 2750 Lode Street, Santa Cruz, California. This pump station receives wastewater from the collection system which is pumped through a force main to the City of Santa Cruz's Wastewater Treatment Facility which is a publicly owned treatment works (POTW) plant at Neary Lagoon, in the City of Santa Cruz.

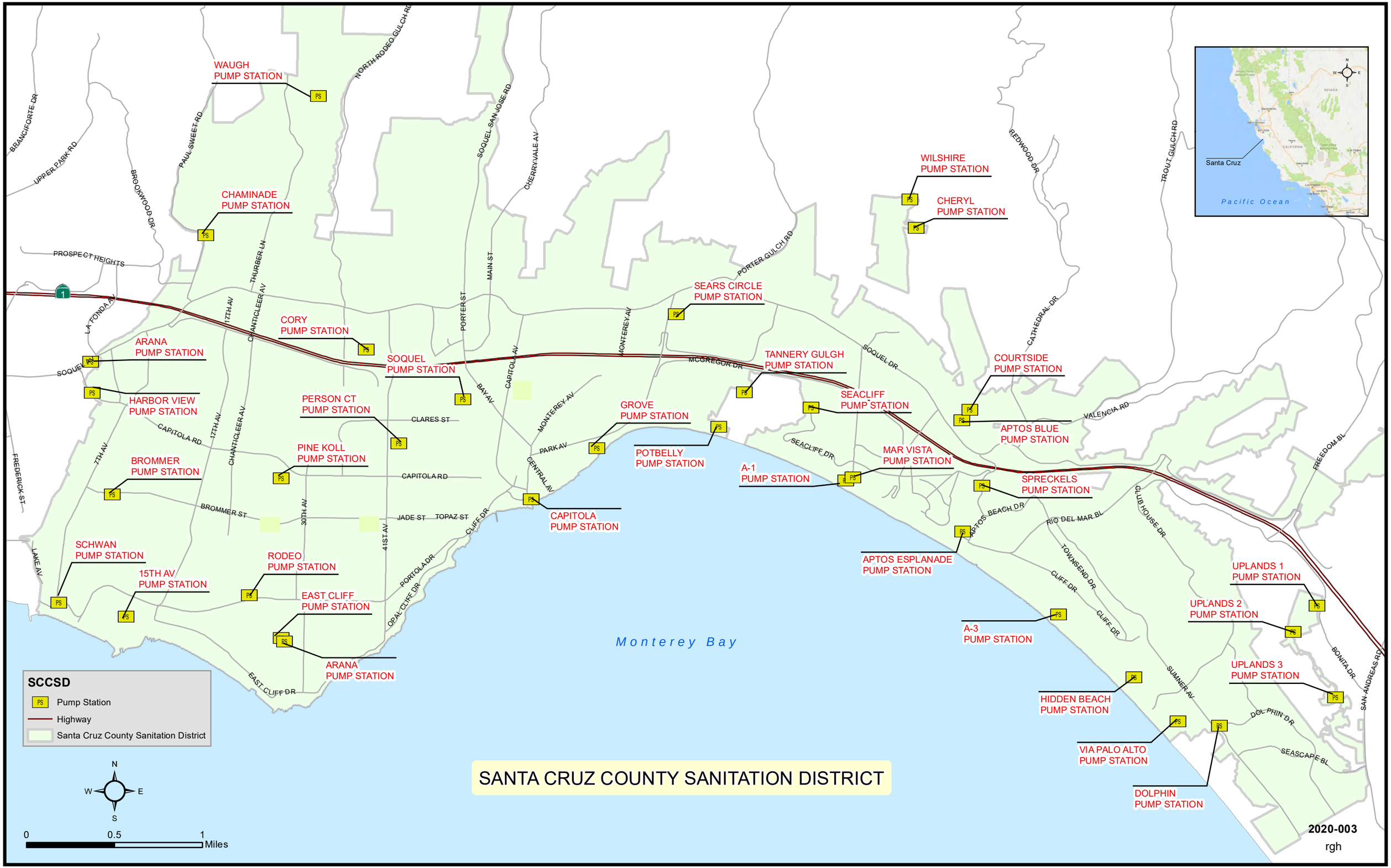
Pump stations (or lift stations) are designed to move raw sewage that is fed from gravity pipelines to pipelines at a higher elevation. Sewage flows into an underground pit, called a wet well. The well is equipped with electrical instrumentation to detect the level of sewage, and when the sewage level rises to a pre-set point, a pump motor creates pressure to push the sewage into a force main where it is eventually discharged into a gravity manhole. The cycle then starts over again until the sewage reaches the City Treatment Facility. The size of the pump station depends on the connections being served and the pumps are between 2hp to 230hp. Typically, large pump stations are located in above ground enclosed structures and smaller pump wet wells are located below ground in residential streets.

SCCSD PUMP STATIONS

15th Avenue +	Pearson Court +	KEY
A-1[1]	Pine Knoll +	
A-3[2]	Potbelly Beach [3]	+On site generator
Aptos Blue +	Rodeo +	[1] Fed from Aptos Esplanade Pump Station
Aptos Esplanade +	Schwan Lake +	[2] Can also gravity to Hidden Beach Pump Station
Arana +	Seacliff +	
Brommer +	Sears Circle	[3] Fed from Tannery Pump Station
Capitola +	Soquel (at Nob Hill) +	
Chaminade +	Spreckels +	
Cheryl Way+	Tannery Gulch +	
Cory Street +	Uplands 1 +	
Courtside +	Uplands 2 +	
D. A. Porath +	Uplands 3 +	
Dolphin Drive +	Via Palo Alto +	
Grove +	Waugh +	
Harbor View +	Wilshire +	
Hidden Beach +		
Mar Vista +		
Moran +		

OTHER FACILITIES

SCADA Repeater Sites: Mt. Toro (Monterey County) and Empire Grade (Santa Cruz County)


WAUGH PUMP STATION
CHAMINADE PUMP STATION
CORY PUMP STATION
ARANA PUMP STATION
SOQUEL PUMP STATION
HARBOR VIEW PUMP STATION
PERSON CT PUMP STATION
PINE KOLL PUMP STATION
BROMMER PUMP STATION
SCHWAN PUMP STATION
15TH AV PUMP STATION
RODEO PUMP STATION
EAST CLIFF PUMP STATION
ARANA PUMP STATION
CAPITOLA PUMP STATION
GROVE PUMP STATION
POTBELLY PUMP STATION
A-1 PUMP STATION
SEARS CIRCLE PUMP STATION
TANNERY GULGH PUMP STATION
SEACLIFF PUMP STATION
MAR VISTA PUMP STATION
APTOS ESPLANADE PUMP STATION
WILSHIRE PUMP STATION
CHERYL PUMP STATION
COURTSIDE PUMP STATION
APTOS BLUE PUMP STATION
SPRECKELS PUMP STATION
A-3 PUMP STATION
HIDDEN BEACH PUMP STATION
VIA PALO ALTO PUMP STATION
DOLPHIN PUMP STATION
UPLANDS 1 PUMP STATION
UPLANDS 2 PUMP STATION
UPLANDS 3 PUMP STATION
PROSPECT HEIGHTS
BRANCIFORTE DR
UPPER PARK RD
BROOKWOOD DR
PAUL SWEET RD
NORTH RODEO GULCH RD
SOQUEL SAN JOSE RD
CHERRYVALE AV
THURBER LN
LA FONDA AV
17TH AV
CHANTICLEER AV
PORTER ST
MAIN ST
CAPITOLA AV
MONTEREY AV
BAY AV
PORTER GULCH RD
MCGREGOR DR
SOQUEL DR
CATHEDRAL DR
REDWOOD DR
TROUT GULCH RD
CLARES ST
PARK AV
CENTRAL AV
CAPITOLA RD
BROMMER ST
JADE ST
TOPAZ ST
30TH AV
41ST AV
CLIFF DR
PORTOLA DR
OPAL CLIFF DR
EAST CLIFF DR
SEACLIFF DR
APTOS BEACH DR
RIO DEL MAR BL
CLUB HOUSE DR
TOWNSEND DR
SUMNER AV
DOLPHIN DR
SEASCAPE BL
FREEDOM BL
BONITA DR
SAN ANDREAS RD
VALENCIA RD
FREDERICK ST
LAKE AV
7TH AV
Monterey Bay
Santa Cruz
Pacific Ocean
NEVADA
CALIFORNIA
SCCSD
Pump Station
Highway
Santa Cruz County Sanitation District
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SANTA CRUZ COUNTY SANITATION DISTRICT
2020-003
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PUMP STATIONS

2021/22 thru 2025/26
CAPITAL IMPROVEMENT PROGRAM

SANTA CRUZ COUNTY SANITATION DISTRICT

15th AVENUE

A1

(At Seacliff Beach)

A3
(At end of Beach Drive)

APTOS BLUE

APTOS ESPLANADE
(At Rio Del Mar Beach)

ARANA
(2 stories underground)

BROMMER

CAPITOLA

CHAMINADE

CHERYL WAY

CORY STREET

COURTSIDE

D.A. PORATH

DOLPHIN DRIVE

GROVE

HARBOR VIEW

HIDDEN BEACH

MAR VISTA

MORAN

PEARSON COURT

PINE KNOLL

POTBELLY BEACH

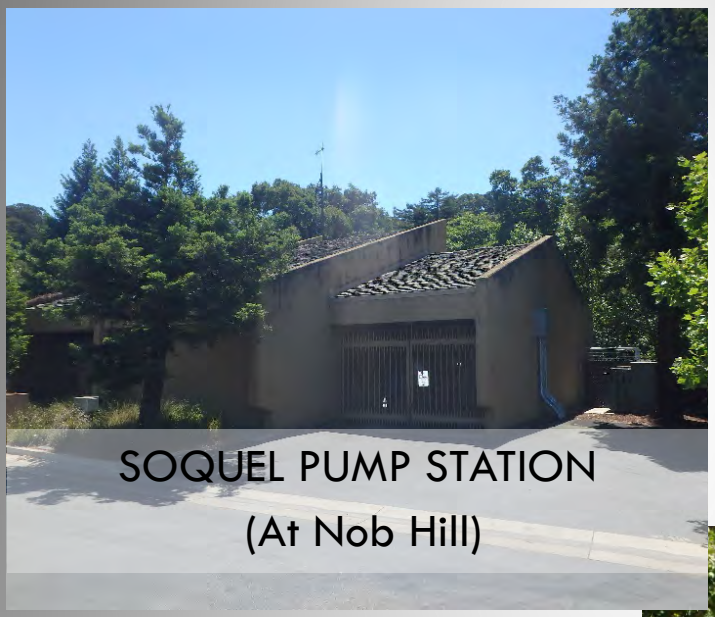
RODEO

(On Richmond Drive)

SCHWAN LAKE

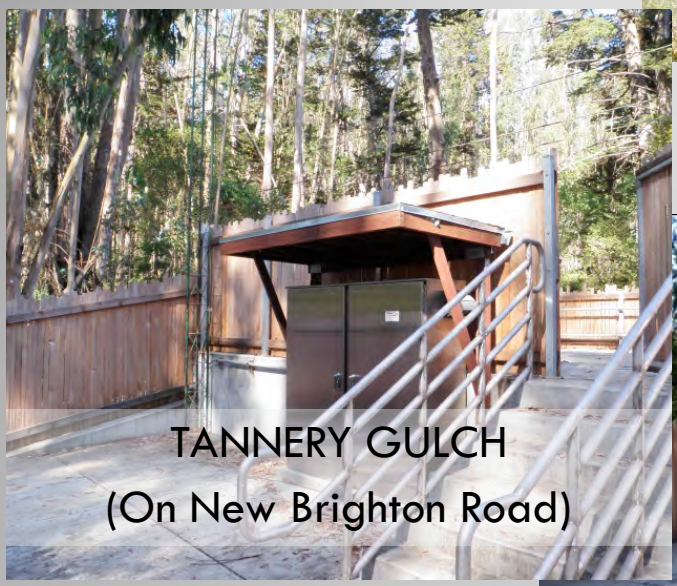
SEACLIFF

SEARS CIRCLE



SOQUEL PUMP STATION
(At Nob Hill)

SPRECKELS



TANNERY GULCH
(On New Brighton Road)

UPLANDS 1
(On Zanzibar Drive, Rio Del Mar)

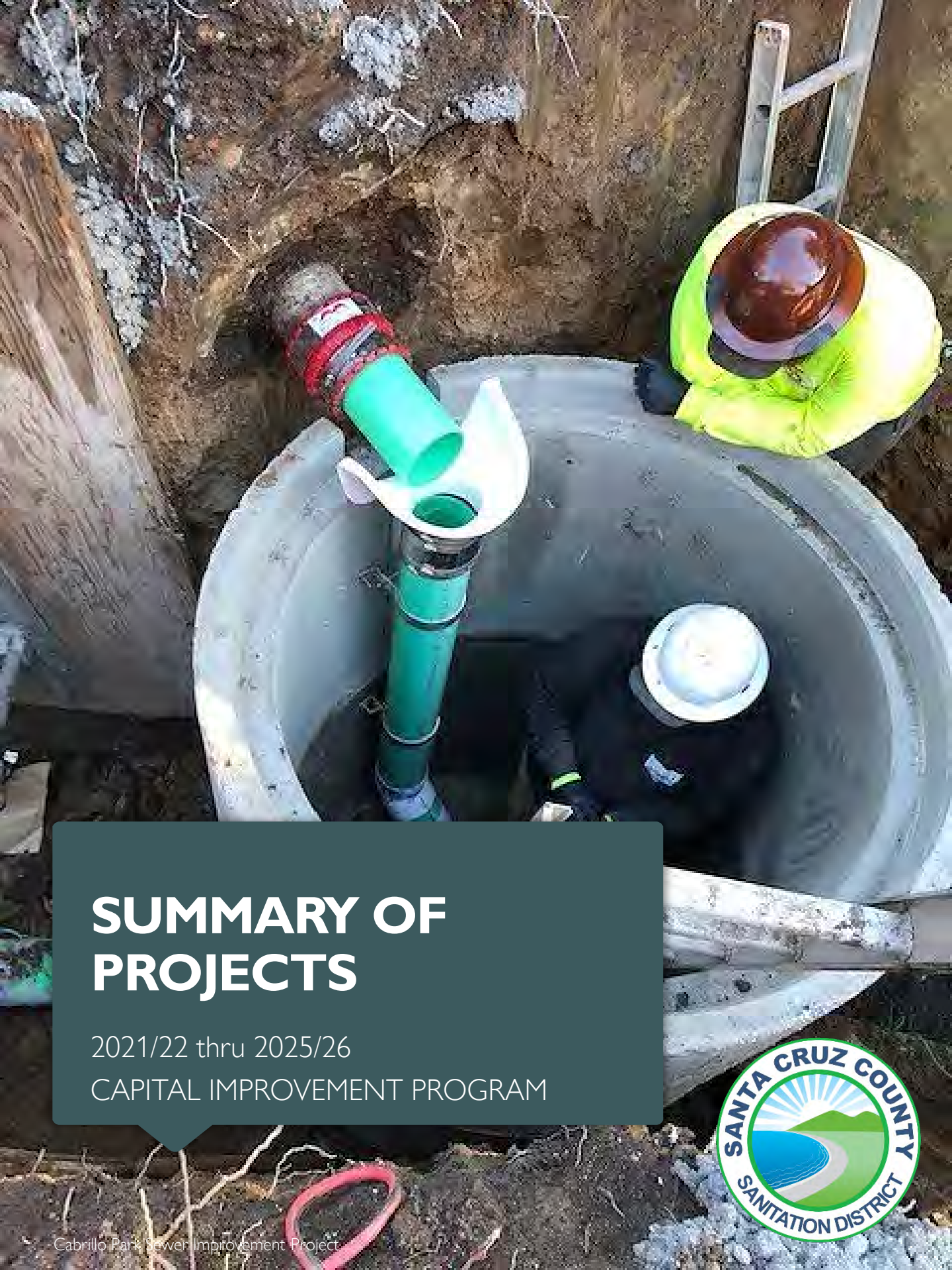
UPLANDS 2
(Also on Zanzibar Drive)

UPLANDS 3
(On Castillo Court)

VIA PALO ALTO

WAUGH AVENUE

WILSHIRE



SUMMARY OF PROJECTS

2021/22 thru 2025/26

CAPITAL IMPROVEMENT PROGRAM

SANTA CRUZ COUNTY SANITATION DISTRICT

Cabrillo Park Sewer Improvement Project

SUMMARY OF PROJECTS

PROJECT NO.	PROJECT	CAPITOLA	DISTRICT 1	DISTRICT 2	CITY OF SC	TOTAL PROJECT COST ESTIMATE	YEAR	STATUS
P53853	41ST AVENUE AT SOQUEL DRIVE SEWER REHABILITATION		X			$ 1,013,420	2020/21	COMPLETED
P53824	CABRILLO PARK SEWER REPLACEMENT PROJECT— PHASE I			X		$ 624,200	2020/21	COMPLETED
P53359	CAPITOLA PUMP REPLACEMENTS 2020/21 (PURCHASE ONLY)	X		X		$ 213,000	2020/21	COMPLETED
P53837	CLIFF DRIVE AREA SEWER REHABILITATION			X		$ 1,482,200	2020/21	COMPLETED
P53802	DOLPHIN PUMP STATION IMPROVEMENTS			X		$ 50,000	2020/21	COMPLETED
P53357	PLC UPGRADES 2020/21		X	X		$ 200,000	2020/21	IN PROGRESS
P53829	RIO DEL MAR SEWER REHABILITATION			X		$ 832,500	2020/21	COMPLETED
P54051	SOQUEL PUMP STATION FORCE MAIN REPLACEMENT PROJECT	X	X	X		$ 8,174,600	2018/19	COMPLETED
P53358	VFD REPLACEMENTS 2020/21 (RODEO PUMP STATION AND SOQUEL PUMP STATION)	X	X	X		$ 165,000	2020/21	IN PROGRESS
P53837	CLIFF DRIVE SEWER TRENCH REPAIRS			X		$ 606,400	2021/22	COMPLETED
P53246	VALVE REPLACEMENTS 2021/22 (PURCHASE ONLY)		X			$ 251,000	2021/22	COMPLETED

SUMMARY OF PROJECTS

PROJECT NO.	PROJECT	CAPITOLA	DISTRICT 1	DISTRICT 2	CITY OF SC	TOTAL PROJECT COST ESTIMATE	YEAR	STATUS
P53854	2021 SEWER PIPE REHABILITATION		X	X		$ 1,135,900	2021/22	IN CONSTRUCTION
P53892	ARANA TRUNKLINE REPLACEMENT		X		X	$ 3,474,200	2021/22	IN DESIGN
P53881	EAST CLIFF, PORTOLA, & RICHMOND DRIVES SEWER REPLACEMENTS		X			$ 7,239,000	2021/22	IN DESIGN
P54048	EAST CLIFF TRANSMISION MAIN RELOCATION AT MURRAY STREET BRIDGE				X	$ 7,350,400	2021/22	IN DESIGN
P53357	PLC UPGRADES 2021/22		X	X		$ 200,000	2021/22	FUTURE DESIGN
P53870	VALENCIA CREEK SEWER RELOCATION			X		$ 2,351,400	2021/22	IN DESIGN
P53358	VFD REPLACEMENT 2021/22 (CAPITOLA PUMP STATION & D.A. PORATH PUMP STATION)	X	X	X		$ 150,000	2021/22	FUTURE DESIGN
P53802	CAPITOLA PUMP STATION PUMP REPLACEMENT	X		X		$ 300,000	2022/23	IN DESIGN
TBD	D.A. PORATH PUMP STATION ACCESS HATCHES		X			$ 436,000	2022/23	FUTURE DESIGN
TBD	D.A. PORATH FACILITY PARKING IMPROVEMENTS		X			$ 257,000	2022/23	IN DESIGN
TBD	D.A. PORATH VALVE REPLACEMENT AND EMERGENCY BYPASS		X			$ 1,199,000	2022/23	FUTURE DESIGN

SUMMARY OF PROJECTS

PROJECT NO.	PROJECT	CAPITOLA	DISTRICT 1	DISTRICT 2	CITY OF SC	TOTAL PROJECT COST ESTIMATE	YEAR	STATUS
P53603	EDDY LANE SEWER RELOCATION		X			$ 930,000	2022/23	IN DESIGN
P53827	LOWER RODEO TRUNKLINE REPLACEMENT		X			$ 1,738,000	2022/23	IN DESIGN
P53357	PLC UPGRADES 2022/23	X	X	X		$ 300,000	2022/23	FUTURE DESIGN
P53601	RIO SANDS SEWER REHABILITATION			X		$ 715,000	2022/23	IN DESIGN
P53802	RODEO PUMP STATION CAPACITY UPGRADE		X			$ 1,915,000	2022/23	IN DESIGN
P53604	RODRIGUEZ STREET SEWER REHABILITATION		X			$ 730,000	2022/23	IN DESIGN
P53876	UPPER RODEO GULCH TRUNKLINE & SOQUEL BRIDGE SEWER REPLACEMENT		X			$ 5,420,000	2022/23	IN DESIGN
TBD	HIDDEN BEACH SEWER TRUNK LINE REHABILITATION			X		$ 1,003,000	2023/24	FUTURE DESIGN
P53357	PLC UPGRADES 2023/24	X	X	X		$ 350,000	2023/24	FUTURE DESIGN
TBD	CAPITOLA VILLAGE SEWER REHABILITATION	X		X		$ 6,171,200	2024/25	FUTURE DESIGN
P53363	EAST CLIFF TRANSMISSION MAIN INSPECTION		X		X	$ 100,000	2024/25	FUTURE DESIGN

SUMMARY OF PROJECTS

PROJECT NO.	PROJECT	CAPITOLA	DISTRICT 1	DISTRICT 2	CITY OF SC	TOTAL PROJECT COST ESTIMATE	YEAR	STATUS
P53357	PLC UPGRADES 2024/25		X	X		$ 200,000	2024/25	FUTURE DESIGN
TBD	RIO DEL MAR SEWER REHABIILITATION—PHASE 2			X		$ 2,019,800	2024/25	FUTURE DESIGN
TBD	SANTA CRUZ HARBOR AREA SEWER REHABILITATION - PHASE 2		X			$ 3,925,200	2024/25	FUTURE DESIGN
TBD	SOQUEL VILLAGE SEWER REHABILITATION—PHASE 2		X			$ 4,837,000	2024/25	FUTURE DESIGN
TBD	TOWNSEND AREA SEWER REHABILITATION			X		$ 2,148,400	2024/25	FUTURE DESIGN
P53809	ARANA PUMP STATION RELOCATION		X		X	$ 5,175,000	2025/26	IN DESIGN
P54055	EAST CLIFF TRANSMISSION MAIN REPAIRS		X		X	$ 900,000	2025/26	FUTURE DESIGN
TBD	VIENNA WOODS SEWER REHABILITATION— PHASE 1			X		$ 1,670,000	2025/26	FUTURE DESIGN

ONGOING OPERATIONS PROJECTS

East Cliff Drive and 12th Avenue Sewer Main Repairs

2021/22 thru 2025/26
CAPITAL IMPROVEMENT PROGRAM

SANTA CRUZ COUNTY SANITATION DISTRICT

ONGOING OPERATIONS PROJECTS

PROJECT NO.	PROJECT	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
P53804	CATHODIC PROTECTION	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
P54002	D.A. PORATH FACILITY IMPROVEMENTS	$ 250,000	$ 1,473,000	$ 600,000	$ 600,000	$ NA	$ NA	$ NA
P54023	SCADA IMPROVEMENTS	$ 263,991	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000
P54005	TRANSMISSION LINE INSPECTION	$ NA	$ 200,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000

Soquel Pump Station Force Main Replacement Project
Horizontal Directional Drilling

INDIVIDUAL PROJECTS

2021/22 thru 2025/26
CAPITAL IMPROVEMENT PROGRAM

SANTA CRUZ COUNTY SANITATION DISTRICT

41ST AVENUE AT SOQUEL DRIVE SEWER REHABILITATION

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	
CITY OF SANTA CRUZ	

PROJECT TYPE:	SYSTEM UPGRADE	PROJECT STATUS:	COMPLETED
LOCATION:	SOQUEL	ESTIMATED CONSTRUCTION YEARS:	2020/21
DESCRIPTION:	Replacement of three broken sewer mains and rehabilitation of the existing manholes.		

ESTIMATED PROJECT COSTS		
Land Survey	$	5,000
Preliminary Design	$	-
Environmental	$	-
Geotechnical	$	-
Engineering Design	$	30,000
Acquisition	$	34,200
Construction	$	632,620
Construction Management	$	20,000
Construction Inspection	$	125,800
Other	$	70,000
Total Estimated Project Costs	**$**	**200,000**

FUNDING SOURCES		
District Funds	$	1,013,420
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	$	**1,013,420**
Funding Not Yet Identified	**$**	**-**

CABRILLO PARK SEWER REPLACEMENT PROJECT — PH. I

CAPITOLA	
DISTRICT 1	
DISTRICT 2	X
CITY OF SANTA CRUZ	

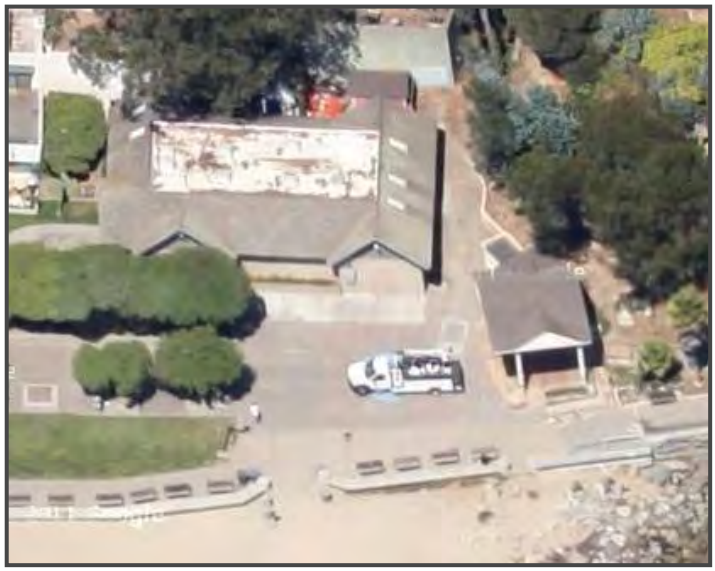
PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	COMPLETED
LOCATION:	APTOS	**ESTIMATED CONSTRUCTION YEARS:**	2020/21
DESCRIPTION:	Relocate a sanitary sewer manhole away from the failing slope to the existing parking lot. Replace 136± linear feet of associated sewer main.		

ESTIMATED PROJECT COSTS		
Land Survey	$	25,000
Preliminary Design	$	-
Environmental	$	-
Geotechnical	$	-
Engineering Design	$	100,000
Acquisition	$	34,200
Construction	$	275,000
Construction Management	$	20,000
Construction Inspection	$	100,000
Other	$	70,000
Total Estimated Project Costs	**$**	**624,200**

FUNDING SOURCES		
District Funds	$	624,200
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**624,200**
Funding Not Yet Identified	**$**	**-**

CAPITOLA PUMP REPLACEMENTS 2020/21

CAPITOLA	X
DISTRICT 1	
DISTRICT 2	X
CITY OF SANTA CRUZ	



PROJECT TYPE:	PUMP IMPROVEMENTS	**PROJECT STATUS:**	COMPLETED
LOCATION:	110 MONTEREY AVE	**ESTIMATED CONSTRUCTION YEARS:**	2020/21
DESCRIPTION:	Purchase of three 75 hp pumps for Capitola Pump Station to replace existing pumps in FY 2021-22.		

ESTIMATED PROJECT COSTS		
Land Survey	$	-
Preliminary Design	$	-
Environmental	$	-
Geotechnical	$	-
Engineering Design	$	-
Acquisition	$	-
Construction	$	-
Construction Management	$	-
Construction Inspection	$	-
Other	$	-
Total Estimated Project Costs	**$**	**213,000**

FUNDING SOURCES		
District Funds	$	213,000
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**213,000**
Funding Not Yet Identified	**$**	**-**

CLIFF DRIVE AREA SEWER REHABILITATION

CAPITOLA	
DISTRICT 1	
DISTRICT 2	X
CITY OF SANTA CRUZ	

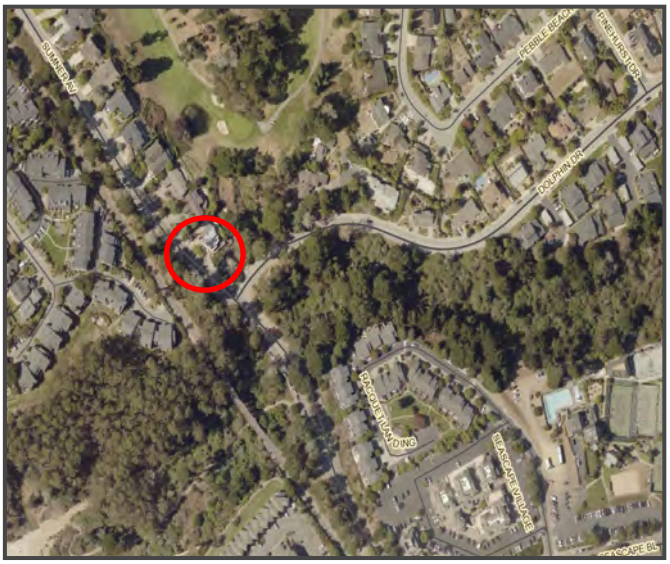
PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	COMPLETED
LOCATION:	APTOS	**ESTIMATED CONSTRUCTION YEARS:**	2020/21
DESCRIPTION:	Replace or repair 2,735± linear feet of deteriorating gravity sewer mains and manholes located near Cliff Drive. The sewer lines are old, deteriorating and at the end of their design life. Recompact an additional 3,365± linear feet of sewer trench contributing to settling pavement and sink holes.		

ESTIMATED PROJECT COSTS		
Land Survey	$	10,000
Preliminary Design	$	-
Environmental	$	1,200
Geotechnical	$	-
Engineering Design	$	40,000
Acquisition	$	-
Construction	$	988,000
Construction Management	$	30,000
Construction Inspection	$	167,000
Other	$	246,000
Total Estimated Project Costs	**$**	**1,482,200**

FUNDING SOURCES		
District Funds	$	1,482,200
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**1,482,200**
Funding Not Yet Identified	**$**	**-**

DOLPHIN PUMP STATION IMPROVEMENTS

CAPITOLA	
DISTRICT 1	
DISTRICT 2	X
CITY OF SANTA CRUZ	



PROJECT TYPE:	SYSTEM/PUMP UPGRADE	**PROJECT STATUS:**	COMPLETED
LOCATION:	SUMMER AVE AND DOLPHIN DR	**ESTIMATED CONSTRUCTION YEARS:**	2020/21
DESCRIPTION:	Pump and system improvements include replacing hydraulic grinder with an electric grinder and construction of a bathroom facility for Sanitation Operations staff.		

ESTIMATED PROJECT COSTS		
Land Survey	$	-
Preliminary Design	$	-
Environmental	$	-
Geotechnical	$	-
Engineering Design	$	-
Acquisition	$	-
Construction	$	-
Construction Management	$	-
Construction Inspection	$	-
Other	$	-
Total Estimated Project Costs	**$**	**50,000**

FUNDING SOURCES		
District Funds	$	50,000
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**50,000**
Funding Not Yet Identified	**$**	**-**

PLC UPGRADES 2020/21

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	X
CITY OF SANTA CRUZ	

PROJECT	LOCATION	EXISTING PLC MODEL
A1	201 STATE PARK DRIVE	Compact Logix L23E
BROMMER	960 BROMMER STREET	MicroLogix 1500
DOLPHIN	DOLPHIN AND SUMNER AVENUE	MicroLogix 1500
RODEO	1400 BLOCK OF RICHMOND	MicroLogix 1500
SPRECKLES	211 FOREST DRIVE	Compact Logix L23E

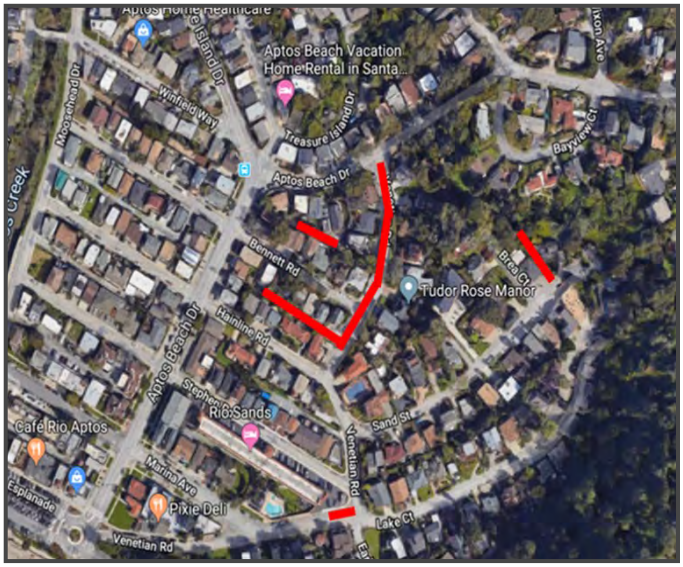
PROJECT TYPE:	OPERATIONS AND MAINTENANCE	**PROJECT STATUS:**	IN PROGRESS
LOCATION:	VARIOUS LOCATIONS	**ESTIMATED CONSTRUCTION YEARS:**	2020/21
DESCRIPTION:	Replace and upgrade older Programmable Logic Controllers (PLCs) at five pump stations.		

ESTIMATED PROJECT COSTS	
Land Survey	$ -
Preliminary Design	$ -
Environmental	$ -
Geotechnical	$ -
Engineering Design	$ -
Acquisition	$ -
Construction	$ -
Construction Management	$ -
Construction Inspection	$ -
Other	$ -
Total Estimated Project Costs	**$ 200,000**

FUNDING SOURCES	
District Funds	$ 200,000
Loans	$ -
Grants	$ -
Other	$ -
Total Project Funding	**$ 200,000**
Funding Not Yet Identified	**$ -**

RIO DEL MAR SEWER REHABILITATION

CAPITOLA	☐
DISTRICT 1	☐
DISTRICT 2	X
CITY OF SANTA CRUZ	☐



PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	COMPLETED
LOCATION:	RIO DEL MAR	**ESTIMATED CONSTRUCTION YEARS:**	2020/21
DESCRIPTION:	Replace or repair 1,070± linear feet of deteriorating gravity sewer mains and manholes located in Rio Del Mar. The sewer lines are old, deteriorating and at the end of their design life.		

ESTIMATED PROJECT COSTS		
Land Survey	$	15,000
Preliminary Design	$	-
Environmental	$	1,500
Geotechnical	$	-
Engineering Design	$	50,000
Acquisition	$	
Construction	$	488,000
Construction Management	$	30,000
Construction Inspection	$	126,000
Other	$	122,000
Total Estimated Project Costs	**$**	**$832,500**

FUNDING SOURCES		
District Funds	$	**$832,500**
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**$832,500**
Funding Not Yet Identified	**$**	**-**

SOQUEL PUMP STATION FORCE MAIN REPLACEMENT PROJECT

CAPITOLA	X
DISTRICT 1	X
DISTRICT 2	X
CITY OF SANTA CRUZ	

PROJECT TYPE:	SYSTEM UPGRADE	PROJECT STATUS:	COMPLETED
LOCATION:	CAPITOLA	ESTIMATED CONSTRUCTION YEARS:	2020/21
DESCRIPTION:	Replace force main from Soquel Pump Station to Soquel Wharf Road. 24-year-old crossing is at the end of its useful life.		

ESTIMATED PROJECT COSTS		
Land Survey	$	8,000
Preliminary Design	$	33,000
Environmental	$	405,000
Geotechnical	$	90,000
Engineering Design	$	555,000
Acquisition	$	156,600
Construction	$	5,700,000
Construction Management	$	322,000
Construction Inspection	$	220,000
Other (District-Purchased Equipment/	$	685,000
Total Estimated Project Costs	**$**	**8,174,600**

FUNDING SOURCES		
District Funds	$	1,197,869
Loans	$	5,000,000
Grants	$	1,976,731
Other	$	-
Total Project Funding	**$**	**8,174,600**
Funding Not Yet Identified	**$**	**-**

VFD REPLACEMENTS 2020/21

(RODEO PUMP STATION AND SOQUEL PUMP STATION)

CAPITOLA	☐
DISTRICT 1	X
DISTRICT 2	☐
CITY OF SANTA CRUZ	☐

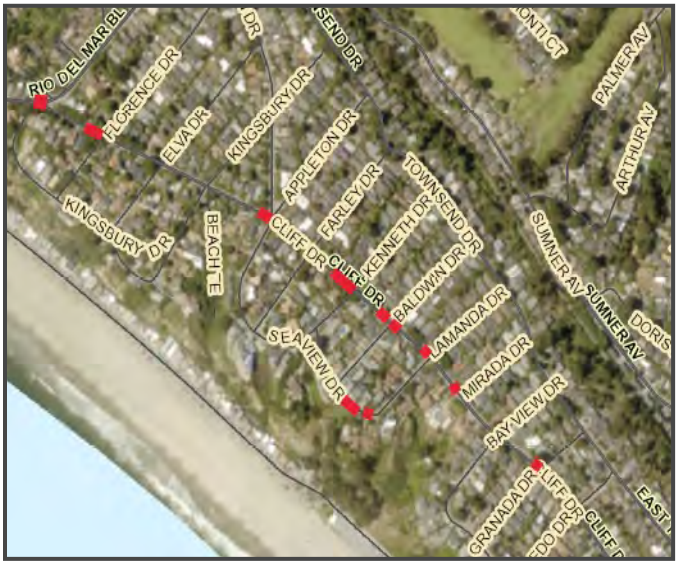
PROJECT TYPE:	SYSTEM IMPROVEMENTS	**PROJECT STATUS:**	IN PROGRESS
LOCATION:	VARIOUS LOCATIONS	**ESTIMATED CONSTRUCTION YEARS:**	2020/21
DESCRIPTION:	Variable Frequency Drive (VFD) replacements at Soquel Pump Station and Rodeo Pump Station.		

ESTIMATED PROJECT COSTS	
Land Survey	$ -
Preliminary Design	$ -
Environmental	$ -
Geotechnical	$ -
Engineering Design	$ -
Acquisition	$ -
Construction	$ -
Construction Management	$ -
Construction Inspection	$ -
Other	$ -
Total Estimated Project Costs	**$ 165,000**

FUNDING SOURCES	
District Funds	$ 165,000
Loans	$ -
Grants	$ -
Other	$ -
Total Project Funding	**$ 165,000**
Funding Not Yet Identified	**$ -**

CLIFF DRIVE SEWER TRENCH REPAIR

CAPITOLA	☐
DISTRICT 1	☐
DISTRICT 2	☒
CITY OF SANTA CRUZ	☐



PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	COMPLETED
LOCATION:	APTOS	**ESTIMATED CONSTRUCTION YEARS:**	2021/22
DESCRIPTION:	Rehabilitation of sewer main trenches; sealing pipe-manhole connections; and lining existing manholes in Rio Del Mar near Cliff Drive.		

ESTIMATED PROJECT COSTS		
Land Survey	$	-
Preliminary Design	$	-
Environmental	$	500
Geotechnical	$	10,460
Engineering Design	$	40,000
Acquisition	$	-
Construction	$	407,200
Construction Management	$	20,000
Construction Inspection	$	88,240
Other	$	40,000
Total Estimated Project Costs	**$**	**606,400**

FUNDING SOURCES		
District Funds	$	606,400
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**606,400**
Funding Not Yet Identified	**$**	

VALVE REPLACEMENTS 2021/22

(PURCHASE ONLY)

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	
CITY OF SANTA CRUZ	

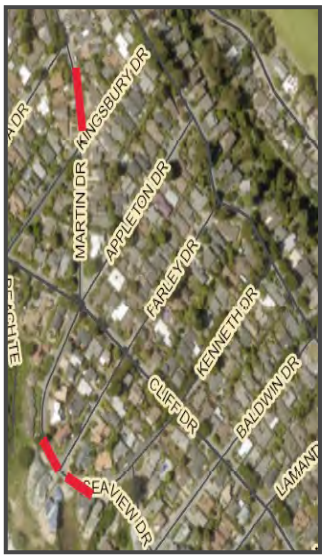
PROJECT TYPE:	SYSTEM IMPROVEMENTS	**PROJECT STATUS:**	COMPLETED
LOCATION:	VARIOUS LOCATIONS	**ESTIMATED CONSTRUCTION YEARS:**	2021/22
DESCRIPTION:	Purchase of valves for D.A. Porath Pump Station to replace suction gate valves in the pump room and valves for the Capitola Pump Station.		

ESTIMATED PROJECT COSTS	
Land Survey	$ -
Preliminary Design	$ -
Environmental	$ -
Geotechnical	$ -
Engineering Design	$ -
Acquisition	$ -
Construction	$ -
Construction Management	$ -
Construction Inspection	$ -
Other	$ -
Total Estimated Project Costs	**$ 251,000**

FUNDING SOURCES	
District Funds	$ 251,000
Loans	$ -
Grants	$ -
Other	$ -
Total Project Funding	**$ 251,000**
Funding Not Yet Identified	**$ -**

2021 SEWER PIPE REHABILITATION

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	X
CITY OF SANTA CRUZ	



PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	IN CONSTRUCTION
LOCATION:	SCCSD/ALL	**ESTIMATED CONSTRUCTION YEARS:**	2021/22
DESCRIPTION:	Replace or repair deteriorating gravity sewer mains and manholes located throughout the Santa Cruz County Sanitation District. The sewer lines are old, deteriorating and at the end of their design life.		

ESTIMATED PROJECT COSTS		
Land Survey	$	4,000
Preliminary Design	$	-
Environmental	$	-
Geotechnical	$	-
Engineering Design	$	-
Acquisition	$	-
Construction	$	766,000
Construction Management	$	80,000
Construction Inspection	$	108,200
Other	$	177,700
Total Estimated Project Costs	**$**	**1,135,900**

FUNDING SOURCES		
District Funds	$	$1,135,900
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	$1,135,900
Funding Not Yet Identified	**$**	

ARANA TRUNKLINE REPLACEMENT

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	
CITY OF SANTA CRUZ	X

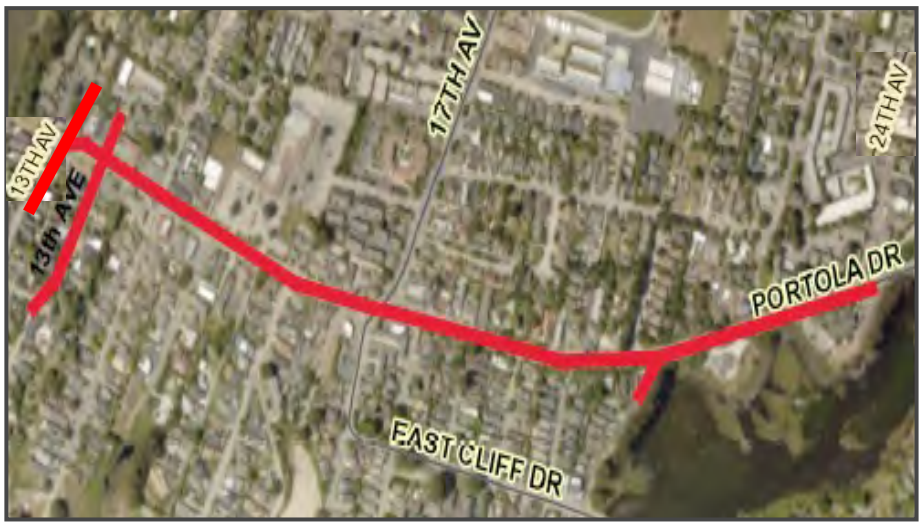
PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	IN DESIGN
LOCATION:	CITY OF SANTA CRUZ & LIVE OAK	**ESTIMATED CONSTRUCTION YEARS:**	2021/22—2022/23
DESCRIPTION:	Replace/rehabilitate 3,000± linear feet of sewer line. Line is old and deteriorating.		

ESTIMATED PROJECT COSTS		
Land Survey	$	40,000
Preliminary Design	$	-
Environmental	$	144,200
Geotechnical	$	75,000
Engineering Design	$	400,000
Acquisition	$	60,000
Construction	$	2,000,000
Construction Management	$	80,000
Construction Inspection	$	250,000
Other	$	425,000
Total Estimated Project Costs	**$**	**3,474,200**

FUNDING SOURCES		
District Funds	$	374,200
Loans	$	-
Grants	$	-
Other (Bonds)	$	3,100,000
Total Project Funding	**$**	**3,474,200**
Funding Not Yet Identified	**$**	**-**

EAST CLIFF, PORTOLA, & RICHMOND DRIVES SEWER REPLACEMENTS

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	
CITY OF SANTA CRUZ	



PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	IN DESIGN
LOCATION:	LIVE OAK	**ESTIMATED CONSTRUCTION YEARS:**	2021/22—2022/23
DESCRIPTION:	Replace 6,300 ± linear feet of sewer line that is old and deteriorating.		

ESTIMATED PROJECT COSTS		
Land Survey	$	50,000
Preliminary Design	$	-
Environmental	$	50,000
Geotechnical	$	40,000
Engineering Design	$	100,000
Acquisition	$	-
Construction	$	6,000,000
Construction Management	$	100,000
Construction Inspection	$	300,000
Other	$	599,000
Total Estimated Project Costs	**$**	**7,239,000**

FUNDING SOURCES		
District Funds	$	339,000
Loans	$	-
Grants	$	-
Other (Bonds)	$	6,900,000
Total Project Funding	**$**	**7,239,000**
Funding Not Yet Identified	**$**	**-**

EAST CLIFF TRANSMISSION MAIN RELOCATION AT MURRAY STREET BRIDGE

CAPITOLA	
DISTRICT 1	
DISTRICT 2	
CITY OF SANTA CRUZ	X

PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	IN DESIGN
LOCATION:	CITY OF SANTA CRUZ	**ESTIMATED CONSTRUCTION YEARS:**	2021/22—2022/23
DESCRIPTION:	Relocate approximately 700 linear feet of transmission main out of the harbor and attach to the bridge in coordination with the City of Santa Cruz's Murray Street Bridge Project. Line is in a sensitive area and is near the end of its useful life.		

ESTIMATED PROJECT COSTS		
Land Survey	$	40,060
Preliminary Design	$	105,850
Environmental	$	17,070
Geotechnical	$	38,880
Engineering Design	$	721,780
Acquisition	$	-
Construction	$	5,200,000
Construction Management	$	250,000
Construction Inspection	$	40,000
Other	$	936,760
Total Estimated Project Costs	**$**	**7,350,400**

FUNDING SOURCES		
District Funds	$	1,766,010
Loans	$	-
Grants	$	5,584,390
Other	$	-
Total Project Funding	**$**	**7,350,400**
Funding Not Yet Identified	**$**	**-**

PLC UPGRADES 2021/22

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	X
CITY OF SANTA CRUZ	

PROJECT	LOCATION	EXISTING PLC MODEL
15TH AVE	262 15TH AVENUE	Compact Logix L23E
APTOS BLUE	3200 APTOS RANCH	Compact Logix L23E
CHAMINADE	3700 BLOCK OF PAUL SWEET ROAD	MicroLogix 1500
MORAN	2750 LODE STREET	Compact Logix L23E
SEACLIFF	837 SEACLIFF DRIVE	MicroLogix 1500
SEARS CIRCLE	18 SEARS CIRCLE	Compact Logix L23E
WAUGH	407 WAUGH AVENUE	Compact Logix L23E
WILSHIRE	WILSHIRE DRIVE	Compact Logix L23E

PROJECT TYPE:	OPERATIONS AND MAINTENANCE	**PROJECT STATUS:**	FUTURE DESIGN
LOCATION:	VARIOUS LOCATIONS	**ESTIMATED CONSTRUCTION YEARS:**	2021/22
DESCRIPTION:	Replace and upgrade older Programmable Logic Controllers (PLCs) at eight pump stations.		

ESTIMATED PROJECT COSTS		
Land Survey	$	-
Preliminary Design	$	-
Environmental	$	-
Geotechnical	$	-
Engineering Design	$	-
Acquisition	$	-
Construction	$	-
Construction Management	$	-
Construction Inspection	$	-
Other	$	-
Total Estimated Project Costs	**$**	**200,000**

FUNDING SOURCES		
District Funds	$	200,000
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**200,000**
Funding Not Yet Identified	**$**	**-**

VALENCIA CREEK SEWER RELOCATION

CAPITOLA	
DISTRICT 1	
DISTRICT 2	X
CITY OF SANTA CRUZ	

PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	IN DESIGN
LOCATION:	APTOS	**ESTIMATED CONSTRUCTION YEARS:**	2021/22—2022/23
DESCRIPTION:	Replace 730+ linear feet of 10-inch pipeline beneath Highway 1, east of the existing 10-inch sewer main and away from Valencia Creek. Replace a temporary repair.		

ESTIMATED PROJECT COSTS		
Land Survey	$	20,000
Preliminary Design	$	-
Environmental	$	53,500
Geotechnical	$	480,000
Engineering Design	$	104,000
Acquisition	$	75,000
Construction	$	1,100,000
Construction Management	$	100,000
Construction Inspection	$	200,000
Other	$	218,900
Total Estimated Project Costs	**$**	**2,351,400**

FUNDING SOURCES		
District Funds	$	958,400
Loans	$	1,393,000
Grants	$	-
Other	$	-
Total Project Funding	**$**	**2,351,400**
Funding Not Yet Identified	**$**	**-**

VFD REPLACEMENTS 2021/22

(CAPITOLA PUMP STATION AND D.A. PORATH PUMP STATION)

CAPITOLA	X
DISTRICT 1	X
DISTRICT 2	X
CITY OF SANTA CRUZ	

PROJECT TYPE:	SYSTEM IMPROVEMENTS	**PROJECT STATUS:**	FUTURE DESIGN
LOCATION:	VARIOUS LOCATIONS	**ESTIMATED CONSTRUCTION YEARS:**	2021/22
DESCRIPTION:	Variable Frequency Drive (VFD) replacements at Capitola Pump Station and D.A. Porath Pump Station.		

ESTIMATED PROJECT COSTS		
Land Survey	$	-
Preliminary Design	$	-
Environmental	$	-
Geotechnical	$	-
Engineering Design	$	-
Acquisition	$	-
Construction	$	-
Construction Management	$	-
Construction Inspection	$	-
Other	$	-
Total Estimated Project Costs	**$**	**150,000**

FUNDING SOURCES		
District Funds	$	150,000
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**150,000**
Funding Not Yet Identified	**$**	**-**

CAPITOLA PUMP STATION PUMP REPLACEMENT

CAPITOLA	X
DISTRICT 1	
DISTRICT 2	X
CITY OF SANTA CRUZ	

PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	IN DESIGN
LOCATION:	CAPITOLA	**ESTIMATED CONSTRUCTION YEARS:**	2022/23
DESCRIPTION:	Replace three 75 HP aging pumps with Flygt pumps. The existing pumps were installed in 2006. The new Flygt pumps were purchased in 2020-21, and will be installed in 2022/23. The valves purchased in 2021-22 would be installed at this time as well.		

ESTIMATED PROJECT COSTS		
Land Survey	$	-
Preliminary Design	$	-
Environmental	$	-
Geotechnical	$	-
Engineering Design	$	-
Acquisition	$	-
Construction/Installation	$	300,000
Construction Management	$	-
Construction Inspection	$	-
Other	$	
Total Estimated Project Costs	**$**	**300,000**

FUNDING SOURCES		
District Funds	$	300,000
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**300,000**
Funding Not Yet Identified	**$**	**-**

D.A. PORATH PUMP STATION ACCESS HATCHES

CAPITOLA	☐
DISTRICT 1	X
DISTRICT 2	☐
CITY OF SANTA CRUZ	☐

PROJECT TYPE:	SYSTEM IMPROVEMENTS	**PROJECT STATUS:**	FUTURE DESIGN
LOCATION:	D.A. PORATH PUMP STATION	**ESTIMATED CONSTRUCTION YEARS:**	2022/23
DESCRIPTION:	Installation of two access hatches on the wet well at the D.A. Porath Pump Station and associated improvements.		

ESTIMATED PROJECT COSTS		
Land Survey	$	-
Preliminary Design	$	-
Environmental	$	-
Geotechnical	$	-
Engineering Design	$	80,000
Acquisition	$	-
Construction	$	240,000
Construction Management	$	10,000
Construction Inspection	$	50,000
Other	$	56,000
Total Estimated Project Costs	**$**	**436,000**

FUNDING SOURCES		
District Funds	$	436,000
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**436,000**
Funding Not Yet Identified	**$**	**-**

D.A. PORATH FACILITY PARKING IMPROVEMENTS

CAPITOLA	☐
DISTRICT 1	X
DISTRICT 2	☐
CITY OF SANTA CRUZ	☐

PROJECT TYPE:	SYSTEM IMPROVEMENTS	**PROJECT STATUS:**	IN DESIGN
LOCATION:	D.A. PORATH PUMP STATION	**ESTIMATED CONSTRUCTION YEARS:**	2022/23
DESCRIPTION:	Construction of new paved parking area for District maintenance vehicles.		

ESTIMATED PROJECT COSTS		
Land Survey	$	5,000
Preliminary Design	$	-
Environmental	$	7,000
Geotechnical	$	15,000
Engineering Design	$	10,000
Acquisition	$	-
Construction	$	100,000
Construction Management	$	10,000
Construction Inspection	$	30,000
Other	$	80,000
Total Estimated Project Costs	**$**	**257,000**

FUNDING SOURCES		
District Funds	$	257,000
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**257,000**
Funding Not Yet Identified	**$**	**-**

D.A. PORATH VALVE REPLACEMENT AND EMERGENCY BYPASS

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	
CITY OF SANTA CRUZ	

PROJECT TYPE:	SYSTEM IMPROVEMENTS	**PROJECT STATUS:**	FUTURE DESIGN
LOCATION:	D.A. PORATH PUMP STATION	**ESTIMATED CONSTRUCTION YEARS:**	2022/23
DESCRIPTION:	The existing gate valve on the force main leaving the station is deteriorated and will be replaced. Improvements to install an emergency bypass will be installed as part of the project and used to facilitate the valve replacement.		

ESTIMATED PROJECT COSTS		
Land Survey	$	7,000
Preliminary Design	$	-
Environmental	$	7,000
Geotechnical	$	35,000
Engineering Design	$	70,000
Acquisition	$	-
Construction	$	700,000
Construction Management	$	40,000
Construction Inspection	$	175,000
Other	$	165,000
Total Estimated Project Costs	**$**	**1,199,000**

FUNDING SOURCES		
District Funds	$	1,199,000
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**1,199,000**
Funding Not Yet Identified	**$**	**-**

EDDY LANE SEWER RELOCATION

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	
CITY OF SANTA CRUZ	

PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	IN DESIGN
LOCATION:	LIVE OAK	**ESTIMATED CONSTRUCTION YEARS:**	2022/23
DESCRIPTION:	Replace 800± linear feet of deteriorating public gravity sewer mains and manholes located on Eddy Lane and private property. This portion of main is deteriorated and beyond its design life. The new sewer mains will be aligned to avoid the building foundation that is over the exiting sewer main. This project will serve to reduce the risk of sanitary sewer overflows in Leona Creek.		

ESTIMATED PROJECT COSTS		
Land Survey	$	10,000
Preliminary Design	$	
Environmental	$	5,000
Geotechnical	$	
Engineering Design	$	50,000
Acquisition/Appraisal	$	25,000
Construction	$	550,000
Construction Management	$	50,000
Construction Inspection	$	90,000
Other	$	150,000
Total Estimated Project Costs	**$**	**930,000**

FUNDING SOURCES		
District Funds	$	930,000
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**930,000**
Funding Not Yet Identified	**$**	**-**

LOWER RODEO TRUNKLINE REPLACEMENT

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	
CITY OF SANTA CRUZ	

PROJECT TYPE:	SYSTEM UPSIZE	**PROJECT STATUS:**	IN DESIGN
LOCATION:	TWIN LAKES	**ESTIMATED CONSTRUCTION YEARS:**	2022/23
DESCRIPTION:	Replace 1,100 ± linear feet of gravity sewer mains and manholes. The sewer line is undersized for the existing flows, therefore a moratorium is restricting new development. Completion of this project (along with the Rodeo Pump Station Capacity Upgrade and Upper Rodeo Gulch Trunkline & Soquel Bridge Sewer Replacement projects) will allow the District to lift a long-standing moratorium for the Rodeo Gulch Sewer Basin.		

ESTIMATED PROJECT COSTS		
Land Survey	$	20,000
Preliminary Design	$	-
Environmental	$	-
Geotechnical	$	-
Engineering Design	$	63,000
Acquisition/Appraisal	$	50,000
Construction	$	1,150,000
Construction Management	$	35,000
Construction Inspection	$	120,000
Other	$	300,000
Total Estimated Project Costs	**$**	**1,738,000**

FUNDING SOURCES		
District Funds	$	238,000
Loans	$	-
Grants	$	-
Other (Bond)	$	1,500,000
Total Project Funding	**$**	**1,738,000**
Funding Not Yet Identified	**$**	**-**

PLC UPGRADE 2022/23

CAPITOLA	X
DISTRICT 1	X
DISTRICT 2	X
CITY OF SANTA CRUZ	

PROJECT	LOCATION	EXISTING PLC MODEL
A3	440 BEACH DRIVE	MicroLogix 1500
CHERYL	1829 CHERYL WAY	MicroLogix 1500
CORY	4035 CORY STREET	MicroLogix 1500
GROVE	100 GROVE LANE	MicroLogix 1500
HARBOR VIEW	CAPITOLA AND HARBOR VIEW	MicroLogix 1500
PEARSON CT.	4146 PEARSON COURT	MicroLogix 1500
POTBELLY BEACH	23 POTBELLY BEACH ROAD	Compact Logix L23E

PROJECT TYPE:	OPERATIONS AND MAINTENANCE	**PROJECT STATUS:**	FUTURE DESIGN
LOCATION:	VARIOUS LOCATIONS	**ESTIMATED CONSTRUCTION YEARS:**	2022/23
DESCRIPTION:	Replace and upgrade older Programmable Logic Controllers (PLCs) at seven pump stations.		

ESTIMATED PROJECT COSTS	
Land Survey	$ -
Preliminary Design	$ -
Environmental	$ -
Geotechnical	$ -
Engineering Design	$ -
Acquisition	$ -
Construction	$ -
Construction Management	$ -
Construction Inspection	$ -
Other	$ -
Total Estimated Project Costs	**$ 300,000**

FUNDING SOURCES	
District Funds	$ 300,000
Loans	$ -
Grants	$ -
Other	$ -
Total Project Funding	**$ 300,000**
Funding Not Yet Identified	**$ -**

RIO SANDS SEWER REHABILITATION

CAPITOLA	☐
DISTRICT 1	☐
DISTRICT 2	X
CITY OF SANTA CRUZ	☐

PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	IN DESIGN
LOCATION:	RIO DEL MAR	**ESTIMATED CONSTRUCTION YEARS:**	2022/23
DESCRIPTION:	Replace or 500± linear feet of deteriorating public gravity sewer mains and manholes located on the Rio Sands Hotel property. This portion of sewer main becomes plugged with roots and has become too deteriorated to apply traditional flushing techniques to clear the blockages.		

ESTIMATED PROJECT COSTS		
Land Survey	$	4,000
Preliminary Design	$	-
Environmental	$	1,000
Geotechnical	$	-
Engineering Design	$	50,000
Acquisition/Appraisal	$	20,000
Construction	$	400,000
Construction Management	$	20,000
Construction Inspection	$	100,000
Other	$	120,000
Total Estimated Project Costs	**$**	**715,000**

FUNDING SOURCES		
District Funds	$	715,000
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**715,000**
Funding Not Yet Identified	**$**	**-**

RODEO PUMP STATION CAPACITY UPGRADE

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	
CITY OF SANTA CRUZ	

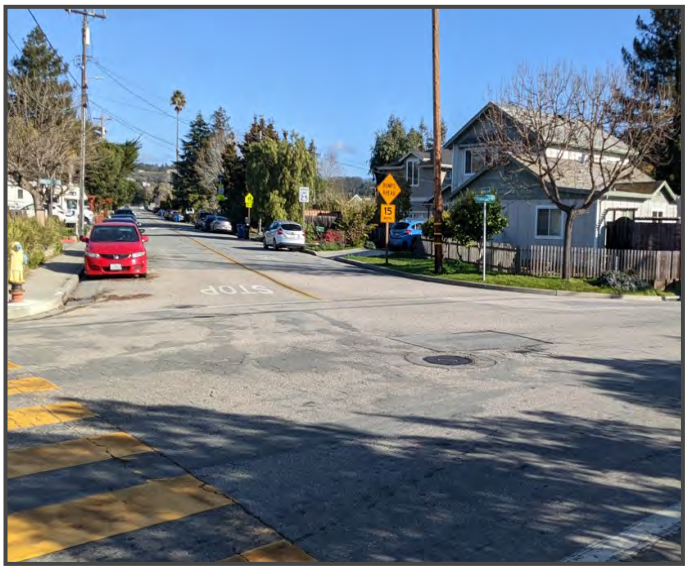
PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	IN DESIGN
LOCATION:	LIVE OAK	**ESTIMATED CONSTRUCTION YEARS:**	2022/23
DESCRIPTION:	Construct an auxiliary wet well for additional storage of current and projected sewer flows during wet weather storm events. Completion of this project (along with the Lower Rodeo Trunkline Replacement and Upper Rodeo Gulch Trunkline & Soquel Bridge Sewer Replacement projects) will allow the District to lift a long-standing moratorium for the Rodeo Gulch Sewer Basin.		

ESTIMATED PROJECT COSTS		
Land Survey	$	15,000
Preliminary Design	$	87,500
Environmental	$	-
Geotechnical	$	51,600
Engineering Design	$	330,900
Acquisition	$	-
Construction	$	1,000,000
Construction Management	$	80,000
Construction Inspection	$	150,000
Other	$	200,000
Total Estimated Project Costs	**$**	**1,915,000**

FUNDING SOURCES		
District Funds	$	515,000
Loans	$	-
Grants	$	-
Other (Bonds)	$	1,400,000
Total Project Funding	**$**	**1,915,000**
Funding Not Yet Identified	**$**	**-**

RODRIGUEZ STREET SEWER REHABILITATION

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	
CITY OF SANTA CRUZ	



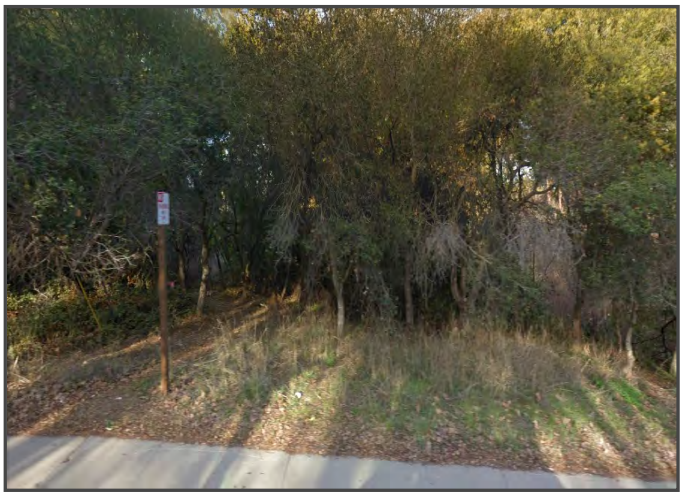
PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	IN DESIGN
LOCATION:	LIVE OAK	**ESTIMATED CONSTRUCTION YEARS:**	2022/23
DESCRIPTION:	Replace or 600± linear feet of deteriorating gravity sewer mains and repair associate manholes. The sewer lines are old, deteriorating and at the end of their design life.		

ESTIMATED PROJECT COSTS		
Land Survey	$	10,000
Preliminary Design	$	
Environmental	$	2,000
Geotechnical	$	
Engineering Design	$	50,000
Acquisition	$	
Construction	$	420,000
Construction Management	$	50,000
Construction Inspection	$	90,000
Other	$	108,000
Total Estimated Project Costs	**$**	**$730,000**

FUNDING SOURCES		
District Funds	$	**$730,000**
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**$730,000**
Funding Not Yet Identified	**$**	**-**

UPPER RODEO GULCH TRUNKLINE & SOQUEL BRIDGE SEWER REPLACEMENT

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	
CITY OF SANTA CRUZ	



PROJECT TYPE:	SYSTEM UPGRADE/ INCREASE CAPACITY	**PROJECT STATUS:**	IN DESIGN
LOCATION:	LIVE OAK	**ESTIMATED CONSTRUCTION YEARS:**	2022/23
DESCRIPTION:	Replace 4,900± linear feet of sewer line. Lines are deteriorating and allow for ground water infiltration that cause the sewer mains to operate over capacity. Pipe under bridge has lost some of its supports and is an exposed asbestos cement pipe. Completion of this project (along with the Lower Rodeo Trunkline Replacement and Rodeo Pump Station Capacity Upgrade projects) will allow the District to lift a long-standing moratorium for the Rodeo Gulch Sewer Basin.		

ESTIMATED PROJECT COSTS		
Land Survey	$	50,000
Preliminary Design	$	250,000
Environmental	$	190,000
Geotechnical	$	80,000
Engineering Design	$	400,000
Acquisition/Appraisal	$	40,000
Construction	$	3,400,000
Construction Management	$	60,000
Construction Inspection	$	300,000
Other	$	650,000
Total Estimated Project Costs	**$**	**5,420,000**

FUNDING SOURCES		
District Funds	$	1,320,000
Loans	$	-
Grants	$	-
Other (Bonds)	$	4,100,000
Total Project Funding	**$**	**5,420,000**
Funding Not Yet Identified	**$**	**-**

HIDDEN BEACH—SEWER TRUNKLINE REHABILITATION

CAPITOLA	
DISTRICT 1	
DISTRICT 2	X
CITY OF SANTA CRUZ	

PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	FUTURE DESIGN
LOCATION:	HIDDEN BEACH, APTOS	**ESTIMATED CONSTRUCTION YEARS:**	2023/24
DESCRIPTION:	Rehabilitate 900± linear feet of sewer trunk line to prevent root infiltration and install an emergency bypass.		

ESTIMATED PROJECT COSTS		
Land Survey	$	5,000
Preliminary Design	$	-
Environmental	$	10,000
Geotechnical	$	-
Engineering Design	$	20,000
Acquisition	$	-
Construction	$	700,000
Construction Management	$	30,000
Construction Inspection	$	75,000
Other	$	163,000
Total Estimated Project Costs	**$**	**1,003,000**

FUNDING SOURCES		
District Funds	$	1,003,000
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**1,003,000**
Funding Not Yet Identified	**$**	**-**

PLC UPGRADE 2023/24

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	X
CITY OF SANTA CRUZ	

PROJECT	LOCATION	EXISTING PLC MODEL
APTOS ESPLANADE GENEROX	104 MARINA AVENUE	Compact Logix L23E
ARANA	2001 SOQUEL DRIVE	Compact Logix L23E
COURTSIDE	7848 TANIAS COURT	MicroLogix 1500
EAST CLIFF HYDROFLOW	2750 LODE STREET	MicroLogix 1500
MAR VISTA	100 MAR VISTA	MicroLogix 1500
PINE KNOLL	2546 CAPITOLA ROAD	MicroLogix 1500
UPLANDS #1	102 ZANZIBAR DRIVE	MicroLogix 1500
UPLANDS #2	162 ZANZIBAR DRIVE	MicroLogix 1500
UPLANDS #3	144 CASTILLO COURT	MicroLogix 1500

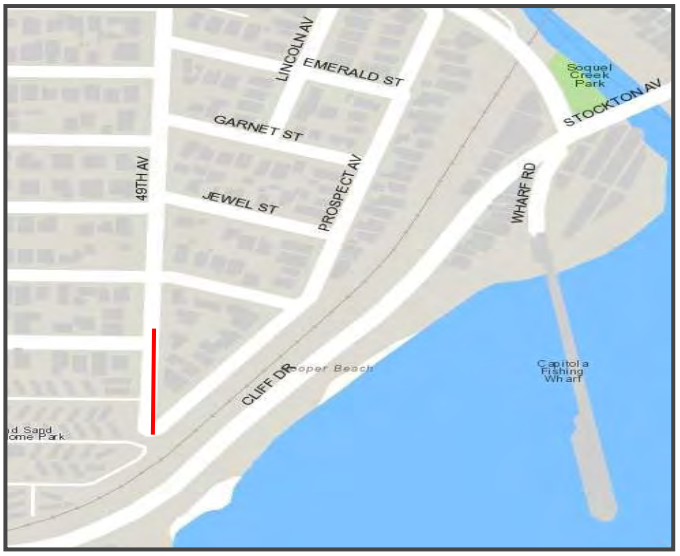
PROJECT TYPE:	OPERATIONS AND MAINTENACE	**PROJECT STATUS:**	FUTURE DESIGN
LOCATION:	VARIOUS LOCATIONS	**ESTIMATED CONSTRUCTION YEARS:**	2023/24
DESCRIPTION:	Replace and upgrade older Programmable Logic Controllers (PLCs) at nine pump stations.		

ESTIMATED PROJECT COSTS	
Land Survey	$ -
Preliminary Design	$ -
Environmental	$ -
Geotechnical	$ -
Engineering Design	$ -
Acquisition	$ -
Construction	$ -
Construction Management	$ -
Construction Inspection	$ -
Other	$ -
Total Estimated Project Costs	**$ 350,000**

FUNDING SOURCES	
District Funds	$ 350,000
Loans	$ -
Grants	$ -
Other	$ -
Total Project Funding	**$ 350,000**
Funding Not Yet Identified	**$ -**

CAPITOLA VILLAGE SEWER REHABILITATION

CAPITOLA	X
DISTRICT 1	
DISTRICT 2	X
CITY OF SANTA CRUZ	



PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	FUTURE DESIGN
LOCATION:	CAPITOLA VILLAGE	**ESTIMATED CONSTRUCTION YEARS:**	2024/25
DESCRIPTION:	Rehabilitate 8,750± linear feet of deteriorating sewer mains. Perform pre-design flow monitoring to determine if some sewer mains are undersized as indicated by 2019 regional flow monitoring. Upsize required sewer mains if required.		

ESTIMATED PROJECT COSTS		
Land Survey	$	20,000
Preliminary Design	$	50,000
Environmental	$	70,000
Geotechnical	$	
Engineering Design	$	60,000
Acquisition	$	40,000
Construction	$	4,800,000
Construction Management	$	80,000
Construction Inspection	$	200,000
Other	$	851,200
Total Estimated Project Costs	**$**	**6,171,200**

FUNDING SOURCES		
District Funds	$	671,200
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**671,200**
Funding Not Yet Identified	**$**	**5,500,000**

EAST CLIFF TRANSMISSION MAIN INSPECTION

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	
CITY OF SANTA CRUZ	X

PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	FUTURE
LOCATION:	CITY OF SANTA CRUZ & LIVE OAK	**ESTIMATED CONSTRUCTION YEARS:**	2024/25
DESCRIPTION:	The force main from the D.A Porath Facility to the City of Santa Cruz was inspected by Pure Technologies in 2014. The District plans to inspect the force main every 10 years.		

ESTIMATED PROJECT COSTS		
Land Survey	$	-
Preliminary Design	$	-
Environmental	$	-
Geotechnical	$	-
Engineering Design	$	-
Acquisition	$	-
Construction	$	-
Construction Management	$	-
Construction Inspection	$	-
Other	$	100,000
Total Estimated Project Costs	**$**	**100,000**

FUNDING SOURCES		
District Funds	$	100,000
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**100,000**
Funding Not Yet Identified	**$**	**-**

PLC UPGRADES 2024/25

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	X
CITY OF SANTA CRUZ	

PROJECT	LOCATION	PLC MODEL
APTOS ESPLANADE	104 MARINA AVENUE	Compact Logix L23E
APTOS ESPLANADE REPEATER & GENERATOR	104 MARINA AVENUE	DeviceNet
D.A PORATH GENERATOR	2750 LODE STREET	MicroLogix 1400
HIDDEN BEACH GENERATOR	770 CLIFF DRIVE	MicroLogix 1400
VIA PALO ALTO	1096 VIA PALO ALTO	Compact Logix L23E

PROJECT TYPE:	OPERATIONS AND MAINTENACE	**PROJECT STATUS:**	FUTURE DESIGN
LOCATION:	VARIOUS LOCATIONS	**ESTIMATED CONSTRUCTION YEARS:**	2024/25
DESCRIPTION:	Replace and upgrade older Programmable Logic Controllers (PLCs) at five locations in the District.		

ESTIMATED PROJECT COSTS	
Land Survey	$ -
Preliminary Design	$ -
Environmental	$ -
Geotechnical	$ -
Engineering Design	$ -
Acquisition	$ -
Construction	$ -
Construction Management	$ -
Construction Inspection	$ -
Other	$
Total Estimated Project Costs	**$ 200,000**

FUNDING SOURCES	
P53357 PLC Upgrades	$ 200,000
Loans	$ -
Grants	$ -
Other	$ -
Total Project Funding	**$ 200,000**
Funding Not Yet Identified	**$ -**

RIO DEL MAR SEWER REHABILITATION—PHASE 2

CAPITOLA	
DISTRICT 1	
DISTRICT 2	X
CITY OF SANTA CRUZ	

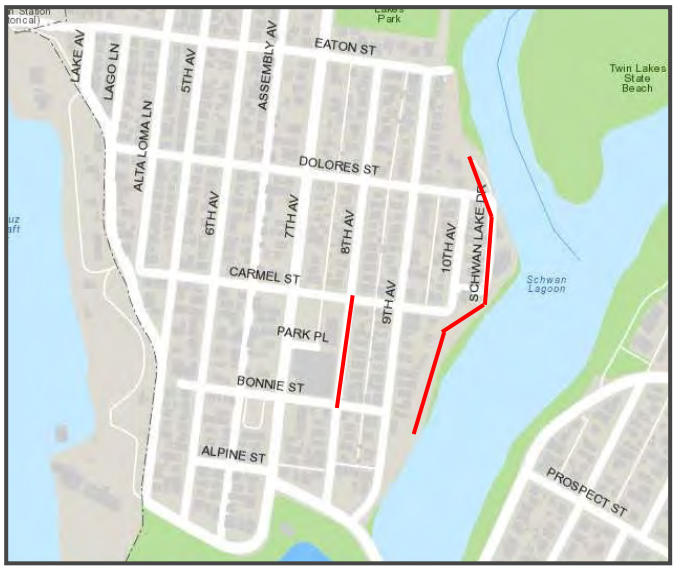
PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	FUTURE DESIGN
LOCATION:	RIO DEL MAR	**ESTIMATED CONSTRUCTION YEARS:**	2024/25
DESCRIPTION:	Rehabilitate 2,700± linear feet of sewer mains that are frequently clogged with roots, which required frequent maintenance and can lead to sewer overflows. This project will eliminate the need for Smart Cover monitoring on two manholes.		

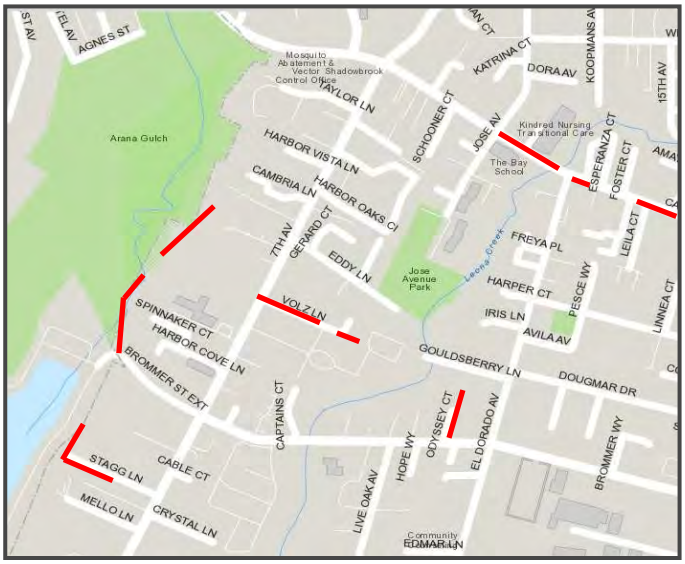
ESTIMATED PROJECT COSTS		
Land Survey	$	20,000
Preliminary Design	$	-
Environmental	$	20,000
Geotechnical	$	-
Engineering Design	$	50,000
Acquisition	$	30,000
Construction	$	1,400,000
Construction Management	$	50,000
Construction Inspection	$	125,000
Other	$	324,800
Total Estimated Project Costs	**$**	**2,019,800**

FUNDING SOURCES		
District Funds	$	2,019,800
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**2,019,800**
Funding Not Yet Identified	**$**	

SANTA CRUZ HARBOR AREA SEWER REHABILITATION—PHASE 2

CAPITOLA	
DISTRICT 1	X
DISTRICT 2	
CITY OF SANTA CRUZ	





PROJECT TYPE:	SYSTEM UPGRADE	**PROJECT STATUS:**	FUTURE DESIGN
LOCATION:	TWIN LAKES	**ESTIMATED CONSTRUCTION YEARS:**	2024/25
DESCRIPTION:	Replace or repair 4,400± linear feet of deteriorating gravity sewer mains and manholes located throughout the east Santa Cruz Harbor area. The sewer lines are old, deteriorating and at the end of their design life.		

ESTIMATED PROJECT COSTS		
Land Survey	$	30,000
Preliminary Design	$	-
Environmental	$	70,000
Geotechnical	$	-
Engineering Design	$	60,000
Acquisition	$	70,000
Construction	$	2,900,000
Construction Management	$	75,000
Construction Inspection	$	175,000
Other	$	545,200
Total Estimated Project Costs	**$**	**3,925,200**

FUNDING SOURCES		
District Funds	$	1,225,200
Loans	$	-
Grants	$	-
Other	$	-
Total Project Funding	**$**	**1,225,200**
Funding Not Yet Identified	**$**	**2,700,000**

The population within 30 minute access by biking or walking to the central point of each key destination based on existing and proposed facilities is assessed to see how well this target is advanced given the projects prioritized in the 2014 RTP. Land use changes that locate more people near key destinations are another factor affecting the number of people who can access goods and services, but land use changes were not considered when analyzing this target because land use is outside the purview of the RTC. The access target discussed here addresses bicycle and pedestrian connectivity, whereas the multimodal network quality analysis under target 1Dii discusses the importance of analyzing the quality of the bicycle and pedestrian network.

The baseline population and maximum possible population that are within a 30 minute distance via walk and bike from key destinations are discussed below. The target for 2035 was set to close the gap between the 2010 baseline population and the maximum possible population by 40% by 2035 and an intermediate target of 20% by 2020.

Forecasting Methodology

ArcGIS network analyst was used to determine the proportion of the population that are within 30 minutes of travel via walking, bicycling, and transit from the central point of each of the key destinations (**Figure D.3)**. This target quantifies how access to key destinations increases through improvements to bike and walk facilities. Transit service improvements through increased frequency or additional routes would affect access in key destinations. Given the specific transit service improvements for the future are unknown as well as limitations of this analysis for transit, access improvements due to enhanced transit have not been analyzed.

The analysis used the following GIS data:

- Roadway centerline file with roadway functional classification and speed limits (from Santa Cruz County GIS)
- Bicycle lanes, trails, and paths (from RTC)
- Transit routes and stops (from Santa Cruz Metropolitan Transit District)
- City of Santa Cruz and Watsonville sidewalk coverage (from the Cities of Santa Cruz and Watsonville; sidewalk information currently unavailable for other areas)
- 2010 Population at the Traffic Analysis Zone (TAZ) level (from AMBAG)

Using the key destinations, a travelshed analysis was performed for each mode using network analyst. Travelshed refers to the area that people are able to travel given time, modes, physical attributes and constraints. For walking and bicycling, two types of travelsheds were developed: a "maximum travel" buffer and an "actual travel" buffer. An "actual travel" buffer provides the area around the central point of each key destination that can be accessed within 30 minutes by walking or biking based on existing facilities. The "maximum travel" buffer provides the area around the central point of each key destination that could be accessed if there was universal bicycle and pedestrian facility coverage. For transit, only the actual travel buffer analysis was performed, since transit could theoretically reach nearly every point in the county within 30 minutes under a maximum travel scenario. Once the area of the buffer is defined, the population living in the buffer can be determined from the census data.

Maximum Buffers. The maximum travel buffer was calculated differently for pedestrian and bicycle travel. For pedestrian travel, a circle was drawn around each key destination at the distance one could travel under ideal conditions (this would represent a transportation network that has a tight network of streets/trails with universal sidewalk coverage). For this analysis, it was assumed that under ideal conditions, a person can walk at 3.5 feet per second (a standard value used in transportation planning). This walking speed was applied to downtown Santa Cruz and Downtown Watsonville (areas with a relatively tight grid of streets) and a GIS network walkshed analysis was performed. Assuming 30 minutes of travel time at 3.5 feet per second, it was determined that one could walk 5,600 feet on the most direct routes. A "true" maximum walkshed is 6300 ft (30 minutes times 3.5 feet per second) but since there are almost no straight line paths leading from a key destination a circular maximum walk buffer of 5,600 feet was defined for each of the key destinations. One exception was made to this analysis for the Watsonville Airport area since it is not reasonable to expect that walking routes would ever be constructed across the airport. A portion of the circular buffer was removed to reflect this constraint.

A similar analysis was performed for bicycling. In this case, a maximum speed of 10 miles per hour was assumed and a GIS network bikeshed analysis was performed. Certain roads, such as freeways and minor mountainous roads were excluded since it is either illegal or impractical for a general member of the public to ride a bicycle on these routes. However, all reasonably foreseeable bicycle connectivity projects (including completion of the Monterey Bay Sanctuary Scenic Trail, connections to this trail, and new bicycle connections in areas anticipating future growth) were assumed in the maximum travel analysis. A circular buffer was not developed for maximum bicycle travel since physical constraints (hills, open spaces) make it impractical to assume that a bicycle network could be constructed that would provide complete bicycle access through the undeveloped and mountainous portions of the county.

Actual Travel Buffers. Actual travel buffers were developed for each key destination and for each mode based on the level of bicycle and pedestrian infrastructure and on the actual travel paths. For the walk mode, the walking speed is adjusted based on the prevalence of sidewalk facilities. In a hypothetical area with no sidewalk facilities, the walking speed in the analysis is reduced by 50%. In areas with 50% sidewalk coverage, the walk speed is reduced by 25%. Given the limited amount of sidewalk coverage data, analysis was based on an estimate of the percentage of sidewalk coverage for each key destination area. This percent coverage was estimated using GIS data for Santa Cruz and Watsonville and google streetview for other key destination areas. This analysis would be improved if actual sidewalk location data could be used to factor the walk speed on a street by street basis. For the bicycle network buffer, travel is allowed on any non-freeway street, however travel speed is reduced by 75% for roads with speeds in excess of 35 miles per hour that have no dedicated bicycle facilities (bicycle lanes or paths). Speeds were similarly reduced on mountainous roads, regardless of speed limit. These reductions in speeds reflect the fact that many potential cyclists are uncomfortable traveling on busy or steep roads, and therefore will either not travel by bike or take other longer routes to avoid these areas. Transit actual travel buffers were based on a five minute walk speed to stops and a 20 minute travel time on the routes, based on route schedules.

Baseline

The baseline results for each of the key destinations are shown in **Figure D.4**. The population within 30 minutes of each destination is based on population data from the 2010 census and bike, pedestrian and transit infrastructure from 2012.

Area	2010 Population within a 30-minute walk		2010 Population within a 30-minute bike ride		2010 Population within a 30-minute transit trip	
	Population	Proportion of County	Population	Proportion of County	Population	Proportion of County
Downtown Santa Cruz	21,691	8.3%	95,976	36.6%	84,721	32.3%
Scotts Valley (combined)	5,742	2.2%	17,385	6.6%	34,221	13.0%
UC Santa Cruz	1,413	0.5%	53,353	20.3%	54,717	20.9%
Soquel Dr (Soquel to Mattison)	4,258	1.6%	97,370	37.1%	87,641	33.4%
41st Ave	11,920	4.5%	86,263	32.9%	80,785	30.8%
Capitola Village	7,744	3.0%	77,236	29.5%	67,449	25.7%
Cabrillo College	2,508	1.0%	57,232	21.8%	59,417	22.7%
Green Valley / Freedom	12,749	4.9%	58,309	22.2%	44,544	17.0%
Watsonville Hospital	8,102	3.1%	57,351	21.9%	44,462	17.0%
Downtown Watsonville	16,934	6.5%	56,600	21.6%	44,276	16.9%

Figure D.4 – Total 2010 (baseline) population within 30 minutes of key destinations based on existing bicycle, pedestrian and transit infrastructure

Figure D.5 shows the baseline aggregate population within 30 minutes of the central point of any of the key destinations. Population within 30 minutes of key destinations via walking has the smallest percentage due to walking speed being slower than biking and riding transit. Percent of population that can access key destinations within 30 minutes via biking is the largest percentage due to the speed of biking relative to walking and no route limitations. Population that can access key destinations via transit is in between walking and biking as the analysis estimates the population within a maximum of a 5 minute walk to a bus stop, a 20 minute ride on the bus and a 5 minute walk to destination.

Figure D.3 shows the size of the access buffer areas for each mode.

Travel Mode	2010 Population within 30 minutes of key destinations	
	Population	Proportion of County
Walk	85,847	32.7%
Bike	193,792	73.9%
Transit	143,170	54.6%

Figure D.5 – Total 2010 (baseline) aggregate population within 30 minutes of any key destinations based on existing transit, bicycle and pedestrian infrastructure

Figure D.6 shows the maximum population within 30 minutes of each of the key destinations. The maximum population is the population that could access the central point of key destinations within 30 minutes by biking or walking if there was complete bicycle and pedestrian facility coverage in vicinity of key destinations.

Area	Maximum 2010 Population within a 30-minute walk		Maximum 2010 Population within a 30-minute bike ride	
	Population	Proportion of County	Population	Proportion of County
Downtown Santa Cruz	26,400	10.1%	98,905	37.7%
Scotts Valley (combined)	10,729	4.1%	21,173	8.1%
UC Santa Cruz	5,289	2.0%	53,764	20.5%
Soquel Dr (Soquel to Mattison)	15,171	5.8%	100,690	38.4%
41st Ave	21,666	8.3%	93,983	35.8%
Capitola Village	13,577	5.2%	87,396	33.3%
Cabrillo College	8,020	3.1%	61,775	23.6%
Green Valley / Freedom	19,418	7.4%	65,197	24.9%
Watsonville Hospital	10,690	4.1%	63,456	24.2%
Downtown Watsonville	24,008	9.2%	59,451	22.7%

Figure D.6 – Total 2010 Maximum* Population within 30 Minutes of Key Destinations

** Maximum reflects population if there was universal bicycle and pedestrian facility coverage*

Figure D.7 shows the maximum aggregate population within 30 minutes of any of the key destinations.

Travel Mode	2010 Maximum Population within 30 minutes of key destinations	
	Population	Proportion of County
Walk	128,029	48.8%
Bike	207,046	78.7%

Figure D.7 – Total 2010 Maximum* Aggregate Population within 30 Minute Walk and Bicycle Trips of Key Destinations

**Maximum reflects population if there was universal bicycle and pedestrian facility coverage*

Results

Figure D.8 shows the results for 2035 assuming that the walk and bike projects that have been prioritized (constrained) in the 2014 RTP are implemented. This analysis does not account for any shifts in population distribution that may occur in the county through 2035. Given current focus on mixed use and

higher density housing near key destinations, the percentage of the population that would live near key destination areas will likely increase. Thus the percentage of the population within a 30 minute walk or bike from key destinations would be even greater. Only an analysis on walk and bike access was performed since there was no information available about how future transit routes will be configured.

	2035 Population within 30 minute walk	2035 Population within 30 minute bike ride
Area	**Proportion of County**	**Proportion of County**
Downtown Santa Cruz	8.4%	36.8%
Scotts Valley	2.2%	7.0%
UC Santa Cruz	0.5%	20.5%
Soquel Dr (Soquel to Mattison)	2.3%	37.4%
41st Ave near Hwy 1	4.9%	34.5%
Capitola Village	3.4%	32.1%
Cabrillo College	1.0%	22.2%
Green Valley / Freedom	4.9%	22.4%
Watsonville Hospital	3.1%	22.2%
Downtown Watsonville	6.6%	21.6%

Figure D.8 – Population within 30 minutes of Key Destinations in 2035 based on 2014 RTP Project List

Figure D.9 shows the aggregate population within 30 minutes of any of the key destinations based on implementing the bike and pedestrian projects that are prioritized in this plan.

Population within 30 minutes of Key Destinations				
	2010 Baseline	2014 RTP Implementation for 2035	2035 Target	Maximum Population
Travel Mode	% of County	% of County	% of County	% of County
Walk	32.7%	33.8%	39.2%	48.8%
Bike	73.9%	74.3%	75.9%	79.0%

Figure D.9 – Aggregate Population within 30 Minutes of Key Destination in 2035, based on the 2014 RTP Project List

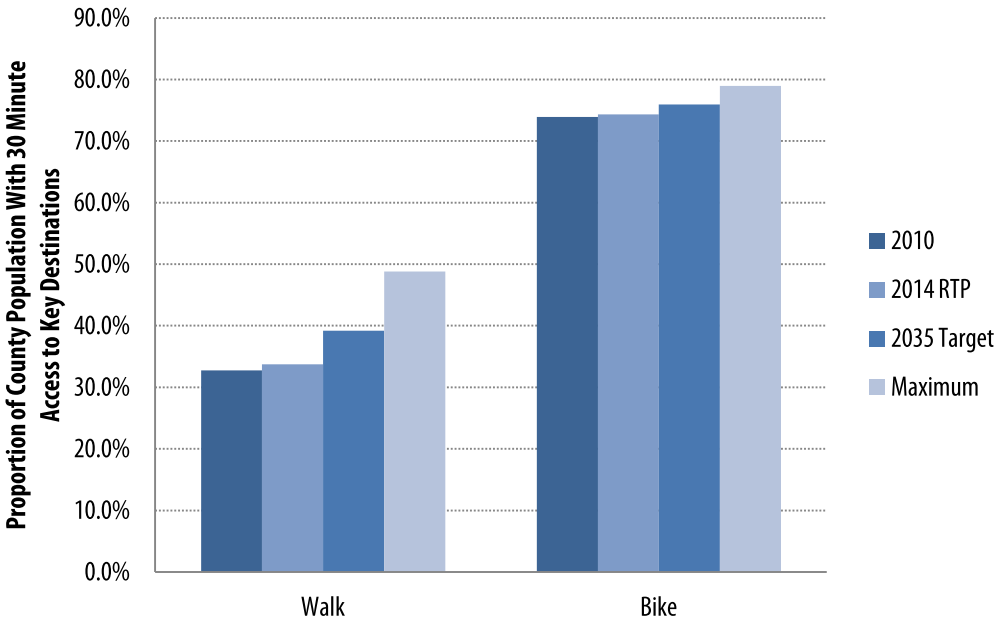


Figure D.10 – Walk and Bicycle Access Improvements Near Key Destinations for Total Population

The results show that despite investment in additional pedestrian and bicycle infrastructure, the proportion of the population within 30 minutes of key destinations does not substantially increase (**Figure D.10**). The target for 2035 was set to close the gap between the 2010 baseline population and the maximum possible population by 40%. It was calculated by taking 40% of the difference between the baseline and the maximum possible population within the key destinations and adding to the baseline (**Figure D.9**). Progress is made towards the target but the 2035 target to close the gap by 40% between the 2010 baseline and the maximum population was not met. The gap between the 2010 baseline and the maximum population was closed by 9% for bike and 6% for walk compared to the 40% target.

This analysis shows that large portions of the county have robust bicycle infrastructure that provides good connectivity near key destinations. Currently, the pedestrian networks near key destinations are not as complete although the analysis is limited due to lack of sidewalk data throughout many areas of the county.

Target 1B. Reduce per capita fuel consumption and greenhouse gas emissions by 1% by 2020 and 5% by 2035.

Target Development

A 5% reduction in per capita greenhouse gas emissions by 2035 for passenger vehicles is a voluntary target that was set by the Regional Transportation Commission (RTC) to be consistent with requirements established by the state for the Monterey Bay region. The California Air Resources Board (ARB) requires a five percent reduction in per capita greenhouse gas (GHG) emissions for passenger vehicles to be achieved through the Association of Monterey Bay Area Governments (AMBAG) Sustainable

Communities Strategy. This reduction in GHG comes from coordination of land use and transportation planning primarily through a reduction in vehicle miles traveled and improvements in vehicle speed. The Santa Cruz County RTP target is based on changes in the transportation system only and does not consider effects of land use changes as land use is outside the purview of the RTC. Vehicle technology improvements and low carbon fuel requirements are expected to generate significant greenhouse gas emission reductions. These reductions are also above and beyond this 5% and are not accounted for in the 2014 RTP since they are outside the authority of the RTC. The 2014 RTP relies on reductions in vehicle miles traveled along with improvements in vehicle speed to achieve the five percent greenhouse gas emissions reduction target.

The average per capita vehicle miles traveled in Santa Cruz County is 15.3 miles per person per day. An emissions reduction of 5% corresponds to an average reduction in vehicle miles of travel or mode shift (carpooling, transit, biking, or walking) of approximately ¾ of a mile per person per day, 5 miles per week, or 275 miles per year. If one day a week, commuters switched from driving alone to either working from home or commuting to work by carpooling, biking, walking, or riding transit, this goal would be readily met.

Forecasting Methodology

Fuel consumption and GHG emissions from a given vehicle fleet mix are the result of two factors—vehicle-miles of travel (VMT) and vehicle speeds. As VMT increases, fuel consumption and GHG increases as well. Vehicle speed is also relevant for GHG emissions because of the following:

- Vehicles traveling at low speeds are generally less efficient than vehicles traveling at moderate speeds since engine and auxiliary losses (e.g., air conditioning, electrical load) represent a larger share of fuel consumption and GHG emissions at low speeds

- Vehicles traveling at high speeds face additional air-resistance, which reduces efficiency

- Acceleration and deceleration, or speed consistency is important for estimating fuel consumption and GHG emissions. Congested, stop-and-go travel is inefficient since fuel consumption and GHG emissions related to idling and accelerating a vehicle from a stop can be considerable. A roadway facility with frequent stop and go conditions will generate more GHG emissions than one with consistent travel speeds (even if that speed is relatively low).

Traveling at the mid-range of speeds (30 to 60 mph) and reducing stop-and-go traffic to maintain speed consistency are effective means of reducing GHG emissions. **Figure D.11** summarizes these factors. Steady state, as referenced in **Figure D.11** refers to consistent travel at a given speed, as opposed to real-world activity that includes stop-and-go driving.

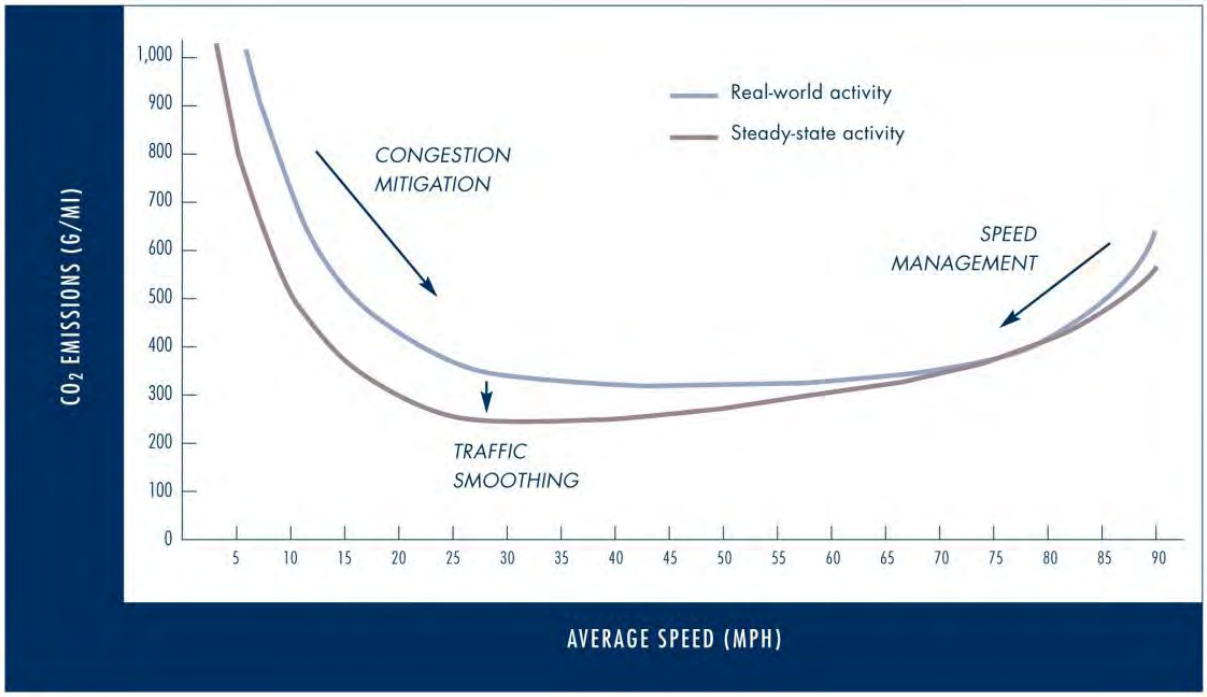


Figure D.11 – CO_2 Emissions versus Average Vehicle Speed

Source: UC Berkeley Transportation Center[8]

This section describes how fuel consumption and GHG emissions are forecast for the 2014 RTP based on changes in vehicle miles traveled, vehicle speeds and speed consistency. To forecast fuel consumption and GHG emissions, the following data from the AMBAG regional travel demand model are used:

- Roadway link traffic volumes
- Roadway link lengths
- Estimated roadway link speeds

Using this information, total passenger vehicle VMT is calculated for every link (e.g., volume x length). Then a spreadsheet program is used to tally up the total VMT that occurs in five mile-per-hour speed ranges. VMT is adjusted to take out all trips that travel through the AMBAG region (external to external trips) and half of the trips that travel either from inside to outside the region (internal to external) or from outside to inside the region (external to internal). These adjustments are consistent with ARB requirements for AMBAG's Sustainable Communities Strategy.

With the VMT data organized by speed, the California Air Resources Board's EMFAC model is used to calculate the GHG emissions from Santa Cruz County. The fuel consumption and CO_2 emission factors based on the passenger vehicle fleet mix for Santa Cruz County are used to calculate the final results. CO_2 emissions is used as a measure of GHG emissions since CO_2 data was more readily available from the EMFAC model results and the relative reduction in CO_2 will be the same as GHG emission reductions since CO_2 accounts for such a large percentage of the GHG emissions. Due to the inability of the travel demand model to model various different types of transportation projects including transportation demand management, transportation system management, and bicycle and pedestrian infrastructure, the

VMT and GHG emissions were than reduced through postprocessing. Postprocessing is a process where the travel model outputs are manually adjusted using factors derived from research studies and other analytic tools.

Baseline

The 2005 baseline per capita CO_2 emission rate for Santa Cruz County from transportation is 15.0 lbs/day. This CO_2 emission rate corresponds to an average vehicle miles traveled per person of 15.3 miles/day. A reduction of 5% by 2035 would require the per capita CO_2 emissions to be reduced to 14.3 lbs/day due to reductions in vehicle miles traveled and improvements in vehicle speed.

Results

The greenhouse gas emissions results for Santa Cruz County for 2035 based on the list of projects that have been prioritized in the 2014 RTP are estimated to be a **17.9%** reduction relative to 2005. This corresponds to a CO_2 per capita emission rate of 12.3 lbs/day/person for 2035 which includes reductions from both transportation and land use changes. The regional travel demand model results determined 13.1% of this reduction (**Figure D.12**) and the postprocessing accounts for the remainder of the reduction (4.7%) (**Figure D.12**). [The postprocessing reduction of 5.46% (**Figure D.13**) is applied to the 2035 VMT and CO_2 results from model as opposed to the 2005 values and thus results in an additional 4.7% reduction relative to 2005.] See the documentation at the end of this target discussion for additional information on how the postprocessing was calculated. The per capita CO_2 reduction of 17.9% is slightly greater than the per capita VMT reductions of 17.1% likely due to more efficient vehicle speeds and speed consistency in 2035 relative to 2005 (**Figure D.14**).

Because of the synergistic effects of land use and transportation on reducing GHG emissions, it is difficult to determine how much of the reduction comes from transportation improvements versus land use changes. All of the postprocessing reductions are based on transportation investments and therefore at a minimum, transportation effects account for 4.7% of the GHG reductions. Assuming half of the GHG reduction that has been forecasted for 2035 is due to transportation (9.0%), this result not only meets but surpasses the 5% target.

VMT and GHG Calculations for Passenger Vehicles	2005	2035
Daily VMT (miles/workday/capita) - modeled	15.29	13.40
Daily CO2 (lbs/workday/capita) - modeled	15.02	13.05
Modeled reduction in VMT from 2005		-12.4%
Modeled reduction in CO2 from 2005		-13.1%
Daily VMT (miles/workday/capita) - modeled and postprocessed		12.67
Daily CO2 (lbs/workday/capita) - modeled and postprocessed		12.34
Total per capita VMT % Reduction from 2005		**-17.1%**
Total per capita CO2 % Reduction from 2005		**-17.9%**

Figure D.12 – Per Capita Reductions of Vehicle Miles Traveled and Greenhouse Gas Emissions for 2014 RTP relative to 2005 for Passenger Vehicles

Project Type	Postprocessing Reductions for VMT/GHG Emissions
Pedestrian facility and traffic calming improvements	-0.30%
Bicycle facility improvements	-2.22%
Intelligent Transportation Systems/Transportation System Management programs	-0.13%
Transportation Demand Management programs	-1.75%
Transit improvements	-0.80%
Increased work at home	-0.26%
Total Postprocessing Reductions	**-5.46%**

Figure D.13 – Postprocessing Reductions of Vehicle Miles Traveled and Greenhouse Gas Emissions for 2014 RTP relative to 2005

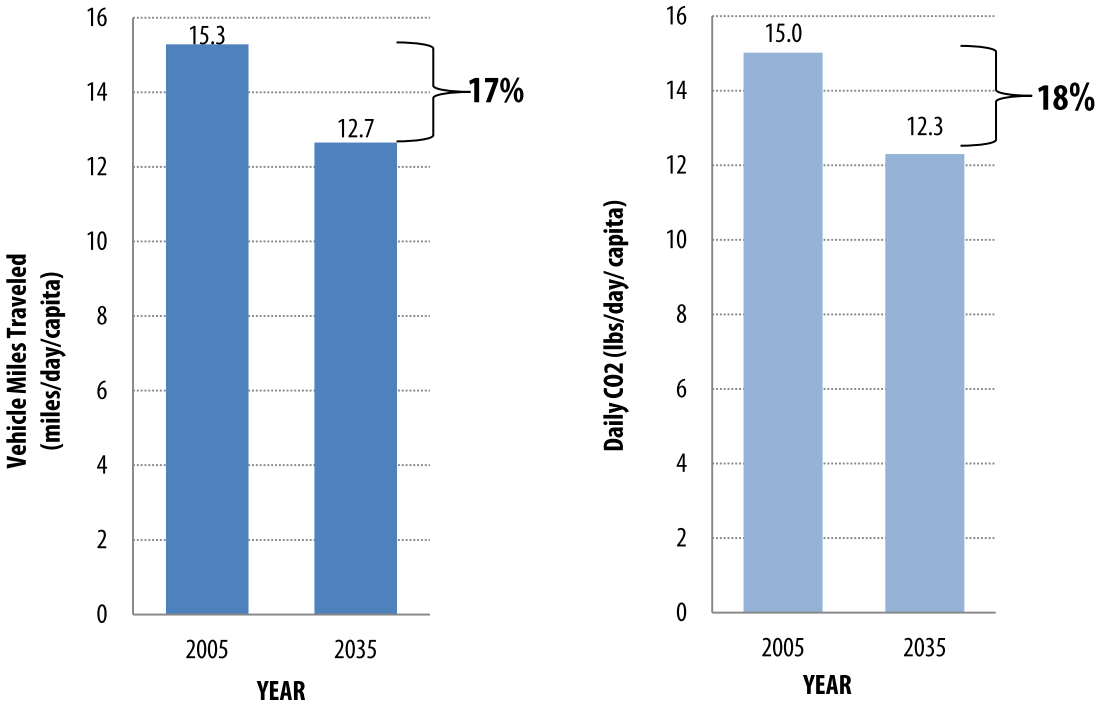


Figure D.14 – 2035 per capita VMT and GHG reductions compared to 2005

VMT and GHG Postprocessing Reduction Methodology

Based on information from AMBAG, the new regional travel model either does not model or is not sensitive to the following transportation projects or programs:

- Pedestrian projects
- Bike projects
- Intelligent Transportation Systems/ Transportation System Management (ITS/TSM) projects
- Transportation Demand Management (TDM) projects
- Transit enhancements – the model's mode choice component is "static" and is therefore insensitive to new or enhanced transit service
- Work at home – the model's mode choice component does not have the ability to vary the percentage of people who work at home

Based on these limitations, Fehr & Peers evaluated postprocessing adjustments to account for the reductions in VMT/GHG from projects in the categories above. The postprocessing was based primarily on the research identified in the following documents:

- *Quantifying Greenhouse Gas Emissions Mitigation Measures*, CAPCOA, 2010[9]
- *Moving Cooler*, Urban Land Institute, 2009[10]
- *INDEX 4D: A Quick-Response Method of Estimating Travel Impacts from Land-Use Changes*, Criterion Planners and Fehr & Peers, 2001[11]
- *Appendix C-4: Final Environmental Impact Report For The Metropolitan Transportation Plan/Sustainable Communities Strategy For 2035*, SACOG, 2012[12]

Below is a brief documentation of how the adjustments were calculated.

Pedestrian Projects

Fehr & Peers estimated the total percent growth in new or substantially enhanced pedestrian facilities based on the research prepared for the STARS access analysis. For each of the TAZs within Santa Cruz County, the percent increase in pedestrian infrastructure was input based on the project list and the estimated existing pedestrian facility coverage in the area. The population-weighted average percent increase was then calculated for the entire county. The results found that—on average—pedestrian infrastructure expanded by about 6% in the county. This growth in pedestrian facilities was multiplied by a VMT reduction elasticity from *INDEX 4D Method*[13]. This resulted in a population-weighted VMT/GHG reduction of -0.24%.

In addition, there are numerous traffic calming projects in the RTP. Since the INDEX method does not account for traffic calming, data from CAPCOA 2010[14], were used. The CAPCOA document, citing data from *Moving Cooler*,[15] identified a low-level reduction of -0.25% of VMT, assuming that traffic calming

was present at approximately 25% of streets and about 25% of intersections on those streets have traffic calming measures. Based on an observation of the project list, it did not seem appropriate that this many traffic calming measures would be implemented, so the minimum reduction was factored by one-quarter for this analysis. The result is a -.063% reduction in VMT.

Bike Projects

Fehr & Peers used GIS data to calculate the percent increase in bicycle facilities as part of the RTP. The result is a 57% increase in the mileage of bicycle facilities (bike lanes and trails) since 2006 (year closest to 2005 when comparable bikeway mileage data was available). This increase was multiplied against the elasticity factor from the INDEX 4D[16] method to yield a 2.2% reduction in VMT/GHG. Note that this 2.2% reduction results in a total VMT reduction for the county of about 91,000 miles.

Intelligent Transportation System/Transportation System Management

Fehr & Peers consulted Moving Cooler[17] to estimate the VMT reducing benefits of ITS/TSM projects. Moving Cooler presents general VMT reductions resulting from some overall strategies. Therefore, it is difficult to be highly specific when applying Moving Cooler results, however, it is the most authoritative source on the topic. Based on a review of the RTP project list, the following ITS/TSM projects were assumed to be implemented at an "expanded current practice" level: incident management, signal control management, and traveler information. Many other ITS/TSM programs are also implemented within the County, but these have less substantial investments and were not considered for inclusion. Based on this assumption, Moving Cooler methodology estimates a VMT/GHG reduction of 0.125%.

Transportation Demand Management

The CAPCOA[18] report was referenced to estimate the extent of benefit from TDM programs. The RTP project list identifies fairly extensive (but voluntary) TDM programs for workplaces and residences. Based on this and the range of VMT reductions assumed for TDM in the CAPCOA report, the following reductions were calculated:

- Commute-based reductions: 75% of workplace commuters have exposure to voluntary TDM; 35% of all VMT is commute-based; 5% reduction in VMT = -1.32% countywide VMT.

- Residence non-work-based reductions: 25% of residents have exposure to voluntary TDM; 35% of all VMT is home-based non-commute; 5% reduction in VMT = -0.44% countywide VMT.

This results in a total VMT reduction of 1.75%.

Transit

Ideally the VMT reducing effects of transit would be identified by the regional travel model but the current AMBAG model is not sensitive to the majority of transit projects. The project list identifies several major expansions to transit in Santa Cruz, including new commuter rail, BRT service, and enhanced freeway express bus service. In looking at other commuter rail and BRT services around the country, combined with Santa Cruz Metro's existing daily ridership totals, it was assumed that these new services could bring 3,500 new daily boardings to the system. This compares to the current daily boarding total of about 19,000 for the Metro system. Since the new service is oriented toward faster and potentially more

frequent service, relatively long trips were assumed, averaging 9 miles in length. The 3,500 new boardings each at 9 miles in length would result in a VMT reduction of about 0.8%.

Work at Home

Fehr & Peers followed SACOG's lead in extrapolating an observed trend toward increasing work-at-home. In the SACOG area, the work at home percentage increased by about 1% between 2000 and 2010 (using US Census Bureau data). SCCRTC determined a similar increase for Santa Cruz over the same period, therefore the same reduction will be assumed for 2035 conditions as was determined by SACOG. The result was a 0.26% VMT/GHG reduction due to increasing work-at-home.

Summary Table

Figure D.13 summarizes the aggregate VMT/GHG postprocessing reduction for the 2014 RTP.

Santa Cruz County 2035 Total GHG Emissions

Based on the list of projects that have been prioritized in the 2014 RTP, it is estimated that by 2035 in Santa Cruz County per capita GHG emissions from passenger vehicles will be reduced by 17.9% relative to 2005. Given a projected population increase of 18.6% from 2005 to 2035, the total reductions in VMT and GHG emissions from passenger vehicles can also be assessed (**Figure D.15**). The decrease in per capita VMT and GHG is substantial enough in SCC that the total VMT and CO_2 will be slightly decreased in 2035 compared to 2005 when taking into account population growth.

There are three main ways to reduce GHG emissions; 1) reducing the number of vehicle miles traveled (VMT), 2) increasing the fuel economy of vehicles and 3) reducing the amount of carbon in fuel. Governor Schwarzenegger's executive order S-3-05 of 2005[19] is to reduce GHG Emissions in 2050 to 80% below 1990 levels. Assuming a 10% reduction in the amount of carbon in fuel, what combinations of VMT reduction and fuel economy (mpg) are needed to reach this goal?

Figure D.16 shows the average per capita VMT with the scale on the left side and the average mpg for vehicles with the scale on the right side. The bars labeled 1990 provide an estimate of the average per capita VMT and fuel economy in 1990. **Figure D.16** shows that if the per capita number of miles traveled is reduced to 90% of 1990 numbers, an average fuel economy of passenger vehicles of about 100 mpg for automobiles on the road (C1) would be necessary to reach the 2050 goal. If the number of per capita VMT is reduced to 80% of 1990 levels, fuel economy would have to be about 90 mpg (C2). If per capita VMT is reduced to 70%, fuel economy would have to be about 80 mpg (C3). If per capita VMT is reduced to 60%, fuel economy would have to be about 70 mpg (C4) and if per capita VMT is reduced to 50%, fuel economy would have to be about 55 mpg (C5).

In 2012, President Obama set the average fuel economy standard for cars and light duty trucks to 54.5 mpg by 2025.[20] This is the average fuel economy standard for automobiles produced in 2025. Another 10 to 15 years will likely be required in order to get the average fuel economy of automobiles on the street to be 54.5 mpg. To reduce GHG by 80% by 2050 it will likely require a VMT reduction of 30-40% along with an average fuel economy of 70 to 80 mpg for automobiles on the road. The 2014 RTP with a reduction in per capita VMT of 17.9% by 2035 is on track but there are still improvements needed to get to a total GHG reduction of 80% relative to 1990 by 2050.

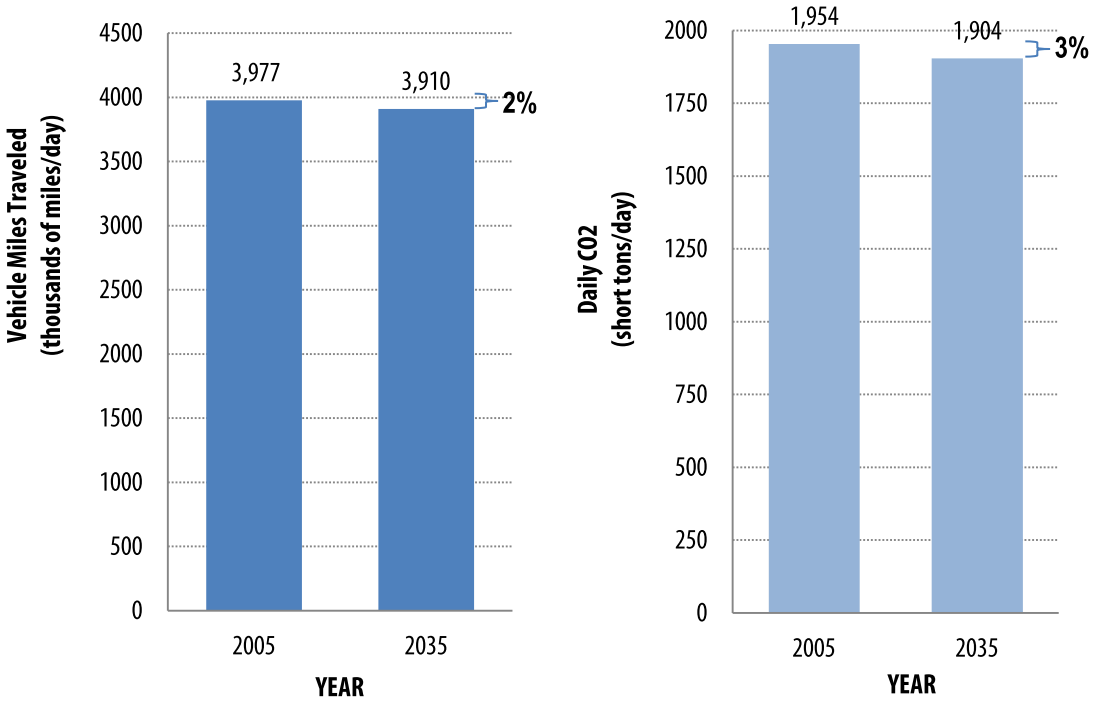


Figure D.15 – Total 2035 VMT and GHG emissions relative to 2005

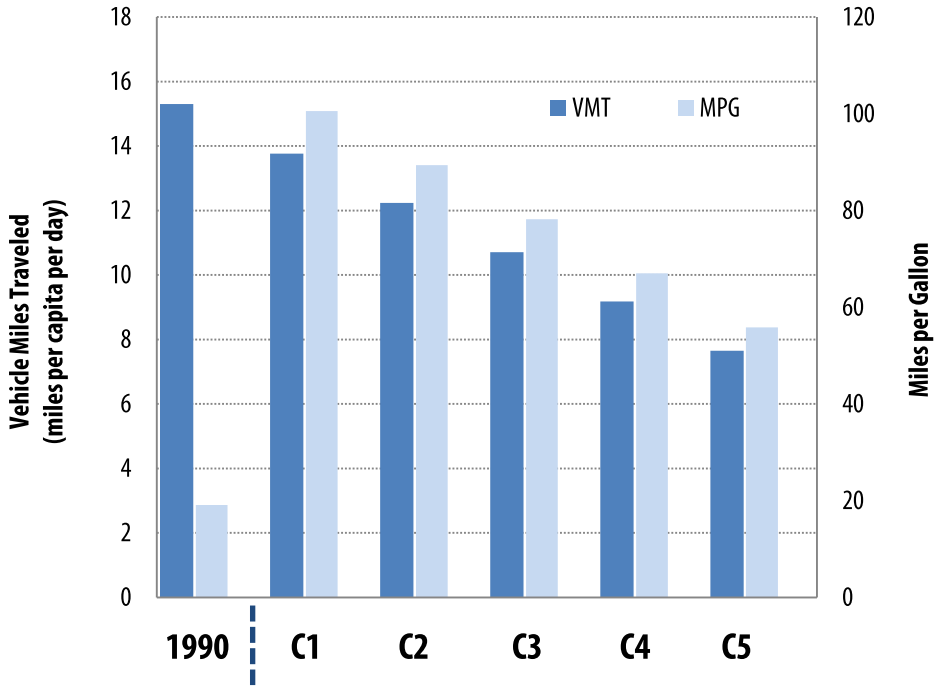


Figure D.16 – Per Capita Vehicle Miles Traveled Versus Fuel Economy (mpg) Necessary to Reduce GHG Emissions by 80% from 1990 levels by 2050

Note: Fuel Economy (mpg) equals the average fuel economy of cars and light duty trucks on roadways.
Source: Santa Cruz County Regional Transportation Commission

Target 1C. Re-invest in the local economy $5 million/year[21] by 2020 and $10 million/year by 2035 from savings resulting from lower fuel consumption due to a reduction in vehicle miles traveled.

Target Development

Economic benefit is a key leg of the "Triple Bottom Line" sustainability stool. The STARS Economic Benefit analysis is based on the "Green Dividend" work of Impresa, Inc. economist Joe Cortright. The Green Dividend analysis, sponsored by CEO's for Cities[22], shows that when people reduce vehicle miles traveled (VMT), they reduce spending on fuel and vehicle use, which is then available to invest in the local economy.

The 2035 target to reinvest $10 million per year in the local economy assumes at least a 5% per capita reduction in vehicle miles traveled (VMT). The calculations were based on the following assumptions:

- Economic benefits are in 2014 dollars
- 2035 population will be 308,582 based on AMBAG projections
- $4 per gallon fuel cost
- 5 percent reduction in per capita VMT relative to 2005
- Fuel efficiency (miles per gallon) will be about 32 percent greater in 2035 based on state fuel economy standards (Pavley)
- 2035 business as usual per capita VMT is equivalent to 2005 per capita VMT (15.3 miles/workday/capita)

Comparing 2035 fuel consumption expenditures with a 5 percent reduction in per-capita VMT relative to 2035 business as usual VMT results in approximately $11 million/year in household savings from a reduction in fuel use. Establishing an economic benefit target will help the RTC and local jurisdictions develop, analyze and prioritize projects that reduce fuel consumption and thereby retain money in the Santa Cruz County economy.

Forecasting Methodology

For the 2014 RTP, the economic benefit of reduced fuel consumption is quantified based on the estimated VMT per capita for 2035. VMT results are derived from the AMBAG Regional Travel Demand model adjusted by postprocessing to account for projects/programs that cannot be modeled or the model is not sensitive to. The postprocessing includes effects of bicycle, pedestrian, transportation demand management, transportation system management projects/programs as discussed under target 1B. In addition to the assumptions used in the target development, the economic benefit calculation takes into consideration the following assumptions:

- 73 % of the cost of fuel leaves the local economy (27% of cost of fuel stays in local economy, 73% leaves local economy and therefore 73 cents of every dollar not spent on fuel is available to invest locally)[23]

- 62% of the amount available to invest locally is retained in the local economy based on buying from locally-owned businesses[24] (62 cents out of every dollar is retained in the local economy)

- Total increase that can be invested in local economy based on reduction in fuel consumption equals 35% * fuel consumption savings. [Note: 35% is determined from increase in the amount available to be reinvested in local economy compared to fuel, 35% = 62%-27%.]

Baseline

The economic benefit is relative to 2035 business-as-usual conditions, which in this case is assumed to have no reduction in per capita VMT compared to 2005 conditions. The baseline data is shown in **Figure D.17**.

Results

The 2014 RTP forecasts a reduction in per capita VMT of 17.9%. A reduction in VMT will cause a decrease in fuel consumption which translates into an average annual household savings of $332 and an annual increase in money invested in the local economy of $13 million/year for Santa Cruz County (**Figure D.17**). An economic benefit of $13 million/year by 2035 meets and surpasses the economic benefit target of $10 million/year.

Measure	2035 Business as Usual	2035 RTP Implementation
Average Weekday VMT (miles/capita/day)	15.3	12.7
Annual Countywide Fuel Consumption (gallons)	55,000,000	46,000,000
Annual Countywide Fuel Expenditures ($)	$220,300,000	$182,500,000
Annual Countywide Savings ($)		$37,800,000
Annual Savings per Household ($)		**$332**
Annual Reinvestment Increase in Santa Cruz County Economy ($)		**$13,200,000**

Figure D.17 – Economic Benefit to Santa Cruz County based on reduction in VMT and Fuel Consumption

Target 1Di. Improve travel time reliability for vehicle trips.

Target Development

Travel time reliability—a consistency or dependability in travel times, as measured from day to day – is universally desired and an important measure of transportation service quality. Travelers want to know that a trip will take a half-hour today, a half-hour tomorrow, and so on. Travel time reliability (TTR) matters since being late to work, an appointment, or for a delivery have substantial repercussions for both travelers and businesses. Literature from the Federal Highway Administration (FHWA) and many academic journals cite travel time *reliability* as a more important measure than *average* travel time between destinations because it is challenging for people to try to plan around the unpredictable nature of travel[25]. A common goal of transportation agencies is to reduce travel time variability by striving to keep the time it takes to take a trip as close as possible to the average trip time. This target seeks to improve travel time reliability for vehicle trips relative to the baseline travel time reliability as discussed below.

Baseline

The baseline travel time data for Highway 1 travel between Watsonville (at Hwy 129) and Santa Cruz (at Ocean St) were measured from Caltrans Performance Monitoring System (PeMS) data.[26] Highway 1 travel time in the northbound direction for this segment was available at 5 minute intervals (**Figure D.18**). Highway 1 travel times in the southbound direction along this segment was only available at 1 hour intervals and thus the travel time reliability was adjusted based on PeMs Highway 1 northbound data averaged over a 15 minute interval. The travel time reliability measure is based on the 95% travel time which is defined as the time when 95% of the trips will be shorter than this time. Both the travel time and 95% travel time versus time of day are plotted for Highway 1 northbound from Watsonville to City of Santa Cruz in **Figure D.18**. Note that the greater the difference between the curves at the peak hour indicates a lesser degree of travel time reliability.

A travel time index (TTI) is a way to normalize congestion levels across facilities with different free-flow speeds. A travel time index is determined by taking average travel time divided by the free flow travel time. The free flow speed assumed here is the posted speed limit (65 mph for highways). Similarly, the 95% travel time index is the 95% travel time divided by the free flow time. Baseline AM and PM peak 15 minute average travel time indices and 95% travel time indices for Highway 1 are presented in **Figure D.19**.

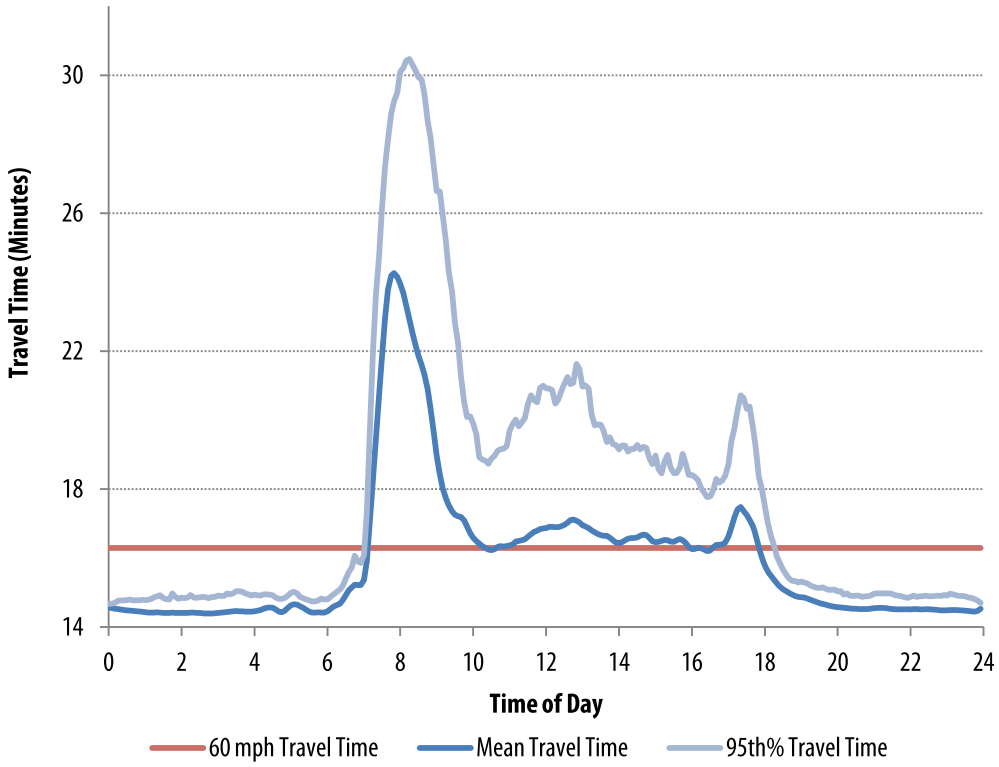


Figure D.18 – Travel Time and Travel Time Reliability for Highway 1 Northbound from Watsonville (Hwy 129) to City of Santa Cruz (Ocean St)

Source: Santa Cruz County Regional Transportation Commission and Caltrans Performance Monitoring System (PeMS)

Baseline data for Highway 17 and countywide urban arterial average were not available through PeMs and thus were extracted from the 2010 AMBAG travel demand model results. The Highway 17 and countywide data was adjusted based on the Highway 1 PeMs data to alleviate differences between actual and modeled data. The results are presented in **Figure D.19**.

Facility	AM Peak 15 Minute Average				PM Peak 15 Minute Average			
	Avg Travel Time (min)	95% Travel Time (min)	Avg TTI	95% TTI	Avg Travel Time (min)	95% Travel Time (min)	Avg TTI	95% TTI
Highway 1 NB – Watsonville to Santa Cruz	24.2	29.2	1.48	1.79	17.4	20.5	1.07	1.26
Highway 1 SB – Santa Cruz to Watsonville	16.2	18.3	0.99	1.12	28.2	33.8	1.73	2.07
Highway 17 NB – Santa Cruz to County Line	23.3	32.2	1.28	1.77	19.1	26.9	1.05	1.48
Highway 17 SB – County Line to Santa Cruz	18.9	26.5	1.01	1.42	25.3	34.7	1.36	1.86
Urban Arterials	985.8	1,382.8	1.01	1.42	994.3	1,392.5	1.02	1.43

Figure D.19 – Baseline Travel Time Reliability Results

Source: Santa Cruz County Regional Transportation Commission, Sustainable Transportation Council, Fehr & Peers

Forecasting Methodology

There are few applications where travel time reliability is predicted for planning purposes. For the 2014 RTP analysis, travel time reliability was forecasted using data from the AMBAG regional travel demand model and adjusted based on the baseline travel demand model results relative to the baseline PeMS data. Travel time reliability is an indicator of the variation in travel times from one day to the next whereas the travel demand model only estimates average travel times over the course of one day. A methodology for forecasting travel time reliability based on correlations with average travel times will be used for this analysis as discussed below.

Data used from the AMBAG regional travel demand model to forecast travel time reliability are:

- Link travel time
- Link volume-to-capacity (v/c) ratio

Travel time reliability is calculated for the following facilities in Santa Cruz County:

- Arterial roads within the urban areas of the county based on their designation in the AMBAG model (**Figure D.20**).
- Highway 1 between SR 129 and Ocean St in City of Santa Cruz
- Highway 17 between Highway 1 and the County Line

Figure D.20 – The Study Area That Defines the Arterial Roads That Will Be Included in the Countywide Travel Time Reliability Calculation

Using the AMBAG travel demand model data from the AM and PM peak hour runs, the average peak hour travel times for each freeway and arterial segment in the study area (**Figure D.20**) were extracted and summed together to develop an average peak hour travel time for this urban area of the county. Total average travel times for Highway 1 and Highway 17 routes are developed by summing the VMT-weighted average travel times for each segment that makes up the route. Peak hour travel times were than adjusted using the baseline data from PeMs to peak 15 minute average travel times for both AM and PM.

With the AM and PM average peak 15 minute travel times known for the facilities of interest, travel time indices (TTI) are calculated using a free flow speed of 60 mph. Next, 95th percentile TTIs are estimated using an observed relationship between average 15 minute TTIs and 95th percentile TTIs based on the PEMS baseline data from Highway 1:

$$95\text{th percentile TTI} = 1.5 * \ln(\text{average TTI}) + 1.4$$

The form of this equation was based on national research conducted by R. Margiotta in a paper to the Transportation Research Board[27]. The national dataset was not used since it estimated higher 95th percentile TTIs than were observed in Santa Cruz County. With the relationship between average travel times and 95th percentile travel times, as developed above, 95th percentile TTIs for 2035 can be forecast from travel times generated from the AMBAG travel demand model results for 2035. The travel time reliability measure using 95th percentile TTIs can thus be assessed. The travel time and travel time reliability values were adjusted to account for the additional reduction in VMT due to the postprocessing as discussed under target 1B.

Results

The travel time and travel time reliability results based on the 2014 RTP project list are summarized in **Figure D.21**. Travel times increase and travel time reliability decreases between 2010 (**Figure D.19**) and 2035 (**Figure D.21**), particularly for the freeway sections of Highway 1 and Highway 17. The travel time increases and travel time reliability decreases only marginally for the arterial streets within the urban portion of Santa Cruz County.

Travel times would be greater and travel time reliability would be less in the absence of the 2014 RTP projects. **Figure D.22** shows the travel time and travel time reliability results for the 2035 No Project scenario. As shown, Highway 1 average travel times are between 3-18% higher under the No Project Scenario compared to 2035 Project. Highway 17 travel times are 5-18% higher under the No Project Scenario compared to 2035 Project. Forecasts of travel time reliability for 2035 based on project implementation (**Figure D.21**) do not improve the travel time reliability relative to existing baseline conditions but does make improvements relative to a no project alternative (**Figure D.22**).

	AM Peak 15 Minute Average				PM Peak 15 Minute Average			
Facility	Avg Travel Time (min)	95% Travel Time (min)	Avg TTI	95% TTI	Avg Travel Time (min)	95% Travel Time (min)	Avg TTI	95% TTI
Highway 1 NB – Watsonville to Santa Cruz	24.9	33.2	1.53	2.04	20.6	28.6	1.26	1.75
Highway 1 SB – Santa Cruz to Watsonville	17.4	24.4	1.07	1.50	28.3	36.3	1.74	2.23
Highway 17 NB – Santa Cruz to County Line	25.0	34.1	1.37	1.87	19.7	27.7	1.08	1.52
Highway 17 SB – County Line to Santa Cruz	19.5	27.3	1.04	1.47	27.3	36.7	1.46	1.97
Urban Arterials	987.5	1,384.0	1.02	1.43	1,003.4	1,407.2	1.03	1.45

Figure D.21 – 2035 Travel Time Reliability Results

Source: Santa Cruz County Regional Transportation Commission, Sustainable Transportation Council, Fehr & Peers

Facility	AM Peak 15 Minute Average				PM Peak 15 Minute Average			
	Avg Travel Time (min)	95% Travel Time (min)	Avg TTI	95% TTI	Avg Travel Time (min)	95% Travel Time (min)	Avg TTI	95% TTI
Highway 1 NB – Watsonville to Santa Cruz	25.6	33.9	1.57	2.08	24.3	32.6	1.49	2.00
Highway 1 SB – Santa Cruz to Watsonville	20.5	28.4	1.26	1.74	29.7	37.5	1.82	2.30
Highway 17 NB – Santa Cruz to County Line	29.3	38.5	1.61	2.11	19.8	27.7	1.09	1.52
Highway 17 SB – County Line to Santa Cruz	19.5	27.4	1.05	1.47	34.5	43.3	1.85	2.32
Urban Arterials	994.3	1,393.8	1.02	1.43	1,011.2	1,418.3	1.04	1.46

Figure D.22 – 2035 No Project Travel Time Reliability Results

Source: Santa Cruz County Regional Transportation Commission, Sustainable Transportation Council, Fehr & Peers

Target 1Dii. Improve multimodal network quality (MMNQ) for walk and bicycle trips to and within key destinations.

Target Development

The level of use of bicycle and pedestrian facilities is highly dependent on the quality of the facility.[28] As outlined in the Monterey Bay Area Complete Streets Guidebook, not only the presence of sidewalks but wider sidewalks, landscape buffers, and streets with lower automobile speeds and volumes can lead to more people walking more often. Bicycle paths that are separated from automobile and truck traffic and bike greenways on low speed and low traffic volume roads will attract more people bicycling more frequently. Establishing a multimodal facility quality target underscores the importance of the quality of the bicycle and pedestrian network for promoting greater use of active transportation in order to reduce GHG emissions, reduce congestion, and improve health. This target is to improve the quality of the bicycle and pedestrian network relative to a 2012 base year.

Forecasting Methodology

Multimodal quality measures are an evolution of the traditional auto-focused Level of Service standards (LOS). LOS provides an assessment of the quality of transportation service a facility provides under different conditions. Multimodal LOS (MMLOS) can be used to evaluate the quality of pedestrian, bicycle or transit facilities but the focus in the 2014 RTP is on pedestrian and bicycle facilities, given that transit routing and service levels are dynamic.

MMLOS has been around for many years, however, only recently has it begun to be more widely discussed and applied. The most recent version of the *Highway Capacity Manual (HCM)* (Transportation Research Board, 2010) includes a MMLOS for pedestrian and bicycle facilities but this method is extremely data intensive and thus challenging for most jurisdictions to apply. It also is influenced heavily by speed, traffic volume and at times minimizes or negates the benefits in investments in active transportation infrastructure that provide a buffer from the higher speeds and volumes.

Fehr & Peers and the Sustainable Transportation Council (STC) developed an alternative methodology that takes some of the quantitative elements of the HCM methodology and simplifies it so it can be utilized more readily. This methodology is known as Multimodal Network Quality (MMNQ). As part of the 2014 Regional Transportation Plan, STC and Fehr & Peers assessed the MMNQ of the baseline and 2035 pedestrian and bicycle network in Watsonville based on the projects on the constrained list for the 2014 RTP. A MMNQ in Watsonville is being used as an indicator for how well the transportation investments through 2035 improve the quality of the pedestrian and bicycle network countywide. This analysis can be performed on additional locations throughout Santa Cruz County for an improved assessment of the quality of the active transportation network but the resources were not available for that level of analysis. The following are the steps used for development of the MMNQ performance measure for the 2014 RTP.

1. Define a complete network of streets/corridors for bicycle travel throughout the City of Watsonville and for pedestrian travel in Downtown Watsonville.

2. With a complete network of bicycle and pedestrian transportation facilities identified, determine appropriate design standards for given areas and given street typologies. For example, it may be

appropriate to define a sidewalk standard that is 9 feet wide with street trees in a downtown area. On low volume suburban residential streets, the standard may call for a sidewalk on only one side of the street. The Complete Streets Guidebook of Monterey Bay Area, as well as many jurisdictions, have identified citywide or subarea pedestrian and bicycle design standards.

3. Define a rating system with service score designations as green, yellow, and red. A green score is defined as a high quality route. A yellow score indicates acceptable conditions, while a red score would not be attractive to most potential users.

4. Apply the rating system to the prioritized, fiscally constrained RTP project list.

5. In addition to ratings for each segment of the bike or pedestrian network, composite MMNQ scores were calculated for pedestrian and bicycle modes within the entire study area. The composite scores are calculated by determining an average score for the network. Green segments receive a score of 2, yellow a score of 1, and red a score of 0. The total segment scores are indexed to 100, where a network that is entirely composed of green routes would score 100.

6. The MMNQ system is designed to be easy to monitor over time to track progress. Since it is often based on adopted design standards and modal plans, it is also simple to update and keep current.

Baseline and Results

Pedestrian Network Quality. Pedestrian network quality was determined for downtown Watsonville in the vicinity of Main St from Freedom Boulevard to Riverside Drive. The design standards and their associated scoring criteria were defined for both arterials/collectors and local roads (**Figure D.23**). Sidewalk presence or absence and sidewalk width was determined from data available from the City of Watsonville GIS department. The service score designations are shown as green (high), yellow (medium), and red (low). A green score is defined as a high quality pedestrian route. A yellow score indicates acceptable conditions, while a red score would not be attractive to many potential pedestrians. The entire street network in the downtown area was included as part of the pedestrian network as shown in **Figure D.24**. Both the baseline conditions (**Figure D.25**) and the 2035 Scenario (**Figure D.26**) were scored.

The 2012 baseline conditions show that sidewalks exist along both sides of the street on most roadways in downtown Watsonville (**Figure D.25**). Most of the local roads thus have a green score and many of the arterials with standard width sidewalks and no buffer have a yellow score. The baseline quality shows a composite score of 55 out of a maximum of 100 for the pedestrian network (**Figure D.27**). As pedestrian projects are implemented through 2035, the quality of the pedestrian network improves with the addition of the Monterey Bay Sanctuary Scenic Trail and Pajaro River Levee Trail as well as sidewalk improvements along a number of the roadways. The composite score is increased to 71 out of a maximum of 100. Pedestrian multimodal network quality is improved by 2035 and thus the target is met.

Network Score	Along Arterials and Collectors	Local Roads
	6′ Sidewalk and 3′ buffer or tree wells on both sides	Sidewalks on both sides
	Sidewalk on both sides, but narrow, no buffer, or missing curb ramps	Sidewalk on one side
	No Sidewalk on one or both sides	No Sidewalk

Figure D.23 – Pedestrian MMNQ Score

Source: Sustainable Transportation Council, Fehr & Peers

Figure D.24 – Pedestrian Network in Downtown Watsonville

Source: Sustainable Transportation Council, Fehr & Peers

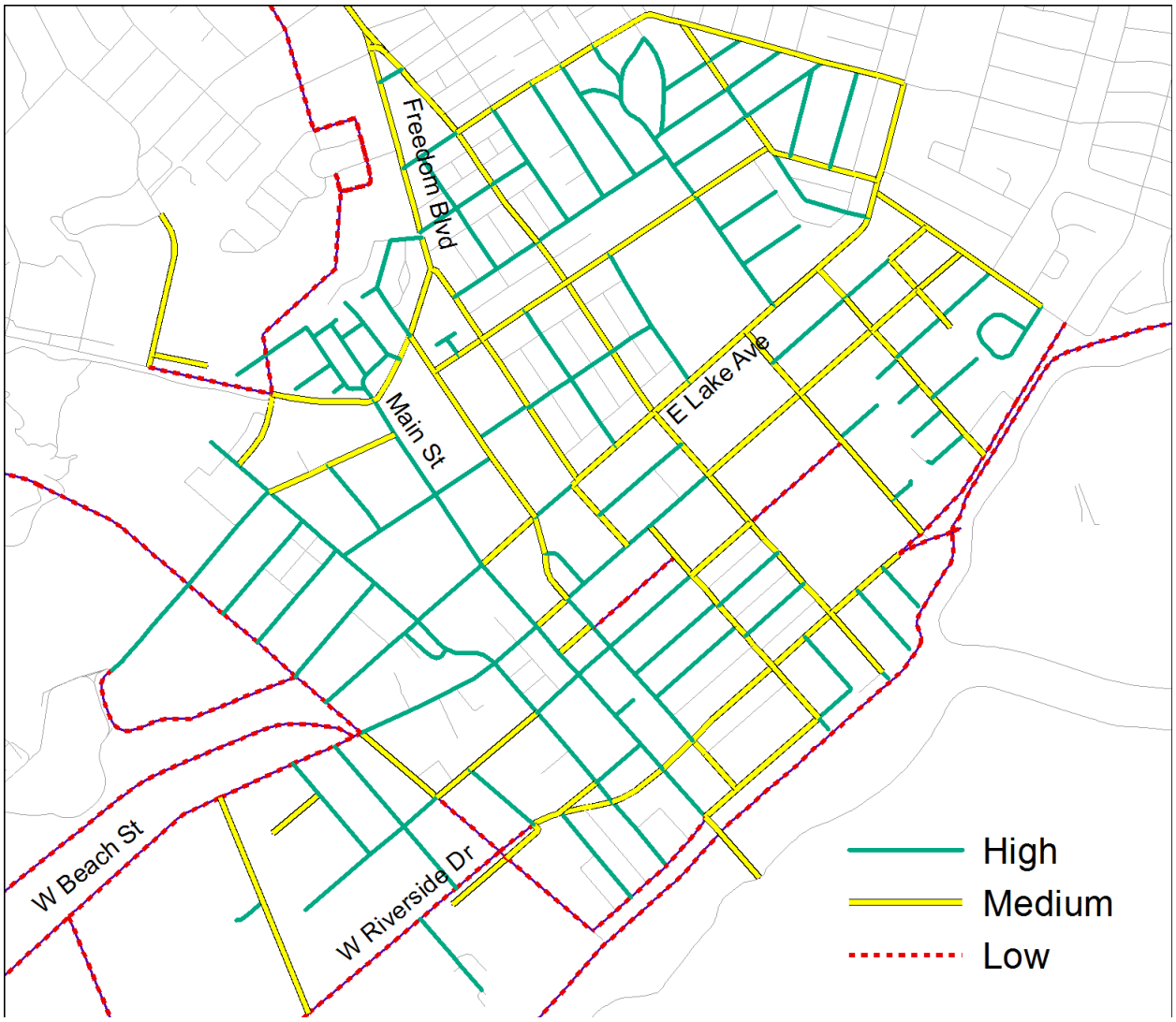


Figure D.25 – 2012 Baseline of Pedestrian Network in Downtown Watsonville with MMNQ Score

Source: Sustainable Transportation Council, Fehr & Peers

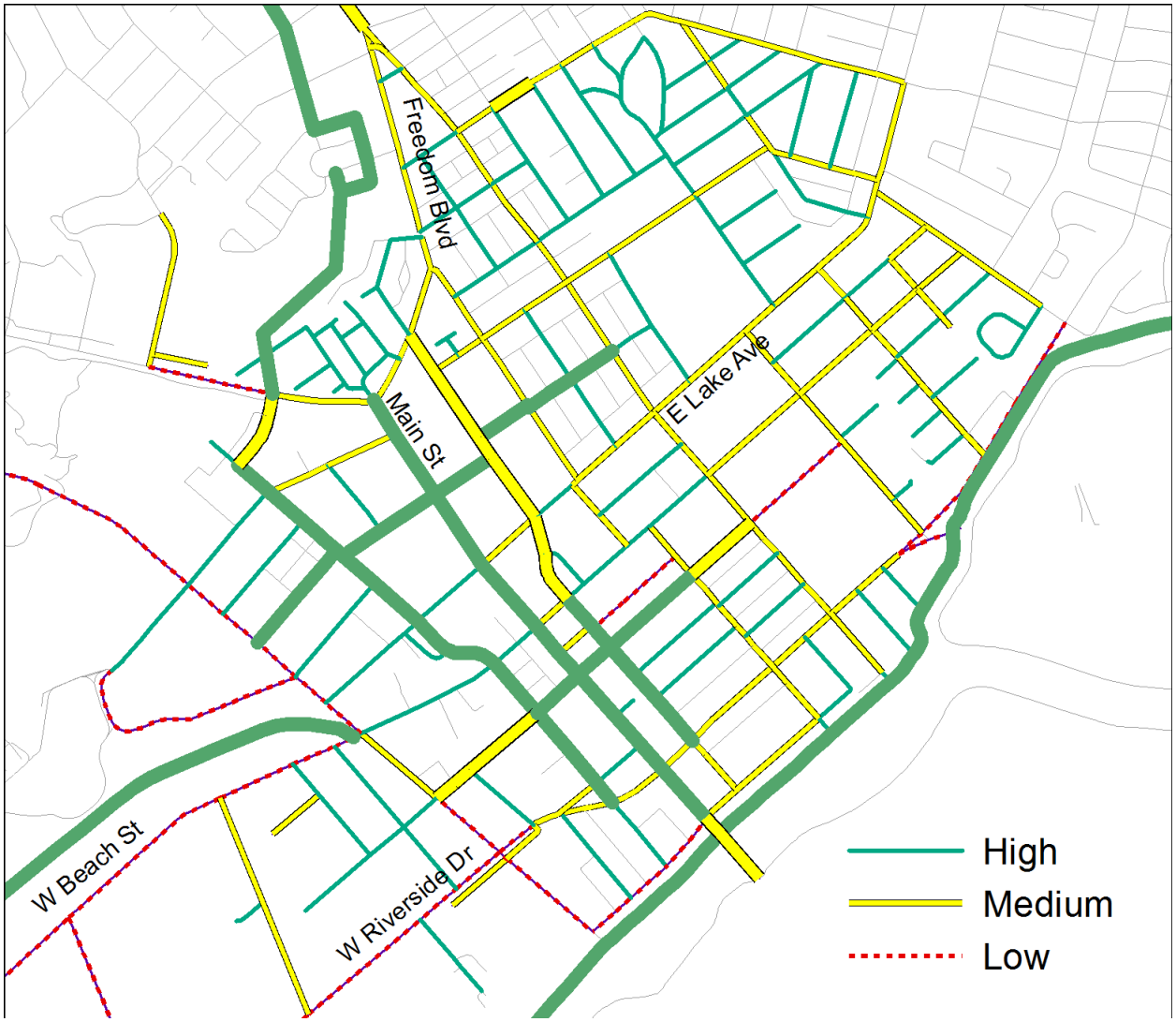


Figure D.26 – 2035 Pedestrian Network in Downtown Watsonville and the MMNQ Score*

Source: Sustainable Transportation Council, Fehr & Peers

**Wider lines designate location of projects that have been added to network through 2035.*

Condition	Pedestrian Network	Bicycle Network
Max Possible Score	100	100
2012 Baseline System Score	55	26
2035 Score	71	39

Figure D.27 – Watsonville Composite MMNQ Score

Source: Sustainable Transportation Council, Fehr & Peers, 2013.

Bicycle Network Quality. The scoring system for the bicycle network varies based on the type of bicycle facility provided: bike route (routes are not striped and not necessarily signed), bike lane, or buffered/separated trail which may be shared with pedestrians. As shown in **Figure D.28** below, roadway classification and speed are intended to guide the determination of which bicycle facility type is most appropriate for a given roadway in Watsonville. The service score designations are shown as green (high), yellow (medium), and red (low). A green score is defined as a high quality bike route. A yellow score indicates acceptable conditions, while a red score would not be attractive to many potential bicyclists. Arterials with speeds greater than 30 mph can get a green rating if the bike facility is buffered from traffic. Unlike with the pedestrian MMNQ analysis, bicycle MMNQ analysis is not performed on every street. Only the streets identified as having a facility in the Watsonville Bicycle Master Plan or the 2014 RTP project list were included in this analysis, since some streets may not be appropriate for cycling (**Figure D.29**). Bicycle system MMNQ analysis was prepared for the 2012 baseline conditions (**Figure D.30**) and 2014 RTP prioritized projects through 2035 (**Figure D.31**).

The 2012 baseline conditions for bicycles show that there is a substantial amount of the defined network that has a score of red either due to a lack of bicycle lanes on collector or arterial roadways or traffic speeds greater than 40 mph. The baseline quality shows a composite score of 26 out of a maximum of 100 for the bicycle network (**Figure D.27**). As projects are implemented through 2035, the quality of the bicycle network improves through addition of the Monterey Bay Sanctuary Scenic Trail, Pajaro River Levee Trail and the Watsonville Slough trails, as well as a number of bicycle lane improvements along the roadways. Using this set of criteria, in order to have green scores along arterial routes where the speed limit is greater than or equal to 40 mph, some sort of buffer is needed to separate the bicycle facility from traffic. The composite score for 2035 is increased to 39 out of a maximum of 100. Bicycle multimodal network quality has been improved and thus the target has been met.

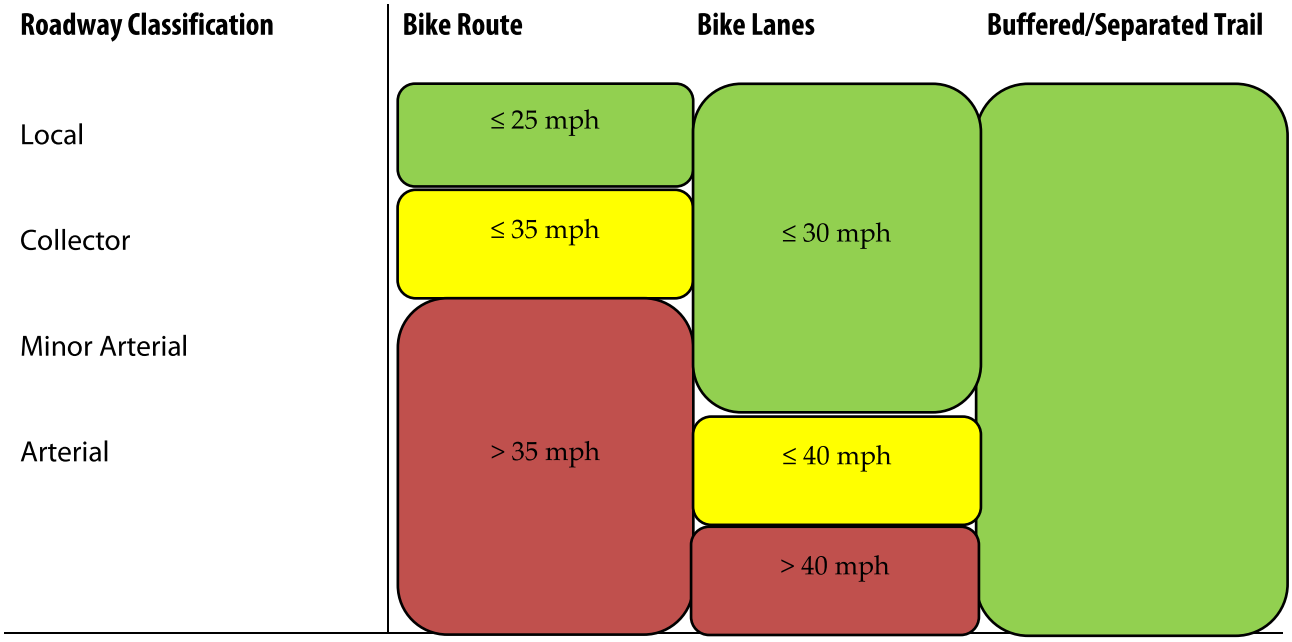


Figure D.28 – Bike Score: Bicycle MMNQ Score

Source: Sustainable Transportation Council, Fehr & Peers

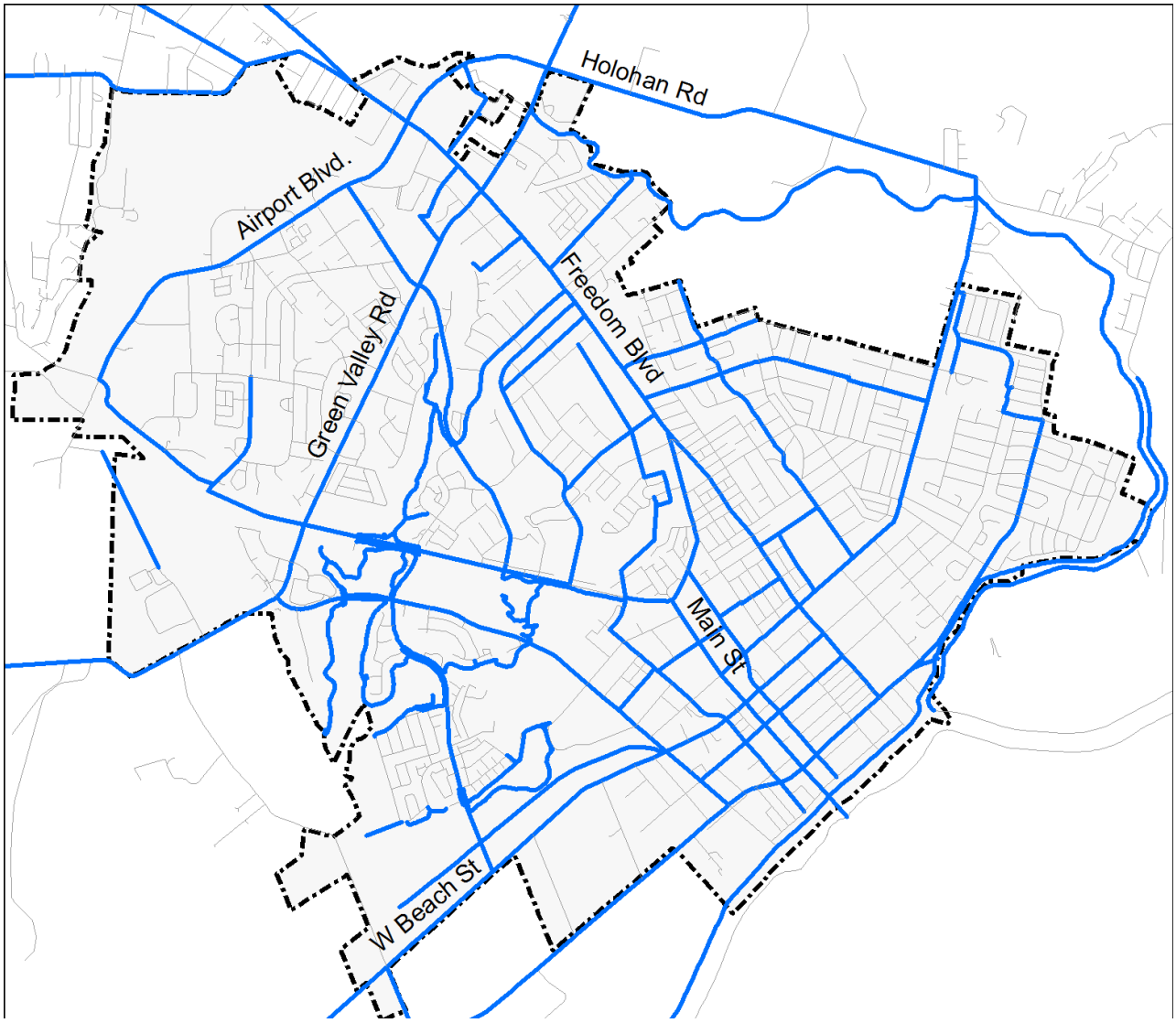


Figure D.29 – Bicycle Network Identified for City of Watsonville

Source: Sustainable Transportation Council, Fehr & Peers

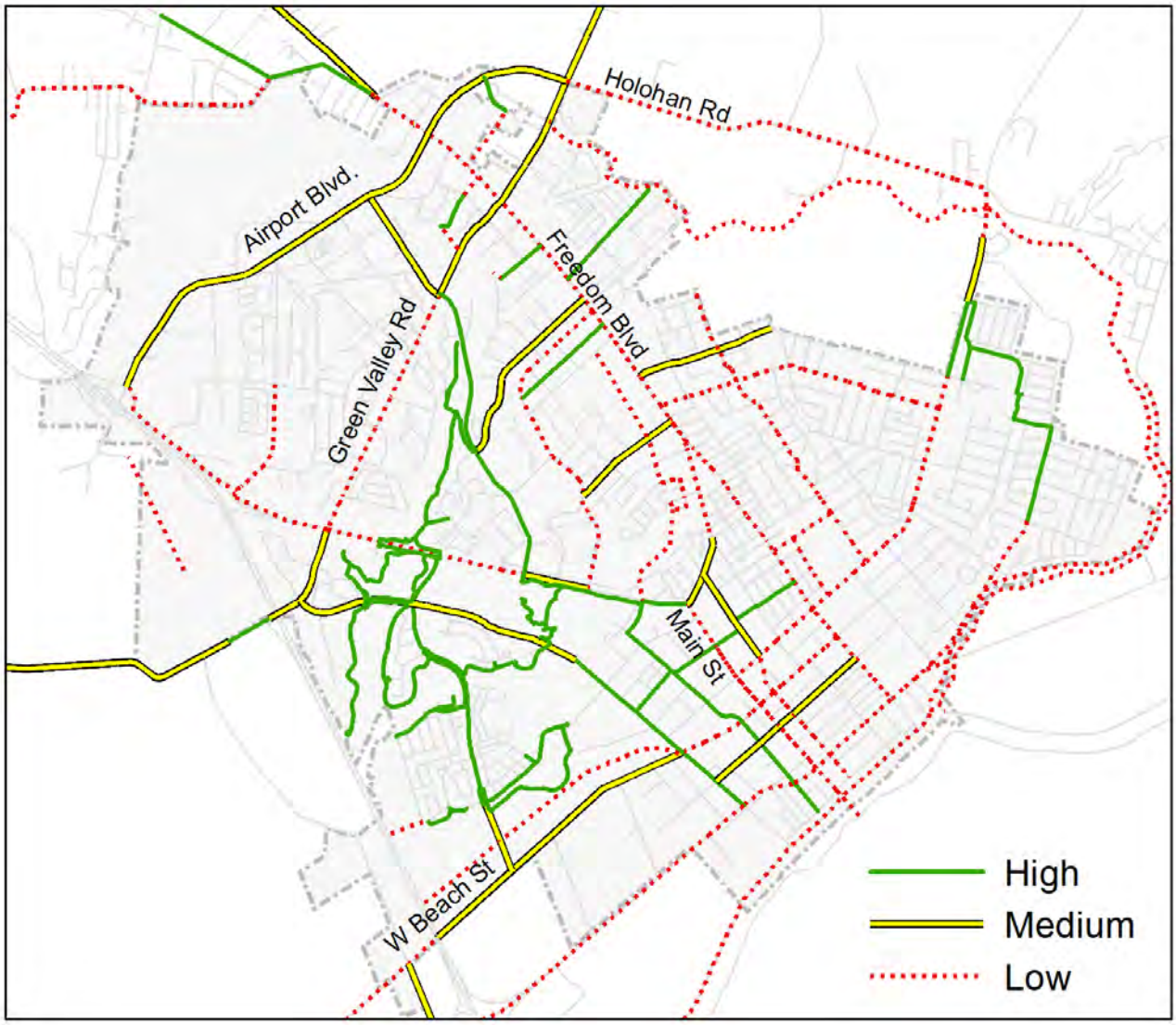


Figure D.30 – 2012 Baseline of Bicycle Network in City of Watsonville with MMNQ Score

Source: Sustainable Transportation Council, Fehr & Peers

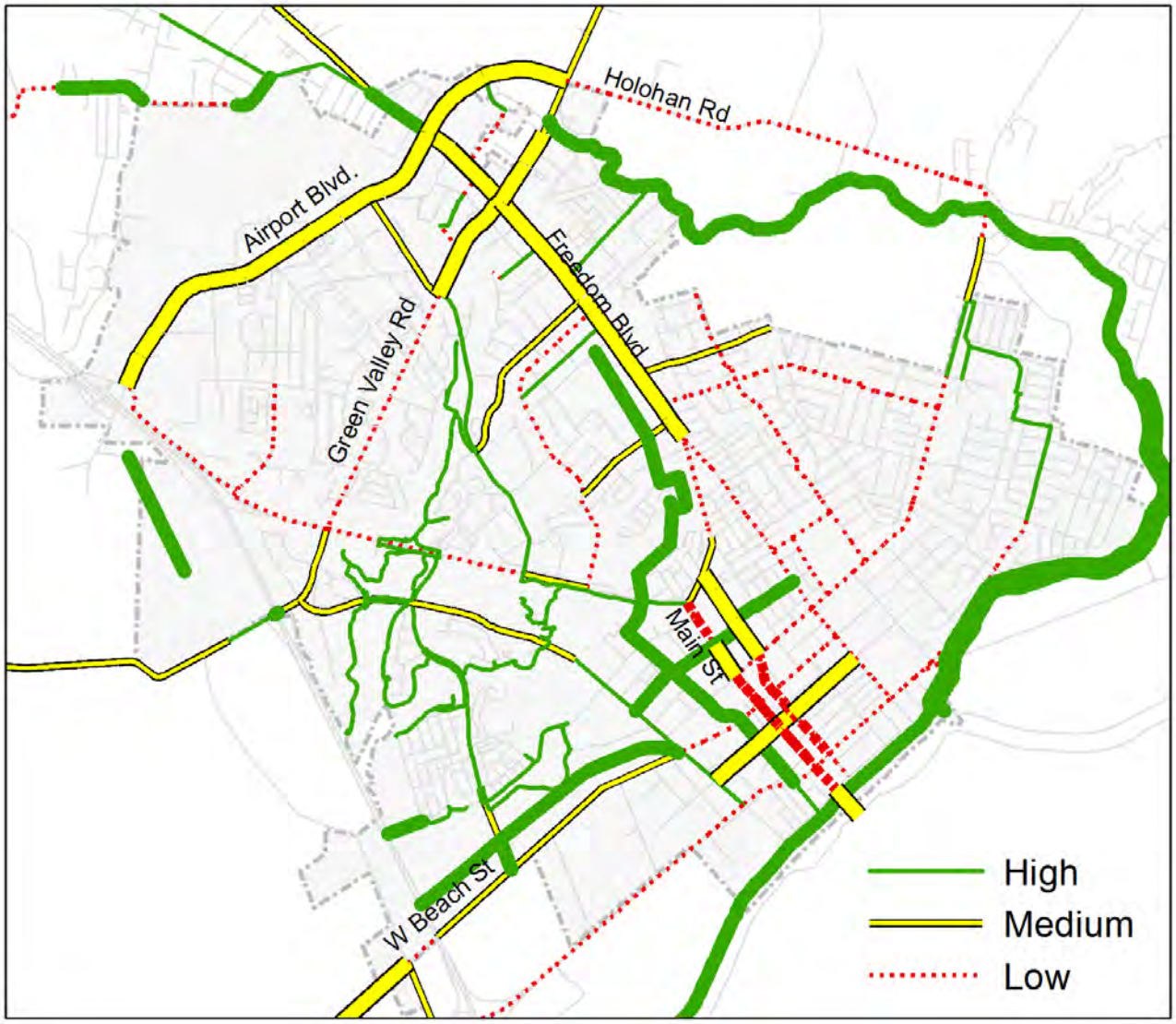


Figure D.31 – 2035 Scenario of Bicycle Network in City of Watsonville with MMNQ Score*

Source: Sustainable Transportation Council, Fehr & Peers

**Wider lines designate location of projects that have been added to network through 2035.*

Target 1E. Decrease single occupancy vehicle (SOV) VMT[29] mode share by 4 percent by 2020 and by 8 percent by 2035.[30]

Target Development

Over the past decade, an increasing body of research links walking and bicycling to improved health, and high levels of driving to health problems.[31] Replacing trips traditionally made in a vehicle with walking or bicycling can lead to regular physical activity which can result in lower rates of chronic disease including cancer, diabetes, stroke and heart disease. According to research by Dr. Lawrence Frank of the University of British Columbia, "every hour a person spends in a car each day makes them six per cent more likely to be obese, while each additional kilometer a person walks makes them five per cent less likely to be obese."[32] Measuring the reduction in the number of miles people drive alone provides an estimate of the shift to walking, biking and taking transit, and thus is a barometer of physical activity and health for Santa Cruz County residents.

In order to set a target for active transportation, an average shift of 1 mile/day from single occupant vehicle to biking/walking was chosen. Given the 15.3 VMT/capita/day for Santa Cruz County for 2005, it is reasonable to assume that 1 mile out of this 15.3 miles/capita/workday can be replaced with bike/pedestrian trips. Since the regional travel demand model can provide a more accurate percent reduction in single occupant vehicle (SOV) mode share rather than a percent increase in active transportation mode share, the target is written as a reduction in SOV. One mile shift to active transportation out of 15.3 miles/day is 6.5% reduction in VMT. Additional increases in transit and HOV mode shares were assumed as well, resulting in a total target reduction in SOV of 8%. An average one mile per person reduction in VMT/day through a shift from driving to a combination of biking, walking, and walking to transit will burn approximately 400 calories/person/week[33] which can cause a reduction in weight of approximately 5 pounds per year[34]. Reducing single occupant vehicle (SOV) mode share not only has health benefits but also decreases climate pollution and fuel consumption, and retains money in the local economy.

Forecasting Methodology

The reduction in the single occupant vehicle mode share for 2035 based on the projects prioritized for this 2014 RTP was determined using the results of the AMBAG regional travel demand model (RTDM) for 2010 and 2035. The mode split data from the 2035 travel demand model are based on person trips rather than VMT. The RTDM results were adjusted based on the postprocessing adjustments to the VMT/GHG as discussed under target 1B as the reductions in VMT will affect the split between modes. Assumptions for the average length of trips for each mode were made in order to get a mode share based on vehicle miles traveled.

Baseline

The baseline for the percentage of single occupant vehicle mode share is also based on the results of the AMBAG regional travel demand model for 2010 model run. The model has been calibrated to the mode share determined from the 2011-2012 California Household Travel Survey data for the AMBAG region. The 2010 baseline SOV VMT mode share for Santa Cruz County is 58.6%.

Results

The results from the regional travel demand model and postprocessing show that based on the projects prioritized in the 2014 RTP, the mode share is 52.2% for 2035. This equates to a reduction of 6.4%, which narrowly misses the target of 8%. Despite missing the SOV mode share target, a significant increase in non-auto travel is achieved, which will help to create a community where active transportation is more the norm.

Target 2A. Reduce injury and fatal collisions by mode by 20% by 2020 and by 50% by 2035.

Target 2B. Reduce total number of high collision locations.

Target Development

The collision reduction target was based on similar targets that have been set in other regions of California as well as nationally. Based on the goals of the California Strategic Highway Safety Plan of 2006, the Metropolitan Transportation Commission for the San Francisco Bay Area set a target of 50% reduction in injuries and fatalities by 2040 for their 2013 Metropolitan Transportation Plan.[35] The FHWA's national highway safety objective "Towards Zero Deaths" and the American Association of State Highway and Transportation Officials (AASHTO) goal of halving fatalities in two decades are aggressive goals to improve transportation safety[36]. The California Highway Patrol Statewide Integrated Traffic Records System (SWITRS) data indicates that there was a 13% decrease in injuries and fatalities from collisions in Santa Cruz County between 2002 and 2011. The target of 50% reduction in motor vehicle injuries and fatalities strives to continue this trend for motor vehicle safety into the future. The number of bicyclists and pedestrians that have been injured or killed in Santa Cruz County has not shown a reduction over the last decade (**Figure D.32**). The target of 50% reduction in injury and fatal collisions for bicyclists and pedestrians endeavors to considerably improve safety for the most vulnerable users of the transportation system.

In order to better assess collision levels, fatalities and injuries for all modes should be quantified relative to the number of miles traveled for that mode and look at patterns over multiple years. Typically, motor vehicle collisions are assessed through use of a Mileage Death Rate statistic which considers the number of collisions divided by the total vehicle miles of travel in a given area. Due to the lack of data on the number of miles traveled for bicyclists and pedestrians, this relative comparison is not possible. It is also important to evaluate the number of collisions over a number of years to better determine the trends in the data. As data and/or assessment methodologies become more available, this relative comparison may be possible in future RTPs.

Forecasting Methodology

Given that projects included in planning documents, such as the RTP, do not include specific design information for projects, it is not possible to estimate the reduction in injuries and fatalities due to improvements in the transportation network. Therefore, safety improvements based on the 2014 RTP implementation have not been forecast. Instead, RTC staff has identified projects with the potential to improve safety and advance the safety targets especially for bicyclists and pedestrians. Projects such as

separated bicycle and pedestrian paths, intersection improvements, safety educational and enforcement programs, and State Highway Operation and Protection Program (SHOPP) projects are included in the 2014 RTP. Monitoring the number of injury and fatal collisions over time for motor vehicles, pedestrians and bicyclists will provide the best assessment for how targets are being advanced. Safety performance monitoring allows the RTC, Caltrans, and other entities to prioritize projects based on injury and fatal collision statistics.

Baseline

A baseline for monitoring injury and fatal collisions in Santa Cruz County for motor vehicles, pedestrians and bicyclists was determined using the California Highway Patrol Statewide Integrated Traffic Records System (SWITRS) collision database. This SWITRS data can be downloaded from the Transportation Injury Mapping System (TIMS) website that is a component of the Safe Transportation Research Education Center (SafeTREC) at the University of California, Berkeley[37]. This database is a comprehensive set of all reported transportation collisions throughout California. At the time of this writing, data from SWITRS is available through the year 2011. Injury and fatal collisions from the last 9 years can be found in **Figure D.32**. The baseline injury and fatal collisions for motor vehicles, pedestrian and bicyclists are taken from an average of 2009 through 2011 as shown in **Figure D.32**.

SANTA CRUZ COUNTY	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	AVERAGE 2009-2011
Ped Injury and Fatal Collisions	89	94	81	84	92	100	80	100	79	85	88
Ped Injuries	89	92	83	88	97	102	80	100	79	87	89
Ped Fatalities	6	7	2	5	3	4	3	4	3	2	3
Bicycle Injury and Fatal Collisions	150	171	160	151	152	145	191	180	145	169	165
Bicycle Injuries	147	169	159	149	152	149	189	177	149	171	166
Bicycle Fatalities	0	1	0	1	1	2	2	3	0	1	1
Motor Vehicle Injury and Fatal Collisions	1307	1387	1212	1218	1201	1231	1209	1210	1129	1139	1159
Motor Vehicle Injuries	1456	1563	1355	1320	1323	1336	1225	1239	1222	1153	1205
Motor Vehicle Fatalities	18	17	17	17	17	20	25	19	9	6	11

Figure D.32 – Santa Cruz County Collision Data

Source: California Highway Patrol Statewide Integrated Traffic Records System (SWITRS) via the Transportation Injury Mapping System (TIMS)[38]

Results

Progress towards the target can be determined through monitoring the motor vehicle, bicycle and pedestrian injury and fatal collisions over time.

Target 3A. Increase the average local road pavement condition index to 57 by 2020 and 70 by 2035.

Target Development

Santa Cruz County continues to struggle to maintain its roadways. While some roads in the county are in good condition, the average Pavement Condition Index (PCI) for Santa Cruz County roads fell from a

rating of "At Risk" in 2008 to "Poor" in 2012; one of only seven counties in the state with a condition rating this low (**Figure D.33**).

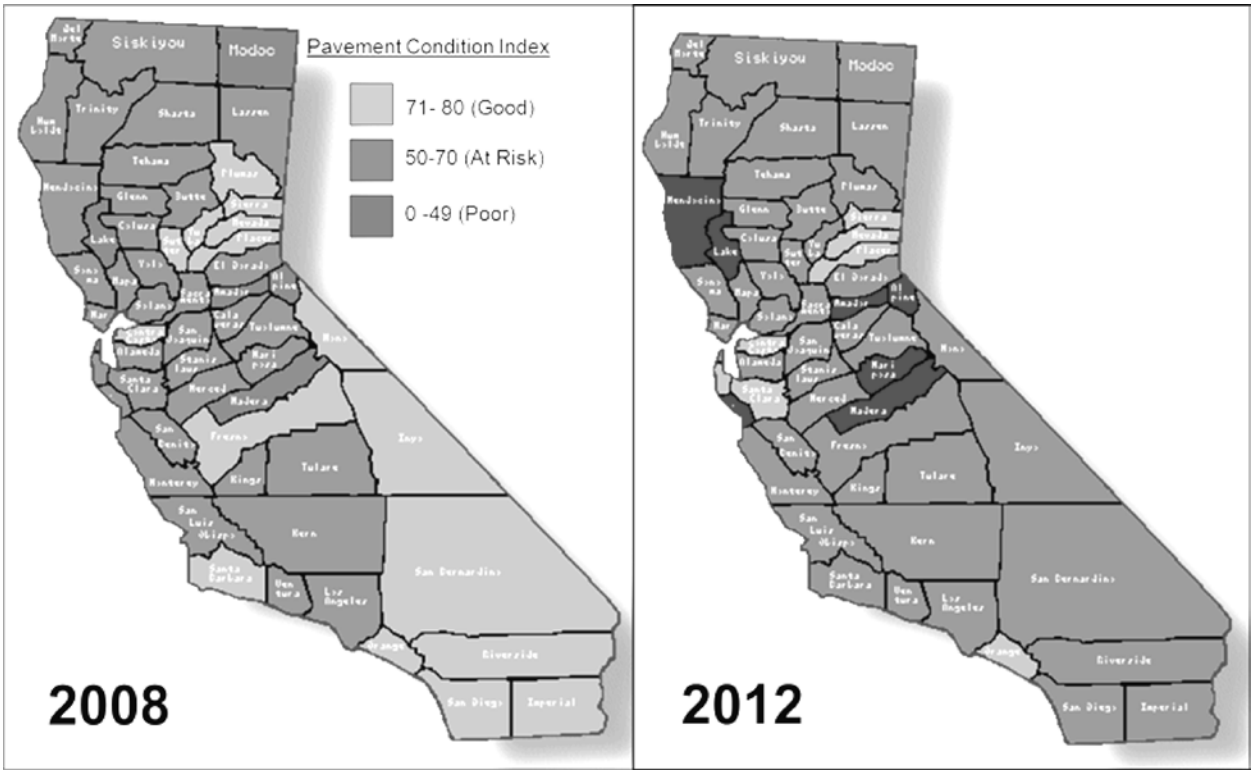


Figure D.33 – 2008 and 2012 Pavement Condition Index Estimates for Counties in California

Source: California Statewide Needs Assessment Project.[39]

Local jurisdictions in Santa Cruz County have estimated the cost to immediately address the backlog of roadway repairs that are needed to bring the average condition of the county roadway system to a PCI of 70 would be over $150 million. Achieving the pavement condition index target of 70 by 2035 will bring the rating up from "At Risk" to "Good". Once the pavement condition can be brought up to a rating of 70, the cost to maintain roadways is substantially reduced. As shown in **Figure D.34**, it is significantly more cost-effective to seal roadways on a regular basis to prolong their life than to rebuild roads that are severely deteriorated. For instance, road rehabilitation costs are 6 to 10 times more expensive than ongoing preventative maintenance ($800k-$2.5M vs $140K/mile over 20 year). Therefore, best practices are to maintain roadways at a PCI of 70-80, which will require the minimum amount of funds to maintain the system.

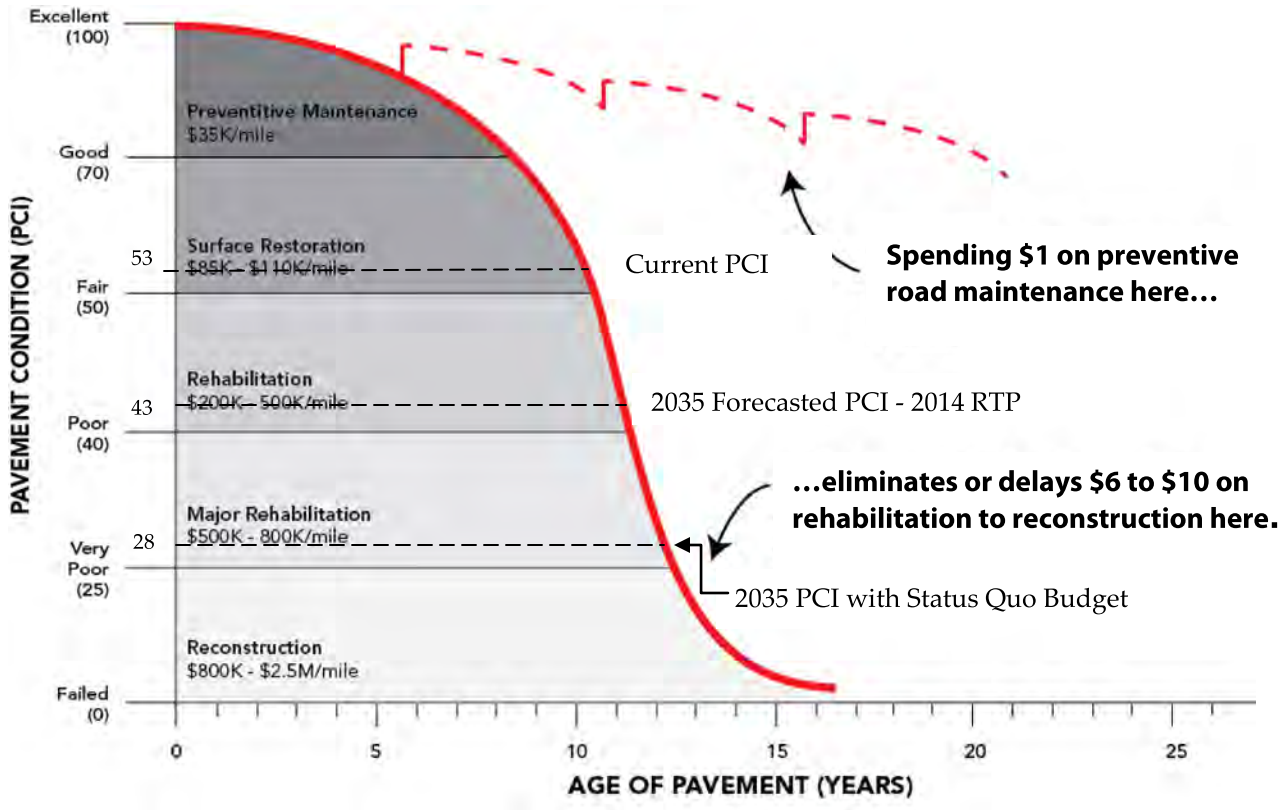


Figure D.34 – Pavement Deterioration Curve - Cost per Mile to Maintain Local Roads

Note: Cost estimates relate only to pavement, (the area from curb to curb).
Source: Metropolitan Transportation Commission, Federal Highway Association, International Slurry Surfacing Association

Forecasting Methodology, Baseline and Results

The pavement condition index for 2035 has been estimated based on how much funding is allocated for maintenance in the financially constrained RTP project list. Due to a one-time influx of funds from Proposition 1B and the federal recovery act, the 2013 Santa Cruz County baseline PCI improved to 53, up from the 2012 PCI rating of 49. The projected PCI for 2035 was calculated from the latest estimates from each of the jurisdictions and the roadway centerline miles (**Figure D.35**). Based on the "State of the Pavement Report" for the Unincorporated County for both 2013[40] and 2011,[41] it was estimated that approximately $23 million per year countywide ($512 million through 2035) will be needed for pavement maintenance just to keep the PCI at the present level (PCI 53) (**Figure D.36**). The total operations and maintenance budget countywide to keep the PCI at the present level of 53 will require $33 million per year ($724 million through 2035). The amount of funds required to bring Santa Cruz County roads up to an average PCI of 70 is approximately $770 million for 22 years just for pavement and total funds for all operations and maintenance is approximately $980 million through 2035(**Figure D.36**). However, funding available countywide for local roadway operations and maintenance in the financially constrained RTP is $23 million/year ($515 million through 2035) of which approximately $14 million/year ($303 million through 2035) is available for pavement. Linearly interpolating the PCI at this level of funding provides an estimated PCI of 43 in 2035 (**Figure D.36**). Even with a significant share of the discretionary funding allocated for maintenance of local streets and roads (an increase of 10 million per year above typical

status quo budget) and assuming a sales tax and vehicle registration fee are approved by voters, the projected 2035 pavement condition index falls below existing conditions of 53 to a PCI of 43. If only the status quo amount of $3.2 million/year is spent on pavement maintenance ($12.8 million/year for all operations and maintenance) and additional funds are not designated to improving the pavement condition of local roads, the PCI is expected to drop to 28 by 2035 (**Figure D.36**).

The repercussions of deferred maintenance are alarming. **Figure D.34** shows how maintenance costs increase exponentially as the PCI of a pavement deteriorates. Plotted on this graph are the PCIs that are predicted for 2035 based on funding levels. Maintenance costs will double or triple if the current PCI of 53 drops to the forecasted PCI of 43 based on the level of funding of this RTP. If funding for maintenance stays at the typical status quo level, maintenance costs will increase by six times the current amount. Clearly, Santa Cruz County must continue to look for additional funding to maintain our current transportation network beyond the funding sources identified in the Financial Element of this RTP.

Jurisdiction	Center Line Miles	Average PCI (2012-2013)	Annual Average Pavement Budget	Optimum Annual Pavement Budget
Capitola	25	68	$75,000	$600,000
City of Santa Cruz	140	51	$2,400,000	$5,500,000
Scotts Valley	36	53	Unavail.	Unavail.
Watsonville	90	35	$700,000	$1,500,000
Unincorporated County	599	55	$0	$12-14M/yr
Total Countywide	**890**	**53**	$3,175,000	$20M/year

Figure D.35 – 2012-2013 Pavement Condition Index for Jurisdictions in Santa Cruz County

Sources: Unincorporated County, Capitola, City of Santa Cruz, Scotts Valley, Watsonville

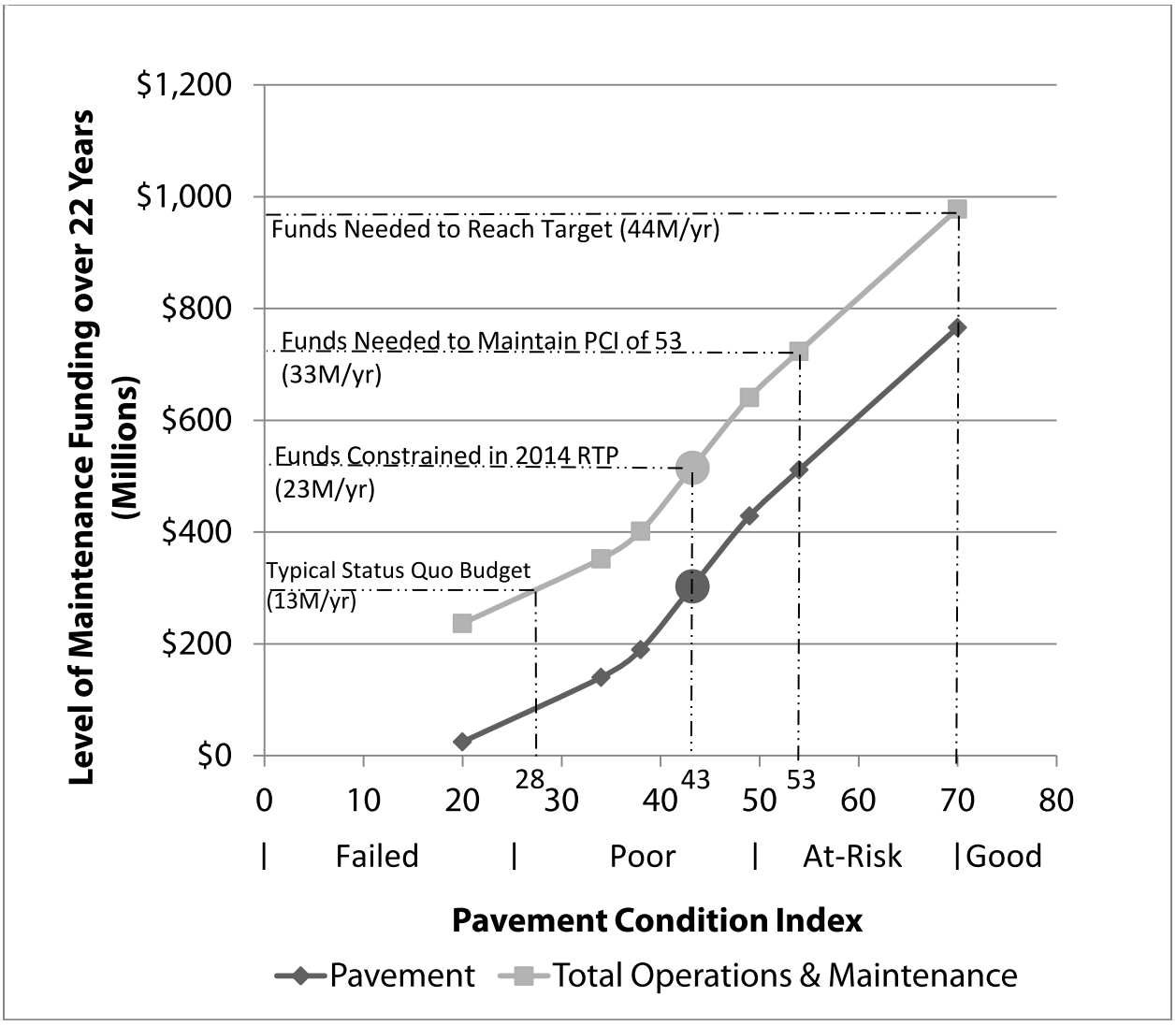


Figure D.36 – Pavement Condition Index Relative to Level of Local Street and Road Maintenance Funding through 2035

Estimated PCI of 42 for 2035 based on level of maintenance funding in RTP project list.

Target 3B. Reduce the number of transportation facilities in "distressed" condition by 3 percent by 2020 and 5 percent by 2035.

Target Development

"Distressed" facilities are defined as any roadway with a PCI of 49 or less (Poor (25 to 49) or Failed (0 to 24) rating). Local jurisdictions' pavement management systems or programs prioritize funding for keeping roadways that are in good condition maintained and slowly bringing the roads that are distressed into good repair. A reduction of 3 percent by 2020 and 5 percent by 2035 of the miles of transportation facilities that are distressed will follow this strategy.

Forecasting Methodology

The number of "distressed" facilities will not be forecast for the 2035 project list as the project descriptions do not provide enough detail on how maintenance funds will be utilized. The public works departments of the local jurisdictions use a Pavement Management Strategy to best use limited funds for maintenance to balance out the facilities that are maintained at best practice levels with major road rehabilitation projects on "distressed" facilities. The number of "distressed" facilities can be monitored over time to assess how this target is being advanced based on updates to the pavement condition from the local jurisdictions. Similarly, the number of distressed transit facilities will be monitored over time to assess progress towards the target.

Baseline

The 2013 baseline of "distressed" (Poor or Failed rating) roadway facilities is 38% based on the 2013 State of the Pavement Update for the unincorporated county (37% of 599 centerline miles) and the City of Santa Cruz (44% of 135 centerline miles). The unincorporated county and the City of Santa Cruz accounts for approximately four-fifths of the centerline miles in the county and thus is a good approximation for the entire county.

The baseline of "distressed" transit facilities could include buses, transit centers, bus shelters etc. The 2013 baseline of "distressed" transit facilities is 28% based on the number of buses that need to be replaced (31 out of 109 that have exceeded their useful life of 12 years). The average cost for a new bus is $469,000. Other transit facilities are also in distressed condition but they are more difficult to quantify.

Results

The number of "distressed" roadway facilities can be monitored over time based on updates on the pavement condition from the local jurisdictions, primarily the State of the Pavement Report update from the unincorporated county. The Metro also tracks the age of their buses which can be monitored regularly.

Target 3C. Reduce travel times and increase travel options for people who are transportation disadvantaged due to income, age, race, disability or limited English proficiency by increasing the percentage that are within a 30-minute walk, bike or transit trip to key destinations by 20% by 2020 and 40% by 2035.[42]

Target Development

People experiencing poverty or language barriers, people of color, older adults, youth and people with disabilities (defined here as transportation disadvantaged) tend to experience a disproportionately small share of benefits from transportation investments, particularly because traditional transportation investment prioritize vehicles. These groups are overrepresented in households without access to a

vehicle. Other elements of the transportation system, such as lack of ADA compliance or safe street crossing also create extra barriers that may prevent these groups from experiencing the full benefit of transportation investments. This target strives to address these inequities by analyzing the population of transportation disadvantaged people that are able to access key destinations within 30 minutes by walk, bike or transit.

RTC identified key destinations throughout Santa Cruz County based on locations of employment centers[43] and commercial centers (determined from the local jurisdictions land use zoning maps in their general plans). These destinations are mapped in

Figure D.3 and listed under Target 1A. The transportation disadvantaged population that is within a 30 minute walk or bike from the central point of each key destination based on existing and proposed facilities is assessed to see how well this target is advanced given the projects prioritized in the 2014 RTP. Land use changes that locate more people near key destinations are another factor affecting the number of people who can access goods and services, but were not considered when developing this target because land use is outside the purview of the RTC.

The baseline transportation disadvantaged population and maximum possible population that are within a 30 minute distance via walk and bike from key destinations were determined as discussed below. The target for 2035 was set to close the gap between the 2010 baseline population and the maximum possible population by 40% by 2035 and an intermediate target of 20% by 2020.

Forecasting Methodology

The forecasting methodology for this target is the same as Target 1A. Please refer to that section for details. The only difference is that instead of total population, subgroups of population that may be transportation disadvantaged are analyzed at the transportation analysis zone (TAZ) level – the unit of geographic area that is used by the travel demand model. The subgroups are detailed below:

- Populations under the age of 18 and over 70, and
- Populations with household incomes less than $15,000, and
- Minority populations

Baseline

The baselines for each of the key destinations are shown in **Figure D.37**. The transportation disadvantaged population within 30 minutes of each of the destinations is based on the population data from the 2010 census.

Transportation Disadvantaged Population within 30 minutes of Key Destinations						
	2010 Population within a 30-minute walk		2010 Population within a 30-minute bike ride		2010 Population within a 30-minute transit trip	
Area	Population	Proportion of County	Population	Proportion of County	Population	Proportion of County
Downtown Santa Cruz	12,716	8.0%	52,812	33.2%	46,624	29.3%
Scotts Valley	2,934	1.8%	8,353	5.3%	18,609	11.7%
UC Santa Cruz	812	0.5%	29,016	18.3%	30,135	19.0%
Soquel Dr (Soquel to Mattison)	2,479	1.6%	53,049	33.4%	47,890	30.1%
41st Ave near Hwy 1	7,042	4.4%	47,718	30.0%	44,151	27.8%
Capitola Village	4,229	2.7%	42,644	26.8%	37,459	23.6%
Cabrillo College	1,258	0.8%	30,423	19.1%	33,098	20.8%
Green Valley / Freedom	11,834	7.4%	52,983	33.3%	55,930	35.2%
Watsonville Hospital	7,517	4.7%	52,275	32.9%	40,459	25.4%
Downtown Watsonville	15,888	10.0%	51,830	32.6%	40,355	25.4%

Figure D.37 – Transportation Disadvantaged Population within 30 Minutes of Key Destinations – Baseline Conditions

Figure D.38 shows the aggregate population within 30 minutes of the key destinations.

Transportation Disadvantaged Population within 30 minutes of Key Destinations		
Travel Mode	Population within 30 minutes of any key destination	
	Population	Proportion of County
Walk	61,194	38.5%
Bike	125,170	78.7%
Transit	93,514	58.8%

Figure D.38 – Total Transportation Disadvantaged Population within 30 Minutes of any Key Destination – Baseline Conditions

Figure D.39 shows the maximum minority and transportation disadvantaged population within 30 minutes of any of the key destinations based on universal bicycle and pedestrian facility coverage.

Transportation Disadvantaged Population within 30 minutes of Key Destinations				
Area	Maximum 2010 Population within a 30-minute walk		Maximum 2010 Population within a 30 minute bike ride	
	Population	Proportion of County	Population	Proportion of County
DT Santa Cruz	15,296	9.6%	54,306	34.2%
Scotts Valley	5,331	3.4%	10,528	6.6%
UC Santa Cruz	3,040	1.9%	29,177	18.4%
Soquel Dr (Soquel to Mattison)	8,920	5.6%	54,597	34.3%
41st St near Hwy 1	12,411	7.8%	51,262	32.2%
Capitola Village	7,633	4.8%	47,849	30.1%
Cabrillo College	3,870	2.4%	32,853	20.7%
Green Valley / Freedom	17,896	11.3%	58,448	36.8%
Watsonville Hospital	9,852	6.2%	56,958	35.8%
Downtown Watsonville	22,330	14.0%	54,126	34.0%

Figure D.39 – Minority and Transportation Disadvantaged Population within 30 Minutes of Key Destinations – Maximum Possible

Figure D.40 shows the aggregate population within 30 minutes of the key destinations.

Transportation Disadvantaged Population within 30 minutes of Key Destinations		
Travel Mode	Maximum 2010 Population within 30 minutes of any key destination	
	Population	Proportion of County
Walk	88,053	55.4%
Bike	133,529	84.0%

Figure D.40 – Maximum Total Minority and Transportation Disadvantaged Population within 30 Minutes of any Key Destination

Results

Figure D.41 shows the results for 2035 assuming that the walk and bike projects that have been prioritized (constrained) in the 2014 RTP are implemented. This analysis does not account for any shifts in population distribution that may occur in the county through 2035. Given current focus on mixed use and higher density housing near key destinations, the percentage of the population that would live near key destination areas will likely increase. Thus the percentage of the population within a 30 minute walk or bike from key destinations would be even greater. Only an analysis on walk and bike access was performed since there was no information available about how future transit routes will be configured.

Transportation Disadvantaged Population within 30 minutes of Key Destinations				
Area	Population within a 30 minute walk		Population within a 30 minute bike ride	
	Population	Proportion of County	Population	Proportion of County
Downtown Santa Cruz	12,839	8.1%	53,038	33.4%
Scotts Valley	2,959	1.9%	8,868	5.6%
Watsonville Hospital	7,517	4.7%	53,039	33.4%
UC Santa Cruz	812	0.5%	29,179	18.4%
Soquel Dr (Soquel to Mattison)	3,556	2.2%	53,447	33.6%
41st Ave near Hwy 1	7,507	4.7%	49,557	31.2%
Capitola Village	4,880	3.1%	46,544	29.3%
Cabrillo College	1,281	0.8%	31,060	19.5%
Green Valley / Freedom	11,982	7.5%	53,380	33.6%
Downtown Watsonville	16,151	10.2%	51,871	32.6%

Figure D.41 – Transportation Disadvantaged Population within 30 Minutes of Key Destinations based on 2014 RTP Project List

Figure D.42 shows the aggregate population within 30 minutes of any of the ten key destinations.

Transportation Disadvantaged Population within 30 minutes of Key Destinations				
	2010 Baseline	2014 RTP Implementation	2035 Target	Maximum Population
Travel Mode	% of Population	% of Population	% of Population	% of Population
Walk	38.5%	39.6%	45.2%	55.4%
Bike	78.7%	79.0%	80.8%	84.0%

Figure D.42 – Total Transportation Disadvantaged Population within 30 Minutes of any Key Destination based on 2014 RTP Project List

Figure D.43 summarizes the findings.

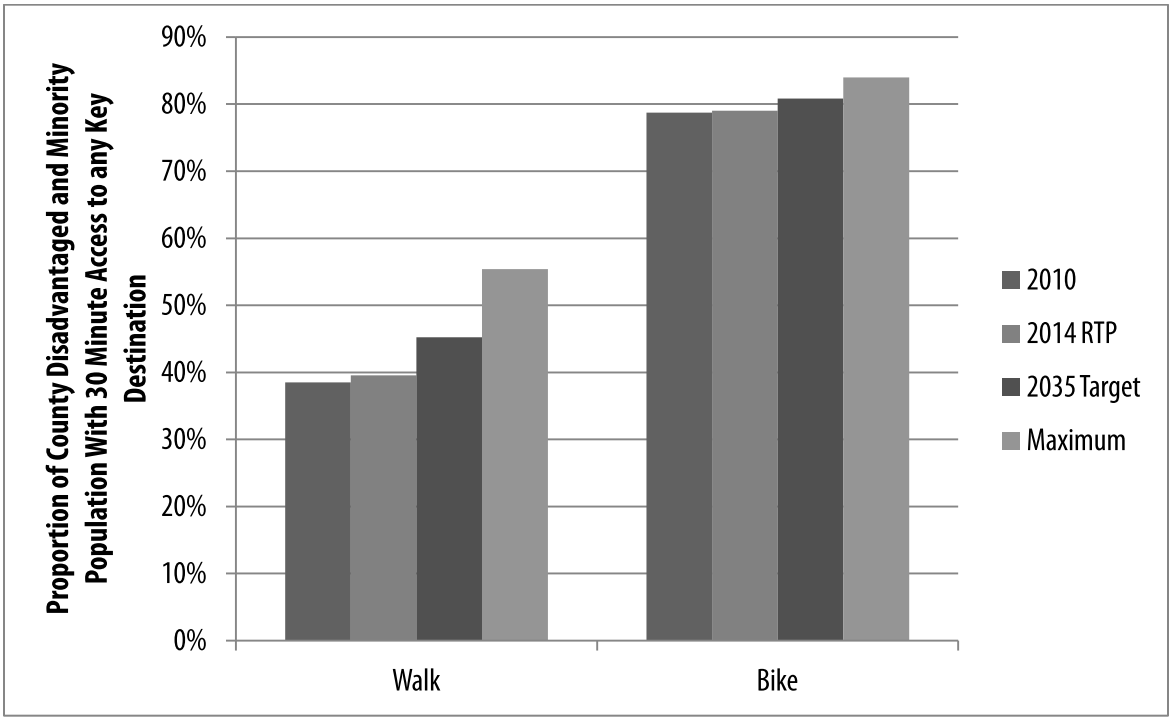


Figure D.43 – Walk and Bicycle Access Improvements near Key Destinations for Transportation Disadvantaged Population

The results show that despite investment in additional pedestrian and bicycle infrastructure, the proportion of the transportation disadvantaged population within 30 minutes of key destinations does not substantially increase (**Figure D.43**). The target for 2035 (**Figure D.42**) was set to close the gap between the 2010 baseline population and the maximum possible population by 40%. It was calculated by taking 40% of the difference between the baseline and the maximum possible population within the key

destinations and adding to the baseline (**Figure D.42**). Closing the gap by 40% is equivalent to increasing the percentage of the population within 30 minutes of key destinations by 2.1% for bike and 6.7% for walk by 2035. Progress is made towards the target but the 2035 target to close the gap by 40% between the 2010 baseline and the maximum population was not met. The gap between the 2010 baseline and the maximum population was closed by 6% for bike and 6% for walk compared to the 40% target.

This analysis shows that larger proportions of the transportation disadvantaged population relative to the total population live near key destinations and that large portions of the county currently have robust bicycle infrastructure that provides good connectivity near key destinations. By investing in active transportation projects with emphasis in key destination areas, transportation disadvantaged people will receive a greater benefit from these investments than the total population.

Target 3D. Ensure transportation services (and impacts) are equitably distributed to all segments of the population.

Target Development

A disproportionately small share of benefits from transportation investments that traditionally prioritize vehicles tend to be realized by disadvantaged populations such as: low income individuals, persons with language barriers, older adults, youth, people of color, and people living with disabilities. These groups are overrepresented in households without access to a vehicle. Other elements of the transportation system, such as lack of Americans with Disabilities Act (ADA) compliance or safe street crossings also create extra barriers that may prevent disadvantaged groups from experiencing the full benefit of transportation investments. Both federal and state laws require that regional transportation system improvements do not have a disproportionate adverse impact on low income or other under-represented groups, and that minority and low income populations receive equal benefits, on an equally timely basis, as other populations. The target is to ensure transportation services and impacts are equitably distributed.

Forecasting Methodology

A geographic analysis was performed by AMBAG to assess equity considerations of the 2014 MTP and 2014 RTP transportation projects and programs. Each regional transportation project was mapped in order to determine whether it is located within or adjacent to areas of low income and/or minority populations based on 2010 census data.

Results

The analysis showed that of all the funding allocated for regional projects within Santa Cruz County through 2035, 85% benefit low income populations, 82% benefit poverty populations and 80% benefit minority populations. Given the high level of regional projects and programs that benefit low income, poverty and minority populations, transportation services and impacts are equitably distributed to all segments of the population.

Target 3E. Maximize participation from diverse members of the public in RTC planning and project implementation activities.

Target Development

Inclusion of the wide spectrum of community interests in the development of the RTP is a key part of the process. The greater the level of involvement, the more likely the plan will serve the needs of the community and further advance the goals of the RTP. The Santa Cruz County Regional Transportation Commission makes use of various methods to provide interested parties with timely information and opportunities to participate in the planning process. The outreach strategies are designed and adapted to generate a robust and informed level of broad-based citizen involvement. The target is to maximize participation from the public.

Results

The RTC joined AMBAG, Monterey and San Benito Counties to develop a public participation plan for the region that identified opportunities for outreach. Components of the plan that have been implemented for developing the 2014 RTP include, but are not limited to:

- Workshops and solicitation of input at various junctures in the development of the RTP to provide information and gain feedback from public
- Maintenance of an email distribution list of community-based groups throughout the county, including neighborhood, health, senior, faith, environmental, low-income, and other social support groups
- Regular updates sent to the email distribution list that informs the public about the RTP process and solicits input
- Community surveys
- Work with citizen and advisory committees
- Information, including sections of the RTP as developed, posted on the RTC website
- Notifications about public hearings
- Bulletins to media partners
- Hard copies of documents available at local libraries
- Bilingual translation of materials, as appropriate

Participation by all in development of the 2014 RTP has been encouraged, consistent with the adopted Public Participation Plan, available online at www.ambag.org.

Notes for Appendix C

[1] The targets are relative to the 2010 maximum population within the key destinations and will close the gap between the baseline population and maximum population by 20% by 2020 and 40% by 2035.

[2] "Housing and Transportation Costs Outpacing Incomes," The Center for Neighborhood Technology, posted October 17, 2012, accessed January 2014, http://www.cnt.org/2012/10/17/housing-and-transportation-costs-outpacing-incomes/.

[3] Joe Cortright, "Portland's Green Dividend," CEOs for Cities, Chicago, Illinois (2007), http://blog.oregonlive.com/commuting/2009/09/pdxgreendividend.pdf.

[4] "Travel Time Reliability Measures," Operations Performance Measurement Program, U.S. Department of Transportation, Federal Highway Administration, accessed January 2014, http://ops.fhwa.dot.gov/perf_measurement/reliability_measures/index.htm.

[5] "Intersection Safety," U.S. Department of Transportation, Federal Highway Administration, accessed January 2014, http://safety.fhwa.dot.gov/intersection/.

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[7] "OnTheMap," U.S. Census Bureau, Center for Economic Studies, accessed December 2013, http://onthemap.ces.census.gov.

[8] Barth and Boriboonsomsin, "Traffic Congestion and Greenhouse Gases," *Access*, Number 35. University of California Transportation Center, Berkeley, CA (Fall 2009).

[9] Barbara Lee, "Quantifying Greenhouse Gas Mitigation Measures," California Air Pollution Control Officers Association (August 2010), http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

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[11] Criterion Planners/Engineers and Fehr & Peers Associates, "Index 4D Method: A Quick-Response Method of Estimating Travel Impacts from Land-Use Changes," Technical Memorandum, prepared for the U.S. Environmental Protection Agency, Washington D.C. (October 2001).

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[13] See note 11 above.

[14] See note 9 above.

[15] See note 10 above.

[16] See note 11 above.

[17] See note 10 above.

[18] See note 9 above.

[19] *California Executive Order S-3-05*, Governor Arnold Schwarzenegger, State of California, June 2005, http://gov.ca.gov/news.php?id=1861.

[20] "Obama Administration Finalizes Historic 54.5 MPG Fuel Efficiency Standards," Office of the United States Press Secretary, The White House (August 28, 2012), http://www.whitehouse.gov/the-press-office/2012/08/28/obama-administration-finalizes-historic-545-mpg-fuel-efficiency-standard.

[21] 2014 dollars.

[22] Joe Cortright, "The Green Dividend," CEO for Cities, accessed December 2013, http://www.ceosforcities.org/city-dividends/green/.

[23] See note 22 above.

[24] Civic Economics, "Buy Local First, Indie Impact Study Series 2013: A National Comparative Study, Utah, Salt Lake City, Ogden and Wayne County," accessed January 2014, http://www.localfirst.org/component/k2/item/217.

[25] "Travel Time Reliability Measures," U.S. Department of Transportation, Federal Highway Administration, Operations Performance Measurement Program, accessed December 2013, http://www.ops.fhwa.dot.gov/perf_measurement/reliability_measures.

[26] "Caltrans Performance Measurement System (PeMS)," California Department of Transportation, accessed January 2014, http://pems.dot.ca.gov/.

[27] Cambridge Systems, Inc., "Analytical Procedures for Determining the Impacts of Reliability Mitigation Strategies," Transportation Research Board, Washington D.C. (2013), http://www.trb.org/Main/Blurbs/166935.aspx.

[28] "National Cooperative Highway Research Program, Report 616: Multimodal Level of Service Analysis for Urban Streets," Transportation Research Board of the National Academies (2008), http://prj.kittelson.com/hcm/v4/docs/NCHRP%20Report%20616.pdf.

[29] Vehicle Miles Traveled.

[30] Mode share in this context is based on VMT, not trips. A 4 percent decrease in single occupancy vehicle mode share includes increasing bicycle trip mode share to 6 percent and pedestrian mode share to 8 percent by 2020. An 8 percent decrease in single occupancy vehicle mode share includes increasing bicycle trip mode share to 10 percent and pedestrian trip mode share to 14 percent by 2035.

[31] Barbara McCann, "Driving, Walking, and Where You Live: Links to Obesity – A report on new research being published in the *American Journal of Preventive Medicine*, 'Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars,'" McCann Consulting, accessed December 2013, http://www.ahtd.info/yahoo_site_admin/assets/docs/JournalofPreventiveMedicine_linkbetweendrivingobesity.14484631.pdf.

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[34] Mayo Clinic Staff, "Counting calories: Get back to weight0-loss basics," Mayo Clinic (June 2012), accessed January 2014, http://www.mayoclinic.com/health/calories/WT00011.

[35] "California Strategic Highway Safety Plan, Version 2," California Business, Transportation, and Housing Agency (2006), http://www.dot.ca.gov/hq/traffops/survey/SHSP/SHSP-Booklet-version2_%20PRINT.pdf.

[36] "Strategic Highway Safety Plan," American Association of State Highway and Transportation Officials (2005), http://safety.transportation.org/plan.aspx.

[37] "TIMS – Transportation Injury Mapping System," SafeTREC, Safe Transportation Research & Education Center, University of California, Berkeley, accessed December 2013, http://tims.berkeley.edu.

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[39] "Reports," Save California Streets, accessed December 2013, http://www.savecaliforniastreets.org/reports.html.

[40] Nichols Consulting Engineers, "State of the Pavements, 2013 Update," Santa Cruz County Public Works (2013).

[41] Nichols Consulting Engineers, "State of the Pavements, 2011 Update," Santa Cruz County Public Works (2011).

[42] The targets are relative to the 2010 maximum population within the key destinations and will close the gap between the baseline population and maximum population by 20% by 2020 and 40% by 2035.

[43] "OnTheMap," U.S. Census Bureau, Center for Economic Studies, accessed December 2013, http://onthemap.ces.census.gov.

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Appendix E

Funding Projections 2018-2040

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2040 RTP FINANCIAL ELEMENT: Funding projections through 2040

(all figures in $000's)

REVENUE SOURCES/PROGRAMS	Funding Type/ Eligible Uses	Base Year	2018-2020 Not Esclated	2021-2035 Not Esclated	2036-2040 Not Esclated	22 Year Total Not Escalated	*22 Year Escalated**
City Sales Taxes Used on Transportation	Local Streets-Roads	$ 2,650	$ 5,300	$ 39,750	$ 13,250	**$ 58,300**	*$ 70,373*
City/County Developer Fees	Local Streets-Roads	$ 1,295	$ 2,590	$ 19,425	$ 6,475	**$ 28,490**	*$ 34,390*
City/County General Funds for Transportation Projects	Local Streets-Roads	$ 10,075	$ 20,150	$ 151,125	$ 50,375	**$ 221,650**	*$ 267,551*
Non-Profit, Member Fees, Private Donations	Flexible	$ 770	$ 1,540	$ 11,550	$ 3,850	**$ 16,940**	*$ 20,448*
LiftLine Specialized Transportation - Non-TDA revenue	Transit	$ 730	$ 1,460	$ 10,950	$ 3,650	**$ 16,060**	*$ 19,386*
Airport Revenues	Airport	$ 2,820	$ 5,640	$ 42,300	$ 14,100	**$ 62,040**	*$ 74,888*
MTC Contribution to Hwy 17 Safety Project	Hwy- Safe on 17 CHP	$ 50	$ 100	$ 750	$ 250	**$ 1,100**	*$ 1,328*
Rail Line Lease Revenue	Rail Corridor	$ 90	$ 180	$ 1,350	$ 450	**$ 1,980**	*$ 2,390*
Regional Vehicle Registration Fee (VRF)	Local Streets-Roads	$ 2,000	$ -	$ 21,000	$ 10,000	**$ 31,000**	*$ 34,969*
Transit Fares	Transit	$ 10,300	$ 20,600	$ 154,500	$ 51,500	**$ 226,600**	*$ 273,526*
Transit non-fare revenue	Transit	$ 500	$ 1,000	$ 7,500	$ 2,500	**$ 11,000**	*$ 13,278*
Transit Fuel Tax Credit	Transit	$ 550	$ 1,100	$ 8,250	$ 2,750	**$ 12,100**	*$ 14,606*
Transit Sales Tax	Transit	$ 20,000	$ 40,000	$ 300,000	$ 100,000	**$ 440,000**	*$ 531,119*
Transportation Development Act/LTF	Transit	$ 9,060	$ 18,120	$ 135,900	$ 45,300	**$ 199,320**	*$ 240,597*
UCSC Revenues & Fees	UCSC	$ 7,550	$ 15,100	$ 113,250	$ 37,750	**$ 166,100**	*$ 200,497*
Measure D: 2016 Transportation Sales Tax	Measure D	$ 20,000	$ 40,000	$ 300,000	$ 100,000	**$ 440,000**	*$ 531,119*
AB2766	Flexible	$ 200	$ 400	$ 3,000	$ 1,000	**$ 4,400**	*$ 5,311*
Airport Improvement Program match	Airport	$ 7	$ 14	$ 105	$ 35	**$ 154**	*$ 189*
California Aid to Airports Program	Airport	$ 10	$ 20	$ 150	$ 50	**$ 220**	*$ 270*
Freeway Service Patrol (approx. 33% from SB1)	Highway -FSP	$ 250	$ 500	$ 3,750	$ 1,250	**$ 5,500**	*$ 6,639*
Service Authority for Freeways and Expressways (SAFE)	Highway	$ 250	$ 500	$ 3,750	$ 1,250	**$ 5,500**	*$ 6,639*
State Highway Operations and Protection Program (SHOPP)	Highway - SHOPP	$ 20,720	$ 41,440	$ 310,800	$ 103,600	**$ 455,840**	*$ 550,239*
SB 1 RMRA SHOPP	Highway - SHOPP	$ 10,620	$ 21,240	$ 159,300	$ 53,100	**$ 233,640**	*$ 282,024*
State Gas Tax to Locals (Highway User Tax)	Local Streets-Roads	$ 10,350	$ 20,700	$ 155,250	$ 51,750	**$ 227,700**	*$ 227,700*
SB1 RMRA Local Gas Tax	Local Streets-Roads	$ 6,715	$ 13,430	$ 100,725	$ 33,575	**$ 147,730**	*$ 147,730*
SB 1 CA General Fund Loan Repayment	Local Streets-Roads	$ 460	$ 920	$ 460	$ -	**$ 1,380**	*$ 1,380*
State Transit Assistance (STA)	Transit	$ 1,940	$ 3,880	$ 29,100	$ 9,700	**$ 42,680**	*$ 51,518*
SB1 STA	Transit	$ 1,600	$ 3,200	$ 24,000	$ 8,000	**$ 35,200**	*$ 42,489*
SB 1 - STA State of Good Repair (SOGR)	Transit	$ 670	$ 1,340	$ 10,050	$ 3,350	**$ 14,740**	*$ 17,792*
STIP - Regional Share (est. 45% from SB1)	Flexible	$ 3,635	$ 15,794	$ 54,281	$ 18,176	**$ 88,251**	*$ 97,708*
Active Transportation Program (80% SB1)	Active Transportation	$ 3,435	$ 6,870	$ 51,525	$ 17,175	**$ 75,570**	*$ 91,220*
Low Carbon Transit Operations Program (LCTOP)	Transit	$ 400	$ 800	$ 6,000	$ 2,000	**$ 8,800**	*$ 10,622*
SB1 Local Partnership Program - Formula	1/2 METRO, 1/2 flexible	$ 600	$ 1,200	$ 9,000	$ 3,000	**$ 13,200**	*$ 13,200*
SB1 Competitive Programs (Congested Corridors, Trade Corridors, TICRP, LPP, etc)	Flexible	$ 2,700	$ 5,400	$ 40,500	$ 13,500	**$ 59,400**	*$ 59,400*
Affordable Housing & Sustainable Communities	Flexible	$ 530	$ 1,060	$ 7,950	$ 2,650	**$ 11,660**	*$ 12,353*
Enhanced Mobility of Seniors and Individuals with Disabilities (5310)	Transit	$ 115	$ 230	$ 1,725	$ 575	**$ 2,530**	*$ 3,054*
State Planning (5304)	Planning	$ 40	$ 80	$ 600	$ 200	**$ 880**	*$ 1,062*
Metropolitan Planning (5303)	Transit	$ 4	$ 8	$ 60	$ 20	**$ 88**	*$ 106*
Rural Area Formula Program (5311)	Transit	$ 195	$ 390	$ 2,925	$ 975	**$ 4,290**	*$ 5,178*
Urbanized Area Formula Program (5307)	Transit	$ 4,380	$ 8,760	$ 65,700	$ 21,900	**$ 96,360**	*$ 116,315*
Small Transit Intensive Cities (5307c)	Transit	$ 2,300	$ 4,600	$ 34,500	$ 11,500	**$ 50,600**	*$ 61,079*

(all figures in $000's)

REVENUE SOURCES/PROGRAMS	Funding Type/ Eligible Uses	Base Year	2018-2020 Not Esclated	2021-2035 Not Esclated	2036-2040 Not Esclated	22 Year Total Not Escalated	*22 Year Escalated**
Bus and Bus Facilities Formula Program (5339)	Transit	$ 450	$ 900	$ 6,750	$ 2,250	**$ 9,900**	*$ 11,950*
Bus and Bus Facilities Discretionary Program (5339b)	Transit	$ 1,000	$ 2,000	$ 15,000	$ 5,000	**$ 22,000**	*$ 26,556*
High Risk Rural Road (HR3)	Local Streets-Roads	$ 260	$ 520	$ 3,900	$ 1,300	**$ 5,720**	*$ 6,905*
Highway Bridge Program (HBP)	Local Streets-Roads	$ 2,750	$ 5,500	$ 41,250	$ 13,750	**$ 60,500**	*$ 73,029*
Highway Safety Improvement Program (HSIP)	Local Streets-Roads	$ 1,400	$ 2,800	$ 21,000	$ 7,000	**$ 30,800**	*$ 37,178*
Surface Transportation Block Grant (STBG)	Flexible	$ 3,500	$ 7,000	$ 52,500	$ 17,500	**$ 77,000**	*$ 92,946*
Federal Lands Access Program (FLAP)	MBSST	$ -	$ 6,000	$ -	$ -	**$ 6,000**	*$ 6,000*
FEMA/CALEMA/ER - Emergency Road Repair Funding	Local Streets-Roads	$ 1,050	$ 2,100	$ 15,750	$ 5,250	**$ 23,100**	*$ 27,884*
FAA Airport Improvement Program (AIP)	Airport	$ 150	$ 300	$ 2,250	$ 750	**$ 3,300**	*$ 3,983*
		$ 171,126	**$ 352,776**	**$ 2,551,206**	**$ 853,331**	**$ 3,757,313**	***$ 4,428,113***

**Average escalation rate assumption: 1.75% applied to funds beyond existing programmed; except sources with set annual amount or predicted to flatline.*

Appendix F

Project List

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2040 Regional Transportation Plan Project List

Constrained and Unconstrained Projects - Not Escalated

Projects listed by lead agency, in alphabetical order by project name.
Project IDs without the letter "P" in front of the number have been also included in the Regional Transportatioon Improvement Program.
"Constrained" represents amount of project cost that could be funded with revenues anticipated through 2040.
While some projects have secured funding, this amount does not typically represent committed funds. "Unconstrained" represents amount of project cost that would need additional funding in order to be implemented.

All Figures in year 2016, '000s (thousands of dollars)

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Caltrans					
Collision Reduction & Emergency Projects	CT-P46	Various SHOPP projects that address collision reduction, mandates (including stormwater mandates) and emergency projects. (Constrained=30% of total cost).	$732,380	$219,714	$512,666
Hwy 1/Harkins Slough Road Interchange: Bicycle/Pedestrian Bridge	WAT 01A	Construction of Pedestrian/Bicycle Bridge over Highway 1. Caltrans Project ID 05-1G490	$9,900	$9,900	$0
Hwy 17 Access Management - Laurel Rd/Sugarloaf Rd/Glenwood Cutoff Area Grade Separation Concept	CT-P52	New structure providing grade-separation to facilitate crossing and turnaround.	$40,000	$0	$40,000
Hwy 17 Access Management - Multimodal Improvements	CT-P50	Multimodal improvements including park and ride improvements, and facilities serving separated bike/ped crossing or express transit route.	$20,000	$0	$20,000
Hwy 17 Access Management - Old Santa Cruz Hwy Area Grade Separation Concept	CT-P53	New structure providing grade-separation to facilitate crossing and turnaround.	$40,000	$0	$40,000
Hwy 17 Access Management - Operational Improvements	CT-P49	Operational improvements to existing facilities including ramp modifications, accel/decel lanes, turning lanes, driveway consolidation, driveway channelization, etc.	$50,000	$0	$50,000
Hwy 17 Access Management - Vine Hill Area Grade Separation Concept	CT-P51	New structure providing grade-separation to facilitate crossing and turnaround.	$40,000	$0	$40,000
Hwy 17 Wildlife Habitat Connectivity	CT-P48	Wildlife Crossing	$9,198	$9,198	$0
Measure D Hwy 9 Corridor Projects	CT-P09e	Corridor study is underway to identify need for shoulder widening, turnouts for buses, bicycle and pedestrian improvements, and turn lanes at spot locations in SLV. Capital Cost Est. TBD.	$10,000	$7,349	$2,651
Minors	CT-P47	Various small SHOPP projects (less than $1 million) that reduce/enhance maintenance efforts by providing minor operational, pavement rehab, drainage, intersection, electrical upgrades, landscape and barrier improvements. (Constrained=30% of total cost).	$8,600	$2,580	$6,020
State Highway Preservation (bridge, roadway, roadside)	CT-P45	Various SHOPP projects that address bridge preservation, roadway & roadside preservation and limited mobility improvements. (Constrained=30% of cost to maintain).	$778,390	$467,163	$311,227
		Caltrans Total	**$1,738,468**	**$715,904**	**$1,022,564**
CHP - California Highway Patrol					
Hwy 129 Safety Program	CHP-P03	Additional CHP enforcement and public education campaign on Highway 129.	$500	$0	$500
Hwy 17 Safety Program	CHP-P01	Continuation of Highway 17 Safety Program in Santa Cruz County at $100/year. Includes public education and awareness, California Highway Patrol (CHP) enhancement, pilot cars, electronic speed signs.	$2,200	$2,200	$0

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Traffic Management	CHP-P02	Patrol of state route system and unincorporated roadways aimed at minimizing traffic collisions and traffic delays; and provide assistance to motorists. COST EST TBD.	$0	$0	$0
		CHP - California Highway Patrol Total	**$2,700**	**$2,200**	**$500**
City of Capitola					
40th Ave (at Deanes Ln)Bike/Ped connection	CAP-P46	40th Avenue N/S bike/pedestrian connection at Deanes Lane.	$10	$10	$0
40th Ave/Clares St Intersection Improvements	CAP-P38	Widen intersection and signalize.	$1,550	$1,050	$500
41st Ave (Soquel to Portola) Crosswalks	CAP-P47	Evaluate and if found necessary, increase number of crosswalks on 41st to closer to every 300 ft.	$20	$20	$0
41st Ave/Capitola Road Intersection Improvements	CAP-P37	Widen intersection and reconfigure signal phasing.	$520	$520	$0
46th/47th Ave (Clares to Cliff Dr) Bike Lanes/Traffic Calming	CAP-P40	46th/47th from Clares to Portola/Cliff - Add traffic calming and wayfinding signage to connect to Brommer and MBSST.	$20	$20	$0
47th Avenue Traffic Calming and Greenway	CAP-P30	Traffic calming and traffic dispersion improvements along 47th Ave from Capitola Rd to Portola Drive and implementation of greenway, which gives priority to bicycles and pedestrians on low volume, low speed streets including, pedestrian facilities, way finding and pavement markings, bicycle treatments to connect to MBSST.	$100	$100	$0
Auto Plaza Drive Extension to Bay Avenue	CAP-P35	Extend Auto Plaza Drive over Soquel Creek to Bay Avenue. Includes improvements to Auto Plaza Drive.	$10,330	$0	$10,330
Bay Avenue Traffic Calming and Bike/Ped Enhancements	CAP-P29	Traffic calming features along Bay Avenue from Highway 1 to Monterey Avenue, including left turn pocket, buffered pedestrian facilities and bicycle treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals) to address speed inconsistency between bicyclists and vehicles.	$410	$210	$200
Bay Avenue/Capitola Avenue Intersection Modifications/Roundabout	CAP 16	Multimodal improvements to intersection. Roundabout.	$1,000	$1,000	$0
Bay Avenue/Hill Street Intersection	CAP-P07	Intersection improvements to improve traffic flow. Roundabout.	$210	$210	$0
Bay Avenue/Monterey Avenue Intersection Modification	CAP-P32	Multimodal improvements to the intersection. Include signalization or roundabout along with pedestrian, bicycle treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals) and transit access.	$310	$310	$0
Brommer Street Complete Street Improvements (250' west of 38th Ave to 41st Ave)	CAP 18	Construct complete street roadway improvements on Brommer St. to improve access for vehicles, bikes, and pedestrians. Pavement reconstruction, install ADA driveways and sidewalks, and reconfigure eastbound approach to 41st Ave. for vehicle access.	$770	$770	$0
Brommer/Jade/Topaz St Bike Lanes/Traffic Calming (Western City Limit on Brommer to 47thAve)	CAP-P41	Add buffered bike lanes, traffic calming and wayfinding signage and bike/ped priority crossing at 41st Ave, connecting the two N/S neighborhood greenways.	$20	$20	$0
Capitola Intra-City Rail Trolley	CAP-P18	Construct & Operate Weekend Rail Trolley Service. Project includes installation of 3 stations.	$14,460	$0	$14,460
Capitola Jitney Transit Service	CAP-P15	Purchase and operate local transit service.	$1,030	$0	$1,030
Capitola Mall (Capitola Rd to Clares) Bike Path	CAP-P48	Separated bicycle facility through Capitola Mall parking lot to connect 38th Ave bike lanes and 40th Ave.	$50	$50	$0

All Figures in year 2016, '000s (thousands of dollars)

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Capitola Rd & 45th Avenue I/S Improvements	CAP-P53	Signalization or other LOS improvements	$400	$400	$0
Capitola Village Enhancements: Capitola Ave	CAP-P34	Multimodal enhancements along Capitola Avenue.	$1,030	$1,030	$0
Capitola Village Multimodal Enhancements - Phase 2/3	CAP-P04b	Multimodal enhancements in Capitola Village along Stockton Ave, Esplanade, San Jose Ave, & Monterey Av. Includes sidewalks, bike lanes, bike lockers, landscaping, improve transit facilities, parking, pavement rehab and drainage.	$3,100	$3,100	$0
Capitola-wide HOV priority	CAP-P50	Evaluate HOV priority at signals and HOV queue bypass.	$40	$40	$0
Citywide Bike Projects	CAP-P52	Bike projects based on needs identified through the Bicycle Plan. These projects are in addition to projects listed individually in the RTP.	$1,030	$400	$630
Citywide General Maintenance and Operations	CAP-P06	Ongoing maintenance, repair, and operation of road/street system within the City limits. (Const=$1850K/yr; Unconst=$150K/yr).	$44,000	$40,666	$3,334
Citywide Sidewalk Program	CAP-P51	Install sidewalks to fill gaps. Annual Cost $50k/yr.	$1,030	$520	$510
Citywide Traffic Calming	CAP-P17	Install traffic calming/neighborhood livability improvements.	$1,450	$1,450	$0
Clares St Bike Lanes/Sharrows (Capitola Rd to 41st Ave)	CAP-P42	Evaluate and if found necessary, add bike lanes/sharrows to Clares.	$100	$100	$0
Clares St/41st Ave Bicycle Intersection Improvement	CAP-P43	Bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals) at Clares across 41st.	$10	$10	$0
Clares Street Pedestrian Crossing west of 40th Ave	CAP-P16	Construct signalized ped x-ing 0.20 miles west of 40th Ave.	$520	$250	$270
Clares Street Traffic Calming	CAP 11	Implementation of traffic calming measures: chicanes, center island median, new bus stop, and road edge landscape treatments to slow traffic. Construct new safe, accessible ped x-ing at 42nd and 46th Av.	$750	$750	$0
Cliff Drive Improvements	CAP-P05	Installation of sidewalks, pedestrian crossing and slope stabilization of embankment including seawall.	$1,550	$1,550	$0
Gross/41st Ave Bicycle Intersection Improvement	CAP-P44	Bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals) from Gross E/B to 41st N/B.	$20	$20	$0
Hwy 1/41st Avenue Interchange	CAP-P01	Implement 41st Avenue & Bay Ave/Porter Ave single interchange improvements as detailed and expensed in Hwy 1 HOV project (RTC 24) as a stand alone project if the RTC project does not proceed. ($117M)	$0	$0	$0
Monterey Avenue and Park Avenue I/S Improvements	CAP-P56	Signalization or other LOS improvements	$400	$400	$0
Monterey Avenue at Depot Hill	CAP-P28	Improve vehicle ingress and egress to Depot Hill along Escalona Ave and improve pedestrian facilities.	$260	$260	$0
Monterey Avenue Multimodal Improvements	CAP-P12	Installation of sidewalks and bike lanes in area near school and parks.	$360	$360	$0
Park Avenue Sidewalks	CAP 15	Installation of sidewalks, plus crosswalks at Cabrillo and Washburn to improve access to transit stops. Links Cliffwood Heights neighborhood to Capitola Village. Currently only 4 short segments of sidewalk exist.	$650	$650	$0
Park Avenue/Kennedy Drive Improvements	CAP-P09	Construct intersection improvements, especially for bikes/peds. May include traffic signal.	$360	$360	$0

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Porter Street and Highway 1 I/S Improvements	CAP-P55	Add additional dedicated right turn lane on Porter St to northbound on ramp	$250	$250	$0
Stockton Ave Bridge Rehab	CAP-P07p	Replace bridge with wider facility that includes standard bike lanes and sidewalks.	$3,000	$1,500	$1,500
Stockton Avenue and Capitola Avenue I/S Improvements	CAP-P57	Signalization or other LOS improvements	$350	$350	$0
Upper Capitola Avenue Improvements	CAP-P03	Installation of bike lanes and sidewalks on Capitola Av. (Bay Av.-SR 1) and sidewalks on Hill St. from Bay Av. to Rosedale Av.	$1,340	$1,340	$0
Upper Pacific Cove Parking Lot Pedestrian Trail and Depot Park Metro Development	CAP 17	Construct 4 foot wide pedestrian pathway along City owned Upper Pacific Cove Parking lot, adjacent to rail line (680'). Includes new signal for ped crossing over Monterey Avenue. Includes a new metro shelter located and landscaped setting along the rail corridor/Park Ave. Part of MBSST.	$310	$310	$0
Wharf Road and Stockton Avenue I/S Improvements	CAP-P54	Signalization or other LOS improvements	$350	$350	$0
Wheelchair Access Ramps	CAP-P27	Install wheelchair access/curb cut ramps on sidewalks citywide.	$200	$200	$0
		City of Capitola Total	**$93,670**	**$60,906**	**$32,764**
City of Santa Cruz					
Almar Ave Sidewalks	SC-P126	Fill gaps in sidewalks and access ramps to improve pedestrian safety.	$200	$200	$0
Arroyo Seco Trail (Medar St to Grandview St)	SC-P107	Pave existing gravel trail and widen and pave connection to Grandview St.	$500	$0	$500
Bay Street Corridor Modifications	SC-P77	Intersection modifications on Bay St Corridor from Mission St to Escalona Dr, including widening at the Mission St northeast corner and widening on Bay. Improve bike lanes and add sidewalks to west side of Bay.	$5,100	$970	$4,130
Bay/California Traffic Signals	SC-P96	Install traffic signals for safety and capacity improvements.	$520	$0	$520
Bay/High Intersection Modification	SC-P109	Install a roundabout or modify the traffic signal to include protected left-turns and new turn lanes. Revise sidewalks, access ramps and bike lanes as appropriate.	$2,150	$2,150	$0
Beach/Cliff Intersection Signalization	SC-P93	Signalize intersection for pedestrian and train safety.	$210	$210	$0
Branciforte Creek Pedestrian Path Connections	SC-P95	Fill gaps in pedestrian and bike paths along and across Branciforte Creek in the Ocean-Lee-Market-May Streets area.	$3,410	$0	$3,410
Brookwood Drive Bike and Pedestrian Path	SC-P21	Provide 2-way bicycle and pedestrian travel.	$1,030	$0	$1,030
Chestnut St. Pathway	SC-P22	Install a Class 1 bicycle/pedestrian facility to connect the east side of Neary Lagoon Park with the Depot Park path.	$570	$570	$0
Chestnut Street Bike Lanes	SC-P47	Install Class 2 bike lanes to provide connection from existing bike lanes on Laurel Street and upper Chestnut Street to proposed Class 1 bike path connections to Bay Street and Pacific Avenue/Beach Street.	$100	$100	$0
Citywide Operations and Maintenance	SC-P07	Ongoing maintenance, repair, and operation of street system within the City limits. (Const=$3.0M/yr; Unconst=$4.2M/yr)	$163,630	$86,249	$77,381
Citywide Safe Routes to School Projects - ATP	SC-P125	Projects to improve pedestrian and bicycle safety near schools.	$8,204	$1,404	$6,800

All Figures in year 2016, '000s (thousands of dollars)

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Citywide Street Sweeping	SC-P128	Ongoing street sweeping, funded from City Refuse Enterprise Fund.	$19,800	$19,800	$0
Delaware Avenue Complete Streets	SC-P23	Fill gaps in bicycle lanes, sidewalks and sidewalk access ramps.	$150	$150	$0
High St/Moore St Intersection Modification	SC-P90	Add a protected left turn to existing signalized intersection along High St at city arterial. Project is located in high pedestrian and bicycle use activity area.	$100	$100	$0
Hwy 1 - Harvey West Area Alternative Access	SC-P108	Development of an on/off ramp from NB Highway 1 to Harvey West Boulevard/Evergreen St, to improve access, especially during peak congestion times and emergencies.	$4,130	$0	$4,130
Hwy 1 Sound Wall	SC-P03	Install sound wall on Hwy 1: River to Chestnut.	$520	$0	$520
Hwy 1/9 Intersection Modifications	SC 25	Intersection modifications including new turn lanes, bike lanes, shoulders, lighting, sidewalks and access ramps. Includes adding second left-turn lane on Highway 1 southbound to Highway 9 northbound; second northbound through lane and shoulder on northbound Highway 9, from Highway 1 to Fern Street; a right-turn lane and shoulder on northbound Highway 9; through-left turn lane on northbound River St; replace channelizers on Highway 9 at the intersection of Coral Street; sufficient lane width along the northbound through/left turn lane on Highway 9 from Fern Street to Encinal Street; new sidewalk along the east side of Highway 9 from Fern Street north to Encinal Street; new through/left turn lane on southbound Highway 9; Traffic Signal interconnect to adjacent signals. (Caltrans project ID - 05-46580)	$7,850	$7,850	$0
Hwy 1/Mission St at Chestnut/King/Union Intersection Modification	SC-P81	Modify design of existing intersections to add lanes and upgrade the traffic signal operations to add capacity, reduce delay and improve safety. Provide access ramps and bike lanes on King and Mission. Includes traffic signal coordination.	$4,650	$4,650	$0
Hwy 1/San Lorenzo Bridge Replacement	SC 38	Replace the Highway 1 bridge over San Lorenzo River to increase capacity, improve safety and improve seismic stability, from Highway 17 to the Junction of 1/9. Reduce flooding potential and improve fish passage. Caltrans Project ID 05-0P460	$20,000	$20,000	$0
Hwy 1/Shaffer Rd Signalization	SC-P92	Signalization of intersection of Hwy 1 and Shaffer Rd. Project may includes some widening of Hwy 1 to accommodate a left turn lane.	$520	$0	$520
King Street Bike Facility (entire length)	SC-P59	Install Class 2 bike lanes on residential collector street which includes some parking and landscape strip removals, and some drainage inlet modifications.	$2,070	$2,070	$0
King/Laurel Intersection Modification	SC-P114	Modify unsignalized intersection to add eastbound right turn lane.	$100	$0	$100
Laurent/High Intersection Improvements	SC-P97	Install Traffic Signal.	$410	$0	$410
Lump Sum Bike Projects	SC-P75	Bike projects based on needs identified through the Active Transportation Plan and Santa Cruz City Schools Complete Streets Master Plan. These are in addition to projects listed individually in the RTP.	$6,800	$0	$6,800
Market Street Sidewalks and Bike Lanes	SC-P105	Completion of sidewalks and bicycle lanes. Includes retaining walls, right-of-way, tree removals, and a bridge modification.	$1,030	$1,030	$0
MBSST (Coastal Rail Trail): Segment 7 (Natural Bridges to Pacific Ave)	TRL 07SC	2.1 miles of Monterey Bay Sanctuary Scenic Trail Network (MBSST) Segment 7 along rail line (excluding Moore Creek rail trestle bridge and trail to Natural Bridges Drive).	$7,400	$7,400	$0
MBSST (Coastal Rail Trail_ - Segment 8 and 9)	TRL 8-9a	Rail Trail Design, Environmental Clearance and Construction along the rail corridor between Pacific Ave in the City of Santa Cruz to 17th Ave in Santa Cruz County	$32,934	$32,934	$0
Measure H Road Projects	SC-P104	Road rehabilitation and reconstruction projects citywide to address backlog of needs using Measure H sales tax revenues. (Some Measure H funds anticipated to fund specific projects listed in the RTP).	$41,800	$41,800	$0

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Mission St (Hwy 1)/Laurel St Intersection Modification	SC-P112	Modify traffic signal to add right-turn from Mission St to Laurel St and signal overlap phase.	$1,030	$0	$1,030
Mission St (Hwy 1)/Swift St Intersection Modification	SC-P113	Modify traffic signal to add Swift St right-turn lane and signal overlap phase.	$500	$0	$500
Morrissey Blvd. Bike Path over Hwy 1	SC-P29	Install a Class 1 bicycle and pedestrian facility on freeway overpass.	$300	$300	$0
Morrissey/Poplar/Soquel Intersection Modification	SC-P12	Modify the roadway configuration in the Morrissey/Poplar/Soquel triangle area to improve traffic circulation and safety for all modes.	$2,070	$0	$2,070
Murray St Bridge Retrofit	SC 37	Seismic retrofit of existing Murray St. bridge (36C0108) over Woods Lagoon at harbor and associated approach roadway improvements and replacement of barrier rail. Includes wider bike lanes and sidewalk on ocean side. Include access paths to harbor if eligible.	$11,440	$11,440	$0
Murray St to Harbor Path Connection	SC-P30	Install a Class 1 bicycle/pedestrian facility.	$210	$210	$0
Neighborhood Traffic Management Improvements	SC-P73	Install traffic control devices and roadway design features to manage neighborhood traffic.	$2,580	$0	$2,580
North Branciforte/Water Intersection Modification	SC-P115	Modify traffic signal and add additional lanes per traffic study. Include signal interconnect if applicable.	$2,070	$0	$2,070
Ocean St and San Lorenzo River Levee Bike/Ped Connections (Felker, Kennan, Blain, Barson Streets)	SC-P120	Improve pedestrian and bicycle facilities on side streets to connect Ocean Street with San Lorenzo River Levee path system.	$620	$0	$620
Ocean St Pavement Rehabilitation	SC 48	Pavement rehabilitation using cold-in-place recycling process; includes new curb ramps, restriping of bicycle lanes and crosswalks.	$1,030	$1,030	$0
Ocean St Streetscape and Intersection, Plymouth to Water	SC-P86	Implement this phase of the Ocean Street plan and modify Plymouth St to provide separate turn lanes and through lanes, widen sidewalks, pedestrian islands/bulbouts, transit improvements, street trees, street lighting and medians landscaping improvements. This includes pedestrian and bicycle crossing improvements and detection and connectivity to the pedestrian and bicycle path on the San Lorenzo River and adjacent neighborhoods. Include Gateway treatment.	$4,130	$2,000	$2,130
Ocean St Streetscape and Intersection, Water to Soquel	SC-P84	Implement this phase of the adopted Ocean Street plan including adding turn lanes on Ocean Street at the Water Street intersections, wider sidewalks, pedestrian crossing islands/bulb outs, transit improvements, street trees, pedestrian scale street lights, and medians improvements, way finding, and pedestrian and bicycle connectivity to San Lorenzo Park and neighborhoods.	$6,200	$0	$6,200
Ocean Street Corridor Multiuse Transit Lane	SC-P122	Consider restricting parking to develop business access and transit (BAT) lane to serve tourism and improving transit facilities.	$410	$0	$410
Ocean Street Widening from Soquel to East Cliff	SC-P66	Implement this phase of the Ocean Street plan that includes utility undergrounding, bike lanes, wider sidewalks, pedestrian crossing islands/bulb outs, transit improvements, pedestrian scale street lights, street trees and left turn lanes at Broadway and a right-turn lane at San Lorenzo Blvd. This includes pedestrian and bicycle crossing improvements and detection and connectivity to the pedestrian and bicycle path on the San Lorenzo River and adjacent neighborhoods.	$5,170	$0	$5,170
Ocean Street/San Lorenzo River Levee Area Wayfinding	SC-P124	Install signage on the bike/ped scale to bike/ped facilities connecting key destinations.	$150	$0	$150

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Pacific Ave. Sidewalk	SC 50	Construct 200' of new sidewalk on Pacific Avenue between Front Street and 55 Front St, including installation of a new accessible crosswalk at Front and Pacific; 150' bike lane.	$440	$440	$0
River (Rte 9)/Fern Intersection Modification	SC-P110	Install traffic signal, sidewalk and new access ramps. Provide bike lanes on Fern.	$520	$0	$520
River St/River Street South Intersection Modification	SC-P116	Install a roundabout or traffic signal to improve access and safety to the Downtown core, integrating bike and pedestrian facilities.	$520	$0	$520
River Street Pavement Rehabilitation (Water St to Potrero Street)	SC 51	Pavement rehabilitation of River Street between Water Street and Potrero Street. (0.4 mi)	$2,000	$1,000	$1,000
Riverside Ave/Second St Intersection Modification.	SC-P13	Modify intersection to reduce congestion and improve pedestrian crossing.	$175	$175	$0
San Lorenzo River Bike/Ped Trail at RR Bridge	TRL 8a	Widen existing four foot walkway that connects the east end of the Beach Street Pathway with East Cliff Drive at the location of the current railroad bridge over the San Lorenzo River and to connect the east and west banks of the San Lorenzo River Pathway. The crossing currently only accommodates pedestrians.	$1,550	$1,550	$0
San Lorenzo River Levee Path Connection	SC-P35	Install a Multi-Use bicycle/pedestrian facility connecting the end of the San Lorenzo River Levee path on the eastern side of the river, up East Cliff Drive near Buena Vista Ave.	$2,070	$2,070	$0
Seabright Avenue Bike Lanes (Pine-Soquel)	SC-P69	Install Class 2 bike lanes on arterial street to complete the Seabright Avenue bike lane corridor and connect to bike lane corridor on Soquel Avenue and Murray. Includes removal of some parking and some landscape strips.	$2,070	$2,070	$0
Seabright/Murray Traffic Signal Modifications	SC-P100	Remove split phasing on Seabright and add right-turn lane northbound.	$1,030	$1,030	$0
Seabright/Water Intersection Improvements	SC-P99	Modify unsignalized intersection to add northbound right and extend left-turn pocket.	$100	$0	$100
Shaffer Road Widening and Railroad Crossing	SC-P91	Construction of a new crossing of the Railroad line at Shaffer Rd. and widening at the southern leg of Shaffer in conjunction with development. Complete sidewalks and bike lanes.	$1,000	$1,000	$0
Sidewalk Program	SC-P09	Install and maintain sidewalks and access ramps.	$20,660	$5,500	$15,160
Soquel Ave at Frederick St Intersection Modifications	SC 42	Widen to improve eastbound through-lane transition on Soquel Ave and lengthen right-turn pocket and bicycle lane on Frederick St. Upgrade access ramps.	$310	$310	$0
Soquel Ave Corridor Widening (Branciforte-Morrissey)	SC-P87	Minor widening and signal modifications along Soquel Ave corridor from Branciforte to Morrissey Blvd to widen sidewalks, transit improvements, improve pedestrian and bicycle detection and crossings, add a travel lane, maintain some commercial parking and improve existing bike lanes. Replacing the split phasing with protected left-turns at Branciforte to reduce delays for all modes of travel and GHG.	$2,320	$0	$2,320
Soquel/Branciforte/Water (San Lorenzo River to Branciforte) Bike Lane Treatments	SC-P123	Consider bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals) to address speed inconsistency and parking conflicts between bicyclists and vehicles.	$410	$410	$0
Soquel/Water (Branciforte to Morrissey) Crosswalks	SC-P119	Evaluate and if found necessary implement additional crosswalks on Soquel/Water with consideration for safety, and update crosswalks to more visible pattern (block).	$300	$150	$150
Storey/King Street Intersection Left-Turn Lane	SC-P76	Remove parking and modify striping for second southbound left turn lane.	$100	$0	$100
Swift/Delaware Intersection Roundabout or Traffic Signal	SC-P101	Install Traffic Signal or Roundabout at Intersection to improve capacity and safety.	$500	$500	$0

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Water Street Pavement Rehabilitation(N. Branciforte Ave- Ocean St)	SC 49	Pavement rehabilitation of Water Street between North Branciforte Avenue and Ocean Street. Grant Condition: Add bicycle and pedestrian treatments at intersections, especially at Branciforte to reduce conflicts between motorized and non-motorized users.	$1,453	$1,453	$0
West Cliff Path Minor Widening (David Way Lighthouse to Swanton)	SC 23	Improve existing path.	$520	$520	$0
West Cliff/Bay Street Modifications	SC-P83	Install signal or roundabout to replace the all-way stop to improve safety and capacity.	$500	$500	$0
		City of Santa Cruz Total	**$412,346**	**$263,295**	**$149,051**
City of Scotts Valley					
Bean Creek Rd Sidewalks (SVMS to Blue Bonnet)	SV-P35	Fill gaps in sidewalks on Bean Creek Rd.	$410	$410	$0
Bean Creek Road Realignment	SV-P16	Realign Bean Creek Road to intersect Scotts Valley Drive farther North to create a four way intersection.	$2,840	$0	$2,840
Bike Rest Stops in Scotts Valley	SV-P38	Bike rest stops (including racks, water) at Camp Evers Park and Skypark.	$230	$0	$230
Citywide Access Ramps	SV-P06	Place handicap ramps at various locations. Avg annual cost: $8K/yr.	$210	$210	$0
Citywide Bike Lanes	SV-P41	Construction of additional bike lanes and paths citywide (including Green Hills).	$3,100	$0	$3,100
Citywide General Maintenance and Operations	SV-P27	Ongoing maintenance, repairs, and operation of road/street system within the City limits. ($400K/yr const; $250/yr unconst).	$14,770	$13,459	$1,311
Citywide Sidewalk Program	SV-P05	Install sidewalks to fill gaps. Annual Cost $50k/yr	$5,170	$2,600	$2,570
Civic Center Dr Bike Lanes	SV-P33	Add bike lanes to narrow road.	$410	$0	$410
El Pueblo Rd Ext North	SV-P14	Connect El Pueblo Road via Janis Way to Victor Square, crossing Carbonero Creek.	$1,240	$0	$1,240
El Pueblo Rd Extensions	SV-P15	Connect El Pueblo Road to Disc Drive.	$410	$0	$410
El Rancho Dr Bike Lanes	SV-P36	Add bike lanes on El Rancho within city limits.	$340	$0	$340
Emergency Access Granite Creek/Hwy 17	SV-P24	Connect Granite Creek Rd to SR 17 via Navarra Drive to Sucinto Drive, for emergency access.	$570	$0	$570
Emergency Access SV DR/Upper Willis Dr	SV-P25	Connect Scotts Valley Drive to Upper Willis Road for emergency access.	$1,030	$0	$1,030
Emergency Access Whispering Pines	SV-P26	Connect Whispering Pines Drive to Manana Woods for emergency access.	$50	$0	$50
Emergency Access-Bethany/Glenwood	SV-P23	Connect Bethany Drive to Glenwood Drive.	$210	$0	$210
Emergency Access-Sundridge/Pueblo	SV-P22	Connect Sunridge Drive to Disc Drive for emergency access.	$410	$0	$410
Erba Lane/Terrace View/SV Drive Realignment	SV-P10	Realign Terrace View to access Scotts Valley Drive via Erba Lane.	$520	$0	$520
Glen Canyon Rd Bike Lanes	SV-P29	Class 2 Bike lanes from Flora Lane to Green Hills. Oak Creek to Flora Ln are already complete.	$1,030	$0	$1,030

All Figures in year 2016, '000s (thousands of dollars)

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Glen Canyon Rd/Green Hills Rd/S. Navarra Dr Bike Corridor and Roadway Preservation	SV 28	Repave two roads, add bike lanes (on Green Hills Rd), and signage. Includes road markings like sharrows and green lane treatments to assist commuters, students, and recreational bikers; and bike/walk education and outreach programs ($14k).	$993	$993	$0
Glenwood Drive Rehabilitation and Bicycle Improvement Project	SV 29	Pavement rehabilitation of Glenwood Dr. (K Street Way to city limits), drainage repair, and widen to add bike lanes. (0.58mi)	$865	$865	$0
Hwy 17/Midtown Interchange	SV-P01	Construct new SR17 interchange midway between Mt. Hermon Rd and Granite Creek Rd. Will require right-of-way.	$30,990	$0	$30,990
Hwy 17/Mt. Hermon Rd Interchange Operations Improvement	SV-P44	Add lane to SB off-ramp at Hwy 17/Mt. Hermon Rd interchange.	$1,030	$0	$1,030
Kings Village Rd/Town Center Entrance Traffic Signal	SV-P52	Install new traffic signal at the intersection of Kings Village Rd and new Town Center entrance (near transit center) with protected pedestrian crossings and transit signal priority. New Signalization of the intersection on Kings Village Rd at the transit center exit and future Plan street connection would provide a location for protected pedestrian crossings, and would allow transit operators to easily exit the transit center and maintain operating schedules.	$210	$105	$105
Kings Village Road/ Bluebonnet Lane Sidewalk	SV 30	Construct new, fill gaps, and improve accessibility of sidewalks on both sides of King's Village Rd. (Mt. Hermon to Bluebonnet) and south side of Bluebonnet Lon (KV to Bean Creek). Approx.0.3mi. Curb ramp upgrades at Mt. Hermon.	$306	$306	$0
Lockhart Gulch Rd Bike Lanes	SV-P37	Add Class 2 bike lanes to narrow, primarily residential street.	$720	$0	$720
Lockwood Ln Pedestrian Signal Near Golf Course	SV-P21	Construct a pedestrian signal at unprotected ped crossing on Lockwood Lane.	$50	$50	$0
Lockwoode Lane Sidewalk and Bike Lanes	SV-P40	Construct Bike Lanes and add sidewalk on the west side from Mt. Hermon to the City limit.	$520	$520	$0
Mt Hermon Rd and Scotts Valley Drive - Crosswalks	SV-P49	Increase number of crosswalks on Mt Hermon/Scotts Valley Dr, update crosswalks to block pattern, add pedestrian treatments where necessary at intersections to decrease distance across using refuge islands. Add crosswalks to all sides of intersections (particularly an issue on Scotts Valley Dr). Add HAWK signals to provide a low delay signalized crossing opportunity at select locations. Examples include the Safeway Driveway on Mt. Hermon Rd, at Victor Square/Scotts Valley Dr., and at Tramell Way/Scotts Valley Dr.	$1,030	$515	$515
Mt Hermon Rd to El Rancho Drive Bike/Ped Connection	SV-P53	New bike/ped connection between Mt Hermon Road and El Rancho Drive which could include improved bike/ped facilities on existing interchange or new bike/ped crossing.	$1,030	$1,030	$0
Mt Hermon Rd/ Spring Lakes Dr. Pedestrian Intersection Improvements	SV-P54	Improve pedestrian crossing at Spring Lakes Drive and Mt. Hermon Road.	$50	$50	$0
Mt Hermon Road Sidewalk Connections	SV-P30A	Add sidewalks to fill gaps in business district.	$520	$520	$0
Mt Hermon, Lockewood, Springs Lake Widening	SV-P13	Widen, reconstruct and improve portions of roadway and intersection.	$4,130	$0	$4,130
Mt Hermon/King's Village Rd-Transit Signal priority	SV-P46	Transit signal priority at Kings Village Rd/Mt Hermon Rd.	$80	$80	$0
Mt Hermon/Scotts Valley - Transit Queue Jump	SV-P47	Evaluate and if found to be beneficial, remove right turn islands at Mt Hermon Rd/Scotts Valley Road to add transit queue jump lanes/signals.	$620	$620	$0
Mt. Hermon Rd Circulation Master Plan	SV-P09	Provides various circulation and access improvements to the Mount Herman corridor.	$3,620	$0	$3,620

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Mt. Hermon Road/Town Center Entrance Traffic Signal	SV-P51	Install new traffic signal at the intersection of the future Town Center road that will accommodate increased pedestrian travel. Add a right-turn lane on the westbound approach. New signalization of the intersection at the future Town Center's primary access point on Mt. Hermon Road would provide protected pedestrian crossing, ADA accessible curb ramps and detectable surfaces on all intersection corners. Permitted left-turn phasing shall be used for the northbound and southbound approaches, while protected left-turn phasing shall be provided on the eastbound and westbound Mt. Hermon Road approaches.	$260	$130	$130
N. Navarra Dr-Sucinto Dr Bike Lanes	SV-P34	Add bike lanes to developing area behind commercial.	$620	$0	$620
Neighborhood Traffic Calming	SV-P28	Citywide traffic calming devices.	$770	$770	$0
Scotts Valley Town Center Bicycle/Pedestrian Facilities	SV-P45	Bicycle and pedestrian facilities and circulation elements within planned development.	$4,130	$4,130	$0
Scotts Valley-wide - Greenway Signage	SV-P48	Add signage for neighborhood greenways.	$20	$0	$20
Sky Park Commercial Area Circulation	SV-P11	Construct infrastructure improvement for Skypark commercial area.	$2,070	$0	$2,070
Synchronize Traffic Signals along Mt. Hermon Road	SV-P42	Re-time to coordinate traffic signals along Mt. Hermon Road.	$100	$100	$0
		City of Scotts Valley Total	**$87,684**	**$27,463**	**$60,221**
City of Watsonville					
2nd/Maple Ave (Lincoln to Walker) Traffic Calming and Greenway	WAT-P49	Evaluate and if found necessary, add traffic calming/bicycle traffic priority with wayfinding signage to provide access to MBSST and create low stress grid around downtown.	$25	$25	$0
5th St (Lincoln to Walker) - Traffic Calming and Greenway	WAT-P50	Evaluate and if found necessary, add traffic calming/bicycle traffic priority with wayfinding signage to provide access to MBSST and create low stress grid around downtown.	$25	$25	$0
Airport Blvd Improvements (Freedom Blvd to City Limits)	WAT 38	Road widening to accommodate extension of bicycle lane and portion of travel lane, installation of bus pull out, new sidewalks and curb ramps, refuge island, rectangular flashing beacon, striping, and roadway rehab.	$1,346	$1,346	$0
Airport Blvd Modifications (Hanger Way to Ross Ave)	WAT-P34	Reconstruct or repave roadway and bike lanes; repair, replace and install curb, gutter, sidewalk and curb ramps; replace and upgrade signage and striping.	$600	$0	$600
Airport Boulevard Improvements: Westgate/Larkin to Hanger Way	WAT 40	Reconstruct roadway, install new sidewalk, upgrade curb ramps and driveway crossings, install median islands, modify traffic signals to include add'l ped crossing and install rectangular rapid flashing beacon at crosswalk.	$1,645	$1,645	$0
Alley Improvements	WAT-P36	Repair & reconstruct some alleys.	$60	$60	$0
Bicycle Safety Improvements (Various Locations)	WAT 44	Improve existing bicycle facilities by installing new striping, markings and signage in place of the existing and installing new green bike lanes at the approaches on various streets. Work will be done at the following locations: Beach St from Lee Rd to Rodriguez St (1.42 mi); Bridge St from Beck St to East Lake Ave (1.48 mi); Green Valley Rd from Harkins Slough Rd to Corralitos Creek Bridge (1.92 mi); Harkins Slough Rd/Walker St from Green Valley Rd to Riverside Dr (1.73 mi); Rodriguez St from Riverside Dr to Main St (0.92 mi).	$525	$375	$150
Bridge Maintenance	WAT-P35	Maintenance of bridges	$115	$115	$0
Buena Vista/Calabasas/Freedom Connection	WAT-P30	Construction of roadway connection from Buena Vista area to Freedom Blvd. Reconstruct Via Nicola.	$5,950	$0	$5,950

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Citywide General Maintenance and Operations	WAT-P06	Ongoing maintenance, repair, and operation of road/street system, including bicycle and pedestrian facilities.(Total Need = $2,600/year, constr=$1500/yr)	$65,350	$41,400	$23,950
Citywide Pedestrian Facilities	WAT-P15	Construct sidewalks and curb ramps where necessary. This work is usually combined with the annual road rehabilitation and maintenance projects. Avg annual cost: $100/yr.	$2,380	$0	$2,380
Citywide Transportation Projects	WAT-P24	Lump sum of transportation projects to be identified in the future. Including major rehabilitation and operational improvements ($1.2M/yr).	$28,510	$0	$28,510
Crestview/Wagner Extension	WAT-P29	Construction of roadway connection from Atkinson Lane area to SR 152. Reconstruct/widen Wagner St.	$4,750	$0	$4,750
Downtown Watsonville Universal Streets	WAT-P59	Evaluate and if feasible, implement universal streets, which are designed for pedestrians and restrict vehicular access, which facilitate new ped access.	$600	$600	$0
East Fifth St (Main St to Lincoln St)	WAT-P39	Repair, replace and install curb, gutter, sidewalk and curb ramps; replace and upgrade signage and striping.	$300	$0	$300
East Lake Ave-(Hwy 152) Widening (Martinelli St-Holohan Rd)	CT-P33	Widen East Lake Ave. (SR 152) from 2 to 4 lanes (Martinelli St-Holohan Rd).	$1,030	$0	$1,030
East Lake/Madison - ped crossing	WAT-P57	Evaluate and if feasible, add pedestrian crossing (HAWK signal if ped volume warrants) at E Lake & Madison for better access to Hall Middle School.	$300	$300	$0
Freedom Blvd (Davis Ave to Green Valley Rd)	WAT-P68	Repair, reconstruct and/or upgrade pavement, bike lanes, sidewalks, transit facilities, signage and striping	$1,730	$1,730	$0
Freedom Blvd (Green Valley Rd to Buena Vista Dr)	WAT-P72	Repair and resurface damaged roadway and bike lanes, replace damaged sidewalks, add pedestrian facilities where none exist.	$5,000	$5,000	$0
Freedom Blvd (Green Valley Rd to Davis) Bicycle and Pedestrian Improvements	WAT-P61	Evaluate and if feasible, install bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals) to address speed inconsistency between bicyclists and vehicles. Complete sidewalks, including pedestrian buffer, and pedestrian islands at crossings.	$300	$300	$0
Freedom Blvd Pedestrian Crossings (Airport to Lincoln)	WAT-P62	Evaluate and if feasible, install new and improve existing uncontrolled pedestrian crossings at Roach Road, Davis Avenue, Clifford Lane, Mariposa Avenue, Alta Vista Street, Crestview Drive, Martinelli Street and Marin Street).	$600	$600	$0
Freedom Blvd Reconstruction (Alta Vista to Green Valley)	WAT 45	Remove and replace non-ADA compliant driveways and curb ramps, install high visibility crosswalks, provide sharrows and bicycle signage, upgrade existing bus stop shelter, install new traffic signal at Sydney Ave with pedestrian signal heads, pedestrian actuated traffic signals, audible countdown, pedestrian-level lighting and illumination at crosswalks and reconstruct roadway.	$3,250	$2,000	$1,250
Freedom Blvd Undergrounding	WAT-P38	Underground existing overhead utilities.	$1,270	$1,270	$0
Freedom Blvd/Green Valley Rd Neighborhood Bike/Ped Connections	WAT-P64	Evaluate and if feasible, implement greenway, which gives priority to bicycles and pedestrians on low volume, low speed streets including, pedestrian facilities, way finding and pavement markings, bicycle treatments to connect neighborhoods to goods and services on Freedom Blvd.	$1,800	$0	$1,800
Freedom Boulevard Plan Line	WAT 43	Preparation of a plan line for Freedom Boulevard between Green Valley Road and Buena Vista Drive that delineates multimodal modifications supported by the community.	$160	$160	$0
Green Valley Rd Improvement (Freedom Blvd to City Limit)	WAT-P45	Reconstruct existing roadway, install a median island to encourage safer turning movements, remove and replace existing driveways and curb ramps that do not comply with existing accessibility standards, restripe roadway to provide striping for bike lanes where none exist.	$2,000	$0	$2,000

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Green Valley Road Reconstruction (Struve Slough-Freedom Blvd)	WAT 42	Reconstruct existing roadway and bikelanes, remove existing asphalt pedestrian path and replace with concrete curb, gutter and sidewalk, remove and replace non-ADA compliant curb ramps and driveways, remove and replace existing signage, striping and loop detectors for traffic signal detectors. Increase sidewalk width consistent with the Complete Streets Guidebook. City may have to reduce existing roadway lane widths in order to provide wider sidewalks; may repave instead of reconstruct roadway or reduce limits of reconstruction based on allocated funds.	$1,598	$1,598	$0
Harkins Slough Rd (Hwy 1 to Green Valley Rd)	WAT-P69	Repair, reconstruct and/or upgrade pavement, bike lanes, sidewalks, transit facilities, signage and striping	$1,150	$0	$1,150
Hillside Ave to Freedom Blvd Ped/Bike Connection	WAT-P60	Evaluate and if feasible, install new bike/ped connection from Carey Avenue to Freedom Boulevard between Roache Road and Green Valley Road to connect neighborhood to goods, services and transit on Freedom Boulevard. Include new crossing from new bicycle/pedestrian facility to east side of Freedom Boulevard.	$360	$0	$360
Kearney/Rodriguez - Ped Crossing	WAT-P53	Evaluate and if found necessary, add pedestrian crossing at Kearney and Rodriguez with traffic calming for access to Radcliffe Elementary.	$35	$35	$0
Lower Watsonville Slough Trail	WAT-P46	Install bicycle/pedestrian trail	$770	$770	$0
Lump Sum Bicycle Projects	WAT-P19	Update the City Bicycle Plan and construction of additional routes and paths (250k/yr).	$5,950	$0	$5,950
Main St - 3 HAWK Signals	WAT-P54	Evaluate and if found necessary, add Hawk signals in 3 locations on Main St.	$890	$890	$0
Main St (Freedom to Riverside) Ped/Bike Enhancements	WAT-P58	Evaluate and if feasible improve ped facilities and bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals) and bike boxes and bicycle priority at intersections on Main Street intersections.	$890	$890	$0
Main St Modifications (500 Block: Fifth St to East Lake Ave)	WAT-P40	Repair, replace and install curb, gutter, and curb ramps; replace and upgrade signage and striping. Evaluate and if feasible, provide bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals), and buffered sidewalk.	$710	$710	$0
Main St Modifications (City Limit to Lake Ave)	WAT-P47	Repave roadway and bike lanes; repair, replace and install curb, gutter, sidewalk and curb ramps: replace and upgrade signage and striping. Evaluate and if feasible, provide bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals) and buffered sidewalks.	$1,670	$1,670	$0
Main St Modifications (East Lake Ave to Freedom Blvd)	WAT-P73	Provide complete streets improvements including but not limited to pedestrian crossings, bicycle facilities, bus stops, parking, sidewalks and traffic management	$1,000	$1,000	$0
Main St. (Hwy 152)/Freedom Blvd Roundabout	WAT 27a	Installation of a roundabout to replace the currently signalized intersection with safety considerations for bike/ped. Caltrans Project ID - 05-0T150.	$1,500	$1,500	$0
Main St/Beach St/Lake Ave Bike Facilities	CT-P38	Bicycle facilities - Main St (GV Rd to Mont Co line), Beach St (Walker to Lincoln) and Lake Ave (Main St to fairgrounds). County/City Project - Cost unknown.	$0	$0	$0
Main/Rodriguez/Union/Brennan (Freedom to Riverside) - Crosswalks	WAT-P55	Evaluate and if found necessary, increase the number of crosswalks on Main St, Rodriguez, and Union/Brennan to aim for 300 ft distance between crossings. Update pattern of crosswalks to block pattern.	$115	$115	$0
MBSST (Coastal Rail Trail): Lee Road, 4000 feet east to City Slough Trail connection	TRL 18L	Construction of 4000-foot long pathway parallel to the railroad tracks: twelve-foot width asphalt (hma). A 500 ft long retaining wall up to 3 ft tall with fence near Lee Road. A drainage structure east of Ohlone Parkway to be modified.Connection to Lee Road shall require installation of pathway or sidewalk to link to the existing sidewalk. At grade crossing at Ohlone Parkway and at a spur line located between Lee Road and Highway 1.	$1,540	$1,540	$0

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
MBSST Rail Trail: Walker Street to City Slough Trail connection	TRL 18W	Construction of 2400 ft pedestrian and bicycle path parallel to the existing railroad tracks and within the rail right-of-way. Also includes public outreach and training to improve bicycle and pedestrian safety.	$860	$860	$0
Neighborhood Traffic Plan	WAT-P04	Plan to identify and address concerns regarding speeding, bicycle and pedestrian access and safety, and other neighborhood traffic issues ($5k/yr).	$115	$115	$0
Neighborhood Traffic Plan Implementation	WAT-P13	Address concerns about traffic complaints through Education, Enforcement, and Engineering solutions. Install traffic calming devices that do not impede bicyclist access ($20k/yr).	$470	$470	$0
Ohlone Parkway Improvements - Phase 2 (UPRR to West Beach)	WAT-P31	Roadway, pedestrian, and bicycle facilities.	$600	$600	$0
Pajaro Lane to Freedom Blvd Ped/Bike Connection	WAT-P63	Evaluate and if feasible, new bike/ped connection from Pajaro Lane to Freedom Blvd to connect neighborhood to goods, services and transit on Freedom Boulevard. Include new crossing from new bicycle/pedestrian facility to west side of Freedom Boulevard.	$360	$0	$360
Pajaro Valley High School Connector Trail	WAT-P42	Install bicycle/pedestrian trail (this trail connects Pajaro Valley High School to Airport Blvd).	$710	$710	$0
Pennsylvania Dr (Green Valley Rd to Clifford Ave)	WAT-P70	Repair, reconstruct and/or upgrade pavement, bike lanes, sidewalks, transit facilities, signage and striping	$4,600	$0	$4,600
Riverside (Hwy 129) Bike Facilities	CT-P39	Bicycle facilities - Lee to Lakeview Road. County/City Project -Cost Unknown.	$0	$0	$0
Rodriguez St (Main St to Riverside)-Buffered Bike Lane	WAT-P51	Evaluate and if found necessary, improve bike lane striping, add buffered lanes on Rodriguez St to delineate bike lane from vehicle parking and traffic.	$12	$12	$0
Union/Brennan (Freedom to Riverside) - Sharrows	WAT-P52	Evaluate and if found necessary, add sharrows to Union/Brennan.	$12	$12	$0
Upper Struve Slough Trail	WAT-P65	Construction of 450 foot long pedestrian/bicycle path along upper Struve Slough from Green Valley Road to Pennsylvania Drive. The trail shall consist of a twelve-foot wide by one foot deep aggregate base section with the center eight feet covered with a chip seal. Additional improvements include installing a 130-length of modular concrete block retaining wall, reinforcing a 160-foot length of slough embankment with rock slope protection and installing a 175-foot long by eight foot wide boardwalk.	$530	$530	$0
Upper Watsonville Slough Trail	WAT-P43	Install bicycle/pedestrian trail.	$770	$770	$0
Walker St Modifications (Beach St to Watsonville Slough)	WAT-P48	Repave roadway and bike lanes; repair, replace and install curb, gutter, sidewalk and curb ramps; replace and upgrade signage and striping	$3,200	$0	$3,200
Watsonville Shuttle	WAT-P27	Year round public transit service.	$300	$0	$300
Watsonville-wide HOV priority	WAT-P56	Evaluate HOV priority at signals and HOV queue bypass.	$60	$60	$0
West Beach St (Lee Rd to Ohlone Parkway)	WAT-P66	Repair, reconstruct and/or upgrade pavement, bike lanes, sidewalks, transit facilities, signage and striping	$2,900	$0	$2,900
West Beach St (Ohlone Parkway to Walker St)	WAT-P67	Repair, reconstruct and/or upgrade pavement, bike lanes, sidewalks, transit facilities, signage and striping	$4,600	$0	$4,600
West Lake Ave Modifications (Main St to Rodriguez St)	WAT-P41	Repair, replace and install curb, gutter, sidewalk and curb ramps; replace and upgrade signage and striping	$240	$0	$240
		City of Watsonville Total	**$168,138**	**$71,808**	**$96,330**

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Consolidated Transportation					
Countywide Specialized Transportation	CTSA-P01	Non-ADA mandated paratransit and other specialized transportation service for seniors and people with disabilities. Includes medical service rides, Elderday, out-of-county rides, Sr. Meal Site, Taxi Script, and same day rides etc. Current avg annual need $2.58M. Constrained=$2M.	$56,700	$46,000	$10,700
Lift Line Maintenance/Operations Center	CTSA-P02	Construct a permanent maintenance center/consolidated operations facility for paratransit program (currently Lift Line).	$15,500	$0	$15,500
Medical Specialized Transportation for Veterans	CTSA-P06	Non-emergency medical transportation for veterans	$6,500	$0	$6,500
Medically Fragile Specialized Transportation	CTSA-P04	Non-emergency transportation service for medically fragile individuals. Includes operations and capital.	$5,000	$0	$5,000
Non-ADA Paratransit Service Expansion	CTSA-P03	Expansion of non-ADA paratransit system to meet needs of growing elderly and disabled populations. May include pre/post natal transport to medical appointments.	$21,700	$0	$21,700
		Consolidated Transportation Total	**$105,400**	**$46,000**	**$59,400**
County Health Services Agency					
Santa Cruz County Health Service Agency - Traffic Safety Education	CO 50	Ongoing education program to decrease the risk and severity of collisions. Includes bicycle and pedestrian programs: Community Traffic Safety Coalition, South County coalition, and Ride n' Stride Bicycle/Pedestrian Education Program.	$6,500	$2,200	$4,300
		County Health Services Agency Total	**$6,500**	**$2,200**	**$4,300**
County of Santa Cruz					
26th Ave Improvements (entire length-Portola Dr to end)	CO-P31a	Roadway and roadside improvements on various Major Collectors including sidewalks, bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$2,580	$0	$2,580
26th to 30th (at Lode/Quartz) Bike/Ped Connection	CO-P78	New bike/ped connection from Lode and Quartz to Moran Trail, which connects to 30th.	$520	$0	$520
37th/38th Ave (Brommer to Eastcliff) Multimodal Circulation Improvements and Greenway	CO-P27a	Evaluate and if feasible improve vehicle and transit access on 38th Avenue from East Cliff to Brommer and develop greenway on 37th Avenue from East Cliff to Portola. Roadway improvements may include roadway and roadside improvements including sidewalks, bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals), transit turnouts, left turn pockets, and intersection improvement.	$2,070	$570	$1,500
41st Ave Improvements Phase 2 (Hwy 1 Interchange to Soquel Dr)	CO-P26a	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,240	$340	$900
Airport Blvd Improvements (City limits to Green Valley Rd)	CO-P02	Major rehab, addition of bike lanes, transit facilities, merge lanes, intersection improvements, sidewalks, drainage, and landscaping.	$1,240	$1,240	$0
Alba Rd Improvements (Empire Grade to State Hwy 9)	CO-P30b	Roadwork includes major rehabilitation and maintenance of the road and roadsides.	$1,760	$0	$1,760
Amesti Road Multimodal Improvements (Green Valley to Brown Valley Rd)	CO-P03	Roadway rehab and reconstruction, left turn pockets at Green Valley Road, Pioneer Road/Varni Road. Add bike lanes, transit turnouts, sidewalks, merge lanes, landscaping, and intersection improvements.	$6,200	$600	$5,600
Aptos Beach Dr Improvements (Esplanade to Rio Del Mar Blvd)	CO-P27b	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvement.	$1,240	$0	$1,240

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Aptos Village Plan Improvements	CO 64	Modifications for ped, bike, bus and auto traffic. Add pedestrian facilities and drainage infrastructure on both sides of Soquel Dr; improve bike lanes; new bike parking; new bus pullout and shelter on north side. Trout Gulch: Replace sidewalks with standard sidewalks on east side, ADA upgrades to west side sidewalks. Install traffic signals at Soquel Dr/Aptos Creek Rd (CO 64c) & Soquel/Trout Gulch. Left turn lanes on Soquel at new street - Parade St and at Aptos Creek Road. RR crossing modifications - new crossing arms, concrete panels for vehicle and pedestrian crossings. New RR xing at Parade St. Phase 1: Trout Gulch Rd improvements w/traffic signal and upgraded RR xg at Soquel Dr. Pavement overlay of Soquel Dr (Spreckels to Trout Gulch) and a portion of Aptos Creek Road.	$4,100	$4,100	$0
Beach Road Improvements (City limits to Pajaro Dunes)	CO-P26b	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,240	$340	$900
Bean Creek Rd Improvements (Scotts Valley City Limits to Glenwood Dr)	CO-P28a	Roadway and roadside improvements on various Minor Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$1,760	$485	$1,275
Bear Creek Road Improvements (Hwy 9 to Hwy 35)	CO-P04	Major rehab, add bike lanes, turnouts, merge lanes, and intersection improvements. Some landscaping and drainage improvements also.	$4,750	$250	$4,500
Bonita Dr Improvements (entire length)	CO-P29b	Improvements of roadways and roadsides on various Minor Collectors including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$1,240	$0	$1,240
Bonny Doon Rd Improvements (Hwy 1 to Pine Flats Rd)	CO-P43	Construction of a Class 1 bike lane facility, addition of transit stops, intersection improvements, major road rehabilitation, road maintenance, and drainage improvements.	$8,260	$0	$8,260
Bowker Rd Improvements (entire length-Buena Vista Dr to Freedom Blvd)	CO-P33a	Roadway and roadside improvements on various Minor Collectors including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$620	$0	$620
Branciforte Dr Improvements (City of Santa Cruz to Vine Hill Rd)	CO-P30c	Improvements of roadways and roadsides on various Major Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road and roadsides.	$1,760	$0	$1,760
Branciforte Drive Chip Seal Project (Granite Creek Rd to SC city limits - 1.91mi)	CO 82	Roadway rehabilitation: Digouts, Rubberized Chip Seal, and restriping of a portion of Branciforte Drive	$433	$433	$0
Branciforte Drive Road Recycle & Overlay (PM 2.4 to Granite Ck Rd)	CO 79	Pavement recycling, asphalt overlay, and restriping of 0.62 miles of Branciforte Drive from Granite Creek to PM 2.4 (0.62 mil). To be constructed with CO 81 (Granite Creek).	$431	$431	$0
Brown Valley Rd Improvements (Corralitos Rd to Redwood Rd)	CO-P26d	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,240	$340	$900
Buena Vista Rd Improvements (San Andreas to Freedom Blvd)	CO-P26e	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$3,000	$825	$2,175
Bulb Ave Road Improvements (Garden St to Capitola City Limits)	CO-P65	Roadway and roadside improvements including curb, gutter, sidewalk, bike lanes, left turn lanes, intersection improvements and roadway rehabilitation.	$770	$0	$770
Cabrillo College Dr Improvements (Park Ave to Twin Lakes Church)	CO-P30d	Improvements of roadways and roadsides on various Major Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road and roadsides.	$1,240	$240	$1,000
Capital improvement projects consistent with the Sustainable Santa Cruz County Plan	CO-P96	Construct associated multi-modal infrastructure improvements associated with the Sustainable Santa Cruz County Plan	$22,000	$11,000	$11,000

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Capitola Rd Ext Improvements (Capitola Rd to Soquel Ave)	CO-P31b	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,240	$0	$1,240
Carol Way/Lompico Creek Bridge Replacement	CO-P49	Replace existing single span-two lane bridge construction of steel girders and long deck with new 30 ft wide single span flat sale concrete bridge. Include (2) 11 ft lanes and (2) 4 ft shoulders.	$1,240	$0	$1,240
Casserly Rd Improvements (Hwy 152 to Green Valley Rd)	CO-P26g	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$770	$208	$562
Cathedral Dr Improvements (entire length)	CO-P33b	Roadway and roadside improvements on Minor Collector. Roadwork includes major rehabilitation and maintenance of the road.	$620	$0	$620
Center Ave/Seacliff Dr Improvements (Broadway to Aptos Beach Dr)	CO-P26h	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,240	$340	$900
Chanticleer Ave Improvements (Hwy 1 to Soquel Dr)	CO-P26i	Roadway and roadside improvements including bike lanes, sidewalks, drainage and intersection improvements.	$1,240	$340	$900
Cliff Dr Improvements (Rio Del Mar to Railroad Crossing)	CO-P29c	Improvements of roadways and roadsides on various Minor Collectors including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$620	$0	$620
Clubhouse Drive Improvements (Sumner Av to Rio Del Mar Blvd)	CO-P32a	Road rehabilitation and maintenance. Roadside improvements: left lane pockets, sidewalks, bike lanes and transit turnouts.	$1,450	$0	$1,450
College Road Improvements (Hwy 152 to Lakeview Rd)	CO-P23	Major road rehab, add left turn pocket at Cutter Drive. Also add bike lanes, transit turnouts, sidewalks, landscaping. Drainage improvements, merge lanes, and intersection improvements may also be needed.	$1,760	$0	$1,760
Commercial Way Improvements (Mission Dr. to Soquel Dr.)	CO-P28c	Roadway and roadside improvements on various Minor Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$620	$170	$450
Corcoran Ave Improvements (Alice St to Felt St)	CO-P27c	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvement.	$620	$150	$470
Corralitos Road Rehab and Improvements (Freedom Blvd to Hames Rd)	CO-P08	Major rehab, transit, bike, and ped facilities. May also include drainage, merge lanes, landscaping and intersection improvements.	$620	$620	$0
County wide guardrail	CO-P97	Install guardrail on County roads	$15,000	$15,000	$0
Countywide ADA Access Ramps	CO-P37	Construction of handicapped access ramps countywide.	$1,240	$620	$620
Countywide Bike Projects	CO-P71	Bike projects based on needs identified through the Santa Cruz County Bicycle Plan and plan updates. These are in addition to projects listed individually in the RTP.	$4,130	$0	$4,130
Countywide General Road Maintenance and Operations	CO-P35	Ongoing maintenance, repair, and operation of road/street system within the unincorporated areas of the county.	$495,000	$446,857	$48,143
Countywide Sidewalks	CO-P41	Install sidewalks.	$72,310	$7,000	$65,310
Day Valley Rd Improvements (entire length-Freedom Blvd to Valencia Rd)	CO-P31c	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,240	$0	$1,240
East Cliff (26th to Moran Way) Sidewalk Improvement	CO-P77	Install sidewalk from 26th south to link to Moran Way.	$410	$0	$410

All Figures in year 2016, '000s (thousands of dollars)

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
East Cliff Dr Pedestrian Pathway (7th-12th Ave)	CO-P50	Construct pedestrian pathway on East Cliff.	$1,760	$1,760	$0
East Cliff Drive Cape Seal (12th-17th)	CO 66	Pavement maintenance, isolated section digout and asphalt replacement and cape seal on entire roadway.	$230	$230	$0
East Cliff Drive Improvements (32nd Ave to Harbor)	CO-P09	Roadway rehab, add left turn pockets at 26th and 30th Ave, fill gaps in bikeways and sidewalks, add transit turnouts, intersection improvements. Some landscaping and drainage improvements.	$4,750	$1,500	$3,250
East Zayante Rd Improvements (Lompico Rd to just before Summit Rd)	CO-P26j	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,760	$485	$1,275
Either Way Ln Bridge Replacement Project	CO-P88	The project will consist of completely replacing the existing narrow one lane structure and roadway approaches with a two lane clear span precast voided concrete slab bridge and standard bridge approaches.	$2,180	$2,180	$0
El Dorado Ave Road Improvements (Capitola Rd to RR)	CO-P67	Roadway and roadside improvements including curb, gutter, buffered sidewalk, bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals), left turn lanes, intersection improvements and roadway rehabilitation.	$1,810	$0	$1,810
El Rancho Dr Improvements (Mt. Hermon/Hwy 17 to SC city limits)	CO-P26k	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$2,380	$655	$1,725
Empire Grade Improvements	CO-P10	Road rehab and maintenance, left turn pocket at Felton Empire Road, add bike lanes, transit facilities, some sidewalks, landscaping. Drainage improvements, merge lanes, and intersection improvements may also be needed.	$4,750	$1,190	$3,560
Eureka Canyon Rd Improvements (Hames Rd to Buzzard Lagoon Rd)	CO-P26l	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$2,380	$655	$1,725
Felton Empire Road Improvements (entire length to State Hwy 9)	CO-P28d	Roadway and roadside improvements on various Minor Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$2,380	$655	$1,725
Fern Dr @ San Lorenzo River Bridge Replacement Project	CO-P90	The project will consist of completely replacing the existing three span single lane structure and roadway approaches with a new two lane clear span reinforced concrete box girder bridge and standard bridge approaches.	$2,830	$2,830	$0
Forest Hill Dr @ Bear Creek Bridge Replacement Project	CO-P86	The Project will consist of completely replacing existing steel girder bridge crossing Bear Creek with a new precast concrete voided slab bridge.	$2,050	$0	$2,050
Freedom Blvd Multimodal Improvements (Bonita Dr to City of Watsonville)	CO-P11	Add bike lanes, sidewalks on some segments, transit turnouts, signalization. Left turn pockets at Bowker, Day Valley, White Rd, and Corralitos Rd. Also includes merge lanes, intersection improvements, landscaping, major rehabilitation and maintenance, drainage improvements.	$3,100	$775	$2,325
Freedom Blvd Pavement Preservation (Hwy 1 to Pleasant Vly Rd)	CO 74	Rehabilitate the roadway surface.	$1,430	$1,430	$0
Glen Arbor Rd Improvements (State Hwy 9 to State Hwy 9)	CO-P30f	Improvements of roadways and roadsides on various Major Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road and roadsides.	$1,240	$0	$1,240
Glen Arbor Road Recycle, Overlay, & Chip Seal (SR 9-Quail Hallow)	CO 80	Pavement recycling, asphalt overlay, chip seal, and restriping 0.52 miles of Glen Arbor Road from Hwy 9 at bridge to Quail Hollow Rd. The project will also include a subdrain at a point where a natural spring is causing subgrade destabilization and repairs rutting damage adjacent to bus stops.	$467	$467	$0

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Glen Canyon Rd Improvements (Branciforte Dr to City of Scotts Valley)	CO-P26m	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$5,990	$1,640	$4,350
Glen Coolidge Drive/Hwy 9 Bike Path	CO-P40	Class 1 bike facility from Glen Coolidge Dr to Hwy 9 to provide eastern access to UCSC.	$2,380	$0	$2,380
Glenwood Cutoff General Improvements (Glenwood Dr to Hwy 17)	CO-P61	Roadway and roadside improvements including bike lanes, left turn lanes, intersection improvements and roadway rehabilitation.	$3,100	$0	$3,100
Glenwood Dr. Improvements (Scotts Valley city limits to State Hwy 17)	CO-P26n	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$3,000	$825	$2,175
Graham Hill Road Multimodal Improvements (City of SC to Hwy 9)	CO-P12	Bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes, traffic signals. Major rehabilitation and maintenance. Drainage improvements. Signal upgrade at SR9.	$7,020	$1,755	$5,265
Granite Creek Rd Improvements (Branciforte Dr to City of Scotts Valley)	CO-P30h	Improvements of roadways and roadsides on various Major Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road and roadsides.	$1,760	$0	$1,760
Granite Creek Road Recycle & Overlay - Part of CO 79B	CO 81	Pavement recycling, asphalt overlay, and restriping of 1.85 miles of Granite Creek Road from Scotts Valley city limits to PM 0.56.	$1,100	$1,100	$0
Green Valley Rd Bridge Replacement Project	CO-P85	The project will consist of completely replacing the existing two lane structure and roadway approaches with a two lane clear span concrete slab bridge and standard bridge approaches.	$2,110	$2,110	$0
Green Valley Rd Pedestrian Safety Project	CO 42b	Build 6-foot wide sidewalk with some curb and gutter on NW side of Green Valley Rd from Airport Blvd to Amesti Rd (1800 ft).	$390	$390	$0
Green Valley Road Improvements	CO-P13	Add two-way left turn lanes from Mesa Verde to Pinto Lake on Green Valley Rd. Also includes some road rehab and maintenance, bike lanes, sidewalks, transit facilities, landscaping, and merge lanes.	$4,130	$1,030	$3,100
Hames Rd Improvements (entire length-Freedom Blvd to Eureka Canyon Rd)	CO-P32b	Road rehab and maint. Roadside improvements--left lane pockets, sidewalks, bike lanes and transit turnouts.	$3,620	$0	$3,620
Harkins Slough Rd. Improvements (entire length-Buena Vista Dr to State Hwy 1)	CO-P32c	Road rehab and maint. Roadside improvements--left lane pockets, sidewalks, bike lanes and transit turnouts.	$1,760	$0	$1,760
Harper St Improvements (entire length-El Dorado Ave to ECM)	CO-P33d	Roadway and roadside improvements on various Minor Collectors including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$1,240	$310	$930
Highway 17 To Soquel Corridor Chip Seal Project	CO 83	Roadway rehabilitation: Digouts, Chip Seal, and restriping of Vine Hill Rd (Hwy 17 to B40), Branciforte Dr (Vine Hill to PM 0.7), Mt. View Rd (B40-N. Rodeo Gulch), N. Rodeo Gulch Rd (Mt. View-PM 1.97), Laurel Rd (N. Rodeo-Soquel San Jose Rd), and Soquel-San Jose Rd. (Laurel Glen to Dawn Lane) - 9.90 mi.	$1,881	$881	$1,000
Huntington Dr Improvements (Monroe Ave to Valencia Rd.)	CO-P32d	Road rehab and maint. Roadside improvements--left lane pockets, sidewalks, bike lanes and transit turnouts.	$2,380	$0	$2,380
Hwy 152/Holohan - College Intersection	CO 84	Intersection capacity enhancements and signal modifications, pedestrian and bicycle safety improvements. Add sidewalks and bicycle lanes on Holohan Rd, an additional left-turn lane from Holohan to EB Hwy 152, sidewalk on north side of Hwy 152 from Holohan to Corralitos Creek bridge, adds crosswalks and speed feedback signs.	$3,150	$3,150	$0
Jamison Cr Rd Improvements (entire length-Empire Grade to Hwy 236)	CO-P32e	Road rehab and maint. Roadside improvements--left lane pockets, sidewalks, bike lanes and transit turnouts.	$620	$0	$620

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
La Madrona Dr Improvements (El Rancho Dr to City of Scotts Valley)	CO-P14	Bike lanes, sidewalks, transit turnouts, left turn pockets at Sims Road, Highway 17, and El Rancho Road), merge lanes, and intersection improvements. Also includes major rehabilitation, drainage and maintenance.	$3,620	$905	$2,715
Lakeview Road Improvements	CO-P15	Major road rehab, add left turn pocket at College Road, intersection improvements at Carlton Rd. Also add bike lanes, new transit facilities, landscaping. Drainage improvements, merge lanes, and intersection improvements may also be needed.	$1,240	$0	$1,240
Larkin Valley Rd Improvements (San Andreas Rd to Buena Vista Dr)	CO-P30i	Improvements of roadways and roadsides on various Major Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road and roadsides.	$620	$0	$620
Larkspur Bridge @San Lorenzo River	CO-P91	The project will consist of completely replacing the existing narrow one lane structure and roadway approaches with a two lane bridge and standard bridge approaches.	$3,930	$3,930	$0
Laurel Glen Rd Improvements (Soquel-San Jose Rd to Mt. View/Rodeo Gulch Rd)	CO-P30j	Improvements of roadways and roadsides on various Major Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road and roadsides.	$1,240	$0	$1,240
Ledyard Way Improvements (entire length-Soquel Dr to Soquel Dr)	CO-P31d	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$620	$0	$620
Lockhart Gulch Improvements (Scotts Valley City limits to end)	CO-P31e	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,240	$0	$1,240
Lockwood Lane Improvements (Graham Hill Rd to SV limits)	CO-P24	Major road rehab, add bicycle lanes, sidewalks, some transit facilities, landscaping, and intersection improvements.	$881	$243	$638
Lompico Rd Bridge Replacement	CO-P95	The project will consist of replacing existing steel stringer bridge with a reinforced concrete slab bridge	$1,860	$0	$1,860
Lompico Rd Improvements (E Zayante Rd. to end)	CO-P30k	Improvements of roadways and roadsides on various Major Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road and roadsides.	$620	$0	$620
Maciel Ave Improvements (Capitola Rd to Mattison Ln)	CO-P29e	Improvements of roadways and roadsides on various Minor Collectors including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$1,450	$400	$1,050
Main St Improvements (Porter St to Cherryvale Ave)	CO-P27e	Roadway and roadside improvements on Major Collector including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvement.	$1,760	$1,760	$0
Manfre Rd Improvements (entire length-Larkin Valley Rd to Buena Vista Dr)	CO-P33e	Roadway and roadside improvements on various Minor Collectors including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$620	$0	$620
Mar Monte Ave Improvements (San Andreas Rd to State Hwy 1)	CO-P30l	Improvements of roadways and roadsides on various Major Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road and roadsides.	$620	$0	$620
Mar Vista Dr Improvements (entire length-just before Seacliff Dr to Soquel Dr)	CO-P33f	Roadway and roadside improvements on various Minor Collectors including addition of bike lanes, buffered sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$300	$0	$300
Mattison Ln Improvements (Chanticleer Ave to Soquel Ave)	CO-P26p	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,450	$400	$1,050

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
McGregor Dr Improvements (Capitola city limits to Searidge Rd)	CO-P33g	Roadway and roadside improvements on various Minor Collectors including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$1,240	$0	$1,240
Mesa Dr Improvements (Vienna Drive to Ledyard Way)	CO-P31f	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,240	$0	$1,240
Mill St Improvements (entire length)	CO-P27f	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvement.	$360	$360	$0
Mountain View Rd Improvements (Branciforte Dr to Rodeo Gulch Rd)	CO-P27g	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvement.	$1,240	$0	$1,240
Mt. Hermon Rd. Improvements (Lockhart Gulch to Graham Hill Rd)	CO-P26q	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$3,000	$825	$2,175
Murphy Crossing Improvements	CO-P39	Bikeway on Murphy Crossing (Hwy 129 to Monterey Co line), major rehabilitation and maintenance of road, drainage improvements may also be needed.	$1,240	$0	$1,240
Opal Cliff Dr Improvements (41st Av to Capitola City Limits)	CO-P31g	Roadway, roadside and intersection improvements including sidewalks, bike treatments (such as buffered and/or painted bike lanes), designed to accommodate the number of users and link to East Cliff Drive.	$1,240	$290	$950
Pajaro River Bike Path System	CO-P38	Construction of a Class 1 bike path along the levees and a Class 2 bikeway on Thurwatcher Road and Beach Road.	$9,500	$2,500	$7,000
Paul Minnie Ave. Improvements (Rodriguez St to Soquel Ave)	CO-P29f	Improvements of roadways and roadsides on various Minor Collectors including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$1,240	$340	$900
Paul Sweet Road Improvements (Soquel Dr to end)	CO-P22	Major road rehab and maintenance. Also adds bike lanes, sidewalks, landscaping. Drainage improvements, merge lanes, and intersection improvements, and new transit facilities may also be needed.	$1,240	$310	$930
Paulsen Rd Improvements (Green Valley Rd to Whiting Rd)	CO-P27h	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvement.	$1,240	$240	$1,000
Pine Flat Rd Improvements (Bonny Doon Rd to Empire Grade Rd)	CO-P28f	Roadway and roadside improvements on various Minor Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$2,380	$655	$1,725
Pinehurst Dr Improvements (entire length)	CO-P27i	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvement.	$880	$180	$700
Pioneer Rd Improvements (Amesti Rd to Green Valley Rd)	CO-P31h	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$880	$0	$880
Polo Dr Improvements (Soquel Dr to end)	CO-P29g	Improvements of roadways and roadsides on various Minor Collectors including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$1,450	$0	$1,450
Porter St Improvements (Soquel Dr to Paper Mill Rd)	CO-P26r	Roadway and roadside improvements including buffered sidewalks and bicycle treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals) to address speed inconsistency between bicyclists and vehicles, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,240	$340	$900
Quail Hollow Rd Bridge Replacement Project	CO-P82	The project will consist of completely replacing the existing two lane structure and roadway approaches with a two lane clear span concrete bridge and standard bridge approaches.	$2,430	$0	$2,430

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Quail Hollow Rd Improvements (entire length- East Zayante to Glen Arbor Rd)	CO-P32f	Road rehab and maint. Roadside improvements--left lane pockets, sidewalks, bike lanes and transit turnouts.	$830	$0	$830
Rancho Rio Ave @ Newell Creek Bridge Replacement Project	CO-P87	The project will consist of completely replacing the existing one lane structure and roadway approaches with a two lane clear span concrete slab bridge and standard bridge approaches.	$1,730	$0	$1,730
Redwood Lodge Rd (Entire Length)	CO-P51	Roadway and roadside improvements including curb, gutter, sidewalk, bike lanes, left turn lanes, intersection improvements and roadway rehabilitation.	$3,100	$0	$3,100
Redwood Rd Bridge Replacement Project	CO-P89	The project will consist of completely replacing the existing steel army tread way bridge crossing a tributary of Brown's Creek on Redwood Road with a reinforced concrete slab bridge and standard bridge approaches.	$1,310	$1,310	$0
Rio Del Mar Blvd Improvements (Esplanade to Soquel Dr)	CO-P30n	Improvements of roadways and roadsides on various Major Arterials including addition of bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road and roadsides.	$3,000	$725	$2,275
Rodeo Gulch Rd Improvements (So & North: Mt. View/Laurel Glen Rd to Hwy 1)	CO-P31i	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,760	$0	$1,760
Roland Dr Improvements (30th to 35th)	CO-P31j	Roadway and roadside improvements and implementation of greenway, which gives priority to bicycles and pedestrians on low volume, low speed streets including, pedestrian facilities, way finding and pavement markings, bicycle treatments to connect to new bike/ped connection to 41st.	$880	$0	$880
San Lorenzo River Valley Trail	CO-P46	15 mile, paved multi-use path for bicyclists and pedestrians from Boulder Creek to Santa Cruz.	$25,830	$0	$25,830
San Lorenzo Valley Trail: Hwy 9 - Downtown Felton Bike Lanes & Sidewalks	CO-P46a	Install sidewalks and bicycle lanes on Hwy 9 through downtown Felton.	$2,270	$2,270	$0
San Lorenzo Valley Trail: Hwy 9 - North Felton Bike Lanes & Sidewalks	CO-P46b	Install sidewalk/pedestrian path on west side, shoulder widening to 5' for bicycle lanes from Felton-Empire/Graham Hill Rd to Glen Arbor Road, Ben Lomond, including frontage of SLV elementary, middle and high schools. Includes new and replacement bike/ped bridges.	$7,640	$7,640	$0
San Lorenzo Way Bridge Replacement Project	CO-P83	The project will consist of completely replacing the existing one lane structure and roadway approaches with a two lane clear span bridge and standard bridge approaches.	$3,190	$3,190	$0
Scotts Valley Area Routes Chip Seal Project	CO 85	Roadway rehabilitation: Digouts, Chip Seal, and restriping Mt. Hermon Rd (PM 1.31 to SV city limits), Lockewood Ln (GH-SV city limits), and Graham Hill Rd (Sims to Lockewood) - 2.76mi	$940	$940	$0
Seacliff Dr Improvements (entire length)	CO-P27j	Roadway and roadside improvements on various Major Collectors including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvement.	$1,760	$0	$1,760
Seacliff Village/State Park Drive Improvements	CO 36	Construct sidewalks, bike lanes, bus turnouts/stops, central plaza, street lighting, EV charging station, parking, landscaping, drainage and roadway overlay in Seacliff core area- consistent with the Seacliff Village Plan adopted by the BOS in 2003.	$3,400	$3,400	$0
Seascape Blvd Improvements (Sumner Ave to San Andreas Rd)	CO-P26s	Roadway improvements and pavement rehabilitation.	$620	$170	$450
Sims Road Improvements (Graham Hill Rd to La Madrona Dr)	CO-P17	Road rehab and maintenance, drainage, intersection improvements, landscaping, add bike, ped, and transit facilities.	$1,760	$440	$1,320
Smith Grade Improvements (entire length- Empire Grade to Bonny Doon Rd)	CO-P32g	Road rehab and maint. Roadside improvements--left lane pockets, sidewalks, bike lanes and transit turnouts.	$2,380	$0	$2,380

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Soquel Ave Improvements (City of SC to Gross Rd)	CO-P18	Transit turnouts, two way left turn lanes from Chanticleer to Mattison, merge lanes, signalization and intersection improvements. Signals at Chanticleer and Gross Rd. Roadwork: major rehabilitation and maintenance, perhaps drainage improvements. Roadside: sidewalks, landscaping, and new transit facilities.	$3,310	$3,310	$0
Soquel Dr Improvements (Soquel Ave to Freedom Blvd)	CO-P19	Major rehab, merge lanes, intersections improvements, signal coordination, transit turnouts, fill sidewalk and bike facility gaps, some landscaping.	$7,540	$1,885	$5,655
Soquel Dr Road Improvements (Robertson St to Daubenbiss)	CO-P62	Roadway and roadside improvements including curb, gutter, sidewalk, bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals), left turn lanes, intersection improvements and roadway rehabilitation.	$410	$410	$0
Soquel Dr Traffic Signal and Left Turn Lane (Robertson St)	CO-P58	Install left turn lane at signalized intersection from Soquel Dr to Robertson St and associated roadside improvements	$1,000	$0	$1,000
Soquel-San Jose Rd Improvements (Paper Mill Rd to Summit Rd)	CO-P36	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$2,580	$580	$2,000
Soquel-Wharf Rd Improvements (Robertson St to Porter St)	CO-P28g	Roadway and roadside improvements on various Minor Arterials including addition of bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals), transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$1,030	$515	$515
Spreckels Dr Improvements (Soquel Dr to Aptos Beach Dr)	CO-P27k	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvement.	$1,240	$340	$900
Spreckels Dr/Treasure Island Dr Improvements	CO-P42	Addition of bike lanes, intersection improvements, major road rehabilitation, road maintenance, and possible drainage improvements.	$620	$0	$620
State Park Drive Improvements Phase 2	CO-P20	Transit turnouts, two way left turn, merge lanes, intersection improvements, and fill gaps in bike and ped facilities including pedestrian crossing improvements, bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike signals). Plus, major rehabilitation and maintenance, drainage improvements, landscaping.	$1,340	$335	$1,005
Summit Rd Improvements	CO-P26u	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$5,580	$1,530	$4,050
Sumner Ave Improvements (entire length-Rio Del Mar Blvd to end [just past via Novella])	CO-P32h	Road rehab and maint. Roadside improvements--left lane pockets, sidewalks, bike lanes and transit turnouts.	$1,450	$0	$1,450
Swanton Rd Bridge Replacement	CO-P94	The project will consist of replacing existing 3 span steel girder bridge with a single span concrete box girder bridge	$2,540	$0	$2,540
Thompson Ave Improvements (entire length-Capitola Rd to end)	CO-P33h	Roadway and roadside improvements including major rehabilitation and maintenance of road and includes implementation of greenway, which gives priority to bicycles and pedestrians on low volume, low speed streets including, pedestrian facilities, way finding and pavement markings, bicycle treatments to connect to MBSST.	$1,240	$0	$1,240
Thurber Ln Improvements (entire length)	CO-P28h	Roadway and roadside improvements on various Minor Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$1,760	$485	$1,275
Thurwachter Road Bike Lanes	CO-P68	Install bicycle lanes.	$50	$0	$50

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Trout Gulch Rd Improvements (Soquel Dr. to end)	CO-P30p	Improvements of roadways and roadsides on various Major Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road and roadsides.	$3,000	$0	$3,000
Upper Zayante Rd Improvements	CO-P98	Roadway and roadside improvements including bike lanes, sidewalks, transit turnouts, left turn pockets, merge lanes and intersection improvements.	$1,500	$0	$1,500
Valencia Rd Improvements (Trout Gulch Rd to Valencia School Rd)	CO-P32j	Road rehab and maint. Roadside improvements--left lane pockets, sidewalks, bike lanes and transit turnouts.	$1,760	$0	$1,760
Varni Rd Improvements (Corralitos Rd to Amesti Rd)	CO-P28i	Roadway and roadside improvements on various Minor Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$1,240	$340	$900
Vine Hill Rd Improvements (Branciforte/Mt. View Rd to State Hwy 17)	CO-P30q	Improvements of roadways and roadsides on various Major Arterials including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road and roadsides.	$1,450	$0	$1,450
Wallace Ave Improvements (entire length-Huntington Dr to end)	CO-P33i	Roadway and roadside improvements on various Minor Collectors including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$880	$0	$880
Webster St Improvements (Jose Ave to 16th St)	CO-P29h	Improvements of roadways and roadsides on various Minor Collectors including addition of bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvements. Roadwork includes major rehabilitation and maintenance of the road.	$1,240	$0	$1,240
Winkle Ave Improvements (entire length from Soquel Dr)	CO-P27l	Roadway and roadside improvements on various Major Collectors including bike lanes, transit turnouts, left turn pockets, merge lanes and intersection improvement.	$2,380	$655	$1,725
Zayante Road Corridor Chip Seal Project	CO 86	Roadway rehabilitation: Digouts, Chip Seal, and restriping East Zayante & Upper E. Zayante from Quail Hallow to SR 35 (up to 9.07mi). Project to be scaled to match available funds	$1,725	$1,025	$700
		County of Santa Cruz Total	**$915,568**	**$565,675**	**$349,893**
Ecology Action					
Bike To Work/School Program	RTC 26	Countywide education, promotion, and incentive program to actively encourage bicycle commuting and biking to school. Coordinates efforts with local businesses, schools, and community organizations to promote bicycling on a regular basis. Provides referrals to community resources. Avg annual cost: $140K/yr-includes in-kind donations and staff time.	$3,870	$1,870	$2,000
Ecology Action Countywide SRTS Youth Pedestrian and Bicycle Safety Education	EA 02	EA will serve approximately 120 second grade classrooms with 'feet on the ground' pedestrian safety education and 88 fifth grade classrooms with bike safety education and 'rodeos' serving a total of 44 local schools.	$8,360	$440	$7,920
Ecology Action Transportation Employer Membership Program	RTC 17	Community organization that promotes alternative commute choices. Work with employers, incentives for travelers to get out of SOVs including: emergency ride home, interest-free bike loans, discounted bus passes. Avg cost: $90K/yr. Coordinates with Bike to Work program.	$2,320	$1,135	$1,185
Every Day is Bike to Work Day	EA 03	Pilot bike commuter initiative to increase bike commuting at 6 large employers in Santa Cruz, Live Oak, and Watsonville areas; includes bike commute and safety workshops, online tracking apps/systems, support/encouragement	$3,360	$60	$3,300

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Monterey Bay Electric Vehicle Alliance (MBEVA)	VAR-P22	Help facilitate this broad collaboration of PEV advocates, businesses, union labor, manufacturers and public agencies to assist the adoption of PEV's in the Monterey Bay region. MBEVA's main goals are to: • Create PEV infrastructure in this region • Educate the public on the benefits of PEV's • Educate gov't agencies on ways to streamline PEV policy, permitting, and implementation and • Help train workforce for PEV related jobs.	$900	$200	$700
		Ecology Action Total	**$18,810**	**$3,705**	**$15,105**
SCCRTC					
Bicycle Route Signage Countywide	RTC 32	Define routes, develop and install signs directing bicyclists to preferred routes to various destinations countywide.	$600	$600	$0
Bike Parking Subsidy Program	RTC 16	Subsidies for bicycle racks and lockers for businesses, schools, government agencies, and non-profit organizations are all eligible. Recipients are responsible for installation and maintenance of the equipment. Avg annual cost: $25K/yr.	$550	$210	$340
County-wide Bicycle, Pedestrian and Vehicle Occupancy Counts	RTC-P50	Conduct counts to assess mode split over time and assess impact of new facilities.	$432	$232	$200
Cruz511 TDM and Traveler Information	RTC 02a	Transportation demand management including centralized traveler information system and ride matching services. Outreach, education and incentives; multimodal traveler information system on traffic conditions, incidents, road and lane closures; ride matching service for carpools, vanpools, and bicyclists; services and information about availability and benefits of all transportation modes, including sharing rides, transit, walking, bicycling, telecommuting, alternative work schedules, alternative fuel vehicles, and park-n-ride lots. Avg annual cost: $315k.	$5,290	$2,640	$2,650
Environmental Assessment, Economic and Other Analyses of Options for Rail Corridor	RTC-P02a	Environmental assessment, economic and other analyses of a possible future public transit system and other transportation options on the rail corridor right-of-way.	$8,000	$8,000	$0
Freeway Service Patrol (FSP) on Hwy 1 and Hwy 17	RTC 01	Maintain and expand tow truck patrols on Highways 1 and 17. Work with the CHP to quickly clear collisions, remove debris from travel lanes, and provide assistance to motorists during commute hours to keep incident related congestion to a minimum and keep traffic moving. Avg need: $300k/yr constrained (some from SB1); $430k/yr total cost.	$9,460	$6,600	$2,860
MBSST - North Coast Rail Trail	TRL 5	Monterey Bay Sanctuary Scenic Trail Network (MBSST) sections ph. 1 Wilder Ranch-Coast Dairies (5.1 mi); ph. 2-Yellow Bank Beach/Panther Beach-Davenport (2.1 mi).	$20,000	$20,000	$0
MBSST - Rail and Hwy 1 Bicycle and Pedestrian Crossing at Laguna Creek Beach	RTC 27d	Design, approval of CPUC, environmental clearance, and construction of a bicycle and pedestrian crossing of the rail line and Hwy 1 to provide access between the Coastal Rail Trail at Laguna Creek Beach and the parking area on the inland side of Hwy 1.	$2,000	$0	$2,000
Measure D Administration and Implementation	RTC-P59	SCCRTC administration, implementation and oversight of Measure D and the revenues generated from the 2016 Santa Cruz County Transportation Sales Tax - Measure D. Costs include annual independent fiscal audits, reports to the public, preparation and implementation of state-mandated reports, oversight committee, preparation of implementation, funding and financing plans, and other responsibilities as may be necessary to administer, implement and oversee the Ordinance and the Expenditure Plan.	$16,500	$16,500	$0
Monterey Bay Sanctuary Scenic Trail Network (Coastal Rail Trail) - Trail Management Program	RTC 27c	Coordinate trail implementation as it traverses multiple jurisdictions to ensure uniformity; serve as Project Manager for construction of some segments; handle environmental clearance; coordinate use in respect to other requirements (closures for ag spraying, etc); solicit ongoing funding and distribute funds to implementing entities through MOUs; coordinate with community initiatives; etc.	$1,030	$1,030	$0

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Monterey Bay Sanctuary Scenic Trail Network - Design, Environmental Clearance, and Construction	RTC 27a	Design, environmental clearance and construction of the 32-mile rail component of the 50+ mile network of bicycle and pedestrian facilities on or near the coast, with the rail trail as the spine and additional spur trails to connect to key destinations. (Funded segments listed individually.)	$80,500	$41,500	$39,000
Monterey Bay Sanctuary Scenic Trail Network (Coastal Rail Trail) - Maintenance	RTC 27b	Maintenance of the rail trail component of the Monterey Bay Sanctuary Scenic Trail Network - ongoing clean-up, trash/recycling removal, graffiti abatement, brush clearance, surface repairs (from drainage issues, tree root intrusion) etc.	$9,600	$4,800	$4,800
Performance Monitoring	RTC-P51	Transportation data collection and compilation to monitor performance of transportation system to advance goals/targets. Includes travel surveys of commuters, Transportation Demand Management plan, a low-stress bicycle network plan and parking standards plan.	$1,650	$220	$1,430
Planning, Programming & Monitoring (PPM) - SB45	RTC 04	Development and amendments to state and federally mandated planning and programming documents, monitoring of programmed projects. Avg annual cost: $250k/yr.	$5,680	$1,870	$3,810
Rail and Trail Corridor Management and Maintenance	RTC-P03	Operating expenses for rail line oversight. Avg annual cost:$175K/yr.	$3,850	$3,850	$0
Rail Line: Freight Service Upgrades	RTC-P41	Upgrade rail line to FRA Class 2 to a condition for reasonable ongoing maintenance into the future. Upgrade crossings, replace jointed rail with continuously welded rail, upgrade signals, and replace ties.	$25,000	$0	$25,000
Rail Transit: Watsonville-Santa Cruz Corridor	RTC-P02	Design, construction, and operation of fixed guideway public transit between Santa Cruz and Watsonville. May be a joint project with the SCCRTC, SCMTD, and local jurisdictions. Annual op cost est: $5-10M/yr; capital: $31.5M-$133M depending on service area and frequency (Total cost reflects Scenario G from 2015Rail Transit Study). Cost shown for 15 years of service during RTP period.	$283,000	$0	$283,000
Railroad Infrastructure Maintenance and Rehabilitation	RTC 36	Protect, maintain and rehabilitate the railroad infrastructure on the Santa Cruz Branch Rail Line including bridges, track, drainage, culverts, signals, etc.	$22,410	$22,410	$0
Real-Time Transit Info	RTC-P58	Develop and maintain distribution channel for disseminating real time transit arrival and departure information to Santa Cruz Metro users. To be developed in coordination with Santa Cruz Metro.	$520	$220	$300
Recreational Rail Infrastructure	RTC 25	Seasonal passenger rail service on Santa Cruz Branch rail line. Infrastructure needed for the service is listed here (e.g. platforms, sidings, pedestrian & disabled access, rail vehicles). Unsubsidized operations will be provided by a private operator and operating costs are therefore not included here. All costs are estimated.	$5,340	$0	$5,340
Regional State Transit Assistance Projects	RTC-P60	State Transit Assistance (STA) eligible transit projects	$33,220	$33,220	$0
RTC Bikeway Map	RTC-P49	Update, print and distribute free SC County Bikeway Map and update GIS files as needed.	$320	$320	$0
SAFE: Call Box System Along Hwys	RTC-P01	Motorist aid system of telephone call boxes along all highways plus maintenance and upgrades. Call boxes may be used to request assistance or report incidents. Avg annual cost: $245/yr	$5,390	$5,390	$0
Santa Cruz Branch Rail Line Improvements	RTC 03a	Infrastructure preservation for current uses and future transportation purposes.	$570	$570	$0
SCCRTC Administration (TDA)	RTC-P07	SCCRTC as Regional Transportation Planning Agency for Santa Cruz County distributes Transportation Development Act Local Transportation Funds and State Assistance Funds for planning, transit, bicycle facilities and programs, pedestrian facilities and programs and specialized transportation in accordance with state law and the unmet transit needs process. Average annual cost: $650K/yr.	$14,300	$14,300	$0

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
SCCRTC Planning	RTC-P08	SCCRTC Planning Tasks. Includes public outreach, long and short range planning, interagency coordination. Avg annual cost: $625k/yr.	$13,750	$13,750	$0
School-Based Mobility/TDM Programs	RTC-P54	Student transportation programs aimed at improving health and well being, transportation safety and sustainability and that facilitate mode shift from driving alone in a motor vehicle to active and group transportation.	$2,690	$1,100	$1,590
Shared Parking Program	RTC-P57	Develop tools to allow adjacent property owners to develop and share parking facilities.	$150	$50	$100
Transportation Demand Management Ordinance and User Guide	RTC-P56	Develop Model TDM Ordinance and User Guide to include provisions for both residential and non-residential projects and address program and facilities improvements in return for reductions in off-street parking requirements.	$260	$0	$260
Vanpool Incentive Program	RTC 15	Assist in start up and retention of vanpools. Includes financial incentives: new rider subsidies, driver bonuses, and empty seat subsidies. Also may include installation of wifi on vans. Avg Annual Cost: $25k/yr.	$670	$100	$570
		SCCRTC Total	**$572,732**	**$199,482**	**$373,250**
SCCRTC/Caltrans					
1 - Hwy 1 Corridor Investment Program	RTC 24a	Tier 1 – program level design/environmental analysis to establish a Corridor Investment Program (CIP) to reduce congestion along the 9 mile section of Highway 1 between San Andreas Rd/Larkin Valley Rd (Aptos) and Morrissey Boulevard (Santa Cruz). [Other RTC24_ projects are increments of the Highway 1 CIP.] Caltrans Project ID 05-0C730	$0	$0	$0
2 - Hwy 1: Auxiliary Lanes from 41st Ave to Soquel Ave and Chanticleer Bike/Ped Bridge	RTC 24f	Construct auxiliary lanes and a bicycle/pedestrian overcrossing of Hwy 1 at Chanticleer Ave. Caltrans Project ID 05-0C732	$32,100	$32,100	$0
3 - Hwy 1 Auxiliary Lanes: State Park Dr-Park Ave and Park Ave-Bay/Porter	RTC 24e	Construct approximately 2.5 miles of auxiliary lanes northbound and southbound between State Park Dr and Park Ave interchange and the Park Ave and Bay/Porter interchange. Includes retaining walls, soundwalls and reconstruction of Capitola Avenue overcrossing with wider sidewalks and bike lanes. [Part of Highway 1 CIP project (RTC 24a)]	$73,000	$73,000	$0
5 - Hwy 1: Reconstruct Morrissey Blvd Interchange	RTC 24h	Reconstruct Morrissey Blvd overcrossing with enhanced pedestrian and bicycle treatments (such as buffered or painted facilities) on both sides of the overcrossing, and/or a bicycle/pedestrian overcrossing at Trevethan Ave, reconfigure ramps and local streets to accommodate the new interchange, and ramp metering.[Part of Highway 1 CIP project (RTC 24a), but listed here as standalone project.]	$45,800	$0	$45,800
6 - Hwy 1: Reconstruct Soquel Avenue Interchange	RTC 24i	Reconstruct the overcrossing with enhanced pedestrian and bicycle facilities on both sides, reconfigure ramps and local streets to accommodate the new interchange, and ramp metering. [Part of Highway 1 CIP project (RTC 24a), but listed here as standalone project.]	$67,330	$0	$67,330
7 - Hwy 1: Reconstruct Bay Ave/Porter St and 41st Avenue Interchange	RTC 24j	Reconstruct highway to operate as a single interchange. Includes construction of a frontage road that includes bike lanes and sidewalks connecting the Bay/Porter and 41st Ave intersections ; reconstruction of the Bay/Porter undercrossing and the 41st Avenue overcrossing with enhanced pedestrian and bicycle treatments on both sides, and reconfiguration of ramps and local streets to accommodate local traffic and ramp metering. [Part of the Highway 1 CIP project (RTC 24a), but is listed here as a standalone project.]	$113,810	$0	$113,810
91 - Hwy 1: Reconstruction of 2 Railroad Crossings in Aptos.	RTC 24o	Reconstruct two railroad crossings over Highway 1 in Aptos. [Part of Highway 1 CIP project (RTC 24a), but listed as a standalone project.]	$41,100	$0	$41,100

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
92 - Hwy 1: Auxiliary Lanes from Rio Del Mar Blvd to State Park Dr Including Bridge over Aptos Creek	RTC 24p	Construct auxiliary lanes and reconstruct bridge over Aptos Creek. [Part of Highway 1 CIP project (RTC 24a), but listed as a standalone project.]	$66,800	$0	$66,800
93 - Hwy 1: Auxiliary Lanes from Freedom Blvd to Rio Del Mar Blvd	RTC 24q	Construct auxiliary lanes. [Part of Highway 1 CIP project (RTC 24a), but listed as a standalone project.]	$16,700	$0	$16,700
94 - Hwy 1: Northbound Auxiliary Lane from San Andreas Rd/Larkin Valley Rd to Freedom Blvd	RTC 24r	Construct northbound auxiliary lane. [Note: This project was not included as part of Highway 1 CIP project (RTC 24a).]	$8,800	$8,800	$0
95 - Hwy 1: Reconstruct Remaining Interchanges	RTC 24k	Interchange modifications not identified as separate projects (San Andreas Rd/Larkin Valley Rd, Freedom Blvd, Rio Del Mar Blvd, State Park Dr, and Park Ave) , including reconfiguration of ramps and local streets for ramp meters, enhanced pedestrian and bike treatments (such as buffered or painted facilities) in each direction and sufficient width to allow addition of HOV lanes. [Part of the Highway 1 CIP project (RTC 24a), but is listed here as a standalone project.]	$127,200	$0	$127,200
96 - Hwy 1: Construction of HOV Lanes from San Andreas Rd/Larkin Valley Rd to Morrissey Blvd	RTC 24m	Construction of High Occupancy Vehicle (HOV or Carpool) Lanes on Highway 1 from San Andreas Rd/Larkin Valley Rd to Morrissey Blvd. Cost excludes auxiliary lanes, reconstruction of interchanges for ramp metering, over and under crossings, and traffic operation system (TOS) elements on the corridor. [These costs are listed separately (RTC 24 a,e,f,g,h,l,j, m,n,o,p,q,r). Could be expensed under a complete Hwy 1 HOV Lane project (RTC 24, $603,000) but currently expensed as a standalone project.]	$61,980	$0	$61,980
97 - Hwy 1: HOV Lanes from San Andreas Rd/Larkin Valley to Morrissey Blvd	RTC 24z	Construct HOV or Carpool lanes on Highway 1 from San Andreas Rd/Larkin Valley Rd to Morrissey Blvd, including auxiliary lanes, reconstruction of interchanges with enhanced bike and pedestrian facilities, arterial and ramp modifications to allow ramp metering, a new bike/ped crossing at Trevethan, and traffic operation system (TOS) element. [Cost if built in entirety: $603,000. See stand alone projects (RTC24f,e,g,h,I,j,a,m) for cost of incremental implementation.] Caltrans Project ID 05-0C730	$0	$0	$0
98 - Hwy 1: TSM Project from Morrissey to San Andreas Rd.	RTC 24n	Construct the TSM project alternative as described in the Tier 1 environmental study to establish a Highway 1 Corridor Investment Program. Project includes auxiliary lanes, modifications of interchanges with enhanced bike and pedestrian treatment, arterial and ramp modifications to allow ramp metering, a new bike/ped crossing at Trevethan, and traffic operation system (TOS) element. [Cost if built in entirety, rather than incrementally: $249,100. Assumes RTC 24f has been completed.]	$0	$0	$0
Hwy 1 Bicycle/Ped Overcrossing at Mar Vista	RTC 30	Construct a bicycle/pedestrian overcrossing of Hwy 1 in vicinity of Mar Vista Drive, providing improved access to Seacliff and Aptos neighborhoods and schools.	$7,800	$7,800	$0
Hwy 1 Ramp Metering: Northern Sections Between San Andreas Road and Morrissey Blvd	RTC 34	Reconfiguration of ramps and local streets to allow for ramp metering and installation of ramp meters. Could be expensed under a separate stand alone project ($6.7 M)	$0	$0	$0
Hwy 1 Ramp Metering: Southern Sections	CT-P01	Reconfigurations of ramps and installation of ramp meters at interchanges from Hwy 129/Riverside Dr to Mar Monte Ave.	$20,600	$0	$20,600
		SCCRTC/Caltrans Total	**$683,020**	**$121,700**	**$561,320**
SCMTD					
ADA Access Improvements	MTD-P51	Add or improve ADA accessibility to all bus stops and METRO facilities.	$4,222	$350	$3,872
ADA Paratransit Service - Continuation of Existing Service	MTD-P10C	Operation & maintenance cost of existing Paratransit service. Avg Annual Cost: $5.5M.	$121,000	$121,000	$0

All Figures in year 2016, '000s (thousands of dollars)

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
ADA Paratransit Vehicle Replacements	MTD 02	Replace buses/vans for ADA paratransit fleet (including Accessible Taxi program).	$14,040	$6,000	$8,040
ADA Service Expansion	MTD-P11	Add capacity to meet increased trip demand thru 2040. Assumes 2% increase/year starting in 2019.	$2,500	$1,050	$1,450
Automatic Vehicle Locator and Automatic Passenger Counter Systems	MTD 24	Automatic Vehicle Locator (AVL), Automatic Passenger Counters, and automatic vehicle announcing systems on METRO buses. Provide real time bus arrival/departure displays at bus stops. Necessary IT upgrades and data collectionfor system operations, security, planning and maintenance.	$3,200	$3,200	$0
Bike Station at Capitola Mall	MTD-P23	Establish bike station at Capitola Mall, especially to serve UCSC. Would be joint mall, UCSC, MTD project.	$1,030	$0	$1,030
Bikes on Buses Expansion	MTD-P20	Add additional space for bikes on articulated buses when/if METRO purchases or leases 60-ft articulated buses.	$60	$0	$60
Bus on Shoulder	MTD-P57	Plan, design, seek Caltrans approvals, and construct improvements to utilize freeway shoulders to bypass congestion on Highway 1 and possibly Highway 17 to speed inter-city bus service	$12,000	$0	$12,000
Bus Rapid Transit	MTD-P15	Construct park & ride lots, transit centers and grade-separation where feasible to operate bus rapid transit to reduce congestion on Highway 1.	$26,780	$0	$26,780
Bus Rebuild and Maintenance	MTD-P31	Rebuild engines; Fleet maintenance equipment. Avg. cost is ~$250k/bus, increases useful life up to 8 years at 40% of the cost of new buses.	$5,250	$5,250	$0
Bus Replacements	MTD-P04	Replace fleet at the end of normal bus lifetime (approximately every 12 years; $675 each for local fixed route; $900k each for Hwy 17 Over the Road coaches).	$142,420	$73,000	$69,420
Bus Stop and Station Improvements	MTD-P52	Improve customer access and/or amenities at bus stops; add bus stop pads to preserve pavement.	$500	$500	$0
Commuter/Subscription Bus Program	MTD-P18	Capital and operating for subscription buses to areas not currently served by express buses (similar to large vanpool).	$2,070	$0	$2,070
Customer IT amenities	MTD-P55	Upgrade Hwy 17 Wi-Fi and expand to local routes; real-time bus arrival website.	$1,010	$0	$1,010
Deviated Fixed-Route Pilot Program	MTD-P43	Pilot project allowing buses to make minor route modifications to address needs of senior and disabled riders.	$100	$0	$100
Electric Non-Fleet Vehicles	MTD-P47	Replace non-revenue vehicles to EV.	$580	$0	$580
EV Fast Charging Stations	MTD-P48	Install 5 electric vehicle charging stations at transit centers.	$1,030	$0	$1,030
Hwy 1 Express Buses	MTD-P27	Hwy 1 express bus replacements - 6 Buses @ $500k ea. Replace every 12 years.	$6,200	$0	$6,200
Hwy 17 Express Service - Continuation of Baseline Service Levels	MTD-P10B	Operation & maintenance cost of existing Highway 17 Express bus service. Avg annual cost: $4.5M.	$99,000	$99,000	$0
Hwy 17 Express Service Restoration and Expansion	MTD-P12	Restore Hwy 17 Express service to FY16 levels, then expand service 2% annually. Restore $300K/yr operating plus 2% annually plus capital costs (2 buses)	$10,000	$4,000	$6,000
Inter-County Paratransit Connection	MTD-P44	Establish paratransit connection location with Santa Clara County.	$1,290	$0	$1,290
Local Transit - Continuation of Baseline Service Levels 2019-2040	MTD-P10	Operation & maintenance cost of existing local fixed route bus service. Avg annual cost: $38M.	$836,000	$836,000	$0

All Figures in year 2016, '000s (thousands of dollars)

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Local Transit Service Restoration and Expansion	MTD-P14	Restore local service to FY16 levels, then expand service 2% annually. Restore $6.2M/yr operating plus 2% annually plus capital costs (16 buses)	$173,000	$72,000	$101,000
Maintenance Facility Expansion	MTD-P38	Property acquisition, design, and construction of maintenance facility expansion.	$15,850	$0	$15,850
Metro facilities repair/upgrades	MTD-P36	Maintain and upgrade facilities.	$6,270	$4,300	$1,970
Metro rebranding	MTD-P58	Develop marketing program and establish consistent brand with uniform signage, letterhead, ads.	$500	$0	$500
Non-Revenue Vehicle Replacements	MTD-P32	Replace support vehicles.	$3,450	$1,200	$2,250
Pacific Station- Bike Station	MTD-P49	Establish bike station at Pacific Station.	$410	$0	$410
ParaCruz Mobile Data Terminals; Radios	MTD-P30	Replace mobile data terminals in vehicles	$760	$400	$360
ParaCruz Operating Facility	MTD-P28	Design, Right-of-Way and construction for new ParaCruz Operating Facility.	$12,400	$0	$12,400
Park and Ride Facilities	MTD-P53	Fund purchase and construction or lease of parking areas for commuter bus patrons, either surface lot or parking structure.	$29,400	$0	$29,400
Replacement of Watsonville Transit Center	MTD-P56	Replacement transit center at existing or new location.	$25,000	$0	$25,000
Replacement Transit Fareboxes, Ticket Vending Machines, and Fare System Enhancements	MTD 18	Upgrade GFI Farebox system to enable fare media loading, tracking, registration, interoperability via internet. Necessary IT upgrade. System Integrator to analyze and propose integrated fare media strategy. Replacement fareboxes at end of useful life. Replacement of Ticket Vending Machines at end of useful life.	$5,550	$1,000	$4,550
Santa Cruz Metro Center/Pacific Station Renovation	MTD 13	Renovate Pacific Station or construct new transit center in alternate location.	$25,000	$0	$25,000
Senior/Disabled/Low-Income Fixed-Route Transit Incentives	MTD-P42	Incentives to encourage fixed-route bus ridership. Includes existing discounts for Seniors and persons with disabilities. May include free/reduced rates for seniors during off-peak hours, free bus passes to ADA eligible persons, bus pass subsidies for low income riders transportation to employment, and other incentives to encourage use of fixed-route system.	$17,125	$0	$17,125
Signal Priority/Pre-Emption for Buses	MTD-P21	Enable coach operators to actuate traffic signals to prolong green or change red lights to improve transit running time.	$2,070	$0	$2,070
Small Bus Fleet	MTD-P24	Purchase smaller buses for travel through residential neighborhoods. Cost currently unknown.	$1,700	$0	$1,700
Solar Panels for Souza Operations Facility	MTD-P29	Energy reduction through installation of solar panels on the new Judy K. Souza Operations Facility	$2,000	$0	$2,000
South County Operations and Maintenance Facility	MTD-P54	Acquisition of property and construction of second operations and maintenance facilities to better serve South County.	$50,000	$0	$50,000
Transit Mobility Training Program Expansion	MTD-P19	Expand public outreach and training to encourage fixed route, rather than Paratransit, use. Outreach may also involve other partners (ex. DMV, doctors, senior centers, etc). Avg annual cost: $80K/yr.	$1,240	$0	$1,240
Transit Security and Surveillance Systems	MTD-P33	Enhance passenger safety and facilities security. Emergency response systems.	$1,140	$0	$1,140

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Transit System Technology Improvements	MTD-P35	Automated Data Processing software, telephones, portable computers, servers, Customer Information Kiosks, digital ID processing equipment. Maintain and upgrade office software and hardware, bandwidth, web site, phone network, to enhance productivity, customer service and maintain functionality.	$5,490	$1,000	$4,490
Transit Technological Improvements	MTD-P06	IT software and hardware upgrades for scheduling, customer service, planning systems. Upgrades every 5 years.	$5,170	$2,500	$2,670
Transit/Paratransit Driver Emergency Training	MTD-P45	Provide training equipment for drivers on new mobility devices (scooters, motorized wheelchairs) plus emergency training and biohazard container and clean-up kits for vehicles.	$260	$0	$260
		SCMTD Total	**$1,674,067**	**$1,231,750**	**$442,317**
Seniors Council					
Senior Employment Ride Reimbursement	RTC-P43	Reimburse low income seniors for transit expenses to/from employer sites.	$1,600	$1,600	$0
		Seniors Council Total	**$1,600**	**$1,600**	**$0**
UCSC					
Alternative Fuel Fleet Vehicles	UC-P64	Purchase and upgrade fleet vehicles to alt. fueled vehicles (refuse trucks, street sweepers, fleet cars, etc.)	$3,100	$500	$2,600
Alternative Fuel/Electric Shuttle Vehicles	UC-P22	Capital acquisition of vehicles/conversion of shuttles to EV.	$10,330	$0	$10,330
Bike Shuttle Vehicle Acquisition	UC-P51	Acquire more alt fueled vehicles for bike shuttle (and possible expansion).	$520	$0	$520
Bus Tracking and AVL Transit Programs	UC-P62	GPS bus tracking and Automatic Vehicle Locator programs inform travelling population of transit locations so they can make informed mode choices.	$260	$260	$0
College Nine/Communications Pedestrian Bridge	UC-P39	Construct pedestrian bridge.	$1,030	$0	$1,030
College Nine/Crown College Pedestrian Bridge	UC-P37	Construct pedestrian bridge.	$1,550	$0	$1,550
Coolidge Overlook	UC-P42	Improve overlook for parking, benches and signage for Sanctuary.	$620	$0	$620
Disability Van Service	UC-P75	Operate disability van service ($240k/yr).	$5,450	$5,450	$0
East Collector Transit Hub	UC-P46	New transit hub at East Collector (East Remote) lot.	$5,170	$0	$5,170
Electric Vehicle Charging Stations	UC-P65	Add additional electrical infrastructure and install electric vehicle charging stations around campus.	$810	$310	$500
Great Meadow Bike Path Safety Improvements	UCSC 07	Bike path safety and maintenance improvements: Reconstruct and widen Class 1 bike path, separate pedestrian improvements northbound to minimize conflicts.	$1,135	$1,135	$0
Hagar/McLaughlin Intersection Improvements	UC-P10	Signal, pedestrian safety improvements(including new crosswalk) and roadway improvements.	$520	$0	$520
Hagar/Steinhart Intersection Improvements	UC-P14	Signal, pedestrian safety improvements, transit, roadway improvements.	$1,030	$0	$1,030
Hagar-Coolidge Connector Road/Hagar/East Remote Intersection Improvements	UC-P47	New roadway connector, including bicycle lanes, between Hagar Drive and Coolidge, plus Hagar/East Remote Intersection Improvements: signal, pedestrian safety improvements and roadway improvements.	$3,100	$0	$3,100

All Figures in year 2016, '000s (thousands of dollars)

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Heller Drive Bicycle Lanes (Empire Grade to Porter College)	UC-P56	Add Class II bicycle lanes in downhill direction as feasible.	$830	$0	$830
Kerr/Porter Rd Pedestrian Bridge ADA Upgrades	UC-P72	Modify bridge to improve access.	$3,100	$0	$3,100
Kresge/Core West Pedestrian Bridge: ADA Upgrades	UC-P57	Modify bridge to enhance ADA access.	$3,100	$3,100	$0
McLaughlin Drive Bike Lanes/Pedestrian Enhancements	UC-P30	Install Class 2 bike lanes and enhance pedestrian circulation on University campus roadway.	$2,580	$0	$2,580
Meyer Drive Extension/Jordan Gulch Bridges	UC-P04	Extension of Meyer Drive from existing Meyer Drive to Hagar Drive. Includes potential construction of two bridges, pedestrian, and bicycle facilities.	$20,660	$0	$20,660
Northern Entrance	UC-P08	Construct new access road including Cave Gulch Bridge to Empire Grade and road and bicycle lanes to Northern Heller Dr. for access and fire safety.	$10,330	$0	$10,330
Northern Loop Roadway	UC-P07	Construct new roadway, including bicycle lanes, on upper campus. Will be phased. Phase I: Chinquapin Extension to support Social Science 3.	$18,590	$0	$18,590
Parking Management Technology Improvements	UC-P68	Updating existing parking management technologies to allow for more effective management, additional parking management at Coastal Marine Campus and 2300 Delaware site.	$410	$410	$0
Pedestrian Directional Map/Wayfinding System	UC-P38	Develop and install signs throughout campus.	$520	$520	$0
Porter/Performing Arts Pedestrian Bridge	UC-P36	Construct pedestrian bridge.	$1,030	$0	$1,030
Science Hill/North Academic Core Pedestrian Bridge	UC-P40	Construct pedestrian bridge.	$1,030	$0	$1,030
Sidewalk/Pedestrian Improvements	UC-P50	Widen sidewalks/improve ped access in areas of campus.	$5,170	$0	$5,170
Spring Street Bikeway	UC-P34	Construct bikeway connecting Spring Street to Hagar Ct.	$310	$0	$310
Steinhart Way Multimodal Improvements	UC-P03	Roadway improvements for shuttles, bikes and pedestrians.	$520	$0	$520
Transit Pullouts and Shelters Enhancements	UC-P19	Construction and installation of transit pullouts and reconstruction of shelters throughout campus.	$1,550	$0	$1,550
Transit Vehicles (ongoing)	UC-P23	Ongoing capital acquisition of transit vehicles for on-campus transit and University shuttles.	$5,170	$5,170	$0
Transportation-Related Stormwater Management Projects	UC-P66	Retrofitting existing transportation facilities and developing new facilities with new stormwater management techniques.	$1,030	$1,030	$0
Traveler Safety Education/Information Programs	UC-P61	Bike/pedestrian safety programs; light and helmet giveaways, safety classes, distracted driver programs, bus etiquette program.	$660	$100	$560
UCSC - Metro Station Bus Rapid Transit Improvements	UC-P48	Bus Rapid Transit Improvements between Metro Station, Bay Street Corridor, and UCSC Roadways.	$5,170	$0	$5,170
UCSC Bicycle Facilities	UC-P55	Add bicycle facilities on campus roadways and paths. Lump sum of projects, including but not limited to UCSC Bicycle Plan that are not listed individually elsewhere in the RTP.	$1,030	$0	$1,030
UCSC Bicycle Parking Improvements	UC-P33	Install bicycle parking facilities to serve bicycle commuters to the University.	$520	$520	$0
UCSC Bike Loan Program	UC-P52	Develop and implement a bike loan program for UC students.	$1,030	$0	$1,030

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
UCSC Bike Showers/Storage Lockers	UC-P32	Install showers and storage facilities to serve bicycle commuters to the University.	$620	$0	$620
UCSC Commute Counseling Program	UC-P69	Staffing program development to individually market to UCSC affiliates on more sustainable means of travel to campus.	$3,100	$3,100	$0
UCSC Commuter Incentive Programs	UC-P70	Provide ongoing support and development of new programs to encourage travel to campus via sustainable modes of travel.	$1,550	$1,550	$0
UCSC Lump Sum Roadway Maintenance	UC-P59	Repaving and rehabilitation of roadways on UCSC campus to maintain existing network.	$10,330	$3,100	$7,230
UCSC Main Entrance Improvements	UC-P01	Realign roadway, transit pullout/shelter, relocate bike parking, construct pedestrian path, historic resource analysis. Work may be done in conjunction with City Roundabout project.	$2,070	$2,070	$0
UCSC Parking Operations & Maintenance	UC-P73	Operate and administer the parking operations for UCSC including planning, TDM, marketing and debt service.	$70,450	$70,450	$0
UCSC Pedestrian/Transit Zone	UC-P44	Pedestrian safety improvements including, colored/textured asphalt and signage at various locations on core campus roadways.	$1,030	$0	$1,030
UCSC Traffic Control	UC-P58	Non-traditional traffic control/crossing guard program at key intersections on UCSC campus to improve pedestrian and vehicle safety, reduce conflicts, improve travel times.	$2,580	$2,580	$0
UCSC Transit Service	UC-P74	Operate the on campus shuttle service and Night Owl ($3.01m/year).	$68,410	$68,410	$0
UCSC Vanpool Program	UC-P63	Maintain, operate and expand upon UCSC vanpool program.	$8,680	$8,680	$0
Zimride Emergency Preparedness Database	UC-P67	Creating a new database through Zimride to have emergency response evacuation of UCSC campus.	$310	$0	$310
		UCSC Total	**$288,095**	**$178,445**	**$109,650**
Various Agencies					
Active Transportation Plan	VAR-P39	Prepare Active Transportation Plans that address bicycle, pedestrian, safe routes to schools and complete streets facilities within the jurisdictions of Santa Cruz County as well as the Santa Cruz Harbor Port District.	$2,380	$2,380	$0
Bicycle Sharrows	VAR-P03	Install sharrows (shared roadway marking) designating areas where bicyclists should ride on streets, especially when bicycle lanes are not available. To be implemented by local jurisdictions.	$520	$520	$0
Bicycle Treatments for intersection improvements (ADD)	VAR-P32	Add painted bike treatments (such as buffered and/or painted bike lanes, bike boxes, bike detection and signals), at major intersections.	$4,130	$4,130	$0
Bike Share	VAR-P16	Establish and maintain an urban centered bike share program allowing county residents to access loaner bikes at key locations such as downtowns, transit centers, shopping districts, and tourist destinations.	$5,170	$5,170	$0
Bike-Activated Traffic Signal Program	VAR-P05	Provide traffic signal equipment to ensure that the traffic signals will detect bicycles just as cars are detected and ensure that the appropriate traffic signal phase is activated by the bicycles.	$1,030	$1,030	$0

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Cabrillo College TDM Programs	RTC 33	Provide students and employees at all four Cabrillo College campuses with education, promotion, and incentives that support the use of sustainable transportation modes. Develop information, programs and services customized to meet the transportation needs of the Cabrillo College community. 'Provide Sustainable Transportation education, promotion, and Go Green program enrollment to Cabrillo College students and employees. Partner with Cabrillo staff and students to reduce SOV trips to the Aptos, Watsonville and Scotts Valley campuses. Provided targeted information and services to Cabrillo members.	$1,560	$780	$780
Carsharing Program	VAR-P06	Program to assist people in sharing a vehicle for occasional use. Implementing Agency TBD, varies.	$2,580	$1,290	$1,290
Climate Action Transportation Programs	RTC-P48	Projects that reduce greenhouse gas emissions through reducing vehicle trips and vehicle miles traveled, increasing fuel efficiency and expanding use of alternatively fueled vehicles. Includes comprehensive outreach and education campaigns, a countywide emergency ride home for those using alternatives, and TDM incentive programs: $100k/year.	$2,580	$2,330	$250
Complete Streets Implementation	VAR-P27	Additional projects for complete streets implementation that would fall under the Complete Streets Guidelines.	$10,330	$10,330	$0
Coolidge Drive Reconstruction	VAR-P23	Reconstruction of roadway and bike lane.	$3,100	$0	$3,100
Countywide Pedestrian Signal Upgrades	RTC-P26	Grant program to fund installation of accessible pedestrian equipment with locator tones including rapid flashing beacons and count down times etc. to facilitate roadway crossings by visually and mobility impaired persons.	$2,070	$1,035	$1,035
Countywide Senior Driving Training	VAR-P24	Coordinate and enhance current programs that help maturing drivers maintain their driving skills and provides transitional info about driving alternatives. (Current programs are run by AARP and CHP.)	$800	$80	$720
Eco-Tourism - Sustainable Transportation	VAR-P17	Provide sustainable transportation information, incentives and promotions to the estimated one million visitors to Santa Cruz County. Work with the Santa Cruz County Conference and Visitors Council, local lodgings, and tourist attractions.	$1,030	$515	$515
Electric Bicycle Commuter Incentive Program	VAR-P44	Financial incentives, promotion and/or education to encourage residents to use electric bikes instead of commuting by car.	$3,400	$1,000	$2,400
Environmental Mitigation Program	VAR-P38	Allocate funds to protect, preserve, and restore native habitat that construction of transportation projects listed in SCCRTC's RTP could potentially impact. EMP funds will be for uses such as, but not limited to, purchasing land prior to project development to bank for future mitigation needs, funding habitat improvements in advance of project development to leverage and enhance investments by partner agencies.	$5,680	$5,680	$0
Hwy 1 Bike/Ped Bridge (Cabrillo-New Brighton)	CT-P07a	Construction of bike/ped bridge connecting New Brighton State Beach and Cabrillo College as part of larger Nisene SP to the Sea trail concept. Lead agency TBD.	$8,260	$0	$8,260
Live Oak Transit Hub	VAR-P46	Transfer node near rail corridor at 17th Ave - may include transit, rideshare, bicycle, bikeshare, pedestrian to provide regional connections to/from other parts of the county.	$530	$530	$0
Local Arterial ITS Infrastructure	VAR-P11	ITS (Intelligent Transportation Systems): advanced electronics and information technologies to increase the safety and efficiency of the surface transportation system, including vehicle detection devices along major arterials in urbanized areas to alert motorists of incidents.	$620	$0	$620
Lump Sum Bridge Preservation	VAR-P14	Painting, Barrier Rail Replacement, Low Water Crossing, Rehab, and Replacement bridges for SHOPP and Highway Bridge Program (HBP).	$54,500	$54,500	$0

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Lump Sum Emergency Response Local Roads	VAR-P13	Lump sum for repair of local roads damaged in emergency. (Based on average ER/FEMA/CalEMA funds, storm damage, fire, etc. Costs of repairs assumed under lump sum maintenance and operations within local jurisdiction listings.)	$23,370	$23,370	$0
Mission St/Hwy 1 Bike/Truck Safety Campaign	VAR-P18	Partnership with road safety shareholders including Caltrans, UCSC, City of Santa Cruz, Ecology Action, trucking companies and others to improve bike/truck safety along the Mission Street corridor. Provide safety presentations, videos, brochures, safety equipment, etc.	$520	$520	$0
Mobility Management Center	VAR-P04	Centralized one-stop-shop for information and resources on specialized transportation options. May be combined with 511 and local senior information and assistance efforts. Implementing agency TBD. Est. annual cost: $100-300k/yr.	$7,750	$0	$7,750
Neighborhood Greenways	VAR-P33	Implement greenways which gives priority to bicycles and pedestrians on low volume, low speed streets including, way finding and pavement markings, bicycle treatments in areas identified for more intensified development in Sustainable Communities Strategy.	$5,170	$0	$5,170
Park and Ride Lot Development	VAR-P26	Upgrade and maintain existing park and ride lots for commuters countywide. Secure additional park and ride lot spaces for motorized vehicles and bicycles. Long range plan: identify, purchase land, construct Park & Ride lots.	$8,260	$2,260	$6,000
Planning for Transit Oriented Development for Seniors	VAR-P25	Evaluate opportunities for Transit Oriented Development serving seniors including access to medical facilities.	$80	$80	$0
Plug-in Electric Vehicle Access, Education & Promotion	VAR-P21	Target motorist looking for a cleaner vehicle by providing access, education and promotion on ever evolving plug-in electric vehicles (PEV). Provide PEV car share, rental and demo drives, educational workshops, online, and hard copy information. Promote through current EA groups, partners, media and other available sources.	$830	$0	$830
Public Transit Marketing	VAR-P20	Initiatives that increase public transit ridership including discount passes, free fare days, commuter clubs, and promotional and marketing campaigns.	$1,550	$775	$775
Public/Private Partnership Bicycle and Pedestrian Connection Plan	VAR-P29	Develop model for assisting local jurisdictions in working with private property owners to allow bicycle and pedestrian access through private property in areas identified for more intensified development in Sustainable Communities Strategy.	$150	$150	$0
Public/Private Partnership Transit Stops and Pull Outs Plan	VAR-P30	Develop model for assisting local jurisdictions in working with businesses to install transit pullouts and shelters on property in areas identified as high quality transit corridors in Sustainable Communities Strategy.	$150	$150	$0
Safe Paths of Travel	VAR-P08	Regional program to construct and/or repair pedestrian facilities adjacent to high frequency use origins and destinations, particularly near transit stops.	$3,100	$3,100	$0
Safe Routes to Schools Studies	VAR-P10	Studies to assess pedestrian and bicycle safety near schools.	$210	$210	$0
Safety Plan	VAR-P36	Develop a safety plan that addresses traffic related injuries and fatalities for all modes of transportation.	$310	$310	$0
Santa Cruz County Open Streets	VAR-P40	Community events promoting alternatives to driving alone as part of a sustainable, healthy, and active life-style. Temporarily opens roadways to bicycle and pedestrian travel only, diverting automobiles to other roadways.(Average annual cost - $100k/yr)	$2,000	$200	$1,800
School Complete Streets Projects	VAR-P35	Implement ped/bike programs and facilities near schools.	$10,330	$10,330	$0

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
School Safety Programs	VAR-P19	Bicycle and walking safety education and encouragement programs targeting K-12 schools in Santa Cruz County including Ecology Action's Safe Routes to School and Bike Smart programs. Provide classroom and on the bike safety training in an age appropriate method. Provide a variety of bicycle, walking, busing and carpooling encouragement projects ranging from bike to school events, to incentive driven tracking, and educational support activities. Est. annual cost $150k.	$3,820	$1,910	$1,910
TDM Individualized Employer/Multiunit Housing Program	RTC-P53	Implement individualized employer and multiunit housing TDM programs with incentives for existing development.	$4,650	$2,325	$2,325
Transit Oriented Development Grant Program	RTC-P25	Smart growth grant program to fund TODs that encourage land use and transportation system coordination. May include joint child care/PNR/transit centers.	$5,170	$2,570	$2,600
Transit Priority	VAR-P34	Install transit queues at major intersections.	$5,170	$2,585	$2,585
Transit Service to San Jose Airport	VAR-P43	Provide transit service to San Jose airport from Santa Cruz. Current average annual need $0.5M	$11,000	$0	$11,000
Transportation Demand Management Plan	VAR-P37	Collaborate with other organizations to develop a coordinated plan for transportation demand management program implementation for Santa Cruz County.	$310	$310	$0
Transportation for Caregivers of Seniors/People with Disabilities	VAR-P42	Transportation service for caregivers of seniors or people with disabilities. Including, but not limited to programs such as, volunteer rides, taxi script, ride to work program. Current avg annual need $.5M. Constrained=$0M.	$11	$0	$11
Transportation for Low Income Youth	VAR-P15	Safe, reliable transportation services for foster care children to/from school. Avg annual cost: $100k/yr.	$2,580	$0	$2,580
Transportation for Low-Income Families	VAR-P41	Transportation service for low income families with children. Includes medical service rides, out-of-county rides, volunteer rides, taxi script, ride to work program, etc. Current avg annual need $.5M. Constrained=$0M.	$11,000	$0	$11,000
Transportation System Electrification	VAR-P07	Partnership with local gov't agencies, electric vehicle manufactures, businesses, and Ecology Action to establish electric vehicle charging stations for EV's, plug-in hybrids, NEV's, as well as ebikes and escooters. Work with manufacturers on developing advanced electric vehicles and educating the public regarding the ease of use and benefits of electric vehicles.	$51,650	$51,650	$0
Uncontrolled Pedestrian Crossing Improvements	VAR-P31	Implement improvements to uncontrolled pedestrian crossing such as painted and/or raised crosswalks, flashing beacons and pedestrian islands.	$5,170	$2,570	$2,600
Watsonville Transit Hub	VAR-P47	Expand transportation mode options at transfer node near rail corridor and current transit center to increase use of transit, rideshare, bicycle, bikeshare, pedestrian to provide regional connections to/from other parts of the county.	$585	$585	$0
West Side Transit Hub	VAR-P45	Transfer node near rail corridor at Natural Bridges Dr - may include transit, rideshare, bicycle, bikeshare, pedestrian to provide regional connections to/from other parts of the county and the university.	$580	$580	$0
		Various Agencies Total	**$275,746**	**$197,840**	**$77,906**
Volunteer Center					
Volunteer Center Transportation Program	VC-P1	Program providing specialized transportation to seniors and people with disabilities. Constrained=existing TDA allocations.	$3,750	$1,640	$2,110
		Volunteer Center Total	**$3,750**	**$1,640**	**$2,110**

All Figures in year 2016, '000s (thousands of dollars)

Project Title	ID	Project Description/Scope	Est total cost	Constrained	Uncon-strained
Watsonville Airport					
Lump Sum Watsonville Municipal Airport Capital Projects	AIR-P01	Projects from the Watsonville Airport Capital Improvement Program. Includes new hangers, reconstruction of aviation apron, security features, and runway extensions.	$21,700	$21,700	$0
Watsonville Municipal Airport Operations	AIR-P02	Ongoing operations/maintenance. Average $2M/year.	$44,000	$44,000	$0
		Watsonville Airport Total	**$65,700**	**$65,700**	**$0**
		Total Within Projected Funds (Constrained)		**$3,757,313**	
		Minimum New Funds Needed (Unconstrained)			**$3,356,681**

***For some projects no cost estinate was available thus was not included in this total**

Appendix G

Escalated Project Costs

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Appendix G: Escalated Project Costs

The Federal Transportation Act and state guidelines require that the RTP reflect the cost of implementing projects in "year of expenditure dollars" (YOE) and must be financially constrained to match escalated projected revenues. While it is unknown the exact year that most projects will be implemented, this spreadsheet demonstrates how much it would cost to implement the constrained RTP project list if the annual escalation rate were 1.75%. Since the actual year that a project will be constructed may vary and numerous economic and external factors can impact project costs, actual costs and escalation rates will likely vary. Additional information on each project is provided in a separate appendix. This list only includes "Constrained" projects which could be funded within the projected revenues identified in this document.

Figures in $000s (thousands)

RTP #	Regionally Significant	Project	Constrained Cost *Current Year*	Escalated Cost Rounded Estimate	Year of Expenditure
AIR-P01	✓	Lump Sum Watsonville Municipal Airport Capital Projects	$ 21,700	$ 26,190	Ongoing
AIR-P02	✓	Watsonville Municipal Airport Operations	$ 44,000	$ -	Ongoing
CAP 11		Clares Street Traffic Calming	$ 750	$ 780	2018-2020
CAP 15		Park Avenue Sidewalks	$ 650	$ 670	2018-2020
CAP 16		Bay Avenue/Capitola Avenue Intersection Modifications/Roundabout	$ 1,000	$ 1,040	2018-2020
CAP 17		Upper Pacific Cove Parking Lot Pedestrian Trail and Depot Park Metro Development	$ 310	$ 320	2018-2020
CAP 18		Brommer Street Complete Street Improvements (250' west of 38th Ave to 41st Ave)	$ 770	$ 800	2018-2020
CAP-P03		Upper Capitola Avenue Improvements	$ 1,340	$ 1,540	2021-2035
CAP-P04b		Capitola Village Multimodal Enhancements - Phase 2/3	$ 3,100	$ 3,560	2021-2035
CAP-P05		Cliff Drive Improvements	$ 1,550	$ 1,780	2021-2035
CAP-P06	✓	Citywide General Maintenance and Operations	$ 40,666	$ 49,090	Ongoing
CAP-P07		Bay Avenue/Hill Street Intersection	$ 210	$ 240	2021-2035
CAP-P07p	✓	Stockton Ave Bridge Rehab	$ 1,500	$ 1,720	2021-2035
CAP-P09	✓	Park Avenue/Kennedy Drive Improvements	$ 360	$ 410	2021-2035
CAP-P12		Monterey Avenue Multimodal Improvements	$ 360	$ 410	2021-2035
CAP-P16		Clares Street Pedestrian Crossing west of 40th Ave	$ 250	$ 290	2021-2035
CAP-P17		Citywide Traffic Calming	$ 1,450	$ 1,790	2021-2040
CAP-P27		Wheelchair Access Ramps	$ 200	$ 220	2018-2035
CAP-P28		Monterey Avenue at Depot Hill	$ 260	$ 300	2021-2035
CAP-P29		Bay Avenue Traffic Calming and Bike/Ped Enhancements	$ 210	$ 240	2021-2035
CAP-P30		47th Avenue Traffic Calming and Greenway	$ 100	$ 110	2021-2035
CAP-P32		Bay Avenue/Monterey Avenue Intersection Modification	$ 310	$ 360	2021-2035
CAP-P34		Capitola Village Enhancements: Capitola Ave	$ 1,030	$ 1,460	2035-2040
CAP-P37	✓	41st Ave/Capitola Road Intersection Improvements	$ 520	$ 600	2021-2035
CAP-P38		40th Ave/Clares St Intersection Improvements	$ 1,050	$ 1,210	2021-2035
CAP-P40		46th/47th Ave (Clares to Cliff Dr) Bike Lanes/Traffic Calming	$ 20	$ 20	2018-2020
CAP-P41		Brommer/Jade/Topaz St Bike Lanes/Traffic Calming (Western City Limit on Brommer to 47thAve)	$ 20	$ 20	2021-2035
CAP-P42		Clares St Bike Lanes/Sharrows (Capitola Rd to 41st Ave)	$ 100	$ 100	2018-2020
CAP-P43		Clares St/41st Ave Bicycle Intersection Improvement	$ 10	$ 10	2021-2035
CAP-P44		Gross/41st Ave Bicycle Intersection Improvement	$ 20	$ 20	2018-2020
CAP-P46		40th Ave (at Deanes Ln)Bike/Ped connection	$ 10	$ 10	2018-2020
CAP-P47	✓	41st Ave (Soquel to Portola) Crosswalks	$ 20	$ 20	2018-2020
CAP-P48		Capitola Mall (Capitola Rd to Clares) Bike Path	$ 50	$ 50	2018-2020
CAP-P50		Capitola-wide HOV priority	$ 40	$ 50	2021-2035
CAP-P51		Citywide Sidewalk Program	$ 520	$ 660	2021-2040
CAP-P52		Citywide Bike Projects	$ 400	$ 490	2021-2040
CAP-P53		Capitola Rd & 45th Avenue I/S Improvements	$ 400	$ 460	2021-2035
CAP-P54		Wharf Road and Stockton Avenue I/S Improvements	$ 350	$ 400	2021-2035
CAP-P55		Porter Street and Highway 1 I/S Improvements	$ 250	$ 290	2021-2035

RTP #	Regionally Significant	Project	Constrained Cost *Current Year*	Escalated Cost Rounded Estimate	Year of Expenditure
CAP-P56		Monterey Avenue and Park Avenue I/S Improvements	$ 400	$ 570	2035-2040
CAP-P57		Stockton Avenue and Capitola Avenue I/S Improvements	$ 350	$ 400	2021-2035
CHP-P01	✓	Hwy 17 Safety Program	$ 2,200	$ 2,660	Ongoing
CO 36		Seacliff Village/State Park Drive Improvements	$ 3,400	$ 3,910	2021-2035
CO 42b	✓	Green Valley Rd Pedestrian Safety Project	$ 390	$ 400	2018-2020
CO 50	✓	Santa Cruz County Health Service Agency - Traffic Safety Education	$ 2,200	$ 2,660	Ongoing
CO 64	✓	Aptos Village Plan Improvements	$ 4,100	$ 4,240	2018-2020
CO 66		East Cliff Drive Cape Seal (12th-17th)	$ 230	$ 240	2018-2020
CO 74		Freedom Blvd Pavement Preservation (Hwy 1 to Pleasant Vly Rd)	$ 1,430	$ 1,480	2018-2020
CO 79		Branciforte Drive Road Recycle & Overlay (PM 2.4 to Granite Ck Rd)	$ 431	$ 450	2018-2020
CO 80		Glen Arbor Road Recycle, Overlay, & Chip Seal (SR 9-Quail Hallow)	$ 467	$ 480	2018-2020
CO 81		Granite Creek Road Recycle & Overlay - Part of CO 79B	$ 1,100	$ 1,140	2018-2020
CO 82		Branciforte Drive Chip Seal Project (Granite Creek Rd to SC city limits - 1.91mi)	$ 433	$ 450	2018-2020
CO 83		Highway 17 To Soquel Corridor Chip Seal Project	$ 881	$ 910	2018-2020
CO 84		Hwy 152/Holohan - College Intersection	$ 3,150	$ 3,620	2021-2035
CO 85		Scotts Valley Area Routes Chip Seal Project	$ 940	$ 970	2018-2020
CO 86		Zayante Road Corridor Chip Seal Project	$ 1,025	$ 1,060	2018-2020
CO-P02	✓	Airport Blvd Improvements (City limits to Green Valley Rd)	$ 1,240	$ 1,420	2021-2035
CO-P03		Amesti Road Multimodal Improvements (Green Valley to Brown Valley Rd)	$ 600	$ 690	2021-2035
CO-P04		Bear Creek Road Improvements (Hwy 9 to Hwy 35)	$ 250	$ 350	2035-2040
CO-P08		Corralitos Road Rehab and Improvements (Freedom Blvd to Hames Rd)	$ 620	$ 710	2021-2035
CO-P09	✓	East Cliff Drive Improvements (32nd Ave to Harbor)	$ 1,500	$ 1,860	2021-2040
CO-P10	✓	Empire Grade Improvements	$ 1,190	$ 1,480	2021-2040
CO-P11	✓	Freedom Blvd Multimodal Improvements (Bonita Dr to City of Watsonville)	$ 775	$ 890	2021-2035
CO-P12	✓	Graham Hill Road Multimodal Improvements (City of SC to Hwy 9)	$ 1,755	$ 2,480	2035-2040
CO-P13	✓	Green Valley Road Improvements	$ 1,030	$ 1,460	2035-2040
CO-P14		La Madrona Dr Improvements (El Rancho Dr to City of Scotts Valley)	$ 905	$ 1,280	2035-2040
CO-P17		Sims Road Improvements (Graham Hill Rd to La Madrona Dr)	$ 440	$ 620	2035-2040
CO-P18	✓	Soquel Ave Improvements (City of SC to Gross Rd)	$ 3,310	$ 4,000	2021-2040
CO-P19	✓	Soquel Dr Improvements (Soquel Ave to Freedom Blvd)	$ 1,885	$ 2,170	2021-2035
CO-P20		State Park Drive Improvements Phase 2	$ 335	$ 470	2035-2040
CO-P22		Paul Sweet Road Improvements (Soquel Dr to end)	$ 310	$ 440	2035-2040
CO-P24		Lockwood Lane Improvements (Graham Hill Rd to SV limits)	$ 243	$ 280	2021-2035
CO-P26a	✓	41st Ave Improvements Phase 2 (Hwy 1 Interchange to Soquel Dr)	$ 340	$ 390	2021-2035
CO-P26b		Beach Road Improvements (City limits to Pajaro Dunes)	$ 340	$ 390	2021-2035
CO-P26d		Brown Valley Rd Improvements (Corralitos Rd to Redwood Rd)	$ 340	$ 480	2035-2040
CO-P26e		Buena Vista Rd Improvements (San Andreas to Freedom Blvd)	$ 825	$ 1,170	2035-2040
CO-P26g		Casserly Rd Improvements (Hwy 152 to Green Valley Rd)	$ 208	$ 290	2035-2040
CO-P26h		Center Ave/Seacliff Dr Improvements (Broadway to Aptos Beach Dr)	$ 340	$ 390	2021-2035
CO-P26i		Chanticleer Ave Improvements (Hwy 1 to Soquel Dr)	$ 340	$ 390	2021-2035
CO-P26j		East Zayante Rd Improvements (Lompico Rd to just before Summit Rd)	$ 485	$ 690	2035-2040
CO-P26k		El Rancho Dr Improvements (Mt. Hermon/Hwy 17 to SC city limits)	$ 655	$ 930	2035-2040
CO-P26l		Eureka Canyon Rd Improvements (Hames Rd to Buzzard Lagoon Rd)	$ 655	$ 930	2035-2040
CO-P26m	✓	Glen Canyon Rd Improvements (Branciforte Dr to City of Scotts Valley)	$ 1,640	$ 2,320	2035-2040
CO-P26n		Glenwood Dr. Improvements (Scotts Valley city limits to State Hwy 17)	$ 825	$ 1,170	2035-2040
CO-P26p		Mattison Ln Improvements (Chanticleer Ave to Soquel Ave)	$ 400	$ 460	2021-2035
CO-P26q	✓	Mt. Hermon Rd. Improvements (Lockhart Gulch to Graham Hill Rd)	$ 825	$ 1,170	2035-2040
CO-P26r		Porter St Improvements (Soquel Dr to Paper Mill Rd)	$ 340	$ 390	2021-2035
CO-P26s		Seascape Blvd Improvements (Sumner Ave to San Andreas Rd)	$ 170	$ 200	2021-2035
CO-P26u		Summit Rd Improvements	$ 1,530	$ 2,160	2035-2040

RTP #	Regionally Significant	Project	Constrained Cost *Current Year*	Escalated Cost Rounded Estimate	Year of Expenditure
CO-P27a		37th/38th Ave (Brommer to Eastcliff) Multimodal Circulation Improvements and Greenway	$ 570	$ 650	2021-2035
CO-P27c		Corcoran Ave Improvements (Alice St to Felt St)	$ 150	$ 170	2021-2035
CO-P27e		Main St Improvements (Porter St to Cherryvale Ave)	$ 1,760	$ 2,130	2021-2040
CO-P27f		Mill St Improvements (entire length)	$ 360	$ 430	2021-2040
CO-P27h		Paulsen Rd Improvements (Green Valley Rd to Whiting Rd)	$ 240	$ 340	2035-2040
CO-P27i		Pinehurst Dr Improvements (entire length)	$ 180	$ 250	2035-2040
CO-P27k		Spreckels Dr Improvements (Soquel Dr to Aptos Beach Dr)	$ 340	$ 480	2035-2040
CO-P27l		Winkle Ave Improvements (entire length from Soquel Dr)	$ 655	$ 930	2035-2040
CO-P28a		Bean Creek Rd Improvements (Scotts Valley City Limits to Glenwood Dr)	$ 485	$ 690	2035-2040
CO-P28c		Commercial Way Improvements (Mission Dr. to Soquel Dr.)	$ 170	$ 240	2035-2040
CO-P28d		Felton Empire Road Improvements (entire length to State Hwy 9)	$ 655	$ 930	2035-2040
CO-P28f		Pine Flat Rd Improvements (Bonny Doon Rd to Empire Grade Rd)	$ 655	$ 930	2035-2040
CO-P28g		Soquel-Wharf Rd Improvements (Robertson St to Porter St)	$ 515	$ 730	2035-2040
CO-P28h		Thurber Ln Improvements (entire length)	$ 485	$ 690	2035-2040
CO-P28i		Varni Rd Improvements (Corralitos Rd to Amesti Rd)	$ 340	$ 480	2035-2040
CO-P29e		Maciel Ave Improvements (Capitola Rd to Mattison Ln)	$ 400	$ 460	2021-2035
CO-P29f		Paul Minnie Ave. Improvements (Rodriguez St to Soquel Ave)	$ 340	$ 390	2021-2035
CO-P30d		Cabrillo College Dr Improvements (Park Ave to Twin Lakes Church)	$ 240	$ 340	2035-2040
CO-P30n		Rio Del Mar Blvd Improvements (Esplanade to Soquel Dr)	$ 725	$ 830	2021-2035
CO-P31g		Opal Cliff Dr Improvements (41st Av to Capitola City Limits)	$ 290	$ 410	2035-2040
CO-P33d		Harper St Improvements (entire length-El Dorado Ave to ECM)	$ 310	$ 360	2021-2035
CO-P35	✓	Countywide General Road Maintenance and Operations	$ 446,857	$ 539,400	Ongoing
CO-P36	✓	Soquel-San Jose Rd Improvements (Paper Mill Rd to Summit Rd)	$ 580	$ 690	2021-2040
CO-P37	✓	Countywide ADA Access Ramps	$ 620	$ 750	Ongoing
CO-P38		Pajaro River Bike Path System	$ 2,500	$ 3,010	2021-2040
CO-P41	✓	Countywide Sidewalks	$ 7,000	$ 8,450	Ongoing
CO-P46a	✓	San Lorenzo Valley Trail: Hwy 9 - Downtown Felton Bike Lanes & Sidewalks	$ 2,270	$ 2,610	2021-2035
CO-P46b	✓	San Lorenzo Valley Trail: Hwy 9 - North Felton Bike Lanes & Sidewalks	$ 7,640	$ 8,780	2021-2035
CO-P50		East Cliff Dr Pedestrian Pathway (7th-12th Ave)	$ 1,760	$ 2,020	2021-2035
CO-P62	✓	Soquel Dr Road Improvements (Robertson St to Daubenbiss)	$ 410	$ 470	2021-2035
CO-P83		San Lorenzo Way Bridge Replacement Project	$ 3,190	$ 4,510	2035-2040
CO-P85		Green Valley Rd Bridge Replacement Project	$ 2,110	$ 2,420	2021-2035
CO-P88		Either Way Ln Bridge Replacement Project	$ 2,180	$ 3,080	2035-2040
CO-P89		Redwood Rd Bridge Replacement Project	$ 1,310	$ 1,510	2021-2035
CO-P90		Fern Dr @ San Lorenzo River Bridge Replacement Project	$ 2,830	$ 3,250	2021-2035
CO-P91		Larkspur Bridge @San Lorenzo River	$ 3,930	$ 5,560	2035-2040
CO-P96		Capital improvement projects consistent with the Sustainable Santa Cruz County Plan	$ 11,000	$ 13,440	2021-2040
CO-P97		County wide guardrail	$ 15,000	$ 18,560	2021-2040
CT-P09e	✓	Measure D Hwy 9 Corridor Projects	$ 7,349	$ 8,440	2021-2035
CT-P45	✓	State Highway Preservation (bridge, roadway, roadside)	$ 467,163	$ 563,910	Ongoing
CT-P46	✓	Collision Reduction & Emergency Projects	$ 219,714	$ 265,210	Ongoing
CT-P47	✓	Minors	$ 2,580	$ 3,110	Ongoing
CT-P48		Hwy 17 Wildlife Habitat Connectivity	$ 9,198	$ 10,570	2021-2035
CTSA-P01	✓	Countywide Specialized Transportation	$ 46,000	$ 55,530	Ongoing
EA 02		Ecology Action Countywide SRTS Youth Pedestrian and Bicycle Safety Education	$ 440	$ 530	Ongoing
EA 03		Every Day is Bike to Work Day	$ 60	$ 60	2018-2020
MTD 02	✓	ADA Paratransit Vehicle Replacements	$ 6,000	$ 7,240	Ongoing
MTD 18	✓	Replacement Transit Fareboxes, Ticket Vending Machines, and Fare System Enhancements	$ 1,000	$ 1,210	Ongoing

RTP #	Regionally Significant	Project	Constrained Cost *Current Year*	Escalated Cost Rounded Estimate	Year of Expenditure
MTD 24		Automatic Vehicle Locator and Automatic Passenger Counter Systems	$ 3,200	$ 3,310	2018-2020
MTD-P04	✓	Bus Replacements	$ 73,000	$ 88,120	Ongoing
MTD-P06	✓	Transit Technological Improvements	$ 2,500	$ 3,020	Ongoing
MTD-P10	✓	Local Transit - Continuation of Baseline Service Levels 2019-2040	$ 836,000	$ 1,009,130	Ongoing
MTD-P10B	✓	Hwy 17 Express Service - Continuation of Baseline Service Levels	$ 99,000	$ 119,500	Ongoing
MTD-P10C	✓	ADA Paratransit Service - Continuation of Existing Service	$ 121,000	$ 146,060	Ongoing
MTD-P11	✓	ADA Service Expansion	$ 1,050	$ 1,270	2021-2040
MTD-P12	✓	Hwy 17 Express Service Restoration and Expansion	$ 4,000	$ 4,860	2021-2040
MTD-P14	✓	Local Transit Service Restoration and Expansion	$ 72,000	$ 87,240	2021-2040
MTD-P30	✓	ParaCruz Mobile Data Terminals; Radios	$ 400	$ 480	Ongoing
MTD-P31	✓	Bus Rebuild and Maintenance	$ 5,250	$ 6,340	Ongoing
MTD-P32	✓	Non-Revenue Vehicle Replacements	$ 1,200	$ 1,450	Ongoing
MTD-P35	✓	Transit System Technology Improvements	$ 1,000	$ 1,210	Ongoing
MTD-P36	✓	Metro facilities repair/upgrades	$ 4,300	$ 5,190	Ongoing
MTD-P51		ADA Access Improvements	$ 350	$ 360	2018-2020
MTD-P52		Bus Stop and Station Improvements	$ 500	$ 520	2018-2020
RTC 01	✓	Freeway Service Patrol (FSP) on Hwy 1 and Hwy 17	$ 6,600	$ 7,970	Ongoing
RTC 02a		Cruz511 TDM and Traveler Information	$ 2,640	$ 3,190	Ongoing
RTC 03a	✓	Santa Cruz Branch Rail Line Improvements	$ 570	$ 690	Ongoing
RTC 04	✓	Planning, Programming & Monitoring (PPM) - SB45	$ 1,870	$ 2,260	Ongoing
RTC 15	✓	Vanpool Incentive Program	$ 100	$ 120	2021-2040
RTC 16	✓	Bike Parking Subsidy Program	$ 210	$ 250	Ongoing
RTC 17	✓	Ecology Action Transportation Employer Membership Program	$ 1,135	$ 1,370	Ongoing
RTC 24e	✓	3 - Hwy 1 Auxiliary Lanes: State Park Dr-Park Ave and Park Ave-Bay/Porter	$ 73,000	$ 83,870	2021-2035
RTC 24f	✓	2 - Hwy 1: Auxiliary Lanes from 41st Ave to Soquel Ave and Chanticleer Bike/Ped Bridge	$ 32,100	$ 36,410	2018-2035
RTC 24r		94 - Hwy 1: Northbound Auxiliary Lane from San Andreas Rd/Larkin Valley Rd to Freedom Blvd	$ 8,800	$ 12,450	2035-2040
RTC 26	✓	Bike To Work/School Program	$ 1,870	$ 2,260	Ongoing
RTC 27a	✓	Monterey Bay Sanctuary Scenic Trail Network - Design, Environmental Clearance, and Construction	$ 41,500	$ 50,070	2021-2040
RTC 27b	✓	Monterey Bay Sanctuary Scenic Trail Network (Coastal Rail Trail) - Maintenance	$ 4,800	$ 5,790	Ongoing
RTC 27c	✓	Monterey Bay Sanctuary Scenic Trail Network (Coastal Rail Trail) - Trail Management Program	$ 1,030	$ 1,240	Ongoing
RTC 30	✓	Hwy 1 Bicycle/Ped Overcrossing at Mar Vista	$ 7,800	$ 8,730	2018-2035
RTC 32	✓	Bicycle Route Signage Countywide	$ 600	$ 660	2018-2035
RTC 33	✓	Cabrillo College TDM Programs	$ 780	$ 940	Ongoing
RTC 36		Railroad Infrastructure Maintenance and Rehabilitation	$ 22,410	$ 27,050	Ongoing
RTC-P01	✓	SAFE: Call Box System Along Hwys	$ 5,390	$ 6,510	Ongoing
RTC-P02a		Environmental Assessment, Economic and Other Analyses of Options for Rail Corridor	$ 8,000	$ 9,080	2018-2035
RTC-P03	✓	Rail and Trail Corridor Management and Maintenance	$ 3,850	$ 4,650	Ongoing
RTC-P07	✓	SCCRTC Administration (TDA)	$ 14,300	$ 17,260	Ongoing
RTC-P08	✓	SCCRTC Planning	$ 13,750	$ 16,600	Ongoing
RTC-P25	✓	Transit Oriented Development Grant Program	$ 2,570	$ 3,100	Ongoing
RTC-P26	✓	Countywide Pedestrian Signal Upgrades	$ 1,035	$ 1,250	Ongoing
RTC-P43	✓	Senior Employment Ride Reimbursement	$ 1,600	$ 1,930	Ongoing
RTC-P48	✓	Climate Action Transportation Programs	$ 2,330	$ 2,810	Ongoing
RTC-P49	✓	RTC Bikeway Map	$ 320	$ 390	2021-2040
RTC-P50	✓	County-wide Bicycle, Pedestrian and Vehicle Occupancy Counts	$ 232	$ 280	Ongoing
RTC-P51	✓	Performance Monitoring	$ 220	$ 270	Ongoing

RTP #	Regionally Significant	Project	Constrained Cost *Current Year*	Escalated Cost Rounded Estimate	Year of Expenditure
RTC-P53	✓	TDM Individualized Employer/Multiunit Housing Program	$ 2,325	$ 2,810	Ongoing
RTC-P54	✓	School-Based Mobility/TDM Programs	$ 1,100	$ 1,330	Ongoing
RTC-P57		Shared Parking Program	$ 50	$ 60	2021-2035
RTC-P58		Real-Time Transit Info	$ 220	$ 270	Ongoing
RTC-P59		Measure D Administration and Implementation	$ 16,500	$ 19,920	Ongoing
RTC-P60		Regional State Transit Assistance Projects	$ 33,220	$ 40,100	Ongoing
SC 23		West Cliff Path Minor Widening (David Way Lighthouse to Swanton)	$ 520	$ 540	2018-2020
SC 25	✓	Hwy 1/9 Intersection Modifications	$ 7,850	$ 8,910	2018-2035
SC 37	✓	Murray St Bridge Retrofit	$ 11,440	$ 13,140	2021-2035
SC 38	✓	Hwy 1/San Lorenzo Bridge Replacement	$ 20,000	$ 22,980	2021-2035
SC 42	✓	Soquel Ave at Frederick St Intersection Modifications	$ 310	$ 320	2018-2020
SC 48		Ocean St Pavement Rehabilitation	$ 1,030	$ 1,180	2021-2035
SC 49		Water Street Pavement Rehabilitation(N. Branciforte Ave- Ocean St)	$ 1,453	$ 1,670	2021-2035
SC 50		Pacific Ave. Sidewalk	$ 440	$ 460	2018-2020
SC 51		River Street Pavement Rehabilitation (Water St to Potrero Street)	$ 1,000	$ 1,040	2018-2020
SC-P07		Citywide Operations and Maintenance	$ 86,249	$ 104,110	Ongoing
SC-P09		Sidewalk Program	$ 5,500	$ 6,640	Ongoing
SC-P100		Seabright/Murray Traffic Signal Modifications	$ 1,030	$ 1,180	2021-2035
SC-P101		Swift/Delaware Intersection Roundabout or Traffic Signal	$ 500	$ 570	2021-2035
SC-P104		Measure H Road Projects	$ 41,800	$ 50,460	Ongoing
SC-P105		Market Street Sidewalks and Bike Lanes	$ 1,030	$ 1,460	2035-2040
SC-P109	✓	Bay/High Intersection Modification	$ 2,150	$ 2,470	2021-2035
SC-P119	✓	Soquel/Water (Branciforte to Morrissey) Crosswalks	$ 150	$ 170	2021-2035
SC-P123		Soquel/Branciforte/Water (San Lorenzo River to Branciforte) Bike Lane Treatments	$ 410	$ 470	2021-2035
SC-P125		Citywide Safe Routes to School Projects - ATP	$ 1,404	$ 1,450	2018-2020
SC-P126		Almar Ave Sidewalks	$ 200	$ 230	2021-2035
SC-P128		Citywide Street Sweeping	$ 19,800	$ 23,900	Ongoing
SC-P13		Riverside Ave/Second St Intersection Modification.	$ 175	$ 180	2018-2020
SC-P22		Chestnut St. Pathway	$ 570	$ 650	2021-2035
SC-P23		Delaware Avenue Complete Streets	$ 150	$ 170	2021-2035
SC-P29	✓	Morrissey Blvd. Bike Path over Hwy 1	$ 300	$ 340	2021-2035
SC-P30		Murray St to Harbor Path Connection	$ 210	$ 240	2021-2035
SC-P35		San Lorenzo River Levee Path Connection	$ 2,070	$ 2,930	2035-2040
SC-P47		Chestnut Street Bike Lanes	$ 100	$ 110	2021-2035
SC-P59		King Street Bike Facility (entire length)	$ 2,070	$ 2,380	2021-2035
SC-P69		Seabright Avenue Bike Lanes (Pine-Soquel)	$ 2,070	$ 2,380	2021-2035
SC-P77	✓	Bay Street Corridor Modifications	$ 970	$ 1,370	2035-2040
SC-P81	✓	Hwy 1/Mission St at Chestnut/King/Union Intersection Modification	$ 4,650	$ 6,580	2035-2040
SC-P83	✓	West Cliff/Bay Street Modifications	$ 500	$ 570	2021-2035
SC-P86	✓	Ocean St Streetscape and Intersection, Plymouth to Water	$ 2,000	$ 2,830	2035-2040
SC-P90		High St/Moore St Intersection Modification	$ 100	$ 100	2018-2020
SC-P91		Shaffer Road Widening and Railroad Crossing	$ 1,000	$ 1,410	2035-2040
SC-P93		Beach/Cliff Intersection Signalization	$ 210	$ 240	2021-2035
SV 28		Glen Canyon Rd/Green Hills Rd/S. Navarra Dr Bike Corridor and Roadway Preservation	$ 993	$ 1,030	2018-2020
SV 29		Glenwood Drive Rehabilitation and Bicycle Improvement Project	$ 865	$ 900	2018-2020
SV 30		Kings Village Road/ Bluebonnet Lane Sidewalk	$ 306	$ 320	2018-2020
SV-P05		Citywide Sidewalk Program	$ 2,600	$ 3,140	Ongoing
SV-P06		Citywide Access Ramps	$ 210	$ 250	Ongoing
SV-P21		Lockwood Ln Pedestrian Signal Near Golf Course	$ 50	$ 60	2021-2035
SV-P27		Citywide General Maintenance and Operations	$ 13,459	$ 16,250	Ongoing
SV-P28		Neighborhood Traffic Calming	$ 770	$ 930	Ongoing

RTP #	Regionally Significant	Project	Constrained Cost *Current Year*	Escalated Cost Rounded Estimate	Year of Expenditure
SV-P30A		Mt Hermon Road Sidewalk Connections	$ 520	$ 590	2018-2035
SV-P35		Bean Creek Rd Sidewalks (SVMS to Blue Bonnet)	$ 410	$ 470	2021-2035
SV-P40		Lockwoode Lane Sidewalk and Bike Lanes	$ 520	$ 600	2021-2035
SV-P42	✓	Synchronize Traffic Signals along Mt. Hermon Road	$ 100	$ 100	2018-2020
SV-P45		Scotts Valley Town Center Bicycle/Pedestrian Facilities	$ 4,130	$ 4,740	2021-2035
SV-P46	✓	Mt Hermon/King's Village Rd-Transit Signal priority	$ 80	$ 90	2021-2035
SV-P47	✓	Mt Hermon/Scotts Valley - Transit Queue Jump	$ 620	$ 710	2021-2035
SV-P49		Mt Hermon Rd and Scotts Valley Drive - Crosswalks	$ 515	$ 630	2021-2040
SV-P51	✓	Mt. Hermon Road/Town Center Entrance Traffic Signal	$ 130	$ 150	2021-2035
SV-P52		Kings Village Rd/Town Center Entrance Traffic Signal	$ 105	$ 120	2021-2035
SV-P53		Mt Hermon Rd to El Rancho Drive Bike/Ped Connection	$ 1,030	$ 1,460	2035-2040
SV-P54		Mt Hermon Rd/ Spring Lakes Dr. Pedestrian Intersection Improvements	$ 50	$ 60	2021-2035
TRL 07SC	✓	MBSST (Coastal Rail Trail): Segment 7 (Natural Bridges to Pacific Ave)	$ 7,400	$ 7,660	2018-2020
TRL 18L	✓	MBSST (Coastal Rail Trail): Lee Road, 4000 feet east to City Slough Trail connection	$ 1,540	$ 1,590	2018-2020
TRL 18W	✓	MBSST Rail Trail: Walker Street to City Slough Trail connection	$ 860	$ 890	2018-2020
TRL 5		MBSST - North Coast Rail Trail	$ 20,000	$ 21,730	2018-2035
TRL 8-9a		MBSST (Coastal Rail Trail_ - Segment 8 and 9)	$ 32,934	$ 37,840	2021-2035
TRL 8a		San Lorenzo River Bike/Ped Trail at RR Bridge	$ 1,550	$ 1,780	2021-2035
UC-P01		UCSC Main Entrance Improvements	$ 2,070	$ 2,380	2021-2035
UC-P23		Transit Vehicles (ongoing)	$ 5,170	$ 6,240	Ongoing
UC-P33		UCSC Bicycle Parking Improvements	$ 520	$ 630	Ongoing
UC-P38		Pedestrian Directional Map/Wayfinding System	$ 520	$ 630	Ongoing
UC-P57		Kresge/Core West Pedestrian Bridge: ADA Upgrades	$ 3,100	$ 3,560	2021-2035
UC-P58		UCSC Traffic Control	$ 2,580	$ 3,110	Ongoing
UC-P59		UCSC Lump Sum Roadway Maintenance	$ 3,100	$ 3,740	Ongoing
UC-P61		Traveler Safety Education/Information Programs	$ 100	$ 120	Ongoing
UC-P62		Bus Tracking and AVL Transit Programs	$ 260	$ 290	2018-2035
UC-P63		UCSC Vanpool Program	$ 8,680	$ 10,480	Ongoing
UC-P64		Alternative Fuel Fleet Vehicles	$ 500	$ 600	Ongoing
UC-P65		Electric Vehicle Charging Stations	$ 310	$ 350	2018-2035
UC-P66		Transportation-Related Stormwater Management Projects	$ 1,030	$ 1,240	Ongoing
UC-P68		Parking Management Technology Improvements	$ 410	$ 490	Ongoing
UC-P69		UCSC Commute Counseling Program	$ 3,100	$ 3,740	Ongoing
UC-P70		UCSC Commuter Incentive Programs	$ 1,550	$ 1,870	Ongoing
UC-P73		UCSC Parking Operations & Maintenance	$ 70,450	$ 85,040	Ongoing
UC-P74		UCSC Transit Service	$ 68,410	$ 82,580	Ongoing
UC-P75		Disability Van Service	$ 5,450	$ 6,580	Ongoing
UCSC 07		Great Meadow Bike Path Safety Improvements	$ 1,135	$ 1,180	2018-2020
VAR-P03		Bicycle Sharrows	$ 520	$ 630	Ongoing
VAR-P05		Bike-Activated Traffic Signal Program	$ 1,030	$ 1,240	Ongoing
VAR-P06		Carsharing Program	$ 1,290	$ 1,480	2021-2035
VAR-P07		Transportation System Electrification	$ 51,650	$ 64,660	2021-2040
VAR-P08		Safe Paths of Travel	$ 3,100	$ 3,740	Ongoing
VAR-P10		Safe Routes to Schools Studies	$ 210	$ 250	Ongoing
VAR-P13		Lump Sum Emergency Response Local Roads	$ 23,370	$ 28,210	Ongoing
VAR-P14		Lump Sum Bridge Preservation	$ 54,500	$ 65,790	Ongoing
VAR-P16		Bike Share	$ 5,170	$ 6,380	2021-2040
VAR-P17		Eco-Tourism - Sustainable Transportation	$ 515	$ 620	Ongoing
VAR-P18	✓	Mission St/Hwy 1 Bike/Truck Safety Campaign	$ 520	$ 630	Ongoing
VAR-P19		School Safety Programs	$ 1,910	$ 2,310	Ongoing
VAR-P20		Public Transit Marketing	$ 775	$ 940	2021-2040
VAR-P22		Monterey Bay Electric Vehicle Alliance (MBEVA)	$ 200	$ 240	Ongoing

RTP #	Regionally Significant	Project	Constrained Cost *Current Year*	Escalated Cost Rounded Estimate	Year of Expenditure
VAR-P24		Countywide Senior Driving Training	$ 80	$ 100	Ongoing
VAR-P25		Planning for Transit Oriented Development for Seniors	$ 80	$ 100	Ongoing
VAR-P26	✓	Park and Ride Lot Development	$ 2,260	$ 2,670	2021-2040
VAR-P27		Complete Streets Implementation	$ 10,330	$ 12,400	2021-2040
VAR-P29		Public/Private Partnership Bicycle and Pedestrian Connection Plan	$ 150	$ 170	2021-2035
VAR-P30		Public/Private Partnership Transit Stops and Pull Outs Plan	$ 150	$ 170	2021-2035
VAR-P31		Uncontrolled Pedestrian Crossing Improvements	$ 2,570	$ 3,130	2021-2040
VAR-P32		Bicycle Treatments for intersection improvements (ADD)	$ 4,130	$ 5,020	2021-2040
VAR-P34		Transit Priority	$ 2,585	$ 3,080	2021-2040
VAR-P35		School Complete Streets Projects	$ 10,330	$ 11,870	2021-2035
VAR-P36		Safety Plan	$ 310	$ 370	2021-2040
VAR-P37		Transportation Demand Management Plan	$ 310	$ 370	2021-2040
VAR-P38		Environmental Mitigation Program	$ 5,680	$ 6,860	Ongoing
VAR-P39		Active Transportation Plan	$ 2,380	$ 2,870	Ongoing
VAR-P40		Santa Cruz County Open Streets	$ 200	$ 240	Ongoing
VAR-P44		Electric Bicycle Commuter Incentive Program	$ 1,000	$ 1,200	2021-2040
VAR-P45		West Side Transit Hub	$ 580	$ 670	2021-2035
VAR-P46		Live Oak Transit Hub	$ 530	$ 610	2021-2035
VAR-P47		Watsonville Transit Hub	$ 585	$ 670	2021-2035
VC-P1		Volunteer Center Transportation Program	$ 1,640	$ 1,980	Ongoing
WAT 01A		Hwy 1/Harkins Slough Road Interchange: Bicycle/Pedestrian Bridge	$ 9,900	$ 11,010	2018-2035
WAT 27a	✓	Main St. (Hwy 152)/Freedom Blvd Roundabout	$ 1,500	$ 1,720	2021-2035
WAT 38	✓	Airport Blvd Improvements (Freedom Blvd to City Limits)	$ 1,346	$ 1,390	2018-2020
WAT 40	✓	Airport Boulevard Improvements: Westgate/Larkin to Hanger Way	$ 1,645	$ 1,700	2018-2020
WAT 42		Green Valley Road Reconstruction (Struve Slough-Freedom Blvd)	$ 1,598	$ 1,650	2018-2020
WAT 43		Freedom Boulevard Plan Line	$ 160	$ 170	2018-2020
WAT 44		Bicycle Safety Improvements (Various Locations)	$ 375	$ 390	2018-2020
WAT 45		Freedom Blvd Reconstruction (Alta Vista to Green Valley)	$ 2,000	$ 2,300	2021-2035
WAT-P04		Neighborhood Traffic Plan	$ 115	$ 130	2021-2035
WAT-P06		Citywide General Maintenance and Operations	$ 41,400	$ 49,970	Ongoing
WAT-P13		Neighborhood Traffic Plan Implementation	$ 470	$ 540	2021-2035
WAT-P31		Ohlone Parkway Improvements - Phase 2 (UPRR to West Beach)	$ 600	$ 690	2021-2035
WAT-P35		Bridge Maintenance	$ 115	$ 130	2021-2035
WAT-P36		Alley Improvements	$ 60	$ 70	2021-2035
WAT-P38	✓	Freedom Blvd Undergrounding	$ 1,270	$ 1,800	2035-2040
WAT-P40	✓	Main St Modifications (500 Block: Fifth St to East Lake Ave)	$ 710	$ 820	2021-2035
WAT-P42		Pajaro Valley High School Connector Trail	$ 710	$ 820	2021-2035
WAT-P43		Upper Watsonville Slough Trail	$ 770	$ 1,090	2035-2040
WAT-P46		Lower Watsonville Slough Trail	$ 770	$ 1,090	2035-2040
WAT-P47	✓	Main St Modifications (City Limit to Lake Ave)	$ 1,670	$ 2,360	2035-2040
WAT-P49		2nd/Maple Ave (Lincoln to Walker) Traffic Calming and Greenway	$ 25	$ 30	2021-2035
WAT-P50		5th St (Lincoln to Walker) - Traffic Calming and Greenway	$ 25	$ 30	2021-2035
WAT-P51		Rodriguez St (Main St to Riverside)- Buffered Bike Lane	$ 12	$ 10	2018-2020
WAT-P52		Union/Brennan (Freedom to Riverside) - Sharrows	$ 12	$ 10	2018-2020
WAT-P53		Kearney/Rodriguez - Ped Crossing	$ 35	$ 40	2021-2035
WAT-P54	✓	Main St - 3 HAWK Signals	$ 890	$ 1,260	2035-2040
WAT-P55	✓	Main/Rodriguez/Union/Brennan (Freedom to Riverside) - Crosswalks	$ 115	$ 130	2021-2035
WAT-P56		Watsonville-wide HOV priority	$ 60	$ 70	2021-2035
WAT-P57		East Lake/Madison - ped crossing	$ 300	$ 420	2035-2040
WAT-P58		Main St (Freedom to Riverside) Ped/Bike Enhancements	$ 890	$ 1,010	2018-2035
WAT-P59		Downtown Watsonville Universal Streets	$ 600	$ 690	2021-2035
WAT-P61		Freedom Blvd (Green Valley Rd to Davis) Bicycle and Pedestrian Improvements	$ 300	$ 340	2021-2035

RTP #	Regionally Significant	Project	Constrained Cost *Current Year*	Escalated Cost Rounded Estimate	Year of Expenditure
WAT-P62		Freedom Blvd Pedestrian Crossings (Airport to Lincoln)	$ 600	$ 850	2035-2040
WAT-P65		Upper Struve Slough Trail	$ 530	$ 750	2035-2040
WAT-P68		Freedom Blvd (Davis Ave to Green Valley Rd)	$ 1,730	$ 1,990	2021-2035
WAT-P72		Freedom Blvd (Green Valley Rd to Buena Vista Dr)	$ 5,000	$ 5,740	2021-2035
WAT-P73		Main St Modifications (East Lake Ave to Freedom Blvd)	$ 1,000	$ 1,150	2021-2035

Appendix H

Regional Transportation Plan Checklist

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Regional Transportation Plan Checklist

(Revised February 2010)

(To be completed electronically in Microsoft Word format by the MPO/RTPA and submitted along with the draft RTP to Caltrans)

Name of MPO/RTPA:	Santa Cruz County Regional Transportation Commission
Date Draft RTP Completed:	December 8, 2017
RTP Adoption Date:	June 14, 2018
What is the Certification Date of the Environmental Document (ED)?	June 13, 2018
Is the ED located in the RTP or is it a separate document?	Separate document. Available online at: http://sccrtc.org/funding-planning/long-range-plans/2040-rtp/

By completing this checklist, the MPO/RTPA verifies the RTP addresses all of the following required information within the RTP.

Regional Transportation Plan Contents

General		Yes/No	Page #
1.	Does the RTP address no less than a 20-year planning horizon? (23 CFR 450.322(a))	Yes	ES-1, App E, App F
2.	Does the RTP include both long-range and short-range strategies/actions? (23 CFR part 450.322(b))	Yes	Chp 6, App F, App G
3.	Does the RTP address issues specified in the policy, action and financial elements identified in California Government Code Section 65080?	Yes	Chps 4,5,6,7, App E, App F
4.	Does the RTP address the 10 issues specified in the Sustainable Communities Strategy (SCS) component as identified in Government Code Sections 65080(b)(2)(B) and 65584.04(i)(1)? (MPOs only)	NA	-
	a) Identify the general location of uses, residential densities, and building intensities within the region? (MPOs only)	NA	-

	b) Identify areas within the region sufficient to house all the population of the region, including all economic segments of the population over the course of the planning period of the regional transportation plan taking into account net migration into the region, population growth, household formation and employment growth? (MPOs only)	NA	-
	c) Identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region pursuant to Government Code Section 65584? (MPOs only)	NA	-
	d) Identify a transportation network to service the transportation needs of the region? (MPOs only)	NA	-
	e) Gather and consider the best practically available scientific information regarding resource areas and farmland in the region as defined in subdivisions (a) and (b) of Government Code Section 65080.01? (MPOs only)	NA	-
	f) Consider the state housing goals specified in Sections 65580 and 65581? (MPOs only)	NA	-
	g) Utilize the most recent planning assumptions, considering local general plans and other factors? (MPOs only)	NA	-
	h) Set forth a forecasted development pattern for the region, which, when integrated with the transportation network, and other transportation measures and policies, will reduce the greenhouse gas emissions from automobiles and light trucks to achieve, if there is a feasible way to do so, the greenhouse gas emission reduction targets approved by the ARB? (MPOs only)	NA	-
	i) Provide consistency between the development pattern and allocation of housing units within the region (Government Code 65584.04(i)(1)? (MPOs only)	NA	-
	j) Allow the regional transportation plan to comply with Section 176 of the federal Clean Air Act (42 U.S.C. Section 7506)? (MPOs only)	NA	-
5.	Does the RTP include Project Intent i.e. Plan Level Purpose and Need Statements?	Yes	App F project descriptions
6.	Does the RTP specify how travel demand modeling methodology, results and key assumptions were developed as part of the RTP process? (Government Code 14522.2) (MPOs only)	NA	-

Consultation/Cooperation		Yes/No	Page #
1.	Does the RTP contain a public involvement program that meets the requirements of Title 23, CFR part 450.316(a)?	Yes	App A, 1-12
2.	Did the MPO/RTPA consult with the appropriate State and local representatives including representatives from environmental and economic communities; airport; transit; freight during the preparation of the RTP? (23CFR450.316(3)(b))	Yes	App A
3.	Did the MPO/RTPA who has federal lands within its jurisdictional boundary involve the federal land management agencies during the preparation of the RTP?	Yes	App A
4.	Where does the RTP specify that the appropriate State and local agencies responsible for land use, natural resources, environmental protection, conservation and historic preservation consulted? (23 CFR part 450.322(g))	Yes	A-18 to A-21
5.	Did the RTP include a comparison with the California State Wildlife Action Plan and (if available) inventories of natural and historic resources? (23 CFR part 450.322(g))	Yes	EIR
6.	Did the MPO/RTPA who has a federally recognized Native American Tribal Government(s) and/or historical and sacred sites or subsistence resources of these Tribal Governments within its jurisdictional boundary address tribal concerns in the RTP and develop the RTP in consultation with the Tribal Government(s)? (Title 23 CFR part 450.316(c))		
7.	Does the RTP address how the public and various specified groups were given a reasonable opportunity to comment on the plan using the participation plan developed under 23 CFR part 450.316(a)? (23 CFR 450.316(i))	Yes	App A
8.	Does the RTP contain a discussion describing the private sector involvement efforts that were used during the development of the plan? (23 CFR part 450.316 (a))	Yes	App A
9.	Does the RTP contain a discussion describing the coordination efforts with regional air quality planning authorities? (23 CFR 450.316(a)(2)) (MPO nonattainment and maintenance areas only)	NA	EIR
10.	Is the RTP coordinated and consistent with the Public Transit-Human Services Transportation Plan?	Yes	2-10
11.	Were the draft and adopted RTP posted on the Internet? (23 CFR part 450.322(j))	Yes	www.sccrtc.org/

12.	Did the RTP explain how consultation occurred with locally elected officials? (Government Code 65080(D)) (MPOs only)	NA	-
13.	Did the RTP outline the public participation process for the sustainable communities strategy? (Government Code 65080(E) (MPOs only)	NA	-

Modal Discussion		Yes/No	Page #
1.	Does the RTP discuss intermodal and connectivity issues?	Yes	Ch 2,3,6
2.	Does the RTP include a discussion of highways?	Yes	2-2 to 2-6, 3-6 to 3-7, 6-3
3.	Does the RTP include a discussion of mass transportation?	Yes	2-8 to 2-15, 3-8 to 3-10, 6-4
4.	Does the RTP include a discussion of the regional airport system?	Yes	2-22 to 2-23
5.	Does the RTP include a discussion of regional pedestrian needs?	Yes	2-17 to 2-19, 6-4 to 6-6
6.	Does the RTP include a discussion of regional bicycle needs?	Yes	2-15 to 2-19, 6-4 to 6-6
7.	Does the RTP address the California Coastal Trail? (Government Code 65080.1) (For MPOs and RTPAs located along the coast only)	Yes	2-19
8.	Does the RTP include a discussion of rail transportation?	Yes	2-10 to 2-15, 6-4
9.	Does the RTP include a discussion of maritime transportation (if appropriate)?	NA	-
10.	Does the RTP include a discussion of goods movement?	Yes	3-11 to 3-13

Programming/Operations		Yes/No	Page #
1.	Is a congestion management process discussed in the RTP? (23 CFR part 450.450.320(b)) (MPOs designated as TMAs only)	NA	-
2.	Is the RTP consistent (to the maximum extent practicable) with the development of the regional ITS architecture?	Yes	2-21 to 2-22
3.	Does the RTP identify the objective criteria used for measuring the performance of the transportation system?	Yes	Ch 4, 7, App D
4.	Does the RTP contain a list of un-constrained projects?	Yes	App F

Financial		Yes/No	Page #
1.	Does the RTP include a financial plan that meets the requirements identified in 23 CFR part 450.322(f)(10)?	Yes	Ch 5, App E
2.	Does the RTP contain a consistency statement between the first 4 years of the fund estimate and the 4-year STIP fund estimate? (2006 STIP Guidelines, Section 19)	Yes	5-8
3.	Do the projected revenues in the RTP reflect Fiscal Constraint? (23 CFR part 450.322(f)(10)(ii))	Yes	Ch 5, App E
4.	Does the RTP contain a list of financially constrained projects? Any regionally significant projects should be identified. (Government Code 65080(4)(A))	Yes	App F, App G
5.	Do the cost estimates for implementing the projects identified in the RTP reflect "year of expenditure dollars" to reflect inflation rates? (23 CFR part 450.322(f)(10)(iv))	Yes	App G
6.	After 12/11/07, does the RTP contain estimates of costs and revenue sources that are reasonably expected to be available to operate and maintain the freeways, highway and transit within the region? (23 CFR 450.322(f)(10)(i))	Yes	Ch 5, App E
7.	Does the RTP contain a statement regarding consistency between the projects in the RTP and the ITIP? (2006 STIP Guidelines section 33)	NA	-
8.	Does the RTP contain a statement regarding consistency between the projects in the RTP and the FTIP? (2006 STIP Guidelines section 19)	Yes	5-7
9.	Does the RTP address the specific financial strategies required to ensure the identified TCMs from the SIP can be implemented? (23 CFR part 450.322(f)(10)(vi) (nonattainment and maintenance MPOs only)	NA	-

Environmental		Yes/No	Page #
1.	Did the MPO/RTPA prepare an EIR or a program EIR for the RTP in accordance with CEQA guidelines?	Yes	EIR
2.	Does the RTP contain a list of projects specifically identified as TCMs, if applicable?	Yes	6-3 to 6-5, App E
3.	Does the RTP contain a discussion of SIP conformity, if applicable? **(MPOs only)**	NA	-
4.	Does the RTP specify mitigation activities? (23 CFR part 450.322(f)(7))	Yes	8-2 to 8-4, EIR

5.	Where does the EIR address mitigation activities?	Yes	EIR ES
6.	Did the MPO/RTPA prepare a Negative Declaration or a Mitigated Negative Declaration for the RTP in accordance with CEQA guidelines?	NA – prepared EIR	-
7.	Does the RTP specify the TCMs to be implemented in the region? **(federal nonattainment and maintenance areas only)**	NA	-

☒ ***I have reviewed the above information and certify that it is correct and complete.***

George Dondero

(Must be signed by MPO/RTPA Executive Director or designated representative)

6/12/2018

Date

George Dondero

Print Name

Executive Director

Title

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Appendix I

Resolutions

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RESOLUTION NO. 31-18

Adopted by the Santa Cruz County Regional Transportation Commission
on the date of June 14, 2018
on the motion of Commissioner Bertrand
duly seconded by Commissioner Rotkin

A RESOLUTION TO ADOPT CEQA FINDINGS, A STATEMENT OF OVERRIDING CONSIDERATIONS, AND A MITIGATION MONITORING AND REPORTING PROGRAM RELATED TO THE ENVIRONMENTAL IMPACT REPORT CERTIFIED BY THE ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS FOR THE 2040 SANTA CRUZ COUNTY REGIONAL TRANSPORTATION PLAN

WHEREAS, the Santa Cruz County Regional Transportation Commission is the state-designated Regional Transportation Planning Agency (RTPA) for Santa Cruz County; and

WHEREAS, California Government Code Section 65080 (c) requires that each RTPA adopt and submit an updated Regional Transportation Plan to the California Transportation Commission and the Department of Transportation every five years in non-urban regions; and

WHEREAS, the Santa Cruz County Regional Transportation Plan has been prepared in accordance with California Transportation Commission 2010 Regional Transportation Plan Guidelines, pursuant to Government Code, Section 14522; and

WHEREAS, pursuant to the California Environmental Quality Act (CEQA) (Public Res. Code, §21000 et seq.) and the State CEQA Guidelines (14 Cal. Code Regs. §15000 et seq.), the Association of Monterey Bay Area Governments (AMBAG) is the lead agency for the 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) and Regional Transportation Plan for Monterey, San Benito and Santa Cruz County Environmental Impact Report (EIR), which incorporates the 2040 Santa Cruz County Regional Transportation Plan; and

WHEREAS, AMBAG has overseen, in coordination with the Santa Cruz County Regional Transportation Commission, the Transportation Agency for Monterey County and San Benito County Council of Governments the preparation of the EIR for each County's Regional Transportation Plans; and

WHEREAS, AMBAG was designated the Santa Cruz County Regional Transportation Plan EIR lead agency by Santa Cruz County Regional Transportation Commission; and

WHEREAS, AMBAG has prepared and certified the Program EIR (SCH# 2013061052) for the 2040 MTP/SCS, which incorporates the 2040 Santa Cruz County Regional Transportation Plan, in compliance with CEQA; and

WHEREAS, the Final EIR consists of: (1) the Final EIR volume, which is a complete revision of the Draft EIR; and (2) all appendices to the Final EIR, including Appendix F, which

consists of comments received on the Draft EIR, a list of persons, organizations and public agencies commenting of the Draft EIR, responses to significant environmental issues raised in the review and consultation process and other information; and

WHEREAS, CEQA Findings have been prepared in compliance with Public Resources Code §§21081 and CEQA Guidelines Section §15091 for every significant impact of the 2040 Santa Cruz County Regional Transportation Plan identified in the EIR and for each alternative evaluated in the EIR, including an explanation of the rationale for each finding (attached hereto as **Exhibit A**); and

WHEREAS, the 2040 Santa Cruz County Regional Transportation Plan will have significant unavoidable impacts that cannot be avoided or substantially lessened, and a Statement of Overriding Considerations has been prepared in compliance with Public Resources Code §21081 and CEQA Guidelines §15093 (attached hereto as **Exhibit A**), which concludes that specific economic, legal, social, technological, and other benefits of the 2040 Santa Cruz County Regional Transportation Plan outweigh the significant and unavoidable impacts identified in the EIR; and

WHEREAS, a Mitigation Monitoring and Reporting Program has been prepared in compliance with Public Resources Code §21081.6 and CEQA Guidelines §15097 (attached hereto as **Exhibit B**) to ensure implementation of the mitigation measures identified in the Final EIR; and

WHEREAS, all other legal prerequisites to the adoption of this Resolution have occurred; and

WHEREAS, prior to taking action on the Project, the Santa Cruz County Regional Transportation Commission has considered all of the information in the EIR administrative record pertaining to the 2040 Santa Cruz County Regional Transportation Plan, including the Final EIR, and all oral and written evidence presented to it during all meetings and hearings;

NOW BE IT RESOLVED BY THE SANTA CRUZ COUNTY REGIONAL TRANSPORTATION COMMISSION:

1. The Santa Cruz County Regional Transportation Commission accepts that the Final EIR consists of: (1) the Final EIR (2) all appendices to the Final EIR (Appendices A-F), including Appendix F, which consists of comments and recommendations received on the Draft EIR, a list of persons, organizations, and public agencies commenting of the Draft EIR, responses to significant environmental points raised in the review and consultation process, and other information;

2. The Santa Cruz County Regional Transportation Commission makes and adopts the Findings required by Public Resources Code §§21081 and 21081.5. and CEQA Guidelines §15091 and 15096(h), which are attached hereto and included in Exhibit A and incorporated fully by this reference;

3. The Santa Cruz County Regional Transportation Commission adopts the Statement of Overriding Considerations as required by Public Resources Code §21081, and CEQA Guidelines §15093 and 15096(h), which is attached hereto and included in Exhibit A and incorporated fully by this reference; and,

4. The Santa Cruz County Regional Transportation Commission adopts the Mitigation Monitoring and Reporting Program as required by Public Resources Code §21081.6 and CEQA Guidelines §15097, which is attached hereto as Exhibit B and incorporated fully by this reference.

AYES:	COMMISSIONERS Bertrand, Bottorff, Chase, Coffman-Gomez Coonerty, Leopold, Rotkin, and Commisioner Alternates
NOES:	COMMISSIONERS V.Johnson, Mulhearn, and Noroyan
ABSTAIN:	COMMISSIONERS
ABSENT:	COMMISSIONERS

John Leopold, Chair
ATTEST:

George Dondero, Secretary

Exhibit A: CEQA Findings, Statement of Overriding Consideration,
Exhibit B: Mitigation Monitoring and Reporting Program

Distribution: Santa Cruz County Clerk of the Board
RTC Planner
AMBAG

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RESOLUTION NO. 32-18

Adopted by the Santa Cruz County Regional Transportation Commission
on the date of June 14, 2018
on the motion of Commissioner Bertrand
duly seconded by Commissioner Rotkin

A RESOLUTION ADOPTING THE 2040 SANTA CRUZ COUNTY REGIONAL TRANSPORTATION PLAN

WHEREAS, the Santa Cruz County Regional Transportation Commission (RTC) is the state-designated Regional Transportation Planning Agency (RTPA) for Santa Cruz County; and

WHEREAS, California Government Code Section 65080 (c) requires that each RTPA adopt and submit an updated Regional Transportation Plan to the California Transportation Commission and the Department of Transportation every five years in non-urban regions; and

WHEREAS, the Commission has prepared a 2040 Santa Cruz County Regional Transportation Plan which describes goals and policies, financial projections, and programs and projects to be prioritized by the Commission, local jurisdictions, and local, state and regional agencies through 2040; and

WHEREAS, the Regional Transportation Plan was prepared through the conduct of a continuing, comprehensive and coordinated transportation planning process in conformance with all applicable state and federal requirements; and

WHEREAS, the Regional Transportation Plan has been prepared in accordance with California Transportation Commission 2010 Regional Transportation Plan Guidelines, pursuant to Government Code, Section 14522; and

WHEREAS, the required consultation with other agencies was conducted and adequate opportunity for public review and comment was provided, in accordance with state and federal law and consistent with the region's public participation plan, including, but not limited to wide circulation and review by RTC advisory committees representing project sponsors and transportation stakeholders; representatives of State and Federal governmental agencies; representatives of special interest groups; representatives of the private business sector; and residents of Santa Cruz County; and

WHEREAS, a public hearing was conducted on January 18, 2018 to hear and consider comments on the 2040 Santa Cruz County Regional Transportation Plan; and

WHEREAS, the Regional Transportation Plans for Santa Cruz, San Benito and Monterey Counties are compiled within the 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy prepared by the Association of Monterey Bay Area Governments; and

WHEREAS, the environmental impacts of the 2040 Santa Cruz County Regional Transportation Plan are analyzed as part of the 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy and Regional Transportation Plans for Monterey, San Benito and Santa Cruz County EIR,

prepared by AMBAG as the lead agency and reviewed by RTC as responsible agency, with RTC making appropriate findings;

WHEREAS, the North Central Coast Air Basin, within which Santa Cruz County is located, meets Federal Criteria Pollutant Ambient Air Quality Standards, is in Attainment Status for these standards, and is therefore exempt from a Clean Air Act conformity analysis.

WHEREAS, the nature of the action being taken would not, in and of itself, directly cause any environmental impacts, since the action of adopting the RTP alone does not alone enable programs and projects to proceed;

NOW BE IT RESOLVED BY THE SANTACRUZ COUNTY REGIONAL TRANSPORTATION COMMISSION:

1. The 2040 Santa Cruz County Regional Transportation Plan is hereby adopted following certification of the Final EIR by the Association of Monterey Bay Area Governments and the adoption of the Final EIR Findings, Statement of Overriding Consideration, and Mitigation Monitoring Reporting Program by the Santa Cruz County Regional Transportation Commission.

AYES: COMMISSIONERS Bertrand, Bottorff, Chase, Coffman-Gomez Coonerty, Leopold, Rotkin, and Commissioner Alternates

NOES: COMMISSIONERS V.Johnson, Mulhearn, and Noroyan

ABSTAIN: COMMISSIONERS

ABSENT: COMMISSIONERS

John Leopold, CHAIR

ATTEST:

George Dondero, SECRETARY

Distribution: AMBAG, Caltrans, CTC, SCMTD, Cities, County, FHWA

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4.4 TRANSPORTATION & TRAFFIC

4.4.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Summary of Transportation Modes & Use
- Transportation Plans & Studies
- Road Network & Traffic Conditions
- Bicycle & Pedestrian Circulation
- Public Transit
- Rail Service
- Planned Improvements
- Transportation Management
- Parking

This section was prepared with assistance from Ron Marquez, traffic consultant to the City of Santa Cruz Public Works Department, and Jeff Waller of Hatch Mott MacDonald (formerly Higgins and Associates), who ran the TRAFFIX model and developed Level of Service calculations under the direction of City staff and consultants. A summary of the traffic analysis methodology is included in Appendix C. Traffic volumes and intersection level of service calculations are included in Technical Appendices F-5 and F-6, respectively. The technical appendices are available for review at the City of Santa Cruz Planning Department[1] and are also included on the Draft EIR CD and on the online version of the Draft EIR on the City's website at www.cityofsantacruz.com, Planning Department.

REGULATORY SETTING

A number of local, regional and state agencies are involved with transportation planning and implementation of transportation programs and improvements within the City of Santa Cruz. The City maintains local roadways and bike and pedestrian facilities. The California Department of Transportation (Caltrans) has jurisdiction over State highway segments that traverse the City, including portions of Highways 1, 9, and 17. To help fund local roadway and intersection improvements, the City has developed a "Traffic Impact Fee" (TIF) that is applied to new development at the time of issuance of building permits (see discussion below in the "Planned Transportation Improvements" subsection for more details), and the City is active in acquiring transportation funding from federal and state sources.

[1] Located at 809 Center Street, Room 107, Santa Cruz, California during business hours: Monday through Thursday, 8 AM to 12 PM and 1 to 5 PM.

The City's Zoning Ordinance includes a trip reduction program requirement for specified classifications of employers (Chapter 10.46-Citywide Trip Reduction Program). Key purposes are: to establish programs and requirements for new and existing employers that will help to reduce traffic congestion and to improve air quality; to assist employers in identifying and utilizing cost-effective programs and methods to reduce vehicle trips made by employees; and to ensure the City plays a significant role in promoting alternatives to the use of single-occupant vehicles. The Zoning Ordinance also provides regulations regarding parking and parking space requirements for different land uses in Chapter 12 that include provisions for reduced parking for specified shared parking opportunities.

In addition to the City and Caltrans, other local and regional agencies responsible for transportation services and/or transportation planning include:

- *The Association of Monterey Bay Area Governments* (AMBAG) addresses transportation problems and concerns through its regional transportation system management element and preparation of regional traffic forecasts related to local land use and population projections. AMBAG is the federally designated Metropolitan Planning Organization (MPO) for transportation planning activities in the tri-county Monterey Bay Region. It is the lead agency responsible for developing and administering plans and programs to maintain eligibility and receive federal funds for the transportation systems in the region. AMBAG works with regional transportation planning agencies, transit providers, the Monterey Bay Unified Air Pollution Control District (MBUAPCD), state and federal governments, and organizations having interest in or responsibility for transportation planning and programming. AMBAG also coordinates transportation planning and programming activities with the three counties and 18 local jurisdictions within the Monterey Bay Region. AMBAG develops the Metropolitan Transportation Plan (MTP) and the Metropolitan Transportation Improvement Program (MTIP). (AMBAG website; online at http://www.ambag.org/programs/met_transp_plann.html).
- *The Santa Cruz Metropolitan Transit District* (SCMTD) provides transit services throughout Santa Cruz County.
- *The Santa Cruz Regional Transportation Commissio*n (SCCRTC) oversees planning and funding programs for local and regional projects within Santa Cruz County using state and federal transportation funds. The City of Santa Cruz has one City representative on the 12-member SCCRTC board and many City transportation projects are funded through grant programs administered by the SCCRTC (Fukuji Planning and Design, July 2003).
- *The University of California at Santa Cruz (UCSC)* implements a transportation systems management and parking program that provides a comprehensive package of commute options, including carpools, bicycles, and transit; free bus passes; and shuttle buses serving all areas of the campus.

SUMMARY OF TRANSPORTATION MODES & USE

The movement of people and goods is provided via a range of transportation modes including private and shared auto on a network of local and regional roads and highways; public transit; bicycle; walking; and rail service that is currently used for freight movement and limited seasonal visitor use. Transportation modes provide access for work, shopping, recreation, and

personal and social purposes. The state highways through the City also carry regional and statewide traffic. Key activity centers in the City include:

- The Mission Street corridor in the Westside;
- Ocean Street;
- Soquel Avenue in the eastside; the downtown area; the beach-Boardwalk area;
- the Harvey West-River Street area; and
- UCSC (Fukiji Planning and Design, July 2003).

The joint City-UCSC "Master Transportation Study" (MTS) found that 70% of daily residential mobility within the City is for local trips. For peak-hour travel citywide, 50% is local and 50% is regional travel. Of regional trips, commute in and commute out trips are roughly split in half (Fukiji Planning and Design, July 2003). Surveys conducted as part of the MTS found that 30% of trips in Santa Cruz are for work compared to 25% for social purposes, 18% for personal purposes, 14% for school, and 13% for shopping (Ibid.).

Daily citywide residential trips were made by auto, bus, bicycle and walking. City resident travel patterns identified in the MTS are shown on Figure 4.4-1.[2] For the PM peak period (4 PM to 7 PM), 80% of all travel modes used a car (68% drove alone and 12% carpooled) and 20% bicycled, walked or rode transit. Of these travel groups, full and part-time employees comprised 84% of the trips, compared to 16% for students and retired persons (Fukiji Planning and Design, July 2003). The Santa Cruz County Regional Transportation Commission reports that the number of people per vehicle has remained fairly constant over the last 15 years at an average of 1.2 persons per vehicle in the morning and 1.3 in the evening based on annual vehicle occupancy counts for Highway 1 and Highway 17 (Santa Cruz County Regional Transportation Commission, June 2010).

LOCAL & REGIONAL TRANSPORTATION PLANS & STUDIES

City-UCSC Master Transportation Study

In April 2000, the City of Santa Cruz and the University of California at Santa Cruz initiated a partnership to jointly fund a community-based approach to planning the City's transportation future that resulted in the completion of "The Master Transportation Study" (MTS). The Mission Statement of the study is to *"Create a Transportation Plan for the City of Santa Cruz that is inspiring, innovative and implementable with broad-based community support."* The MTS integrates pedestrian, bicycle, transit and street transportation plans and programs as a foundation for updating the City's General Plan, City zoning ordinance, UCSC's Long Range Development Plan and other city and regional transportation planning documents (Fukuji Planning and Design, July 2003). The MTS is not an adopted plan, but was reviewed and accepted by the City Council.

The MTS recommends a series of City-initiated strategies, short-term transit strategies and long-term recommendations to reduce single-occupant trips, increase multiple-occupant vehicles,

[2] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

increase transit, bicycle and pedestrian modes, and improve traffic system efficiency. Elements of these recommendations include an emphasis on carpooling and recommended support of a Bus Rapid Transit (BRT) system. The recommended travel mode splits as envisioned in the MTS would shift as follows:

- SINGLE-OCCUPANT VEHICLES (SOV): Decrease by 13% for internal trips and 4% for external trips.
- MULTIPLE-OCUPPANT VEHICLES (MOV): Increase by 4% for internal trips and 3% for external trips.
- BUS USE: Increase by 2% for internal trips and 1% for external trips.
- BIKE USE: Increase by 3% for internal trips.
- PEDESTRIAN USE: Increase by 4% for internal trips (Fukuji Planning and Design, July 2003).

  (Fukuji Planning and Design, July 2003).

The following projects are identified as MTS high priority projects:

- Metrobase Transit District Consolidations Operations Facility,
- Right-of-Way Acquisition on rail corridor,
- Bike and pedestrian path on rail right-of-way,
- Local bike projects and expanded bus service.

Santa Cruz County Regional Transportation Plan (RTP)

The Santa Cruz County Regional Transportation Commission (SCCRTC) deals with transportation issues in Santa Cruz County. The purpose of the SCCRTC is to:

- Set priorities for major capital improvements to the County's transportation infrastructure, including highways, major roads, rail and alternative transportation facilities.
- Pursue and allocate funding for all elements of the County's transportation system.
- Adopt policies to improve mobility, access and air quality.
- Plan for future projects and programs to improve the regional transportation system.
- Inform businesses and the public about alternatives to driving alone and the need to better manage our existing transportation system.
- Conduct programs to encourage the use of alternative transportation modes (Santa Cruz County Regional Transportation Commission website: www.sccrtc.org).

The *Regional Transportation Plan* (RTP) is a state-mandated, long-range plan that serves as a blueprint to guide future transportation funding decisions. The RTP, prepared by the SCCRTC, outlines transportation challenges and establishes investment priorities for all of Santa Cruz County. The plan includes lists of transit, highway, local road, bike, and pedestrian needs in the region and estimates the amount of local, state and federal dollars that may be available for these projects over the next 25 years. The plan is updated to reflect the latest funding and project needs every four to five years (Santa Cruz County Regional Transportation Commission website, online at: http://www.sccrtc.org/rtp.html.)

The current version was adopted by the SCCRTC in June 2010. The "2010 RTP" is a minor update of the last version, completed in 2005, and provides guidance for transportation policy and projects through the year 2035. The 2010 RTP is the SCCRTC's comprehensive planning document, which identifies the goals, projects, and programs that will maintain and improve the County's transportation system over the next twenty-five years. Identified improvements and projects are categorized as either "Constrained", meaning there are foreseeable funds for the improvement or "Unconstrained", meaning new revenues would need to be generated or become available. Individual projects listed in the 2010 RTP must still undergo separate design and environmental processes, and can only be implemented as local, state and federal funds become available (Santa Cruz County Regional Transportation Commission, June 2010).

The 2010 RTP carries forward goals from the 2001 and 2005 RTPs, which are to:

- Preserve and maintain the existing transportation system, emphasizing safety and efficiency
- Increase mobility by providing an improved and integrated multi-modal transportation system.
- Coordinate land use and transportation decisions to ensure that the region's social, cultural, and economic vitality are sustained for current and future generations.
- Ensure that the transportation system complements and enhances the natural environment of the Monterey Bay region and reduce greenhouse gas emissions.
- Make the most efficient use of limited transportation financial resources.
- Solicit broad public input on all aspects of regional and local transportation plans. Santa Cruz County Regional Transportation Commission, June 2010).

The 2010 RTP assigns future transportation funds to a range of projects and programs designed to maintain the current transportation system, provide traffic congestion relief and broaden transportation options. Key proposals include:

- Maintenance of the existing transportation network including roads, highways, bike lanes, sidewalks, and transit.
- Safety and operational improvements to Highways 1, 9, 17, 129 and 152.
- Adding auxiliary lanes and High Occupancy Vehicle (HOV) lanes on Highway 1 between Aptos and Santa Cruz.
- Modifications to major arterial roads -- including bus, pedestrian and bicycle facilities.
- Expanded bus service, with additional Highway 17 Express buses and more Park and Ride lots to serve Silicon Valley, University of California Santa Cruz (UCSC), and south county commuters.
- Construction of the Monterey Bay Sanctuary Scenic Trail Network along the coast.
- Local bicycle and pedestrian projects designed to increase bicycle commuting, and provide safe bicycle and pedestrian routes to schools.
- Expansion of specialized transport services in response to projected increases in senior and disabled populations.

- Increased availability of information about road conditions, transit operations, and other transportation options.
- Landscaping and lighting improvements to make transportation corridors part of livable communities (Santa Cruz County Regional Transportation Commission, June 2010).

The 2010 RTP also includes a new discussion on greenhouse gas (GHG) emissions in relation to transportation planning. In the absence of tools to measure the effectiveness of specific RTC policies towards reducing GHGs and without having the specific GHG reduction targets from the state during development of the 2010 RTP, the new chapter introduces some of the best practices which could be included in a portfolio of strategies to meet future emission reduction goals in Santa Cruz County. The RTP includes many projects that pro-actively implement GHG reduction strategies such as: operating a Commute Solutions program to encourage ridesharing; funding freeway service patrols to remove incidents and improve traffic flow; adding high occupancy vehicle lanes in the Highway 1 corridor to encourage carpools, vanpools and transit use; acquiring the rail corridor for goods movement, bicycle and pedestrian access and possible passenger service; and supporting bicycle, pedestrian and transit projects (Santa Cruz County Regional Transportation Commission, June 2010).

Monterey Bay Area Metropolitan Transportation Plan (AMBAG)

AMBAG is the MPO (Metropolitan Planning Organization) for the Monterey Bay Area, and as the region's MPO, AMBAG is required to produce certain documents that maintain the region's eligibility for federal transportation assistance. The Metropolitan Transportation Plan (MTP) is the federally mandated long-range transportation plan for the Monterey Bay Area. This plan lays out a financially constrained list of transportation projects over the following 25 years that will enhance regional mobility (AMBAG website, "Metropolitan Transportation Plan", online at: http://www.ambag.org/programs/met_transp_plann/mtp.html).

Federal regulations require that this long-range transportation plan be both financially constrained and fall under the on-road motor vehicle emissions budget included in the Federal Air Quality Maintenance Plan. The MTP, referenced as *Monterey Bay Area Mobility 2035*, was approved by the AMBAG Board of Directors on June 8, 2010, and includes goals, policies, programs and projects to meet the stated objectives and meet the transportation needs and deficiencies. Programs and projects are taken from each county's RTP and first incorporated, in their entirety, into the MTP (AMBAG, June 2010).

As a region that meets federal standards for ozone precursors, the region is considered to be in 'attainment' for those standards. As an attainment region, the MTP is only required to be updated every five years. Because new state legislation, SB 375, calls for MPOs to prepare a Sustainable Communities Strategy (SCS) to be used to synchronize and coordinate both the metropolitan transportation planning process and the regional housing needs allocation process, AMBAG is treating this 2010 update of the MTP as a minor update. Beginning with the 2012 update, AMBAG is moving to a four-year update cycle to align regional planning efforts for transportation with an eight year housing planning cycle. (AMBAG website, "Metropolitan Transportation Plan", online at: http://www.ambag.org/programs/met_transp_plann/mtp.html).

Caltrans' Corridor System Management Plan

Caltrans is in the process of developing a "Corridor System Management Plan" (CSMP) for Highway 1 from the junction of Highway 68 in Monterey County to King Street/Mission Street in Santa Cruz to develop strategies to manage the corridor and sustain existing transportation investments (Caltrans, October 2010). The draft plan indicates that the following strategies will be used to manage State Route 1 over the next 20 years:

- Maintenance and preservation of the roadway.
- Support improvement of transit service, including new express bus service on the HOV lanes planned for the Santa Cruz corridor.
- Support land use and transportation planning efforts such as AMBAG's "Blueprint Plan".
- Reduce congestion by encouraging programs that increase the use of transit, improve bicycle and pedestrian programs and encourage programs such as carpools, ridesharing, telecommuting and park-and-ride facilities to reduce demand.
- Intelligent Transportation Systems/Traveler Information/Traffic Management to clear congestion after collisions.
- Operational Improvements, including auxiliary lanes, intersection improvements, ramp metering (Caltrans, October 2010).

ROAD NETWORK & TRAFFIC CONDITIONS

Road and Highway Network

LOCAL ROADWAYS

The City's road system consists of arterial highways and arterial, collector and local streets (see Figure4.4-2). These different classifications relate to different transportation functions and are classified in terms of access, mobility, design and use. Additionally, visitor/coastal access and truck routes have been designated to facilitate the movement of visitor traffic and commodities.

Highways and arterial streets carry the City's heaviest traffic flows and provide regional and inter-community access. State highways through the City are described in the following section. Major arterial streets within the City include:

- Ocean Street (the primary north-south arterial);
- Mission Street, Water Street, Soquel Avenue and Broadway Avenue-Laurel Street (the primary east-west arterials);
- Other designated arterial streets include Bay Street, Delaware Avenue, Morrissey Blvd., Murray Street-San Lorenzo Blvd., Seabright Avenue, Market Street, Beach Street, Second Street, Front Street, Pacific Avenue, Cedar Avenue, Center Street, Walnut Street, River Street and High Street.

Collector streets provide circulation within and between neighborhoods and commercial and industrial areas. These streets usually serve relatively short trips and are meant to collect traffic from local streets and distribute them to the arterial network. Examples of collector streets

include: California Street, Chestnut Street, Escalona Drive, Fairmount Street, Frederick Street, King Street, Swift Street, and West Cliff Drive.

Local streets provide direct access to abutting land uses, collectors, or arterials, and usually do not accommodate bus routes.

Visitor/coastal access routes are intended to be inviting to visitors and to provide convenient, clear access to and from visitor and coastal destinations. Highways 1 and 17, Ocean Street and Mission Street are key visitor routes into Santa Cruz and the City's beach areas. West Cliff Drive also provides a scenic route along the coast.

Truck routes are intended to channel trucks through the community and away from residential and other areas where they would be a nuisance. The truck routes in the City are Highway 1 – Mission Street, Highway 17, Bay Street north of Mission, Empire Grade west of Bay, Highway 9, Morrissey Boulevard, and Soquel Avenue.

STATE HIGHWAYS

State highways that go through the City of Santa Cruz include segments of Highways 1, 17, and 9. Though referenced as "state routes" in Caltrans documents, the more common term, "highway", is used in this EIR. Highways 1 and 17 serve regional traffic, including motorists who commute to jobs in the Santa Clara Valley and motorists who travel into Santa Cruz County for recreational opportunities offered in the county. A short segment of Highway 9 also is within city limits.

Highway 1 provides access to San Francisco to the north and Monterey to the south. Regionally, Highway 1 is the major inter- and intra-county route for Santa Cruz County. Within the City of Santa Cruz, it is oriented in an east-west direction, although the interregional alignment of Highway 1 is primarily north-south. It is a four-lane arterial along Mission Street from the west side of Santa Cruz to Chestnut Street Extension, a four-lane expressway between Mission Street-Chestnut Street and River Street, and a four-lane freeway east of River Street. The speed limit on Highway 1 is 25 miles per hour (mph) along Mission Street, 45 mph along the expressway section, and 55 and 65 mph on the freeway sections further east. Recurrent congestion results in queuing on Highway 1 that extends for several miles during peak hours. Accidents, events, and other incidents in the corridor can further increase congestion related delays in either direction, on any day, including weekends.

Highway 9 is a two-lane state highway that connects the City of Santa Cruz with the San Lorenzo Valley, and eventually, Saratoga and Los Gatos. Approximately 0.5 miles of Route 9 are located within Santa Cruz city limits.

Highway 17 connects Santa Cruz with Scotts Valley and San Jose and other Santa Clara County communities. It is a four-lane freeway north of the Highway 1/ Highway 9 intersection. Highway 17 is the primary route between the Santa Clara Valley and Santa Cruz County that serves as both a commute route for Santa Cruz County residents that work in Santa Clara County and for recreational visitors that come to Cruz County. Congestion occurs both during weekday commute times and on summer weekends. This winding, four-lane road has steep sections, frequent road crossings, and substandard median shoulders and outside shoulders for

most of its length. In addition to the challenging roadway configuration, weather-related conditions such as thick fog, heavy rains and mudslides affect roadway operations.

Existing Traffic Conditions & Level of Service

Traffic conditions are measured by average daily traffic (ADT), peak hour traffic volumes, and level of service (LOS), average delay, and volume to capacity (V/C) ration. Average daily traffic is the total number of cars passing over a segment of the roadway, in both directions, on an average day. Peak hour volumes are the total number of cars passing over a roadway segment during the peak hour in the morning (AM) or afternoon/evening (PM). In the City of Santa Cruz, the peak hour for weekdays occurs in the evening.

"Level of Service" (LOS) is used to identify the magnitude of traffic congestion and delay at intersections. Traffic flows along city streets are typically controlled by the volume and capacity of the nearest intersection (City of Santa Cruz, 1994). Intersections are rated based on a grading scale of LOS "A" through LOS "F", with LOS A representing free flowing conditions and LOS F representing forced flow conditions. The intermediate levels of service represent incremental levels of congestion and delay between these two extremes.

The signalized intersection LOS methodology addresses the capacity, LOS, and other performance measures for lane groups and intersection approaches and the LOS for the intersection as a whole. Capacity is evaluated in terms of the ratio of demand flow rate to capacity (v/c ratio), whereas LOS is evaluated on the basis of control delay per vehicle (in seconds per vehicle). Control delay is the portion of the total delay attributed to traffic signal operation for signalized intersections. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay as listed in the following table from the *Highway Capacity Manual 2000,* Transportation Research Board.

LOS CRITERIA FOR SIGNALIZED INTERSECTIONS

LOS	LOS Control Delay per Vehicle (seconds/vehicle)
A	≤ 10
B	> 10–20
C	> 20–35
D	> 35–55
E	> 55–80
F	> 80

Capacity analysis at two-way stop control (TWSC) intersections depends on a clear description and understanding of the interaction of drivers on the minor or stop-controlled approach with drivers on the major street. Both gap acceptance and empirical models have been developed to describe this interaction. LOS for a TWSC intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS is not defined for the intersection as a whole as shown in the following table.

LOS CRITERIA FOR TWSC INTERSECTIONS

LOS	LOS Control Delay per Vehicle (s/veh)
A	**0–10**
B	**> 10–15**
C	**> 15–25**
D	**> 25-35**
E	**> 35-50**
F	**> 50**

SOURCE: *Highway Capacity Manual 2000,* Transportation Research Board

The City of Santa Cruz has established LOS D as the minimum acceptable LOS for overall intersection operations during weekday AM and PM peak hours. However, the existing General Plan recognizes that some major regional intersections (which were once part of the "Congestion Management Program" – a formerly mandated state program[3]) as experiencing lower levels of service than the City's LOS D standard. Thus, the existing General Plan accepts a lower (i.e., worse) LOS at these intersections (listed below) per existing Circulation Policy 5.1.2 due to environmental, economic, and/or feasibility constraints with implementing improvements at these locations.

- Mission St. / Chestnut St.-Hwy 1 (F)
- Highway 1 / River St.-Hwy 9 (F)
- Ocean St. / Plymouth St. (F)
- Water St. / Ocean St. (F)
- Soquel Ave. / Ocean St. (F)
- Soquel Ave. / Water St. / Morrissey Blvd. (E)

Caltrans, which has jurisdiction over state highways, endeavors to maintain a target LOS at the transition between LOS C and D. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS (Caltrans, December 2002). If an existing State highway facility is operating at less than the appropriate target LOS, the existing LOS should be maintained (Ibid.).

The critical volume to capacity ratio (V/C) is another measure of the operating conditions of an intersection as opposed to LOS. The ratio provided in the worksheets is a calculation of the volume to capacity for the critical movements at the intersection. It is not the average of all the movements at the intersection. V/C is not used as a measure to define the levels of service.

[3] The Code of Federal Regulations, Title 23 Volume 1, adopted in April. 2005 require Transportation Management Areas (TMAs) to prepare Congestion Management Programs. TMAs are defined as urbanized areas with a population over 200,000. There are eight such areas in California plus Santa Barbara that asked to be included.

LOCAL INTERSECTION LEVELS OF SERVICE

Weekday Peak Hour Traffic Conditions. In the City of Santa Cruz, the peak hour for weekdays occurs in the evening. The PM peak hour (roughly 4 PM to 7PM) generally has the highest number of trips compared to the AM peak hour (7 AM to 10 AM) or the midday peak hour (Fukuji Planning and Design, July 2003). Intersection traffic counts were collected during the weekday PM peak hour (4:00 – 6:00 PM) at nearly 80 intersections throughout the City. The counts were done in May 2006, November 2006 and February 2007. The intersection counts are included in Appendix F-5.

The City's consulting traffic engineer compared traffic counts taken for the General Plan traffic with counts taken in 2008 and 2009 that were obtained from the SCCRTC to ensure the validity of the counts for the General Plan EIR analysis. The review indicates that all but one of the counts the City made in 2006 were higher than those reported by the Commission (Marquez, March 2010; see Appendix C for details). Traffic counts were also compared to traffic volumes reported by Caltrans; overall the counts reported for 2006 are 8% higher than those reported in 2008 (Ibid.).

In Fall 2010, UCSC completed new traffic counts at intersections within the City. Of the 24 intersections that the City was able to compare, traffic volumes increased for about half of these and half decreased. Overall, on average, traffic has decreased by 5%. The increased traffic increases were at intersections along Mission Street, High Street, and at the River/Water, Bay/W. Cliff, Delaware/Swift and Front/Laurel intersections (see Appendix C). The increased traffic has been addressed in the City's traffic model. Traffic from projects that were being constructed and/or occupied after the General Plan traffic counts were taken have been added to the "Existing" baseline conditions (see Appendix C) as these projects would be generating traffic at the time the EIR NOP was released. As a result, the existing-baseline condition for this EIR is slightly higher overall than the 2010 counts (Marquez, personal communication, February 2011), except for three intersections – Bay/West Cliff, King/Storey, and Laurel/Front. However, overall, the City continues to see lower counts than were experienced four years ago. Thus, the traffic estimates made for the General Plan 2030 are conservatively high and represent a worst-case scenario for CEQA purposes.

Quantitative Levels of Service (LOS) analysis was performed for the study intersections based the *2000 Highway Capacity Manual* methodologies, prepared by the Transportation Research Board. Intersection operations were evaluated using the Traffix analysis software. Intersection traffic flow operations are evaluated using a level of service (LOS) concept. The technical LOS calculations are included in Technical Appendix F-6, which is available for review at the City of Santa Cruz Planning Department[4] and is also included on the Draft EIR CD and on the online version of the Draft EIR on the City's website at www.cityofsantacruz.com, Planning Department.

Existing intersection PM peak hour levels of service are summarized in Table 4.4-1. All of the study intersections currently operate at an acceptable LOS except for the following 11 intersections, of which six intersections are signalized, and five intersections are unsignalized.

[4] Located at 809 Center Street, Room 107, Santa Cruz, California during business hours: Monday through Thursday, 8 AM to 12 PM and 1 to 5 PM.

For these intersections. Table 4.4-1 also identifies the delay (in seconds) and V/C ratio[5] for the intersections operating at unacceptable levels. For unsignalized intersections, the unacceptable LOS is usually due to delays on a minor leg of the intersection.

- Highway 1 / Highway 9-River Street (F)
- Highway 9-River / Street-Encinal (E)
- Ocean Street / San Lorenzo Blvd. -East Cliff Drive (E)
- Ocean Street / Water Street (E)
- Mission Street / Bay Street (E)
- Bay Street / Escalona Drive (F)
- Bay Street / California Street (F)
- Bay Street / California Avenue (F)
- Laurent Street / High Street (F)
- Western Drive / High Street (E)
- Seabright Avenue / Water Street (F)

Summer and Weekend Peak Hour Traffic Conditions. The City also experiences significant traffic during the summers and holiday weekends due to tourist traffic. A portion of the City's circulation system is affected by seasonal surges resulting from coastal access demands from all of northern California. Santa Cruz has recognized that it is not practical to build to accommodate this seasonal demand, and has considered beach access congestion to be acceptable as long as it does not divert traffic onto residential streets. The 2030 Plan has focused on addressing the congestion associated with the weekday travel of City residents, employees and customers.

STATE HIGHWAY TRAFFIC OPERATIONS & LEVEL OF SERVICE

Based on the most recent Caltrans traffic data (2009 counts), the average daily trips (ADT) on state highways within Santa Cruz is as follows:

- Highway 1, Morrissey Boulevard. ADT is approximately 88,000 to 97,000 trips with 6,300 to 6,900 trips occurring during the peak hour.
- Highway 17, between Santa Cruz and Scotts Valley. ADT is approximately 63,000 - 73,000 trips with 5,700 – 6,300 trips occurring during the peak hour.
- Highway 9 within Santa Cruz City Limits. ADT is approximately 5,000 trips with approximately 510-550 trips in the peak hour as measured at the City limits, north of Encinal.

[5] The V/C ratio is the average adjusted volume of vehicles for each movement over the serviceable capacity of each movement at the intersection. The volume for each approach is adjusted for percentage of trucks and buses, for peaking characteristics, and for abutting parking characteristics. The capacity of each movement is adjusted for lane width, grade, and green time available.

TABLE 4.4-1
Existing Intersection PM Peak Hour Levels of Service

	Intersection	PM Peak LOS	Delay [in seconds]	V/C Ratio
SIGNALIZED INTERSECTIONS				
1	Hwy 1/Western	B		
2	Mission/Swift	B		
3	Mission/Miramar	B		
4	Mission/Almar-Younglove	B		
5	**Mission/Bay**	**E**	**55.8**	**0.944**
6	Mission/Laurel	B		
7	Mission/Walnut	B		
8	Mission/King-Union	C		
9	Mission/Chestnut-Hwy. 1	D		
10	High/Moore	A		
11	Bay-Coolidge/High	D		
12	Bay/Nobel-Iowa	B		
13	Bay/King	B		
14	California/Laurel	C		
15	Chestnut/Laurel	B		
16	Center/Laurel	B		
17	Center/Mission	B		
18	Pacific/Laurel	B		
19	Front/Laurel	C		
20	Front/Metro Center	A		
21	Front/Cathcart	A		
22	Front/Soquel	C		
23	Front/Cooper	A		
24	Front-Pacific/Mission-Water	B		
25	River/Water	C		
26	N. Pacific/River	B		
27	River/Potrero	B		
28	**River/Hwy. 1**	**F**	**83.9**	**0.942**
29	**River/Encinal**	**E**	**73.9**	**1.099**
30	San Lorenzo/Laurel-Broadway	B		
31	Riverside/San Lorenzo	C		
32	Riverside/Third	C		
33	Riverside/Beach	A		
34	**Ocean/San Lorenzo-East Cliff**	**E**	**64.7**	**1.061**
35	Ocean/Broadway	C		
36	Ocean/Soquel	D		
37	**Ocean/Water**	**E**	**73.6**	**1.081**
38	Ocean/Kennan-Washburn	A		
39	Ocean-Hwy.17/Ocean-Plymouth	C		
40	Market/Water	C		

TABLE 4.4-1
Existing Intersection PM Peak Hour Levels of Service

	Intersection	PM Peak LOS	Delay [in seconds]	V/C Ratio
41	N. Branciforte/Water	D		
42	Branciforte/Soquel	C		
43	S. Branciforte/Broadway	B		
44	Seabright/Soquel	C		
45	Seabright/Broadway	B		
46	Seabright/Murray	D		
47	Morrissey/Water-Soquel	C		
48	Morrissey/Fairmount	A		
49	Frederick/Soquel	C		
50	Hagemann-Trevethan/Soquel	A		
51	Park/Soquel	B		
52	Capitola Rd./Soquel Ave.	C		
53	La Fonda/Soquel	B		
54	Riverside-Dakota/Soquel (new)	A		
55	River S./Soquel	B		
56	Seventh Ave./Soquel Ave.	C		
57	Seventh Ave./Capitola Rd.	C		
58	Seventh Ave./Eaton	D		
UNSIGNALIZED INTERSECTIONS				
59	**Bay/California St**	**F**	**434.0**	**1.704**
60	**Bay/California Ave**	**F**	**67.6**	**1.130**
61	West Cliff/Bay	C		
62	Beach/Pacific Ave	C		
63	Pacific Avenue/Center	B		
64	Storey/King	B		
65	River/Fern	B		
66	King/Laurel	B		
67	**Laurent/High**	**F**	**59.6**	**1.066**
68	Market/Isbel-Goss	B		
69	North Branciforte/Goss	B		
70	Highway 1/Shaffer Rd	B		
71	Cedar/Laurel	C		
72	**Bay/Escalona**	**F**	**782.2**	**2.015**
73	**Western/High**	**E**	**45.9**	**05.44**
74	Cliff/Beach	B		
75	Riverside/Second-Liebrandt	A		
76	**Seabright/Water**	**F**	**112.8**	**0.589**
77	Swift and Delaware	C		
78	Seventh Ave./Brommer	C		
79	Seventh Ave./E. Cliff	C		

SOURCE: Hatch Mott MacDonald

State Route 1 (Highway 1). The highest average daily traffic volumes along Highway 1 within Santa Cruz County occur in Capitola at the 41st Avenue interchange with 94,000 to 104,000 ADT (Caltrans, October 2010). The segment near the Morrissey Blvd. interchange carried the second highest volume of traffic. Highway 1 west of Morrissey Boulevard is currently operating at LOS D-E (Caltrans, October 2010). Congestion along Highway 1 extends for several miles during peak hours.

According to the *Transportation Concept Report* for Highway 1, the target level of service for State Highway 1 east of Morrissey Boulevard is LOS D (Caltrans, April 2006). Additionally, according to the *Caltrans Guide for the Preparation of Traffic Impact Studies (Caltrans, 2002),* if an existing State Highway facility is operating at less than the target LOS, the guide states that the existing LOS should be maintained (Caltrans, 2002).

Caltrans is in the process of developing a "Corridor System Management Plan" (CSMP) for Highway 1 from the junction of Highway 68 in Monterey County to King Street/Mission Street in Santa Cruz to develop strategies to manage the traffic and congestion along the corridor and sustain existing transportation investments. According to the draft plan released in October 2010, a small segment of the City is located in Segment 4 (Larkin Valley to Branciforte Creek Bridge), with the remainder of the City being located in Segment 5 (Branciforte Creek Bridge to King Street). The draft CSMP indicates that between Branciforte Creek and King Street, traffic volumes are projected to increase from 54,000 average daily trips (AADT) in 2008 to 60,000 in 2025. Existing and future LOS along Highway 1 as identified by Caltrans in this draft plan is identified below (Caltrans, October 2010).

	Existing LOS (2007)	Future LOS (2030)
❑ Hwy 1, Larkin Valley Road to Branciforte Creek Bridge	E - F	F
❑ Branciforte Creek Bridge to King St.	D - E	E - F

The *Concept Report* for Highway 1 indicates that to achieve LOS D on Highway 1, added capacity, operational improvements, and investment in the multi-modal system will be required (Caltrans, April 2006). The Route Concept Report for Highway 1 includes the addition of High Occupancy Vehicle (HOV) lanes to Highway 1 in each direction to reduce congestion, encourage carpooling, expand express bus service, and improve safety from Morrissey Boulevard to San Andreas/Larkin Valley Road. Caltrans' draft *Corridor System Management Plan* for Routes 1 and 183 indicates that LOS along added Highway 1 HOV lanes during peak hours would range between B and C in the year 2035 (Caltrans, October 2010). While the overall LOS would remain unchanged in the other lanes with addition of an HOV lane, average speeds would be increased and delays and average travel time would be reduced (Ibid.).

In October 2008, Caltrans completed improvements to Highways 1 and 17 as part of the Route 1/17 Merge Lanes Project, which was designed to improve merging by adding additional merge lanes from Highway 1 to Highway 17. The project added merge lanes to the connection between northbound Route 1 and northbound Route 17 and to southbound Route 1 through the 1/17 interchange. Existing bridge structures were widened or replaced, soundwalls were constructed, and landscaping was installed.

State Route 17 (Highway 17). Highway 17 near Pasatiempo Boulevard is currently operating at LOS F (Caltrans, April 2006). According to the *Transportation Concept Report* for Highway 17, the target peak level of service for State Highway 17 between the Ocean Street and Scotts Valley is LOS E (Caltrans, January 2006). The Route Concept Report for Highway 17 indicates that widening is not envisioned and this segment of the highway is considered to be a four-lane freeway (Caltrans, January 2006).

Traffic Forecasts

The SCCRTC's *Regional Transportation Plan* (RTP) indicates that annual Vehicle Miles Traveled (VMT) throughout Santa Cruz County will increase over 2005 levels within the next 30 years. These VMT projections are made using AMBAG's Regional Travel Demand Model (RTDM). The current RTDM is developed and calibrated for 2005 and forecast for the year 2035.[6] Overall the RTP forecasts the following traffic conditions between the years 2005 and 2035 within Santa Cruz County:

- Daily person trips (trips per person) are projected to increase by 16%.
- Single-occupant auto travel for work trips is projected to increase by 13%.
- Daily vehicle miles of travel are projected to increase by 40%.
- The largest increases in vehicle miles traveled are projected to be on freeways (Santa Cruz County Regional Transportation Commission, June 2010, page 2-10).

According to the SCCRTC, there are three reasons why traffic congestion is a major issue in Santa Cruz County, as well as elsewhere in the state and nation. First, more people are driving more miles and per person vehicle registrations are at an all time high. Second, investment in transportation facilities and services has not kept pace with growing demands for road space and transportation alternatives due to decreases in the amount of transportation funding available for local projects. Third, there has been a lack of consensus on how to invest in the County's transportation system (Santa Cruz County Regional Transportation Commission, June 2010).

The joint City-UCSC "Master Transportation Study" (MTS) also made traffic projections for the years 2000 to 2020 based on AMBAG traffic model projections and population projections, which have now been superseded by more current projections as described in the POPULATION AND HOUSING (Chapter 4.2) section of this EIR. The AMBAG projections at the time the MTS was prepared assumed a 15% increase in population growth within the City (from 67,900 to 78,100 people in 2020) and a 24% increase in employment growth (from 37,800 workers to 47,000 workers 2020) (Fukuji Planning and Design, July 2003). However, current adopted AMBAG forecasts show a lower level of forecast growth with estimated population at 65,884 in 2030 and 41,548 workers in 2030.

[6] The AMBAG model relies on land-use and socio-economic data from the AMBAG forecast and road and transit network information to estimate traffic volumes and determine trip generation rates by mode. Where possible, the model is calibrated using existing roadway data (Santa Cruz County Regional Transportation Commission, June 2010).

The MTS includes a goal of no net growth in traffic between 2000 and 2020 and examined two scenarios to substantially decrease single-occupant travel and increase use of other transportation modes. One scenario increases transit use moderately and carpooling substantially. The second scenario increases transit substantially and carpooling moderately. Both scenarios were based on implementation of regional transportation improvements of either the addition of a HOV lane on Highway 1 or development of a Bus Rapid Transit (BRT) corridor along the Union Pacific Railroad right-of-way (Fukuji Planning and Design, July 2003). In Scenario 1, to achieve no growth in the year 2020 traffic, single-occupant travel internal to Santa Cruz needs to be reduced by 29%, carpooling increased by 75%, transit use increased by 50%, and bicycling and walking modes increased by 38% and 100%, respectively (Ibid.). Without a change in travel patterns, the MTS predicted a 19% increase in vehicle miles traveled between the years 2000 and 2020.

BICYCLE & PEDESTRIAN CIRCULATION

Bicycle Circulation

The existing bikeway system in the City of Santa Cruz has developed over the last 35 years. The City of Santa Cruz' bicycle system is comprised of off-street multi-use paths (Class I), on-street bicycle lanes (Class II) and on-street bicycle routes (Class III). Class I and Class II bike facilities are shown on Figure 4.4-3. Class I bike paths are currently limited to West Cliff Drive, the San Lorenzo River levees, a new path under Highway 1 from the river levee, and a new path under Highway 1 at Lee Street, all of which are also shared by pedestrians. A Class I path also is provided on the UCSC campus.

Support facilities include different classes of bicycle parking facilities, which are required by City parking regulations, and shower facilities at major employment facilities. All of the SCMTD buses are equipped with front-mounted bicycle racks capable of carrying two bicycles (City of Santa Cruz, November 2008). The University of California operates a bike shuttle near the intersection of Bay/Mission Streets to transport bicycles to the University.

In October 2007, the City of Santa Cruz was awarded the Silver Level Bicycle Friendly Community by the League of American Bicyclists. According to data contained in the 2000 Census, approximately 4.7% of the commuters within the City of Santa Cruz are bicyclists (City of Santa Cruz, 2008). The City's existing Bicycle Plan, adopted in November 2008, forecasts a bicycling increase to 7% of the peak hour traffic within a 5-year period.

The emphasis of the 2008 Bicycle Transportation Plan shifted from earlier plans in 2000 and 2004 Plans, which were focused on completing large-scale bicycle projects on the major commute corridors. Many of those significant projects have been completed—Bay Street, Beach Street, Broadway-Laurel, High Street, Soquel Avenue, and major portions of the San Lorenzo River Path. The bicycling projects to be pursued in the next five years include completing those significant projects begun in the earlier Plans, as well as building the connector projects that can get bicyclists from origin to destination easily and safely. One new possibility for an east-west bicycle travel corridor is the Union Pacific rail right-of- way, which the SCCRTC has purchased and begun a planning process.

Pedestrian Circulation

The City has approximately 135 miles of sidewalks. Approximately 50 miles of sidewalk is missing from the existing system; predominate problem areas are the upper eastside and Westlake areas that have large continuous sidewalk links missing (Fukuji Planning and Design, July 2003).

The "Pedestrian System" chapter of the Master Transportation Study is considered the City's Pedestrian Plan. The MTS was accepted by the City Council on December 9, 2003. The MTS goals for Santa Cruz's pedestrian system are to:

- Provide multiple transportation modes thereby creating a flexible and adaptive transportation system throughout the City of Santa Cruz.
- Close all "gaps" in the pedestrian network and connect all major destinations and activity centers.
- Ensure that the City's diverse user groups have access to a sustainable and efficient mode of transportation / Create a system that is "scaleable" and responds to changing community needs, and provide flexibility and variety in the City's transportation network.
- Adopt design standards for the pedestrian system to assure a high level of user amenities, safety and quality.

Overall, priorities for the City's pedestrian system include completion and maintenance of the City sidewalk system, improve safety, adopt pedestrian-friendly street designs, enhance key pedestrian connections, and encourage walking (Fukuji Planning and Design, July 2003). .

PUBLIC TRANSIT

Transit service within Santa Cruz County is primarily provided by the Santa Cruz Metropolitan Transit District (SCMTD). Regional bus routes provide service to destinations in Santa Clara and Monterey Counties including daily weekday service via Highway 17 by the SCMTD. SCMTD buses provide service from the downtown Santa Cruz transit center to the San Jose Caltrain station, with connections to San Francisco, Sacramento, Stockton and other cities. Greyhound bus service also is provided from Downtown Santa Cruz to select destinations.

The City of Santa Cruz operated the Summer Beach Shuttle in the past when private donations were available. The Shuttle provided service to and from destinations within the City of Santa Cruz, such as the Downtown and the Santa Cruz Boardwalk. Use of the County Government Center parking lot was used in conjunction with the beach shuttle. Due to lack of funding, the Summer Beach Shuttle was discontinued over ten years ago. Recently the business sector has initiated a Beach-Downtown Shuttle for the summer of 2010. Budget constraints have prevented the City from continuing operation of a beach shuttle.

SCMTD Service

The Santa Cruz Metropolitan Transit District (SCMTD), also known as Santa Cruz Metro, provides transit service within Santa Cruz County. SCMTD provides the following types of service: regional (Highway 17 Express), intercity (8 routes), urban local-feeder (16 routes), UCSC (7 routes) and rural routes (7 routes) (Wilbur Smith Associates, December 2008). The Highway 17 Express Bus service was initiated after the 1989 Loma Prieta earthquake in response to an emergency need for transit over the Hill while Highway 17 was being repaired, and is currently a joint operation between the SCMTD, . Amtrak, and the Santa Clara Valley Transportation Authority (VTA). The route currently connects Santa Cruz (downtown METRO station) and San Jose (Diridon station); at the Diridon station, passengers can connect to the Santa Clara Valley Transportation Authority' transit system and Caltrain and Amtrak regional rail systems (Ibid.).

The District serves transit centers in Santa Cruz, Capitola, Felton, Scotts Valley and downtown Watsonville. SCMTD routes also meet Monterey-Salinas Transit (MST) routes at the Watsonville Transit Center. The two operators have provided reciprocal transfers since 1989. Additionally, SCMTD partners with the University of California, Santa Cruz (UCSC) to provide late night fixed route and demand response service in the general Westside Santa Cruz area (AMBAG, June 2010).

The SCMTD complements its regular fixed-route bus service with ParaCruz, a shared ride-door-to-door paratransit service that provides public transportation for persons who are unable to independently use fixed route buses due to a disability some or all of the time. It is provided by public transportation systems as part of the requirements of the Americans with Disabilities Act of 1990 (ADA). Rides are scheduled in advance and frequently include picking up and dropping off other customers along the way. ParaCruz operates a fleet of lift-equipped small buses and ramp-equipped minivans. On November 1, 2004, Santa Cruz METRO assumed direct operation of the ParaCruz (Santa Cruz Metropolitan Transit District, "METRO Para Cruz ADA Paratransit Service").

SCMTD's total ridership on fixed route service for Fiscal Year 2008-09 was 5,987,518; annual expenses for providing these transit services, including ParaCruz, were approximately $37 million (Santa Cruz County Regional Transportation Commission, June 2010). From 2003 to 2007, there had been a general increase in fare revenues and total operating cost, while ridership and hours of operation declined (Wilbur Smith Associates, December 2008). However, the SCCRTC noted a 7% increase in ridership since Fiscal Year 2004/05 due to rising gasoline prices, traffic congestion, and job market uncertainty (Santa Cruz County Regional Transportation Commission, June 2010).

Increasing congestion on highways and the local transportation network in Santa Cruz County is expected to generate more transit service demand (AMBAG, June 2010). However, the SCCRTC's RTP does not envision expansion of transit services without additional revenues. In order to increase transit service to levels needed to meet projected population growth, greenhouse gas emission reduction goals, and significantly increase the percentage of people using transit, bus service would need to be increased by 25% at an additional annual cost of approximately $11 million (Santa Cruz County Regional Transportation Commission, June 2010). To accommodate this demand, the SCMTD would like to increase service, but due to

ongoing funding shortfalls, SCMTD is struggling to maintain existing service (Ibid.). Due to declining sales tax and other non-fare revenue sources, the SCMTD reduced service in the fall of 2010. It is expected that transit service will continue with minor improvements without major route cuts or rate changes for about five years, however, additional funding will be necessary in the future for expansion of service (White, SCMTD, personal communication, August 2011).

In recent years, Metro has been working on upgrading its transit operations facilities in an effort to reduce operating costs, improve efficiency, and allow for future expansion of the transit system (Santa Cruz County Regional Transportation Commission, June 2010). In 2008, Santa Cruz METRO completed the compressed natural gas-CNG fueling station and conversion of 40 buses.

Bus Rapid Transit (BRT)

The joint City-UCSC "Master Transportation Study" (MTS) recommends "Bus Rapid Transit" (BRT) for long-term implementation as the technology with the highest potential to increase ridership and shift travel modes to transit. BRT is a rubber tire vehicle system operation on an exclusive transit way or dedicated busway with flexibility to operate on surface streets with mixed flow traffic. According to the MTS, a BRT system has significant potential to affect a regional commute shift away from SOV to transit for trips to and from the UCSC campus, downtown and the Harvey West area. A BRT busway could operate on a dedicated HOV lane along Highway 1 or on a shared bus/freight/bicycle lane using the Union Pacific rail corridor. Application to Soquel Avenue and Water Street was also considered (Fukuji Planning and Design, July 2003).

RAIL SERVICE

Freight Service

The former Union Pacific Railroad rail line forms a continuous, single-track, 32-two mile corridor from Davenport to the City of Watsonville. The Santa Cruz County Regional Transportation Commission is in the process of purchasing the right-of-way and is awaiting final approval from the state. This branch rail line extends from Watsonville Junction in Pajaro north to Davenport and passes through much of the county's urban area. For many years, freight deliveries to and from the CEMEX cement plant in Davenport occurred three times per week. As of 2010, CEMEX plant operations ceased due to the economic downturn. The rail line is currently operated by Sierra Northern. Sierra Northern Railway. Sierra runs trains twice per week to serve existing freight customers and stores empty rail cars in the unused northern section of the rail line. Sierra will be responsible for operations, maintenance and start-up costs associated with rail service (Santa Cruz County Transportation Commission, February 2011).

Recreational Service

The Santa Cruz Big Trees and Pacific Railway Company operates a tourist-oriented passenger service between Felton and the Santa Cruz Beach Boardwalk on its 9-mile track line from Santa Cruz to its current terminus at Roaring Camp. The service is provided daily during mid June through the end of August, and weekends and holidays in May, early June, September through

October, late November, and December. The trains run twice in each direction every day during regular operations, and partially use the Union Pacific Railway tracks that cross Pacific Avenue just north of the intersection of Pacific Avenue and Beach Street. The line is occasionally used for freight (AMBAG, June 2010). Historically the line crossed the Santa Cruz Mountains to Los Gatos, but was abandoned in 1939 past Olympia. The tunnel sections are now used as records storage for major corporations in the San Francisco Bay Area (Ibid.).

Passenger Service

The Santa Cruz Branch line has been the subject of a number of studies regarding its potential for passenger rail service. A 1996 study analyzed the potential viability of inter-city passenger rail service between Santa Cruz and Watsonville to San Jose. The 1999 Major Transportation Investment Study examined three options for passenger rail on the Santa Cruz Branch line along the Watsonville- Santa Cruz-UCSC corridor. Also in 1999, the Around-the-Bay Rail Study looked at the feasibility of partnering with Monterey County to bring passenger rail from the San Francisco Bay Area to both counties, as well as linking the two counties via a wharf-to-wharf type rail transit service.

On May 6, 2010, the SCCRTC unanimously agreed to acquire the Santa Cruz Branch Rail Line right-of-way, which is being finalized. Future transportation uses could include passenger rail service, transit, bicycle and pedestrian facilities, and freight rail service. This project was one of the selected outcomes for the Watsonville-Santa Cruz-UCSC corridor from the SCCRTC's 1999 Major Transportation Investment Study. The SCCRTC also intends to maintain the existing freight service on the rail line. The *2005 Regional Transportation Plan* (Policy 3.4.5) supports reserving areas adjacent to rail lines for future rail and bus facilities as part of new development adjacent to rail lines. Passenger service to from Santa Cruz to Davenport is currently being considered by the SCCRTC.

PLANNED IMPROVEMENTS

State Highways

STATE ROUTE 1

Beginning in 1986 the Santa Cruz County Regional Transportation Commission (SCCRTC), working with Caltrans and the Federal Highway Administration, conducted a series of studies to identify an affordable and appropriate response to the growing congestion problem on Highway 1, including feasibility studies for Highway Occupancy Vehicle Lanes (HOV) on Highway 1 and a toll lane feasibility study in 2002. The current Caltrans Route Concept Report for Highway 1 includes the addition of High Occupancy Vehicle (HOV) lanes to Highway 1 (California Department of Transportation, April 2006). This project will add a lane in each direction to reduce congestion, encourage carpooling, expand express bus service, and improve safety. The limits of this project extend from Morrissey Boulevard to San Andreas/Larkin Valley Road. Preliminary traffic performance data shows the anticipated shift in traffic volumes from local arterials to Highway 1 with the HOV Lane Alternative (Santa Cruz Regional Transportation Commission website, http://www.sccrtc.org/hov.html). Caltrans' draft *Corridor System Management Plan* for Routes 1 and 183 also supports HOV lanes on Highway 1 in

conjunction with other transportation demand management strategies (Caltrans, October 2010).Detailed project design and environmental data is in development and is expected to be available in the winter of 2012. Funding is not secured to advance the project beyond the current environmental study. The SCCRTC's *2010 Regional Transportation Plan* assumes adoption of a transportation sales tax measure to provide a significant amount of the funding needed to advance this project into the next development phase – final design, right-of-way, and construction (Santa Cruz Regional Transportation Commission website, http://www.sccrtc.org/hov.html).

In 2006, the Santa Cruz County Regional Transportation Commission initiated work on the preliminary design and environmental review phase of the Highway 1 Soquel to Morrissey Auxiliary Lanes Project spanning the busiest section of Highway 1 in Santa Cruz County (carrying 115,000 vehicles per day in 2006). An auxiliary lane connects an adjacent highway on-ramp with the next highway off-ramp thereby extending the weaving and merging distance between the ramps and improving traffic flow and safety on the highway. An auxiliary lane is not designed for use by through traffic, but to provide greater separation between vehicles entering and exiting the freeway from mainline traffic. The Soquel/Morrissey Auxiliary Lanes project proposes to add 12–foot wide auxiliary lanes northbound and southbound between Soquel Avenue and Morrissey Boulevard, respectively. This project includes reconstruction of the La Fonda Avenue overcrossing; the La Fonda Avenue overcrossing must be replaced to accommodate the auxiliary lanes under the bridge. The new La Fonda Avenue bridge will be wider to provide bike lanes and wider sidewalks for pedestrians. This project is designed to complement the work recently completed as part of the Highway 1/17Merge Lanes Project, by eliminating the proposed lane drop north of the La Fonda Avenue resulting from the Highway 1/Highway 17 Project. Design is nearly complete, and the final environmental documents were approved by Caltrans, although the project is contingent on approval by the California Transportation Commission.. Funding has been secured for the project. Construction could begin in 2012 or 2013.

STATE ROUTE 17

According to the Transportation Concept Report for State Route 17 in District 5 (Caltrans District 5, January 2006), the target level of service for State Highway 17 between the Ocean Street and Scotts Valley is LOS E. The Route Concept Report for Highway 17 indicates that the highway segment between Santa Cruz and Scotts Valley accommodates local and regional trips. Recognizing the existing policy of the Santa Cruz County Regional Transportation Commission, widening is not envisioned and this segment of the highway is considered to be a four-lane freeway (Caltrans, January 2006).

Reconstruction of the highway to meet current standards would be both exorbitantly expensive and environmentally destructive. Thus, over the past two decades, the Santa Cruz County Regional Transportation Commission (SCCRTC) has consistently opted to keep Highway 17 a four-lane highway, targeting funds for safety and operational improvements. Median barriers, acceleration-deceleration lanes, motorist call boxes and changeable message signs are improvements that have been installed over the past decade.

In the fall of 2000, Caltrans completed a Project Report that assessed the operational value and cost of constructing a 1.1-mile truck climbing lane on northbound Highway 17 at the

summit. As a result of the study, Caltrans recommended, and the Regional Transportation Commission concurred, not building the project ("No Build"), as the potential benefits of the project were not justified by the high cost and potentially significant environmental impacts. As an alternative, Caltrans continued to evaluate other potential safety and operational improvements on Highway 17. The products of this analysis were two safety improvement projects on Highway 17 at Laurel Curve and Glenwood Curve.

In response to the need for further safety and reliability improvements in this corridor, the *Highway 17 Transportation Improvement Study* was conducted to provide SCCRTC, Santa Clara Valley Transit Authority (VTA), and SCMTD to recommend safety and efficiency improvement projects with the following two main objectives: 1) recommend steps *to optimize* the Highway 17 Express Bus service reliability; and 2) *expand* Highway 17 Express Bus ridership in the corridor in order to reduce vehicle trips, miles traveled, and emissions. Recognizing that the roadway and traffic conditions along Highway 17 affect the operation of the Highway 17 Express Bus service, an additional objective was to recommend safety and operational improvements to add reliability, speed and functionality to the project corridor to benefit both the patrons of the Highway 17 Express Bus service and the motorists traveling along this route. A series of recommendations were made to support and expand the existing transit service on Highway 17, including provision of weekend service.

STATE ROUTE 9

The Highway 1/Highway 9 intersection, which is controlled by a signal, currently operates at LOS E during the both the PM and Design Day peak hours, which does not meet Caltrans standards. The City is working with Caltrans to implement lane modifications at this intersection. The improvements require Caltrans approval and an encroachment permit. With implementation of these improvements, the intersection would operate at LOS D during both the existing PM and Design Day peak hours.

The following improvements are included in the Highway 1/Highway 9 intersection planned improvement:

- Widen and add a left-thru turn lane from Highway 9 southbound.
- Improve the northbound River Street approach to modify the existing exclusive left-turn lane to a shared thru/left-turn lane.
- Widen and add a second left-turn lane from Highway 1 southbound onto Highway 9.
- Widen and add a second northbound lane on Highway 9.
- Modify signal.
- Add bike lane and shoulder

Currently, a Project Report, preliminary engineering, associated studies and environmental review are underway. The improvements are already required under existing conditions.

Planned City Improvements

The City faces an ongoing challenge to meet its capital needs with limited resources. Preparing and adopting a Capital Improvements Program (CIP) is an important part of the City's planning

process to identify and meet those needs. It is a multi-year schedule of projects with their associated costs and proposed funding sources. The CIP represents the best efforts to allocate available resources toward projects that provide the most benefit for the people of Santa Cruz. In addition to the Highway 1 / Highway 9 intersection improvement described above, other major improvements on the current CIP include: intersection improvements at Mission/Bay and Mission/Chestnut (design and environmental review); intersection signalization (Bay/West Cliff); installation of a roundabout at the Pacific/Beach intersection;

The City operates a "Traffic Impact Fee" (TIF) program based on future projected trips generated for each new project. The TIF program, adopted in June 2005, evaluated over 60 intersections and identified numerous projects within the City which were needed to address the effects of cumulative development, and fees established. The fees are used to fund planned improvements at those intersections and roadways included in the program. New development and redevelopment projects are required to pay traffic impact fees, which are calculated at the time of building permit issuance. The TIF includes highway intersections on Mission (Highway 1) and at the Highway 1 / Highway 9 intersection.

The City's TIF program includes both a City-wide TIF fee and a Beach/South of Laurel (B/SOL) TIF. New projects that are located in the B/SOL area are required to pay both fees. The fee program is updated annually in July. The fees are based on project trip generation and are calculated at the time the project applies for a building permit. By ordinance the City has identified the per trip fee, which was determined by dividing the total cost of all projects identified in the City's "Cumulative Development Traffic Study" by the total cumulative additional trips added by new development. The fee assumes the City will fund 25% of the cost of improvements as a result of existing capacity differences. In addition, 15% of the fee is dedicated to alternative transportation. The current City-wide fee is $405 per trip. The current B/SOL fee is $94 per trip.

Bicycle and Pedestrian Path Improvements

The City's adopted *Bicycle Transportation Plan* (2008) includes the following new paths: Arana Gulch path to connect Broadway with Brommer Street; Branciforte Creek Connection to complete the levee path under the Soquel Bridge; Monterey Bay Sanctuary Scenic Trail Network (as discussed below); and Spring Street Connection to UCSC. The Plan also includes numerous other improvements to existing bike lanes and facilities.

The Monterey Bay Sanctuary Scenic Trail Network (MBSST) is proposed to span the Monterey Bay from Lover's Point in Pacific Grove to Wilder Ranch in Santa Cruz. The SCCRTC is in the process of developing a more detailed plan for the Santa Cruz County portion of the trail. The MBSST efforts will ultimately result in a network of continuous multi-use recreational, interpretive and transportation pathways spanning the Monterey Bay that will also be an important piece of the 1,300 mile statewide California Coastal Trail (Santa Cruz Regional Transportation Commission, January 2008). If the SCCRTC is successful in its rail line acquisition efforts, part of the network may be built within the rail line right-of-way (Ibid.).

The SCCRTC is working on a comprehensive Master Planning process that will include: developing goals and objectives; identifying and assessing possible segments; setting design options; soliciting and incorporating input from interested parties and the community at large;

preparing cost estimates for segments; and conducting environmental analysis of the Plan. In addition to identifying new trails, the MBSST Network is intended to link together (and upgrade where needed) trail segments that already exist and to fill in gaps in the existing trail system (Santa Cruz Regional Transportation Commission, January 2008).

TRANSPORTATION MANAGEMENT

Transportation System Management

Transportation Systems Management (TSM) refers to methods to find optimum strategies to relieve, lessen or control traffic congestion with minimum roadway widening. These strategies can reduce vehicle travel time and enhance system accessibility with little impact on other modes (Fukuji Planning and Design, July 2003). Examples of TSM measures include signal synchronization, intersection modifications, access management, i.e., consolidation of driveways, railroad crossing modifications, highway ramp metering, preferential treatment for high occupancy vehicles, and signage and lighting upgrades.

Transportation Demand Management

Transportation Demand Management (TDM) refers to measures that can be implemented to encourage the use of alternative modes of transportation to single occupancy vehicles. TDM emphasizes the movement of people and goods rather than motor vehicles, and gives priority to public transit, ridesharing and non-motorized travel, particularly under congested conditions (Fukuji Planning and Design, July 2003). TDM is a demand side strategy with the purpose to change human travel behavior through incentives and disincentives in order to reduce the number of peak-hour vehicle trips, shift trips to non-peak times, and increase the percentage of people bicycling, walking, riding transit, carpooling and vanpooling (Ibid.). Examples include carpool and vanpool rideshare matching, employer outreach and assistance, emergency ride home programs, telecommuting, bike loan programs, bicycle parking subsidies, bicycle advocacy, and parking pricing and management strategies.

Existing agencies and programs that support and promote TDM in the city of Santa Cruz include the following as presented in the "Master Transportation Study":

- *Santa Cruz Regional Transportation Commission* (SCCRTC) serves many transportation roles in Santa Cruz County, including housing "Commute Solutions" and providing bicycle planning and funding to the region. Commute Solutions provides carpool and vanpool ride matching to commuters throughout Santa Cruz County, especially long-distance commuters.
- *Transportation Membership Services* is run by Ecology Action and offers programs that encourage member employees to use transportation modes other than driving alone to commute to and from work, including Emergency Ride Home Programs, 0% Interest Bicycle Loan Programs and Discount Metro Bus Passes.
- *Ecology Action* supports "Bike to Work," a 10-year old community-based effort that seeks to increase the number of people riding bikes. Ecology Action also receives funds for the Electric Bike Commuter Incentive Program.

- *Onsite Employer Programs*. Major employers within the City that implement TDM measures include: UCSC, SCMTD, the City of Santa Cruz, the County of Santa Cruz, the Seaside Company, the Santa Cruz Medical Clinic, and others.

Traffic Calming

Measures to reduce speeding and cutting through neighborhoods has been a focus over the years as these issues have been raised by residents. Measures include installation of traffic claming measures, signage, and improving the arterial street system.

PARKING

The City of Santa Cruz maintains both on-street and off-street public parking throughout the City, including the Downtown Parking District. Amendments to the State CEQA Guidelines, effective in March 2010, eliminated the environmental checklist question regarding adequacy of parking. Nonetheless, general background on existing conditions is provided below.

Downtown Parking District

Public parking in the downtown area is managed by the Downtown Parking District, which includes the most concentrated City ownership and operation of parking in the City and is the only parking district in the City. In 2007, there were 4,510 parking spaces available to the public, including 820 on-street spaces, 2,247 off-street spaces, and 1,443 private spaces ("Downtown Parking Study, 2007"). In 2010, there were 4,583 parking spaces available to the public, including 830 on-street spaces, 2,226 off-street parking spaces and 1,527 private parking spaces. In 2010, the parking supply (4,583 spaces) in the Downtown Parking District exceeded demand (4,504 spaces). However, by the year 2012 with new projects in place, the demand (4,731 spaces) is estimated to exceed supply (4,638 spaces) by 93 spaces.

The City-operated spaces include a wide variety of parking types dispersed throughout the District, including meters that have different time periods. The municipal parking garages have an average peak occupancy of approximately 85%, with the Cedar/Church garage almost 100% occupied at peak times (Fukuji Planning and Design, July 2003).

New businesses are exempt from typical parking requirements required elsewhere in the City. Business owners have the option of providing required parking or paying a Deficiency Fee that is used to fund, operate and maintain parking facilities. The District charges an annual deficiency fee.

Beach / South of Laurel Area

The Beach / South of Laurel area includes the area directly adjacent to the Downtown Parking District and stretching down to the Beach. It provides parking for both its own set of uses, though also experiences overflow demand from the Downtown and the Beach Areas. The Beach Area itself includes the largest supply of privately provided for-charge parking in the City, as well as a mix of publicly provided parking (Fukuji Planning and Design, July 2003).

The Beach / South of Laurel Area includes about 7,800 parking spaces with over 80% of which, about 6,300 space, are in the Beach Area. A total of 4,145 spaces, a little over 50% of the total, are available to the general public, independent of intended activity. A total of 3,562 of these spaces are in the in the Beach Area and 583 spaces are in the South of Laurel district. Unrestricted publicly available Beach Area spaces are dominated by the two Seaside Company lots, with a combined total of 1,771 spaces, and the City owned and operated 430-space Wharf lot. Other spaces include other City operated lots, on-street meters, and free curbside spaces. South of Laurel general public access spaces include small City operated lots, on-street meters, and free curbside parking spaces. The City operates 633 on-street meters in the Beach and South of Laurel areas (Fukuji Planning and Design, July 2003).

Residential Parking Permit Programs

Due to seasonal influx of visitors and UCSC students and encroachment into residential neighborhoods, the City implements a residential parking program in the following neighborhoods: beach area, downtown, Lighthouse/Cowell neighborhood, eastside, Seabright, and Westside. Residents in these areas must purchase permits to park on streets without citations. According to information on the City's Public Works Department website, the coastal permit programs are enforced seasonally from May 15th through September 30th, between the hours of 9 AM and 9 PM, everyday. The Westside permit program is enforced from September 15th through June 30th, Monday through Friday, during posted hours (excluding City holidays). Parking in these areas without a permit is subject to a citation and fine. The downtown and eastside area permit requirements are enforced all year.

4.4.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The proposed *General Plan 2030* includes goals, policies and actions that address transportation planning, management and traffic. The MOBILITY chapter of the draft *General Plan 2030* corresponds to the required circulation element. Its purpose is to set forth policies and ways to ease the ability of people and vehicles to move around, out of, and into the City in the long term, through 2030. This chapter looks at ways to facilitate transportation alternatives, keep transportation and road systems safe and efficient, and systematically interconnect bicycle and pedestrian ways. The proposals below aim to encourage greater use of alternative transportation modes and reduce automobile travel in concert with other parts of the Plan that foster supportive land uses, building types, and activities. The City Council accepted the following key principle with regard to Mobility:

> *We will provide an accessible, comprehensive, and effective transportation system that integrates automobile use with sustainable and innovative transportation options—including enhanced public transit, bicycle, and pedestrian networks throughout the community.*

The draft General Plan includes four goals and 19 associated policies with 94 accompanying actions that address transportation management and modes of travel. The four goals related to transportation are outlined below. Overall, the accompanying policies and actions Furthermore, proposed General Plan policies seek to maintain an acceptable LOS D or better at signalized intersections with acceptance of a lower LOS at major regional intersections (M3.1.3, M3.1.4) and promote transportation system management strategies (M2.5.2) and other alternative transportation modes.

GOAL M1	Land use patterns, street design, parking, and access solutions that facilitate multiple transportation alternatives.
GOAL M2	A safe, sustainable, efficient, adaptive, and accessible transportation system.
GOAL M3	A safe, efficient, and adaptive road system.
GOAL M4	A citywide interconnected system of safe, inviting, and accessible pedestrian ways and bikeways.

Other goals, policies and actions promote sustainable land use patterns, such as encouraging mixed-use development along the City's four major transportation corridors that have easy access to pedestrian, bike and transit facilities, and encouraging use of alternative transportation modes.

PROPOSED IMPROVEMENTS

The draft *General Plan 2030* includes several policies and actions that call for implementation of road, pedestrian, bicycle and transit improvements through the City's Capital Improvement Program and other sources (M2.1.3, M2.3.2, M3.2.2). The draft Plan supports regional funding and implementation of key regional projects "that can significantly benefit Santa Cruz and further the City's mobility policies" (M2.1.4). There are no specific road transportation improvements identified for specific locations, except for improvement of access to/from the Harvey West area, including a possible new approach to Highway 1 (M3.1.13), and that the circulation system of the specific plan for the Swenson parcel shall be from Shaffer Road (LU1.1.4).

Several policies address visitor traffic improvements. .Policy ED1.2.1 specifically encourages transportation improvements and pedestrian activity along Ocean Street to stimulate economic vitality. Policy ED1.8.4 directs the City to improve access to and routes between tourist and visitor designations and lodging facilities as part of the City's economic development policies. The proposed General Plan also calls for updating the Beach and South of Laurel Area Plan to reflect needed improvements along the Visitor/Beach Area travel corridors (M3.3.3) with improvement of access along these corridors through coordinated signs and street naming, protected turn lanes, remote parking/shuttle programs, and other strategies (M3.3.2).

The draft Plan promotes alternative transportation improvements with TSM strategies, road improvements and widening/expansion projects that can achieve an acceptable LOS (M2.32). Action M4.3.2 seeks to develop bike commute routes along the railroad right-of-way, West Cliff Drive, Broadway, King and other streets. The draft General Plan also includes a policy that prohibits approval or construction of an Eastern Access to the University without a citywide

vote (M2.1.5). No other specific road or alternative transportation projects are identified for specific support. The draft *General Plan 2030* also encourages passenger rail transit or other alternative transportation options along the existing rail corridor via the continued support, acquisition, and expansion of railroad rights-of-way (M2.2) and encourages the continuing transport of goods by rail (M2.2.1). Policy LU4.5 supports securing land for development of a transit center along the rail line, and evaluation of a rail transit stop is to be included in the Area Plan analysis for the Golf Club Drive area (LU1.15). Pedestrian and bicycle access to Pogonip and nearby employment areas are also to be included in this future area plan.

POTENTIAL FUTURE DEVELOPMENT

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations that have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Additionally, land use designation changes are proposed for three specified sites: Swenson, Golf Club Drive area, and an addition to the Dimeo Lane landfill site. The Swenson and Golf Club Drive sites are designated for residential uses. A 5.5-acre parcel immediately south of and adjacent to the City's Landfill and Resource Recovery Center on Dimeo Lane has been acquired by the City, and it is expected that future uses would be ancillary to the landfill and Resource Recovery Center uses. Specific uses have not yet been identified and will be determined in the future, however, the parcel is not planned for expansion of the landfill disposal operations (Arman, personal communication, April 2010).

Additionally, some of the *General Plan 2030* policies and actions also support mixed use districts and/or intensified redevelopment along transit and commercial corridors (Policies LU3.3.1 and LU4.1). In addition, the proposed *General Plan 2030* supports development of a downtown performing arts center or expansion of the Civic Center (Policy HA2.2.5).

4.4.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

4a Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit (see discussion of City standards below);

4b Change the level of service of a State Highway roadway segment from acceptable operation (LOS A, B, or C) to deficient operation (LOS D, E or F) based on Caltrans significance criteria[7];

4c Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;

4d Substantially increase hazards due to a design feature (for example, sharp curves or dangerous intersections) or incompatible uses (for example, farm equipment);

4e Result in inadequate emergency access; or

4f Conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities or otherwise decrease the performance or safety of such facilities.

The City of Santa Cruz considers "D" or better to be an acceptable intersection level of service for intersections, which is a policy in the City's existing General Plan as well as in the proposed General Plan. A significant impact would result if LOS dropped below a "D" level of service or where a project would contribute traffic increases of more than 3% at intersections currently operating at unacceptable levels (E or F), as further described below. The existing and proposed General Plans also account for accepting a LOS below "D" at major regional intersections where improvements would be prohibitively costly or result in significant, unacceptable environmental impacts. There are no other adopted plans, ordinances or policies that establish "measures of effectiveness" for the performance of the circulation system.

For City intersections that already operate at unacceptable levels of service (E or F), the City considers project impacts to be significant if congestion will measurably worsen at the intersection as a result of the project. "Measurably worse" is considered to be a 3% increase in trips at the affected intersection. The City has used the 3% significance criterion for project trip contribution at existing impacted intersections, in part based on directives in the City's existing General Plan to accept a certain level of congestion during peak hours at major intersections, as well as to reflect variations in daily traffic volumes. The 3% criterion has been used throughout the City and is based upon the likelihood that a project will result in an observable increase in congestion at a given intersection or road segment. This is based in part on information provided by Caltrans in the yearly "Traffic Volumes" reports that identifies the standard deviation expected with regards to reliability of traffic count data. The standard deviation ranges indicate a 12% deviation at 10,000 vehicle trips, meaning that if a traffic count totals 10,000 vehicles per day, then approximately 90% of the time, the actual traffic counts will lie within a range of 8,800 to 11,200 vehicles. Thus, the 3% reflects this variation in daily traffic conditions (California Department of Transportation, June 2006).

[7] Caltrans. December 2002. "Guide for the Preparation of Traffic Impact Studies."

IMPACT ANALYSIS

Based on the significance criteria identified above, the following impact analyses address potential impacts to the City's circulation system (4a); potential traffic impacts on state highways (4b); potential increase in hazards (4d); and potential conflicts with adopting policies, plans or programs that support alternative transportation (4f). There are no applicable congestion management programs in effect within the City of Santa Cruz (4c), and thus this is not an issue that needs discussion. Emergency access issues (4e) are addressed in the "Fire Protection" and "Police Protection" subsections of the PUBLIC SERVICES (Chapter 4.8) section of this EIR.

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development. The proposed General Plan would accommodate future development. As described in the PROJECT DESCRIPTION and LAND USE sections of this EIR (Chapters 3.0 and 4.1, respectively), buildout projections were estimated for the draft General Plan to provide an estimate of the amount of development that is expected to occur by the year 2030.[8] The projections indicate the following level of new development by the year 2030:

- 3,350 residential units
- 1,087,983 square feet of commercial development and 311 hotel rooms
- 1,273,913 square of office space
- 776,926 square feet of industrial development.

The proposed *General Plan 2030* supports infill development along transportation corridors to promote alternative land use patterns to help reduce automobile travel. Development under the proposed General Plan would primarily occur on vacant infill sites, on underutilized properties that could redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan,[9] approximately 55 percent of all new housing, 45 percent of new commercial development and 52 percent of new office development would located along these corridors. Thus, new development would be concentrated in specific areas.

The proposed General Plan also includes other policies and actions that could result in development that supports year-round expanded performances, events, visitors that would result in potential traffic increases. These potential uses include:

[8] The projections are based on the draft Land Use Map, taking into account land use map changes, vacant lands, sites subject to reuse or redevelopment, and underutilized parcels, assuming that not all development will occur at maximum density. On average it is assumed that all new development will occur at 80% of the permitted residential density or floor area ratio. See Appendix B for further discussion.

[9] See Table 3-3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development per specific areas in the City.

- Supporting a downtown performing arts center or expansion of the Civic Center (HA2.2.5),
- Amending the Zoning Ordinance to allow development of arts and cultural facilities in a wide variety of districts (HA2.2.4),
- Supporting Santa Cruz as a year-round conference destination (Policy ED1.4), and supporting development of a new conference center (ED1.4.1) or developments that accommodate conferences (ED1.5.1),
- Encouraging development of new lodging facilities (ED1.5) and attracting top-end, full-service hotels (ED1.5.2),
- Supporting year-round events (HA3.2.4), and promoting Santa Cruz as a year-round arts destination, and
- Promoting Santa Cruz as a principal retail, cultural, recreational, entertainment and commercial destination in the region (ED1.1).

There are no specific locations or intensity of development anticipated for these types of uses. It is likely that development of such entertainment and/or visitor-serving uses would be within the total square footage of commercial development that has been estimated for the proposed *General Plan 2030* buildout. Adoption of Arts and Entertainment Districts also is supported in the draft plan (HA3.1.1), but most performances do not occur during peak commute hours.

Impact 4.4-1: Traffic Impacts on Intersections Levels of Service (LOS) Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that would result in increased vehicle trips and traffic, resulting in changes in intersection levels of service to unacceptable levels or further deterioration of intersections currently operating at unacceptable levels of service. With implementation of proposed *General Plan 2030* policies and actions, including road improvements identified in an updated Traffic Impact Fee program, intersection operations would be improved and traffic levels would be reduced, except at eight intersections. This is considered a *significant impact*.

PROJECT TRIP GENERATION AND DISTRIBUTION

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased population or new development. However, the draft General Plan includes policies and a land use map that support additional development as summarized above. This potential development would generate an estimated 78,260 new daily trips with approximately 7,180 trips occurring during the PM peak hour. The Traffix model was used for the traffic impact analysis, which estimates the trip generation for all uses and distributes these new trips to the existing road network.

The trip generation is based on the new potential development expected with buildout under the *General Plan 2030*. Results of surveys conducted for the MTS indicate that 58% of all trips by City residents are made for shopping, work or personal purposes. In addition about 75% of

all trips made by residents remain within the City of Santa Cruz. If it is assumed that this distribution will remain relatively constant for all new residents in the City then approximately 44% of all trips made by new residents will be to commercial, office, industrial or personal service facilities within the City (Marquez, March 2010). Appendix C provides a full description of trip generation assumptions. A reduction was also included for trips generated along the new mixed-use corridors in which transportation modes other than vehicles would be used.

The traffic forecast includes assumptions regarding trip reduction due to mixed use and smart growth developments, which in part utilized information identified in the MTS regarding travel patterns, taking into account travel patterns identified in the City's "Master Transportation Study." See Appendix C for further discussion of these underlying assumptions and the details of determining trip generation rates.

INTERSECTION LEVEL OF SERVICE

Project traffic volumes were calculated by adding peak-hour project trips generated by the estimated General Plan buildout to the existing volumes, which are provided in Appendix F-5. The LOS calculations are included in Technical Appendix F-6, which is available for review at the City of Santa Cruz Planning Department[10] and is also included on the Draft EIR CD and on the online version of the Draft EIR on the City's website at www.cityofsantacruz.com, Planning Department.

Intersection levels of service during the PM peak hour with addition of new development accommodated by the *General Plan 2030* are summarized on Table 4.4-2. A majority of the intersections would drop from LOS B or C to LOS C or D, but would remain within the City's acceptable LOS of "D". However, 21 intersections would operate at unacceptable levels of service. Of these, the following ten intersections would degrade from acceptable to unacceptable levels of service as follows, which include three unsignalized intersections:

- Mission / Laure1 – from LOS B to **F**
- Mission / King-Union – from LOS C to **F**
- Mission / Chestnut – from LOS D to **F**
- Ocean / Broadway – From LOS C to **F**
- N. Branciforte / Water – From LOS D to **E**
- Branciforte / Soquel – From LOS C to **E**
- Seabright / Murray – From LOS D to **E**
- Beach / Pacific – From LOS C to **E**
- River / Fern – From LOS B to **F**
- Swift / Delaware– From LOS C to **F**

Five intersections would drop from an unacceptable "E" to "F" LOS s to include the following, of which only one is unsignalized (Western/High):

- Mission / Bay – From LOS **E** to **F**
- River / Encinal – From LOS **E** to **F**
- Ocean / San Lorenzo-East Cliff – From **E** to **F**

[10] Located at 809 Center Street, Room 107, Santa Cruz, California during business hours: Monday through Thursday, 8 AM to 12 PM and 1 to 5 PM.

- Ocean / Water – From **E** to **F**
- Western / High – From **E** to **F**

Six intersections would continue to operate at unacceptable levels of service E or F as identified below, which are unsignalized, except for the signalized River/Highway 1 intersection. For unsignalized intersections the delays are experienced on the minor approach.

- River / Highway 1 – Remain at **F** with further delays
- Bay / Escalona – Remain at **F** with further delays
- High / Laurent – Remain at **F** with further delays
- Seabright / Water – Remain at **F** with further delays
- Bay / California Ave. – Remain at **F** with further delays
- Bay / California St. – Remain at **F** with further delays

Improvements have been identified for the intersections forecast to operate at unacceptable levels of service as a result of future development accommodated by the *General Plan 2030*. Many of the impacted intersections can be improved to an acceptable LOS with signalization, turning restrictions, and/or other improvements. Table 4.4-3 summarizes these improvements and resulting LOS and delays for the impacted intersections. However, even with improvements, the following eight intersections would remain at an unacceptable LOS:

- Western / High – Would improve from **F** to **E**
- River / Highway 1 – Would remain at **F**
- Bay / Mission – Would remain at **E**
- Laurel / Mission – Would remain at **F**
- Chestnut / Mission – Would remain at **F**
- Ocean / Water – Would improve from **F** to **E**
- Seabright / Water – Would improve from **F** to **E**
- Seabright / Murray – Would remain at **E**

Intersections that are identified in the current TIF Program as requiring improvement in the future are those listed below. The proposed General Plan 2030 supports maintaining and updating the City's Traffic Impact Fee (TIF) program to implement road improvements (M3.1.5, M2.1.3). The TIF Program would be updated to reflect new intersections and/or new or revised improvements identified as a result of the EIR analyses and recommendations. Improvement costs and potentially revised impact fees would be calculated.

- Western/High (Extended two-way left turn lane)
- High/Laurent (Signalization)
- River-Hwy 9/Hwy 9
- Bay/Escalona (turn Restrictions
- Mission/Bay
- Mission/Chestnut
- Ocean/Water
- Bay/California Street
- Branciforte/Soquel
- Ocean/San Lorenzo-E. Cliff Dr
- Seabright/Murray
- Beach/Pacific

TABLE 4.4-2
Intersection PM Peak Hour Levels of Service with *General Plan 2030* Buildout

	Intersection	PM Peak LOS	Delay [in seconds]	V/C Ratio
SIGNALIZED INTERSECTIONS				
1	Western/Hwy. 1	B		
2	Swift/Mission	D		
3	Miramar/Mission	C		
4	Almar-Younglove/Mission	C		
5	**Bay/Mission**	**F**	**164.1**	**1.347**
6	**Laurel/Mission**	**F**	**87.9**	**1.201**
7	Walnut/Mission	D		
8	**King-Union/Mission**	**F**	**90.5**	**1.143**
9	**Chestnut-Hwy. 1/Mission**	**F**	**121.8**	**1.228**
10	Moore/High	A		
11	Bay/High/Coolidge	D		
12	Bay/Nobel-Iowa	B		
13	Bay/King	C		
14	California/Laurel	C		
15	Chestnut/Laurel	C		
16	Center/Laurel	C		
17	Center/Mission	C		
18	Pacific/Laurel	D		
19	Front/Laurel	D		
20	Front/Metro Center	A		
21	Front/Cathcart	A		
22	Front/Soquel	C		
23	Front/Cooper	A		
24	Front-Pacific/Mission-Water	C		
25	River/Water	D		
26	N. Pacific/River	B		
27	River/Potrero	B		
28	**River/Hwy. 1**	**F**	**209.0**	**1.540**
29	**River/Encinal**	**F**	**198.7**	**1.715**
30	San Lorenzo/Laurel-Broadway	B		
31	Riverside/San Lorenzo	D		
32	Riverside/Third	D		
33	Riverside/Beach	A		
34	**Ocean/San Lorenzo-East Cliff**	**F**	**113.9**	**1.168**
35	**Ocean/Broadway**	**F**	**90.8**	**1.153**
36	Ocean/Soquel	D		
37	**Ocean/Water**	**F**	**169.4**	**1.454**
38	Ocean/Kennan-Washburn	B		
39	Ocean-Hwy.17/Ocean-Plymouth	D		
40	Market/Water	C		

TABLE 4.4-2
Intersection PM Peak Hour Levels of Service with *General Plan 2030* Buildout

	Intersection	PM Peak LOS	Delay [in seconds]	V/C Ratio
41	**N. Branciforte/Water**	**E**	**73.7**	**1.117**
42	**Branciforte/Soquel**	**E**	**67.6**	**1.073**
43	S. Branciforte/Broadway	B		
44	Seabright/Soquel	D		
45	Seabright/Broadway	C		
46	**Seabright/Murray**	**E**	**62.7**	**1.013**
47	Morrissey/Water-Soquel	D		
48	Morrissey/Fairmount	B		
49	Frederick/Soquel	D		
50	Hagemann-Trevethan/Soquel	B		
51	Park/Soquel	B		
52	Capitola Rd./Soquel Ave.	C		
53	La Fonda/Soquel	B		
54	Riverside-Dakota/Soquel (new)	A		
55	River S./Soquel	B		
56	Seventh Ave./Soquel Ave.	C		
57	Seventh Ave./Capitola Rd.	C		
58	Seventh Ave./Eaton	D		
UNSIGNALIZED INTERSECTIONS				
59	**Bay/California St**	**F**	**OVRFLW**	**2.917**
60	**Bay/California Ave**	**F**	**150.3**	**1.429**
61	West Cliff/Bay	C		
62	**Beach/Pacific Ave**	**E**	**39.9**	**1.058**
63	Pacific Avenue/Center	C		
64	Storey/King	D		
65	**River/Fern**	**F**	**OVRFLW**	**1,251**
66	King/Laurel	D		
67	**Laurent/High**	**F**	**94.1**	**1.190**
68	Market/Isbel-Goss	C		
69	North Branciforte/Goss	C		
70	Highway 1/Shaffer Rd	C		
71	Cedar/Laurel	D		
72	**Bay/Escalona**	**F**	**OVRFLW**	
73	**Western/High**	**F**	**69.5**	**0.678**
74	Cliff/Beach	B		
75	Riverside/Second-Liebrandt	A		
76	**Seabright/Water**	**F**	**OVRFLW**	**2.963**
77	**Swift and Delaware**	**F**	**241.6**	**2.751**
78	Seventh Ave./Brommer	D		
79	Seventh Ave./E. Cliff	C		

SOURCE: Hatch Mott MacDonald

TABLE 4.4-3
Intersection PM Peak Hour Levels of Service with Recommended Improvements

Intersection	Existing		Buildout		Recommended Improvement	With Mitigation	
	LOS	Delay	LOS	Delay		LOS	Delay
Western Dr/High St	E	45.9	F	69.5	TWLTL	**E**	38.1
High/Laurent	F	59.6	F	94.1	Signalize	B	18.2
River-Hwy 9/Hwy 1	F	83.9	F	209	Ebnd 2l 3t 1r, wbnd 2l 3t 1r, nbnd 1tl 1t 2r, sbnd 2l 1tl 1t 1r	**F**	80.8
River/Fern	B	14.5	F	Ovrfl	Signalize no l esbnd	B	15.1
River/Encinal	E	73.9	F	198.7	Ebnd 1l 1tr 1r, wbnd 1l 1tr, nbnd 1l, 1t, 1r, sbnd 1l,1t, 1tr	D	37.9
Bay St/Escalona Dr	F	782.2	F	Ovrfl	Escalona right turns only	C	18.3
Bay/Mission	E	55.8	F	164.1	Ebnd 1l, 2t,1r, wbnd 1l,2t,1r,nbnd 1l,1t,1r, sbnd 2l,1t,1r	**E**	57.7
Mission/Laurel	C	24.9	F	87.9	Add Ebnd r	**F**	85.6
Mission/King	C	32.7	F	90.5	Ebnd no l, 2t, 1tr, wbnd 1l, 1t, 1tr,nbnd 1ltr, sbnd 2l 1ltr	D	50.8
Mission/Chestnut	D	42.9	F	121.8	Ebnd 2l, 2t, 1r, wbnd 1lt,1t, 1r, nbnd 1l, 1t, 1tr, sbnd 1l,2t, 2r	**F**	112.9
Ocean/Water	E	73.6	F	169.4	Ebnd 2l, 2t, 1r, wbnd 1l,2t, 1r, nbnd 1l, 2t, 1tr, sbnd 2l, 3t, 1r	**F**	130.7
Seabright/Water	F	112.8	F	Ovrfl	Extend TWLTL & add nbnd r	**E**	39
Water/Branciforte	D	36.6	E	73.7	Add ebnd 1, nbound r & sbnd r	D	53.6
California Ave/Bay	F	67.6	F	150.3	Allow nbnd t free	D	26.4
California St/Bay	F	434	F	Ovrfl	Allow sbnd t free	B	12.5
Branciforte/Soquel	C	23.6	E	67.6	Esbnd 1 l, 1t, 1 tr, wsbnd 1l, 1tr no splt phase	C	24.5
Ocean St/Broadway	C	34.3	F	90.8	Prohibit lfts from Ocean	D	36.5
Pacific/Beach	C	20.9	E	39.9	Roundabout	C	
Ocean St/San Lorenzo-ECliff Dr	E	64.7	F	113.9	Add sbnd r	D	53.2
Seabright/Murray	D	43.7	E	62.7	ADD wsbnd r, nbnd r & sbnd r	**E**	59.4
Swift/Delaware	C	23.9	F	241.6	Roundabout/Signal	C	20.1

The mitigation measure column reflects the recommended lane geometry where r = right turn lane, rt = right/through lane, l = left turn lane, lt = left/through lane, t = through lane, and twltl = two-way left turn lane.

SOURCE: Ron Marquez

IMPACT DISCUSSION

The proposed *General Plan 2030* strives to maintain LOS D or better at signalized intersections with acceptance of a lower LOS at major regional intersections if necessary improvements would be too costly or result in significant environmental impacts (Policies M3.1.3, M3.1.4). In conjunction with this directive, Policies M2.1.3, M2.1.4 and ED1.9.2 direct the City to implement pedestrian, bike, mass transit, and road system improvements through the Capital Improvements Program (CIP), and draft plan supports "regional funding and implementation of key regional projects that can significantly benefit Santa Cruz and further the City's mobility policies," although it is not clear what these projects may be. As most of the recommended improvements to impacted intersections are within the City's TIF Program or would be added with proposed updating of the TIF (M3.1.5), the needed improvements are expected to be implemented over time as projects are added to the City's CIP. Intersections along state highways would also come under the jurisdiction of Caltrans. Overall, intersection improvements would be constructed within existing developed rights-of way, and would not be expected to required construction on undeveloped land that would result in potential significant impacts. However, an appropriate level of environmental review would be required at the time a specific intersection improvement is proposed.

As shown on Table 4.4-3, eight intersections would remain at unacceptable levels of service even with implementation of identified improvements. These include four major intersections within the City that carry regional and visitor traffic: River-Highway 9/Highway 1; Mission/Chestnut, Mission/Bay and Ocean/Water. For these intersections, the proposed *General Plan 2030* accepts a lower LOS at major regional intersections (M3.1.4). These intersections would be considered major intersections, and are also included in the existing General Plan as deficient intersections for which a lower LOS would be accepted. However, while, the City may be willing to accept a lower LOS at the intersections along Highway 1- Mission Street, these intersections are within the jurisdiction of Caltrans and would not meet its desired C-D LOS. The recommended intersection improvements would improve delay to slightly less than what occurs under existing conditions even though an acceptable LOS still would not be achieved with the improvements at one of these intersections: River-Highway 9/Highway 1.

The other four intersections that would remain at unacceptable levels of service include: Mission/Laurel (Caltrans intersection), High/Western, Seabright/Water and Seabright/Murray. As shown on Table 4.4-3, delays would be reduced below existing levels with implementation of the recommended improvements at the High/Western and Seabright/Water intersections. The level of service calculation for these two intersections is based on the left turn movement from the minor stop controlled street. Overall both of these intersection operate well, despite the LOS. However, the Mission/Laurel and Seabright/Murray intersection would operate at an unacceptable level of service.

The Draft *General Plan 2030* includes goals, policies and actions that set forth comprehensive measures to reduce vehicle trips, increase vehicle occupancy, encourage use of alternative transportation modes, and promote alternative-sustainable land use patterns, all of which would help reduce vehicle trips, and avoid and minimize adverse impacts related to traffic. A summary of the proposed *General Plan 2030* policies that serve to reduce/mitigate impacts of increased traffic is presented in Table 4.4-4.

Policy M2.3 and its four accompanying actions seek to increase the efficiency of the City's multi-modal transportation system to design for and accommodate multiple transportation modes (M2.3.1), as well as TSM measures and road improvements to achieve an acceptable level of service (M2.3.2). Policies M3.1.1 and M3.1.2 direct the City to seek ways to reduce vehicle trip demand, reduce the number of peak hour vehicle trips, and encourage high occupant vehicle travel. A significant rise in vehicle occupancy from the existing average of 1.2-1.3 persons per vehicle would provide additional road capacity, increase the efficiency of the existing transportation and roadway system and reduce the need for costly improvement to the road system (Santa Cruz County Regional Transportation Commission, June 2010).

TABLE 4.4-4
Proposed General Plan Policies and Actions that Reduce Traffic Impacts

Type of Measure / Action	Policies / Actions

MAINTAIN LEVEL OF SERVICE STANDARD & IMPLEMENT TRANSPORTATION IMPROVEMENTS	• Maintain LOS D or better at signalized intersections; accept lower LOS at major regional intersections: M3.1.3, M3.1.4
	• Implement road improvements & alternative transportation to achieve acceptable LOS: M2.3.2
	• Manage, reduce congestion: M.3.1, M2.4.4 (work with UCSC)
	• Maintain road system with efficient arterial operations: M3.2.2, M3.3.6, M3.1.12 (coordinated signal timing)
	• Promote TSM strategies: M2.5.2
	• Improve access along the Visitor/Beach Area travel corridors: M3.3.2
	• Maintain/update Traffic Impact Fee and implement road improvements: M3.1.5; M2.1.3
	  ⅄ Implement pedestrian, bike, transit & road improvement through CIP: M2.1.3, ED1.9.2
	  ⅄ Support regional funding & implementation of key regional projects that benefit Santa Cruz: M2.1.4
	  ⅄ Transportation improvements on Ocean: ED1.2.1
	  ⅄ Visitor access improvements: ED1.8.4

REDUCE AUTO/VEHICLE TRIPS & INCREASE VEHICLE OCCUPANCY	• Reduce auto dependence, vehicle trips and peak hour trip & increase vehicle occupancy: M1.1, M3.1.1, M3.1.2 • Encourage employment-related strategies (i.e., flex-time, telecommuting, parking management, ridesharing): M3.1.7, M3.1.8, M2.4.4
ENCOURAGE MULTI-MODAL SYSTEMS	• Design, accommodate & increase efficiency of multiple transportation modes: M2.3, M2.3.1, ED1.9.2 (alternative transportation), NRC4.4.2, M3.1.11 (studies to determine deficiencies) • Include pedestrian, bike, transit facilities in ROW acquisition, street design, bridge & road projects: M1.4.1, M1.4.2, M2.3.3 • Develop Depot Park as multi-modal center: LU3.5.2 • Multi-modal use of future rights-of-way: M1.4.2
ENCOURAGE ALTERNATIVE TRANSPORTATION MODES	• Encourage use of alternative transportation modes: M.2.1.2 • Promote alternative transportation with TSM strategies: M2.3.2, M2.5.2 • Connect activity centers with pedestrian & bike paths: M1.1.2 • Encourage hotels to provide bike/shuttle programs: M2.3.4 • Employment and parking-related strategies: M3.1.7, M3.1.8, M3.1.9 **(CONTINUED ON NEXT PAGE)**

TABLE 4.4-4
Proposed General Plan Policies and Actions that Reduce Traffic Impacts

Type of Measure / Action	Policies / Actions
➤ Bicycle Use	• Interconnected bike network & maintain/update Bike Plan: M4.2, M4.2.1, M4.2.2, M4.2.3 • Implement bicycle improvements: M2.1.3 • Bike lanes: M4.3.1, 4.5.4 • Bike commute routes: M4.3.2 (rail r-o-w, West Cliff, Broadway) • Support bicycle improvements, amenities & maintenance: M4.4 & actions, M4.2.6, M4.3, M4.5 & actions, PR1.6.4 (at parks); CC8.4 (at educational facilities)
➤ Pedestrian Use	• Connected street and pedestrian network: CD5.1, M1.1.2, M1.1.3, M4.1.5 (development dedication) • Implement pedestrian improvements: M2.1.3, M1.3.1 • Implement MTS pedestrian recommendations; update/implement Pedestrian Master Plan: CD5.1.1, M1.2, M4.1.1 • Encourage walking: M4.1, M4.1.3 and pedestrian access: CC8.4 • Neighborhood parking strategies & development designs to foster pedestrians: CD 5.2.3, M4.1.7
➤ Transit Use & Expansion	• Encourage transit options & increased transit service, capacity & ridership: M1.1.3, M2.1.1, M2.4, M2.4.2, M2.4.6, M2.4.7, M2.4.8 (commuter travel), M2.4.9 • Implement transit improvements: M2.1.3 • Consider giving priority to transit on City corridors: M2.4.5 • Conveniently located transit stops, centers & transit links: M.1.4, M2.4.11 and as part of new development: M2.4.12, M2.4.12 • Encourage maintenance/upgrading of transit infrastructure: M.2.4.10 • Encourage Beach shuttle: M2.4.1
➤ Rail	• Encourage/support passenger rail transit & other modes along rail ROW: M2.2, M2.2.1 • Rail Land Use Plan: LU4.2.4 • Rail Transit Center: LU4.5, LU4.5.2 • Condition development along rail-potential stops: LU4.5.2 • Encourage transport of good by rail: M2.2.2
LAND USES / PATTERNS TO REDUCE VEHICLE TRIPS	• Reduce auto use with pedestrian/transit-oriented activity centers & development centers (M1.1) • Expand neighborhood facilities (LU4.3, LU4.3.1) • Encourage land use changes that reduce auto use: LU4.2); locate community facilities within walking distance to residential areas and transit: (CC2.1.4) • Encourage home occupations & telecommuting: LU4.4, LU4.4.1 and live-work units: LU4.1.4, HA4.4 (artists) • Ensure optimum utilization of infill parcels (LU1.1, LU1.1.1) and Consolidation of Underutilized Parcels (LU1.1.2) • Encourage mixed uses: LU3.5 (Lower Pacific), LU3.6 (River) , LU4.1.1, LU4.2.2 (new districts), LU4.2.3, LU4.1.3 • Encourage assembly of small parcels along transit: CD3.3, CD3.3.1, CD3.3.2 **(CONTINUED ON NEXT PAGE)**

TABLE 4.4-4
Proposed General Plan Policies and Actions that Reduce Traffic Impacts

Type of Measure / Action	Policies / Actions
	• Encourage higher/maximum densities: LU3.6.1 (Lower Front St), LU3.7, LU3.7.1, LU3.8 • Encourage higher densities along transit/commercial corridors: LU4.1, LU4.1.1 • Encourage University shopping/services on UC lands: LU4.2.5
REDUCE & DISCOURAGE THROUGH-TRAFFIC IN NEIGHBORHOODS	• Discourage, reduce, and slow through-traffic: M3.3 • Enhance neighborhood livability through road& transit design: M3.3.1 • New development to be designed to discourage through traffic and encourage bicycle or pedestrian connections: M3.3.5 • Reduce traffic in residential neighborhoods by improving arterial and collector streets: M3.3.6 • Develop neighborhood traffic control plans where necessary to minimize traffic impacts on local streets: M3.3.7

Policy M2.1.2 encourages use of alternative modes of transportation, and numerous policies and actions support expanded and improved bicycle and pedestrian facilities, a well as increased transit use. Several policies support higher land use densities along transit corridors (LU4.1, LU4.2, M1.1) to support land use patterns that reduce reliance on automobiles. Home occupations and telecommuting also are encouraged (LU4.4). The draft General Plan also directs the City to improve access to and routes between tourist and visitor designations and lodging facilities as part of the City's economic development policies ED1.8.4).

These policies would serve to help reduce project vehicular traffic and thus reduce traffic impacts in addition to proposed intersection improvements. Of the eight identified intersections that would remain at unacceptable levels of service with implementation of identified improvements, four are at major intersections where the City has historically accepted a lower level of service at major regional intersections where improvements would be too prohibitively costly or could result in unacceptable significant environmental impacts, and this policy is maintained in the proposed General Plan (M3.1.4), although the intersections within Caltrans' jurisdiction would not meet Caltrans LOS standards. Additionally, the delays at these intersections would be less than without the improvement, and at the Highway 1/Highway 9 intersection, the delay would be less than under existing conditions. The other four intersections that would remain at unacceptable levels of service, although delays would be reduced to levels below existing conditions at the Western/High and Seabright/Water intersections.

Roadway, as well as bicycle and other non-vehicular improvements, would be contingent on future funding. The potential growth estimated to result from implementation of the proposed *General Plan 2030* could generate nearly $32 million in impact fees at current rates that could be used for improvements, of which 15% would be for alternative transportation. However the TIF program, including improvements, costs and impact fees, would be updated pursuant to actions specified in the draft General Plan (M3.1.5). Improvements to intersections along state highways would be contingent on Caltrans approval and state and/or federal funding. Revenues for transportation, including road and other transportation mode improvements, have not kept pace with the multimodal needs of travelers in Santa Cruz County (Santa Cruz County

Regional Transportation Commission, June 2010). Given chronic state budget deficits, as well as reduced local revenues funding road, bicycle, and pedestrian improvements will continue to be a challenge. Additionally, the lack of community consensus on regional highway improvements and local multi-use paths further constrain the feasibility of either roadway or alternative transportation mode improvements being implemented (Santa Cruz County Regional Transportation Commission, June 2010).

Revenue issues and service cuts have reduced the SCMTD's level of service, affecting the ability to increase transit service. It is estimated that 1,500 to 2,000 additional transit passengers may need to be served with projected General Plan buildout. It is expected that service would continue along major the City's major transportation corridors and where high use is concentrated. However, additional funding will be necessary to expand transit service in the future and provide implementation of "Sustainable Community" strategies,[11] and such funding, is at this time uncertain (SCMTD, White, personal communication, August 2011).

Conclusion. Future development accommodated by the proposed *General Plan 2030* would generate traffic that would result in unacceptable levels of service at 21 intersections, all of which could be improved to acceptable levels with intersection improvements, except for four local intersections and four intersections on state highways. Therefore, these intersections could not be improved to an acceptable LOS to meet City or Caltrans' standards, and the resulting effects on these eight intersections would be considered a significant impact unavoidable impact as no feasible improvements have been identified. With implementation of the identified improvements and proposed *General Plan 2030* policies and actions to reduce vehicular traffic, increase vehicle occupancy and support/encourage use of alternative transportation measures, the impact could be reduced to a less-than-significant level at the remaining impacted intersections. However, funding availability likely will remain constrained for major facility improvements and expansion of transit service into the foreseeable future. Thus, implementation of recommended improvements and alternative transportation facilities cannot be assured, and thus, the impact to the intersections identified as operating at unacceptable levels of service under the proposed *General Plan 2030* remains significant.

Mitigation Measures

With implementation of the proposed *Plan 2030* policies and actions to reduce vehicular traffic, increase vehicle occupancy and support/encourage use of alternative transportation measures, the impact could be reduced to a less-than-significant level at all but four intersections along state highways and the four local intersections. Impacts would remain significant and unavoidable. With uncertainly regarding funding and implementation of transportation projects for the other intersections, the impact remains

[11] Senate Bill 375 (SB 375) provides a means for addressing greenhouse gas (GHG) emissions by aligning regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation, thereby discouraging urban sprawl and reducing vehicle miles traveled, with an emphasis on increasing land use intensity along transit corridors. See the GLOBAL CLIMATE CHANGE (Chapter 4.12) section of this EIR for further discussion.

significant and unavoidable. However, revision of the following *General Plan 2030* action is recommended.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

M3.1.4 Accept a lower level of service and higher congestion at major regional intersections if necessary improvements would be ~~too~~ prohibitively costly or result in significant, unacceptable environmental impacts.

Impact 4.4-2: Traffic Impacts on State Highway Levels of Service (LOS) Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that would result in increased vehicle trips and traffic on state highways in the regions (Routes 1, 17, and 9), which would further exacerbate existing unacceptable levels of service. This is considered a *significant impact*.

The proposed project would result in increased traffic on state highway segments. It is estimated that the proposed project would generate approximately 78,235 weekday daily trips. Based on the results of the TRAFFIX model, the distribution of project traffic to state highways is estimated as follows:

- Highway 1, southbound: 24.6% of all trips
- Highway 9, north of City Limits: 1.9% of all trips
- Highway 17, northbound: 20.5% of all trips

Based on this distribution, traffic resulting from future development accommodated by the proposed *General Plan 2030* would increase traffic on southbound Highway 1 by approximately 19,250 daily trips, on northbound Highway 17 by approximately 16,000 daily trips, and on northbound Highway 9 by about 1,500 daily trips. This represents an increase of approximately 20% on Highway 1 and 22% on Highway 17, which would be considered a substantial increase.

According to the Transportation Concept Report for state highways, the target level of service for State Highway 1 west of Morrissey Boulevard is LOS D, and the target level of service for State Highway 17 south of Pasatiempo is LOS E (Caltrans, April 2006, January 2006). However, according to the Caltrans Guide for the Preparation of Traffic Impact Studies (Caltrans, 2002), if an existing State Highway facility is operating at less than the target LOS, the guide states that the existing LOS should be maintained. Highway 1 between Morrissey and Branciforte Creek Bridge operates at a E-F LOS (Caltrans, October 2010), and Highway 17 operates at LOS F (Caltrans, January 2006).

The addition of project-related traffic would contribute to significantly worsened conditions. However, some of this traffic would be within projected future volumes estimated by Caltrans. According to Caltrans' studies, Highway 1 traffic near Morrissey-Branciforte Creek Bridge is expected to increase by 50,000 daily trips in 2030-2035 (Caltrans, October 2010). Future year traffic volumes were projected using growth rates from AMBAG's regional travel demand model, version April 2007, applied to 2007 counts (Ibid.). By incorporating trip reduction and smart growth design in the proposed General Plan policies and actions, the forecast of increased traffic on Route 1 as a result of potential development accommodated by the *General Plan 2030* is significantly less than that anticipated in Caltrans Corridor Systems Management Plan.

The Route Concept Report for Highway 1 includes the addition of High Occupancy Vehicle (HOV) lanes to Highway 1. This project will add a lane in each direction to reduce congestion, encourage carpooling, expand express bus service, and improve safety. The limits of this project extend from Morrissey Boulevard to San Andreas Road/Larkin Valley Road. Project environmental review and preliminary design are underway. Caltrans' draft "Corridor System Management Plan's" strategy for Highway 1 includes new express bus services on the planned HOV lanes, support of land use and transportation efforts to reduce traffic, and overall reduction of congestion by encouraging alternative transportation facilities and programs. The County and Caltrans are also working on design and environmental review for reconstruction of the La Fonda Avenue overcrossing as part of the Auxiliary Lane Project.

The Route Concept Report for Highway 17 identifies an increase of about 8,100 daily trips to the year 2023 (Caltrans, January 2006). The report acknowledges that Highway 17 will remain a 4-lane freeway without widening. Using the traffic forecast in the Corridor System Management Plan for Route 1 the increase in volume on Route 17 would range from 30,000 to 40,000 vehicles per day by the year 2035. Again this figure is well above the volume forecast for the general plan.

As discussed above in the Impact 4.4-1 analysis, the Draft *General Plan 2030* includes goals, policies and actions that set forth comprehensive measures to reduce vehicle trips, increase vehicle occupancy, encourage use of alternative transportation modes, and promote alternative-sustainable land use patterns, all of which would help reduce vehicle trips, and avoid and minimize adverse impacts related to traffic. The draft Plan encourages use of alternative modes of transportation, and numerous policies and actions support expanded and improved bicycle and pedestrian facilities, as well as increased transit use. Several policies support higher land use densities along transit corridors to support land use patterns that reduce reliance on automobiles. The draft Plan supports regional funding and implementation of key regional projects "that can significantly benefit Santa Cruz and further the City's mobility policies" (M2.1.4).

Caltrans is responsible for improvements along state routes and has proposed a series of improvements along Highway 1, which would improve transit and carpooling with addition of an HOV lane. While overall levels of service would remain unchanged if the additional lane were not an HOV lane, average speeds would be increased and delays reduced (Caltrans, October 2010). Similarly, Highway 17 is forecast to remain at an unacceptable LOS in the future with no potential improvements having been identified. Both the Highway 1 planned HOV lanes and Soquel/Morrissey auxiliary lanes are supported in the current Regional

Transportation Plan. The SCCRTC assumes that a half-cent, 30-year sales tax measure or similar local funding mechanism will be ultimately be approved (Santa Cruz Regional Transportation Plan, June 2010).

The increase of 1,500 vehicles per day on Route 9 will not result in a significant impact. The existing volumes on Route 9 range from 5,000 AADT to 5,600 ADT north of City limits during peak months. Traffic volumes have increased on this highway approximately 1,000 vehicles per day in the last 30 years. Route 9 is a conventional undivided two-lane highway which is classified as a major collector. No major improvements are planned in the corridor from Santa Cruz to Felton north of the City limits. (Transportation Planning Fact Sheet State Route (SR) 9 in Santa Cruz County, Caltrans).

Conclusion. Future development accommodated by the proposed *General Plan 2030* would generate traffic that would contribute to existing and future forecast unacceptable levels of service along Highway 1 and Highway 17. Project traffic represents a significant addition, although the estimated General Plan buildout traffic is less than the future forecasts estimated by Caltrans in its draft "Corridor System Management Plan." With implementation of the proposed *General Plan 2030* policies and actions to reduce vehicular traffic, increase vehicle occupancy and support/encourage use of alternative transportation measures, and with future improvements along Highway 1 that are planned by Caltrans, traffic congestion along Highway 1 will be minimized. However, highway operations would continue to remain at unacceptable levels. Thus, the impact remains significant.

Mitigation Measures

None are known beyond those being considered for Highway 1 by Caltrans as discussed above.

Impact 4.4-3: Traffic Hazards
Adoption and implementation of the proposed *General Plan 2030* would not result in new roads that could potentially create hazards, and with implementation of proposed *General Plan 2030* policies and actions to ensure road safety, the project would not result in direct or indirect impacts related to increased hazards. Therefore, there is *no impact* related to road safety/hazards.

The proposed *General Plan 2030* does not include new roads or road alignments, and thus, would not create or increase hazards due to a road or intersection design. Action M3.1.13 does support an approach to Highway 1 to from the Harvey west area, but a specific location is not identified. If this option were to be considered in the future, it would require Caltrans' approval, and would be subject to project-level design and environmental review.

Furthermore, Policy M3.2 seeks to ensure road safety for all users. To this end, the plan proposes to maintain the condition of the existing road system (M3.2.1), ensure safe and

efficient arterial operations and designs (M3.2.2, M3.2.11), ensure adequate street widths and designs for emergency vehicles (M3.2.3), and improve traffic safety and flow, including at high collision and congested areas (M3.2.4, M3.2.5). Regular inspection and maintenance of street pavements is supported to help encourage bicycling (M3.2.6).

Conclusion. The proposed *General Plan 2030* does not include new roads or road alignments, and thus, would not create or increase hazards due to a road or intersection design. Implementation of the proposed *General Plan 2030* policies and actions would help to maintain road safety and prevent hazardous conditions due to future designs of roadway or intersection improvements. Therefore, there is no impact associated with creating or increasing hazards due a specific roadway design feature.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.4-4: Conflicts with Adopted Plans
Adoption and implementation of the proposed *General Plan 2030* would not result in conflicts with adopted plans, policies or programs that support alternative transportation, as the proposed goals, policies and actions directly support implementation and use of alternative transportation modes. Therefore, there is *no impact* related to potential conflicts with plans and policies.

Both the SCCRTC's *Regional Transportation Plan* and AMBAG's *Monterey Bay Area Mobility 2035* support and promote transit, bicycling, walking, carpooling and other alternative transportation modes. The proposed *General Plan 2030* directly supports these alternative modes as well. Action M2.1.2 encourages use of alternative modes of transportation, and numerous policies and actions support expanded and improved bicycle and pedestrian facilities, a well as increased transit use and passenger rail transit, as summarized on Table 4.4-4. Policy M2.3 seeks to increase the efficiency of the City's multi-modal transportation system. Several policies support higher land use densities along transit corridors (LU4.1, LU4.2, M1.1) to support land use patterns that reduce reliance on automobiles.

Conclusion. The proposed *General Plan 2030* directly supports regional plans and policies that support alternative transportation modes as it includes numerous policies and actions that encourage use of alternative modes of transportation, and support expanded and improved bicycle and pedestrian facilities, a well as increased transit use. Therefore, there is no impact related to potential conflict with adopted plans and policies that support alternative transportation.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

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4.7 TRAFFIC & TRANSPORTATION

This section analyzes traffic and transportation impacts of the proposed project based on the trip generation, distribution and level of service analyses prepared by Kimley-Horn (May 2017) that was reviewed by the City of Santa Cruz Public Works Department staff and consulting traffic engineer, Ron Marquez. A summary of the methodology is included in Appendix F of this document.

Public and agency comments related to traffic and transportation were received during the public scoping period in response to the Notice of Preparation (NOP). Issues raised in these comments include:

- Traffic should be considered in the EIR.

To the extent that issues identified in public comments involve potentially significant effects on the environment according to the California Environmental Quality Act (CEQA) and/or are raised by responsible agencies, they are identified and addressed within this EIR. Public comments received during the public scoping period are included in Appendix B.

4.7.1 Environmental Setting

Regulatory Setting

A number of local, regional and state agencies are involved with transportation planning and implementation of transportation programs and improvements within the City of Santa Cruz. The City maintains local roadways and transportation facilities. The California Department of Transportation (Caltrans) has jurisdiction over State highway segments that traverse the City, including portions of Highways 1, 9, and 17. To address roadway and intersection improvements needed as a result of impacts of new development, the City has developed a "Traffic Impact Fee" (TIF) program. The TIF is applied to new development and redevelopment and is collected at the time of issuance of building permits (see discussion below in the "Planned Transportation Improvements" subsection for more details). The City also is active in acquiring transportation funding from federal, state, and local sources.

Other local and regional agencies responsible for transportation services and/or transportation planning are summarized below.

- *The Association of Monterey Bay Area Governments* (AMBAG) is the federally designated Metropolitan Planning Organization (MPO) for transportation planning activities in the tri-county Monterey Bay region (Santa Cruz, Monterey and San Benito counties). It is the lead agency responsible for developing and administering plans and programs to maintain eligibility and receive federal funds for the transportation systems in the region. AMBAG conducts regional transportation planning activities through its Metropolitan Transportation Plan (MTP), the Metropolitan Transportation Improvement Program

(MTIP), maintenance of a regional travel demand model and demographic forecasts. AMBAG works with regional transportation planning agencies, transit providers, the Monterey Bay Unified Air Pollution Control District (MBUAPCD), state and federal governments, and organizations having interest in or responsibility for transportation planning and programming.

- *The Santa Cruz Regional Transportation Commissio*n (SCCRTC) is the State designated Regional Transportation Planning Authority (RTPA) for transportation planning activities in Santa Cruz County. SCCRTC oversees planning and funding programs for local and countywide projects within Santa Cruz County using state and federal transportation funds. The City of Santa Cruz has one City representative on the 12-member SCCRTC board and some City transportation projects are funded through grant programs administered by the SCCRTC.
- *The Santa Cruz Metropolitan Transit District* (SCMTD) provides transit services throughout Santa Cruz County.

Study Area

The project area consists of the downtown area generally covered by the Downtown Recovery Plan (DRP) and the Central Business District zone, and specifically the lower downtown area generally between Soquel Avenue and Laurel Street on the north and south, and Cedar Street and the San Lorenzo River on the west and east. (Locations are shown on Figures 1-2 an d 2-1 in Section 3, Project Description.) The study area includes properties adjacent to the western San Lorenzo River levee.

Since the proposed project includes an amendment to the land use designation text for the Regional Visitor Commercial land use designation, the study area also includes lands located within this designation. In addition to the downtown area, the Regional Visitor Commercial (RVC) land use designation is applied to sites in the Beach area and upper Ocean Street adjacent.

The City's "Transportation Impact Study Guidelines" (2011), requires a traffic impact analyses to be conducted where a project would result in an increase of 50 or more trips during the weekday PM peak hour. In the City of Santa Cruz, the PM peak hour (between 4 PM and 6 PM) generally has the highest number of trips compared to the AM peak hour (between 7 AM and 9 AM) or the midday peak hour (City of Santa Cruz, April 2012-DEIR), and is considered the peak hour period for traffic impact studies in the City.

Based on the Transportation Impact Study Guidelines and the trip generation of the project, study intersections were selected for evaluation by the City Public Works Department and include those listed below. AM and PM peak traffic count data was collected on Thursday, May 22, 2014 and Tuesday November 17, by Kimley-Horn Associates.

1. Front Street / Laurel Street
2. Pacific Avenue / Laurel Street
3. Front Street / Cathcart Street
4. Front Street / Metro Station Driveway
5. Pacific Avenue / Metro Station Driveway
6. Pacific Avenue / Maple Street
7. Pacific Avenue / Front Street / Mission-Water Street
8. Front Street / Soquel Avenue
9. Pacific Avenue / Cathcart Street
10. Soquel Avenue / Pacific Avenue
11. Ocean Street / Water Street
12. Highway 1 / Highway 9
13. Chestnut Street / Mission Street / Highway 1

Roadway Network

Local Streets and Roads

Project site access will be provided primarily from Pacific Avenue, Front Street, Laurel Street and Soquel Avenue. Other local streets and roads include Maple Street, Elm Street and Cathcart Street.

Pacific Avenue is a north-south street and is classified as arterial in the City of Santa Cruz General Plan (City of Santa Cruz, June 2012). Between Laurel Street and Cathcart Street it is a two lane divided roadway. North of Cathcart Street, Pacific becomes a one-way roadway. There is two hour metered on-street parallel parking and sidewalks are present on both sides of the street. SCMTD buses use Pacific Avenue to enter Pacific Station, a large transit center providing regional service to the City of Santa Cruz.

Front Street is a north-south two lane arterial with left turn pockets. Between Cathcart Street and Soquel Avenue, Front Street becomes three lanes. Sidewalks and bicycle lanes are present on both sides of the street. Metered on-street parallel parking is provided on the east side of the street as well. Front Street provides direct access to three surface parking lots and one parking structure. SCMTD buses use Front Street to enter and exit the Metro Station transit center.

Laurel Street is an east-west arterial with left turn pockets. Bicycle lanes and sidewalks are present on both sides of the street. There is no on-street parking allowed on Laurel Street in the study area.

Soquel Avenue is an east-west arterial that provides a major east-west connection over the San Lorenzo River to downtown and to the eastern portion of the City. Near the study area it is a four lane roadway with sidewalks and bicycle lanes on both sides of the street. Limited, metered, parallel parking is provided on both sides of the street between Pacific Avenue and Front Street.

Water Street is an east-west four lane arterial with left turn pockets between Center Street and Branciforte Avenue east of the study area. At its intersection with Center Street, Water Street becomes Mission Street. Between Chestnut Street Extension and Center Street, Mission Street is a two lane arterial. There are bicycle lanes on both sides of the street and crosswalks at every intersection within the study area. There is on-street twelve hour metered parallel parking on the north side of the street between Center Street and River Street. East of Pacific Avenue twelve hour metered on-street parallel parking is available on the south side of the street until River Street.

Cedar Street is a north-south two lane arterial parallel to Pacific Avenue. There are bicycle lanes on both sides of the street and crosswalks at every intersection in the study area. Metered on-street parallel parking is provided as well as access to several paid surface parking lots and parking structure. At its intersection with Laurel Street, vehicles are restricted to right turns only southbound.

River Street is a north-south arterial that parallels the San Lorenzo River. It connects to State Route 9 at its northern terminus with State Route 1. South of Water Street it splits into River Street and S. River Street. River Street terminates at Front Street and S. River Street terminates at Soquel Avenue. Bicycle lanes are provided on both sides of the roadway on River Street between Front Street and State Route 9. While there is no bicycle facility on S. River Street the San Lorenzo Riverwalk runs parallel to it. (See below for more information on the San Lorenzo Riverwalk.) There are textured colored crosswalks connecting to the pedestrian bridge over the San Lorenzo River at the Regal Cinemas theater. Twelve hour metered on-street parallel parking is provided on the west side of S. River Street and on the east side of River Street between Front Street and S. River Street.

State Highways

State highways that are in the vicinity of the project site include segments of State Routes 1 and 17; State Route 1 is located approximately 1/2 mile driving distance northwest of the project site. Though referenced as “state routes” in Caltrans documents, the more common term, “highway”, is used in this EIR. Highways 1 and 17 serve regional traffic, including motorists who commute to jobs in the Santa Clara Valley and motorists who travel into Santa Cruz County for recreational opportunities offered in the county (City of Santa Cruz, April 2012, DEIR volume).

Highway 1 provides access to San Francisco to the north and Monterey to the south. Regionally, Highway 1 is the major inter- and intra-county route for Santa Cruz County. Within the City of Santa Cruz, it is oriented in an east-west direction, although the interregional alignment of Highway 1 is primarily north-south. It is a four-lane arterial along Mission Street from the west

side of Santa Cruz to Chestnut Street Extension, a four-lane expressway between Mission Street-Chestnut Street and River Street, and a four-lane freeway east of River Street. The speed limit on Highway 1 is 25 mph along Mission Street, 45 mph along the expressway section, and 55 and 65 mph on the freeway sections. Recurrent congestion results in queuing on Highway 1 that extends for several miles during peak hours. Accidents, events, and other incidents in the corridor can further increase congestion related delays in either direction, on any day, including weekends (City of Santa Cruz, April 2012, DEIR volume).

Highway 9 is a multi-lane highway between Highway 1 and Encinal Street. It is two-lanes north of Encinal Street that connects the City of Santa Cruz with the San Lorenzo Valley, and eventually, Saratoga and Los Gatos.

Highway 17 connects Santa Cruz with Scotts Valley and San Jose and other Santa Clara County communities. It is a four-lane freeway north of the Highway 1/ Highway 9 intersection. Highway 17 is the primary route between the Santa Clara Valley and Santa Cruz County that serves as both a commute route for Santa Cruz County residents that work in Santa Clara County and as a route for recreational visitors that come to Cruz County. Congestion occurs both during weekday commute times and on summer weekends. This winding, four-lane road has steep sections, frequent road crossings, and substandard median shoulders and outside shoulders for most of its length. In addition to the challenging roadway configuration, weather-related conditions such as thick fog, heavy rains and mudslides affect roadway operations (City of Santa Cruz, April 2012, DEIR volume).

Other Transportation Modes

Pedestrian and Bicycle Facilities

Pedestrian facilities within the study area include sidewalks, crosswalks, ADA ramps and pedestrian signal heads. The sidewalks on Pacific Avenue are 10 to 25 feet wide and crosswalks with ADA ramps are provided at every intersection. The sidewalks on Front Street are generally 8 to 10 feet wide and crosswalks are provided at intersections as well as in front of the Pacific Station transit center. Bicycle amenities include bicycle parking (located at Pacific Station), Class II facilities (bicycle lanes) and the San Lorenzo Riverwalk.

The San Lorenzo Riverwalk is a north-south bicycle and pedestrian path that follows the San Lorenzo River in Santa Cruz for approximately 2.5 miles. The paved trail is on the river levee on both the east and west sides of the river, except for a short segment in the vicinity of the County Building north of Soquel Avenue, which is currently under construction. A pedestrian/bicycle bridge north of Soquel Avenue connects both sides of the levee trail system, and can be accessed from River Street, approximately 750 feet north of the project site.

Public Transit Service

Public transit service in the City and County of Santa Cruz is provided by the Santa Cruz Metropolitan Transit District (SCMTD). Pacific Station, located on the east side of Pacific Avenue between Elm Street and Maple Street, is the largest transit center for SCMTD bus service. There are four bus departure lanes and a staffed customer service information booth. All routes except 33-34, 55, and 72-79 service the station. In September 2016, SCMTD implemented a large service reduction to address funding shortfalls. This reduction affected some of the routes servicing Pacific Station, however it is still provides high frequency service.

Existing Traffic Conditions

According to City data, from the years 2010 to 2014, 63% of commuters within the City drove alone, 11% walked, 10% bicycled, 8% carpooled, 6% took the bus, and 2% used other modes such as taxi, motorcycle (City of Santa Cruz, 2016 Annual Traffic Safety Report). This data shows significant progress towards the City's Climate Action Plan goals to increase biking and walking and decrease single-occupancy vehicle use within the City. Santa Cruz has one of the highest bicycle mode splits in the country, and a lower "Drive Alone" mode split than most California cities (Ibid.).

Vehicle Traffic

Vehicle traffic conditions are measured by average daily traffic (ADT), peak hour traffic volumes, level of service (LOS), average delay, and/or volume to capacity (V/C) ratio. Average daily traffic is the total number of cars passing over a segment of the roadway, in both directions on an average day. Peak hour volumes are the total number of cars passing over a roadway segment during the peak hour in the morning (AM) or afternoon/evening (PM) (City of Santa Cruz, April 2012, DEIR Volume).

To evaluate the performance of roadways and levels of traffic congestion, many jurisdictions, including the city of Santa Cruz, use LOS. "Level of Service" is a qualitative measure that describes the level of traffic congestion and delay at intersections based on the amount of vehicle traffic that a roadway or intersection can accommodate and factors such as maneuverability, driver dissatisfaction, and delay. Traffic flow along roadways is typically controlled by the volume and capacity of the nearest intersection, therefore intersections are analyzed using LOS as an indicator of congestion. Intersections are rated based on a scale of LOS "A" through LOS "F," with LOS A representing free-flowing conditions and LOS F representing congested conditions. The intermediate levels of service represent incremental levels of congestion and delay between these two extremes. Table 4.7-1 relates the operational characteristics to each associated LOS category for signalized and unsignalized intersections.

The signalized intersection LOS methodology addresses the LOS for the intersection as a whole, whereas LOS methodology for unsignalized intersections computes delay for the minor

movements. The critical volume to capacity ratio (V/C) is another measure of the operating conditions of an intersection as opposed to LOS. It is not the average of all the movements at the intersection and is not used as a measure to define the levels of service.

The City of Santa Cruz General Plan 2030 seeks to maintain LOS D or better at signalized intersections during the PM peak hour (Action M3.1.3). However, the General Plan also accepts a lower level of service and higher congestion at major regional intersections if necessary improvements would be prohibitively costly or result in significant, unacceptable environmental impacts (Action M3.1.4).

Caltrans, which has jurisdiction over state highways, endeavors to maintain a target LOS at the transition between LOS C and D. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS (Caltrans, December 2002). If an existing State highway facility is operating at less than the appropriate target LOS, the existing LOS should be maintained (Ibid.).

TABLE 4.7-1: Intersection Level of Service Definitions

Level of Service	Description	Signalized (sec/veh.)	Unsignalized (sec/veh.)*
A	Free flow with no delays. Users are virtually unaffected by others in the traffic stream.	≤ 10	≤ 10
B	Stable traffic. Traffic flows smoothly with few delays.	>10 – 20	>10 – 15
C	Stable flow but the operation of individual users becomes affected by other vehicles. Modest delays.	>20 – 35	>15 – 25
D	Approaching unstable flow. Operation of individual users becomes significantly affected by other vehicles. Delays may be more than one cycle during peak hours.	>35 – 55	>25 – 35
E	Unstable flow with operating conditions at or near the capacity level. Long delays and vehicle queuing.	>55 – 80	>35 – 50
F	Forced or breakdown flow that causes reduced capacity. Stop and go traffic conditions. Excessive long delays and vehicle queuing.	> 80	> 50

*Two-way stop control intersection

SOURCE: Transportation Research Board, *Highway Capacity Manual 2010*, National Research Council as cited in City of Santa Cruz General Plan 2030 EIR.

Intersection Levels of Service

Intersection turning movement counts were conducted on Thursday, May 22, 2014 and Tuesday November 17, 2015 at the study intersections during the PM peak period (4:00 pm to 6:00 pm). From these counts the peak one-hour period was identified. Figure 4.7-1 shows the traffic volumes during the PM peak one-hour period. LOS for the project traffic study intersections was calculated using methods defined in the *Highway Capacity Manual, 2010 and 2000* (HCM) and Synchro 8 traffic analysis software. HCM 2010 was used for all intersections except for the intersection of Pacific Avenue / Front Street / Mission-Water Street due to the presence of a fifth approach at this location, which HCM 2010 cannot analyze correctly. Therefore, HCM 2000 was used to analyze this study intersection. The delay and corresponding LOS for each of the study intersections was calculated.

Table 4.7-2 shows the resulting LOS based on approach to the intersection. All intersections operate at an acceptable LOS except Highway 1 / Highway 9 and Chestnut Street / Mission Street, which operate at LOS E.

State Highway Operations

Based on the most recent (2015) Caltrans Traffic Census Program (Caltrans 2015) data, the annual average daily traffic (AADT) on state highways within Santa Cruz is as follows:

- Highway 1
  - At Highway 17, AADT is approximately 61,000 to 86,000 trips with 4,950 to 6,300 trips occurring during the peak hour.
  - At Emeline Street Connection, AADT is approximately 85,000 to 86,000 trips with approximately 5,900 to 6,300 trips occurring during the peak hour.
  - At Morrissey Boulevard, AADT is approximately 85,000 to 94,000 trips with 5,900 to 6,300 trips occurring during the peak hour.
- Highway 17, at Pasatiempo (between Santa Cruz and Scotts Valley). AADT is approximately 67,000 to 70,000 trips with 5,700 to 6,000 trips occurring during the peak hour.
- Highway 9 within Santa Cruz City Limits. AADT is approximately 5,000 to 5,200 trips with 530 to 550 trips occurring during the peak hour as measured at the City limits, north of Encinal.

Review by the City's consulting traffic engineer, Ron Marquez, indicates that the highway segments in the vicinity of the project site are operating at LOS of C and D during the peak hour as summarized on Table 4.7-3.

TABLE 4.7-2: Existing Intersection Weekday PM Peak Hour Levels of Service

#	Intersection	Control Type	Jurisdiction	Threshold[2]	Existing Conditions[1]		
					PM Peak Hour		
					Movement	Delay[3]	LOS
1	Front Street / Laurel Street	Signal	Santa Cruz	D	Overall	30.8	C
2	Pacific Avenue / Laurel Street	Signal	Santa Cruz	D	Overall	17.9	B
3	Front Street / Cathcart Street	Signal	Santa Cruz	D	Overall	19.0	B
4	Front Street / Metro Station Access	Signal	Santa Cruz	D	Overall	4.9	A
5	Pacific Avenue / Metro Station Access	SSSC	Santa Cruz	D	Overall	1.1	A
		Worst Approach	Santa Cruz	D	WB	11.4	B
6	Pacific Avenue / Maple Street	AWSC	Santa Cruz	D	Overall	8.1	A
7	Pacific Avenue / Front Street / Mission-Water Street	Signal	Santa Cruz	D	Overall	20.2	C
8	Front Street / Soquel Avenue	Signal	Santa Cruz	D	Overall	21.9	C
9	Pacific Avenue / Cathcart Street	AWSC	Santa Cruz	D	Overall	8.8	A
10	Soquel Avenue / Pacific Avenue	SSSC	Santa Cruz	D	Overall	3.6	A
		Worst Approach		D	WB	10.3	B
11	Ocean Street / Water Street	Signal	Santa Cruz	D	Overall	35.3	D
12	Highway 1 / Highway 9	Signal	Caltrans	C-D	**Overall**	**71.7**	**E**
13	Chestnut Street / Mission Street / Highway 1	Signal	Caltrans	C-D	**Overall**	**74.1**	**E**

Source: Kimley-Horn May 2017.

Notes:

1. Analysis performed using HCM 2010 methodologies, except for Intersection 7 where HCM 2000 methodology was applied.
2. The City of Santa Cruz has established LOS D as the minimum acceptable LOS for overall intersection operations during the AM and PM peak hours. Caltrans maintains a standard of between LOS C and D.
3. Delay indicated in seconds/vehicle.
4. Intersections that fall below the LOS threshold are shown in **bold**.

TABLE 4.7-3: Existing Highway Traffic Volumes and Peak Hour Levels of Service

Segment	Direction	Number of Lanes	Volume	Max Flow Rate for C	Max Flow Rate for D	LOS
Route 1: Route 9 to Route 17	N	2	2,080	2,761	3,444	C
	S	2	3,120	2,761	3,444	D
Route 1: Route 17 to Emeline	N	2	2,820	2,761	3,444	D
	S	2	1,880	2,761	3,444	C
Route 17: Route 1 to Pasatiempo	N	3	3,300	3,888	5,165	C
	S	3	2,700	3,888	5,165	C
Peak hour volumes from Caltrans 2015 Peak hour factor-.92, free flow speed – 55, heavy vehicle factor-.985 (Exhibit 11-17 HCM 2010)						

SOURCE: Ron Marquez, Traffic Engineer Consultant

Planned Transportation System Improvements

Metropolitan Transportation Improvement Program

AMBAG, as an MPO, is required by state and federal laws to develop and adopt a Metropolitan Transportation Improvement Program (MTIP), a multi-year transportation project program that includes multi-modal projects, including but not limited to major highway, arterial, transit, bikeway and pedestrian projects. The 2016 MTIP is a four-year program that covers the federal fiscal years from October 1, 2016 through September 30, 2020. The MTIP implements the 2035 Monterey Bay Area Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) adopted by the AMBAG Board of Directors in June 2014. The 2035 MTP/SCS is a financially constrained document and includes identified transportation improvement projects for the region. Once the projects are included in the MTP, they become eligible for inclusion in the MTIP and FSTIP. The projects included in the 2016 MTIP are consistent with the 2035 MTP/SCS (AMBAG, September 2016). Planned projects in the vicinity of Ocean Street and Ocean Street Extension include improvements to the Highway/9 intersection, Highway 1 auxiliary lanes (Soquel Avenue to 41st Avenue), and High Occupancy Vehicle (HOV) lanes between the Morrissey and San Andreas interchanges.

City of Santa Cruz Planned Improvements

The City's adopted Capital Improvements Program (CIP) is a multi-year schedule of projects with their associated costs and proposed funding sources. The CIP represents the best efforts to allocate available resources toward projects that maximize benefit and address the most critical needs. Major improvements on the current 2018-2020 CIP include: Highway 1 / Highway 9-River Street intersection improvement (programmed for 2018/19) described below; intersection improvements at the Ocean Street/Water Street intersection (programmed for completion in 2018); Branciforte Creek bike/pedestrian bridge path connection on the San Lorenzo River levee (under construction); and preliminary work to replace the Highway 1 bridge over the San Lorenzo River.

The City of Santa Cruz has adopted a "Traffic Impact Fee" (TIF) program based on future projected trips generated for each new development or redevelopment project. The TIF program, originally adopted in June 2005, evaluated over 60 intersections and identified numerous projects within the City which were needed in order to address the effects of cumulative development, and established fees. The fees are used to fund planned improvements at intersections and roadways included in the program. New development and redevelopment projects are required to pay traffic impact fees, which are paid at the time of building permit issuance. The TIF was updated in November 2012 to reflect traffic conditions associated with buildout accommodated by the City's General Plan as identified in the City's *General Plan 2030* EIR. All of the projects noted above are TIF program intersections, except for the Highway 1 bridge project. The program also funds bike and pedestrian projects (15% of fees collected) and neighborhood improvement projects adjacent to significant development (5% of fee collected).

Bicycle and Pedestrian Improvements

The City's recently adopted *Active Transportation Plan* (2017) includes the following paths that are included in the FY2018-2020 CIP: Branciforte Creek Connection to complete the levee path over Branciforte Creek and under the Soquel Bridge, Monterey Bay Sanctuary Scenic Trail Network Segment 7 along the railroad track on the west side of the City, and the San Lorenzo River Trestle Bridge trail widening project. The Plan also includes numerous other infill and improvements to existing bike and pedestrian facilities.

Regional Transportation Plan Improvements

The SCCRTC periodically completes a Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP) according to state guidelines to guide short- and long-range transportation planning and project implementation for the county. This 2014 RTP provides guidance for transportation policy and projects through the year 2035. Projects identified in the RTP that are within the project vicinity include:

- Highway 1/Highway 9 Intersection Modifications (also on City CIP and MTIP).
- Highway 1 bridge replacement over San Lorenzo River (also on City CIP).
- Highway 17: Preparation of study to determine long-range solutions to access, operations and safety on this route.
- Branciforte Creek multi-use path and bridge (also on City CIP and under construction)
- Ocean Street Widening from Soquel to East Cliff
- Hwy 1/Mission St at Chestnut/King/Union Intersection Modification
- Pacific Station: Bike Station
- River St/River Street South Intersection Modification
- Water Street Signal Synchronization
- Soquel/Branciforte/Water (San Lorenzo River to Branciforte) Bike Lane Treatments

Planned State Highway Improvements

Highway 1. As indicated above, improvements for the Highway 1 Soquel to Morrissey Auxiliary Lanes Project are complete. In addition, the SCCRTC has been working with Caltrans and the Federal Highway Administration since 1986 on studies for longer-term improvements to Highway 1. The current Caltrans Route Concept Report for Highway 1 includes the addition of HOV lanes to Highway 1 to reduce congestion, encourage carpooling, expand express bus service, and improve safety in the Watsonville to Santa Cruz corridor. (Caltrans, April 2006). This project will add a lane in each direction from Morrissey Boulevard in the City of Santa Cruz to San Andreas/Larkin Valley Road. Caltrans' *Corridor System Management Plan* for Routes 1 and 183 also supports HOV lanes on Highway 1 in conjunction with other transportation demand management strategies (Caltrans, October 2011).

A Draft EIR for the Highway 1 Corridor Investment Program was prepared and released for public review and comment in November 2015 (Caltrans and FHWA, November 2015). The Draft EIR considers three alternatives including an HOV Lane alternative with auxiliary lanes and a Transportation System Management alternative without HOV lanes. A final decision on the preferred alternative has not been made yet. The Draft EIR provides a program level analysis of the Highway 1 corridor alternatives using a two tiered approach. Tier I is a long term, program-level analysis for the future of the Highway 1 corridor between Santa Cruz and Aptos. The Tier I concept for the corridor would be built over time through a series of smaller incremental projects (referred to as Tier II projects). The Tier II analysis includes project-level analysis of smaller incremental projects within the Tier I corridor which would move forward based on available funding. Each of the Tier II projects would undergo separate environmental and public review. Caltrans received a total of 263 letters, emails, and recorded comments from public agencies, organizations and individuals, on the Draft EIR. Based on review of the comments received, the project team has identified a need to update the air quality, natural environment, and traffic operations studies, as well as reporting of the cumulative impacts of the project alternatives prior to completion and release of a Final EIR.

Caltrans has prepared and approved a "Corridor System Management Plan" (CSMP) for Highway 1 from the junction of Highway 68 in Monterey County to King Street/Mission Street in Santa Cruz. The following strategies will be used to manage State Route 1 over the next 20 years:

- Cost-effective maintenance and preservation of the roadway.
- Support improvement of transit service, including new express bus service on HOV lanes if implemented in the Santa Cruz corridor.
- Support land use and transportation planning efforts through participating in local development review and regional planning efforts.
- Reduce congestion through transportation demand management to increase the use of transit, improve bicycle and pedestrian programs, and encourage programs such as carpools, ridesharing, telecommuting, and park-and-ride facilities.

- Implement Intelligent Transportation Systems/Traveler Information/Traffic Management to improve incident management and provide real time traveler information which helps reduce delay.
- Increase modal options such as Caltrain and integrate transit, bicycle and pedestrian transportation into a coordinated multimodal system.
- Collaborate with local partners on a ramp metering plan.
- Operational Improvements, including auxiliary lanes, intersection improvements, and other system refinements to enhance existing services and reduce delay.
- Upgrade intersections to maximize throughput on the State highway and parallel routes.
- Increase the capacity, operational efficiency and connections on parallel roads to reduce local traffic demand on Highway 1.
- Improve mobility, accessibility, reliability, reduce congestion and improve safety by improving capacity on the existing system (Caltrans, October 2011).

Highway 17. Highway 17 connects Santa Cruz with Scotts Valley and San Jose and other Santa Clara County communities. It is a four-lane freeway north of the Highway 1/ Highway 9 intersection. The highway is the primary route between the Santa Clara Valley and Santa Cruz County that serves as both a commute route for Santa Cruz County residents that work in Santa Clara County and for recreational visitors that come to Cruz County. Congestion occurs both during weekday commute times and on summer weekends. This winding, four-lane road has steep sections, frequent road crossings, and substandard median shoulders and outside shoulders for most of its length. In addition to the challenging roadway configuration, weather-related conditions such as thick fog, heavy rains and mudslides affect roadway operations (City of Santa Cruz, April 2012-DEIR volume). According to the Transportation Concept Report for State Route 17 in District 5, (Caltrans District 5, January 2006), the target level of service for Highway 17 between Ocean Street and Scotts Valley is LOS E. The highway segment between Santa Cruz and Scotts Valley is considered to be a four-lane freeway (Caltrans, January 2006).

Highway 9. The current Caltrans Route Concept Report for Highway 9 includes recommendations to widen the shoulders to accommodate bicycle traffic, widening to four lanes from the junction of Highway 1 and Highway 9 to the Santa Cruz city limits, and other left turn improvements outside of the City of Santa Cruz (Caltrans, September 2007).

The Highway 1/Highway 9-River Street intersection, which is controlled by a signal, currently operates at LOS E during the both the PM and Design Day peak hours, which does not meet Caltrans standards. The City is working with Caltrans to implement lane modifications at this intersection. The improvements require Caltrans approval and an encroachment permit. With implementation of these improvements, the intersection would continue to operate at LOS E during the existing PM peak hours, but the average delay would be reduced by approximately 20 seconds.

The following improvements are identified for the Highway 1/Highway 9-River Street intersection, and are included in the current City Traffic Impact Fee (TIF) Program:

- Northbound Approach: Modify the intersection to consist of one left/thru, one-thru, two right lanes and a bike lane; add one northbound lane on Highway 9 and a shoulder/bike lane.
- Southbound Approach: Modify the intersection to consist of two-left, one-left/thru, one-thru, one right lane and a bike lane.
- Eastbound Approach: Reconstruct to consist of two left, three through, and one right-turn lanes.
- Upgrade all sidewalks and access ramps to meet ADA requirements.

Currently, a Project Report, preliminary engineering and associated studies, and environmental review are complete. Construction is anticipated in 2018.

4.7.2 Impacts and Mitigation Measures

Thresholds of Significance

In accordance with the California Environmental Quality Act (CEQA); State CEQA Guidelines (including Appendix G); City of Santa Cruz plans, policies and/or guidelines; and agency and professional standards, a project impact would be considered significant if the project would:

7a Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit (see discussion of City standards below);

7b Change the level of service of a State Highway roadway segment from acceptable operation (LOS A, B, or C) to deficient operation (LOS D, E or F) or result in a change in LOS for a segment currently operating at a deficient level based on Caltrans significance criteria[1];

7c Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;

7d Substantially increase hazards due to a design feature (for example, sharp curves or dangerous intersections) or incompatible uses (for example, farm equipment);

[1] Caltrans. December 2002. "Guide for the Preparation of Traffic Impact Studies."

7e Result in inadequate emergency access; or

7f Conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

The City of Santa Cruz General Plan 2030 strives to maintain a LOS of "D" or better as the acceptable level of service for intersections. A significant impact would result if LOS dropped below a "D" level of service or where a project would contribute traffic increases of more than three percent at intersections currently operating at unacceptable levels (E or F), as further described below. This criteria is applied only to intersections within the City's jurisdiction, but not to Caltrans intersections. The City's General Plan 2030 also accounts for accepting a LOS below "D" at major regional intersections where improvements would be prohibitively costly or result in significant, unacceptable environmental impacts. There are no other adopted plans, ordinances, or policies that establish "measures of effectiveness" for the performance of the circulation system.

For City intersections that already operate at unacceptable levels of service (E or F), the City considers project impacts to be significant if congestion will worsen measurably at the intersection as a result of the project. "Measurably worse" is considered to be a three percent increase in trips at the affected intersection. The City has used the three percent significance criterion for project trip contribution at existing impacted intersections, except for Caltrans-maintained intersections (which are subject to the criteria in 3b above), in part based on directives in the City's existing General Plan to accept a certain level of congestion during peak hours at major intersections, as well as to reflect variations in daily traffic volumes. The three percent criterion has been used throughout the City and is based upon the likelihood that a project will result in an observable increase in congestion at a given intersection or road segment. This is based in part on information provided by Caltrans, in the yearly "Traffic Volumes" reports, which identifies the standard deviation expected with regard to reliability of traffic count data. The standard deviation ranges indicate a 12 percent deviation at 10,000 vehicle trips, meaning that if a traffic count totals 10,000 vehicles per day, then approximately 90 percent of the time, the actual traffic counts will lie within a range of 8,800 to 11,200 vehicles. Thus, the three percent reflects this variation in daily traffic conditions (California Department of Transportation, June 2015).

Regarding Caltrans' intersections and other Caltrans maintained facilities, the Caltrans Traffic Impact Study Guidelines (Caltrans 2002) state that Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities. As such, LOS C through D is considered to be acceptable traffic operations during the peak hour at intersections maintained by Caltrans. The Guidelines also state that if an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE (LOS) should be maintained (Caltrans, 2002).

Vehicle Miles Traveled

In September 2013 Governor Brown signed Senate Bill 743 which made significant changes to how transportation impacts are to be assessed under CEQA. SB 743 directs the Governor's Office of Planning and Research (OPR) to develop a new metric to replace LOS as a measure of impact significance and suggests vehicle miles travelled as that metric. According to the legislation, upon certification of the guidelines, automobile delay, as described solely by LOS shall not be considered a significant impact (Section 21009(a)(2)). SB 743 also creates a new CEQA exemption for certain projects that are consistent with the regional Sustainable Communities Strategy.

OPR has released draft CEQA Guidelines to address this requirement; however, at the time this analysis was completed the Guidelines have not been finalized or certified. It is anticipated that the revisions to the CEQA Guidelines will be finalized in 2017. According to the most recent draft CEQA Guidelines released by the OPR, lead agencies would have a grace period of two years to update and adopt new thresholds once the final Guidelines have been adopted. The City of Santa Cruz will update its transportation standards of significance to reflect SB 743 once the state has finalized the guidelines. Because there are no adopted thresholds and the revised State CEQA Guidelines' have not yet been certified, vehicle miles travelled is not utilized as a standard of significance in this EIR. However, VMT estimates are provided in the Impact 4.7-1 discussion as an informational item.

Analytical Method

The proposed project consists of amendments to the City's Downtown Recovery Plan, General Plan, Local Coastal Plan and Zoning Code regarding development in the downtown area and Central Business District. The proposed project would not directly result in new development. However, the proposed Downtown Plan amendment would expand areas for potential additional building height that could accommodate intensified redevelopment of existing developed sites. City staff estimates that the proposed amendments could indirectly lead to development, resulting in a potential net increase of 711 new residential units and 2,200 square feet of office space with a net decrease of approximately 14,700 square feet of commercial building space over existing conditions within the downtown area. The proposed General Plan amendment would increase FAR in areas designated as RVC in the General Plan, but would not lead to development on sites not already considered in the General Plan and General Plan EIR. The proposed LCP and Zoning Code amendments would not result in changes that could indirectly lead to intensified development.

A project traffic impact study was prepared for the project in accordance with City requirements. As indicated, above, the City of Santa Cruz uses LOS To evaluate the performance of roadways and levels of traffic congestion. The project traffic impact study was based on intersection turning movement counts taken on Thursday, May 22, 2014 and Tuesday November 17, 2015 at the study intersections during the PM peak period (4:00 pm to 6:00 pm), from which the PM peak hour was determined.

The traffic study computed intersection LOS using the 2010 and 2000 HCM methodology and Synchro 8 software. The result of the HCM calculations is an estimate of average control delay at the intersection which corresponds to an LOS grade as shown in Table 4.7-1 above. Project trip generation is provided in the traffic impact study, and traffic distributed on city streets utilizing the City's traffic model that was developed as part of the General Plan 2030 using Traffix software. AMBAG maintains a regional travel demand model, but it was not used as the City's model is more detailed and specific to conditions in the City. The study scenarios analyzed include existing conditions, existing with the project, and cumulative conditions, including the project. The traffic impact analysis also includes evaluation of other travel modes based on adopted regional plans and review with City of Santa Cruz staff.

Impacts and Mitigation Measures

As described in the Initial Study (see Appendix A), there are no adopted congestion management programs[2] for the project area (7c). The following impact analyses address impacts to City streets and intersections (7a) and state highways (7b), the potential to substantially increase hazards or result in inadequate emergency access (7d-e), and potential project conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities or impacts to the performance of these facilities (7f).

Traffic Impacts

Impact 4.7-1: **Circulation System Impacts.** The project will result in an increase in daily and peak hour trips, but would not cause existing or planned intersections to operate at an unacceptable Level of Service (LOS) or further degrade intersections that already operate at an unacceptable LOS (7a). Therefore, the impact is *less than significant.*

A LOS analysis was completed to comply with City regulations, and as discussed above, LOS is the performance measure used to evaluate the effectiveness of the circulation system. In order to identify the potential traffic impacts of the project using LOS, a multi-step process was utilized. The first step is calculating trip generation, which estimates the total arriving and departing traffic during a peak hour and on a daily basis. Trip generation was estimated for the project by applying vehicle trip generation rates to the project development based on land use. Figure 4.7-2 shows the downtown project area zones and study intersections. Trip rates specific to the downtown area were used from the City of Santa Cruz General Plan EIR (City of Santa Cruz 2012). The project area was divided into zones and trip generation was calculated separately for each zone. Trip generation calculations include a 40 percent trip reduction due to proximity to the downtown transit center, mixed use development, bicycle use and walking trips. The project

[2] The Code of Federal Regulations, Title 23 Volume 1, adopted in April 2005 require Transportation Management Areas (TMAs) to prepare Congestion Management Programs. TMAs are defined as urbanized areas with a population over 200,000. There are eight such areas in California plus Santa Barbara that asked to be included (City of Santa Cruz, 2012).

would generate 293 weekday PM peak hour trips (188 in and 106 out) between 4 and 6 PM and 2,627 daily trips as summarized on Table 4.7-4.

TABLE 4.7-4: Project Trip Generation

Land Uses	Size	Units	Daily Trips	PM Peak Hour		
				Total Peak Hour	IN	OUT
Trip Generation Rates[1]						
Commercial		1,000 Sq Ft	44.32	2.71	44%	56%
Office		1,000 Sq Ft	11.01	1.49	17%	83%
Townhomes[2]		Dwelling Unit(DUs)	7.50	0.62	65%	35%
Apartments		DUs	6.65	0.62	65%	35%
Trips Generated						
Area X - Riverfront						
Commercial	11,171	Sq Ft	496	30	13	17
Office	18,296	Sq Ft	202	27	5	22
Townhomes	321	DUs	2,408	199	129	70
Apartments	0	DUS	0	0	0	0
Area X Total Trips			*3,106*	*256*	*147*	*109*
40% Reduction for Downtown Area[3]			*(1,242)*	*(102)*	*(59)*	*(44)*
Area X Net Trips			***1,864***	***154***	***88***	***65***
Area Y - E. Pacific/W. Front Pacific Station						
Commercial	(27,864)	Sq Ft	(1,236)	(76)	(33)	(43)
Office	(16,105)	Sq Ft	(178)	(24)	(4)	(20)
Townhomes	0	DUs	0	0	0	0
Apartments	370	DUs	2,462	229	149	80
Area Y Total Trips			*1,048*	*129*	*112*	*17*
40% Reduction for Downtown Area[3]			*(419)*	*(52)*	*(45)*	*(7)*
Parking Garage Added Trips[4]				*52*	*26*	*26*
Area Y Net Trips			***629***	***129***	***93***	***36***
Area Z - W. Pacific						
Commercial	2,000	Sq Ft	90	5	2	3
Office	0	Sq Ft	0	0	0	0
Townhomes	0	DUs	0	0	0	0
Apartments	20,000	DUs	134	12	8	4
Area Z Total Trips			*224*	*17*	*10*	*7*
40% Reduction for Downtown Area[3]			*(90)*	*(7)*	*(4)*	*(3)*
Area Z Net Trips			***134***	***10***	***6***	***4***
Total Project Trips			***2,627***	***293***	***188***	***106***

Source: Kimley Horn, May 2017.

Notes:

1. Trip generation rates obtained from Appendix C of the City of Santa Cruz General Plan 2030 EIR.
2. ITE Land Use 270 Rates used for Townhomes per City direction (email correspondence with Ron Marquez dated 04/22/16).
3. 40% Reduction for mixed use development in Downtown Santa Cruz per City direction (email correspondence with Ron Marquez dated 04/22/16).
4. Required parking per City Code= 414+880+871=2,165 spaces. With 20% reduction=1,732, so 259 additional spaces (1,991-1,732) that will generate traffic. 10% in the AM peak = 26 trips; 20% in the PM peak = 52 trips.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing or anticipated travel patterns in the study area. Figure 4.7-2 shows the trip distribution that was applied to the study area roadway network.

The third step is traffic assignment, which involves the allocation of project traffic to streets and intersections in the study area. Traffic distribution patterns are indicated by percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area. Figure 4.7-3 depicts project trip assignment.

With the forecasting process complete and project traffic assignments developed, the impact of the project is identified by comparing operational (LOS) conditions with and without the project at the study intersections. Table 4.7-5 summarizes the PM peak hour LOS at the study intersections for Existing Conditions with and without the project. See Figure 4.7-4 for intersection traffic volumes with the addition of project traffic.

As shown, traffic associated with the project will not degrade LOS to below acceptable levels at any of the study intersections under the jurisdiction of the City. The two Caltrans intersections of Highway 1 / Highway 9 and Chestnut Street / Mission Street would continue operate at LOS E as a result of the proposed project. There are improvements identified for the Highway 1/Highway 9-River Street intersection as discussed above, which are included in the current City Traffic Impact Fee (TIF) Program, and the Chestnut Street / Mission Street intersection is included in the RTIP. The improvements are already required under existing conditions without the project. Traffic associated with the project does not further degrade the LOS at the two Caltrans intersections, and would not substantially increase delay. Therefore, based on the significance criteria discussed above, traffic associated with the project would not cause existing or planned intersections to operate at an unacceptable Level of Service (LOS) or further degrade intersections that already operate at an unacceptable LOS. Therefore, the impact is less than significant.

For informational purposes, a per capita VMT resulting from potential development accommodated by the proposed plan amendments was estimated utilizing trip length information from the California Statewide Travel Demand Model and percentages for different trip types, i.e., home to work, included in the CalEEMod air emissions model. Estimated new net development, including reduction in commercial uses, is estimate to result in a total of weekday VMT of 14,059 trips. Based on U.S. Census data for the downtown area and employee projections in the City's General Plan 2030 EIR, total residential and employee population is estimated at approximately 1,280, which results in a weekday per capita VMT of 11.0. According to the Santa Cruz County Regional Transportation Commission, VMT per capita within Santa Cruz County is estimated to decrease by 17% from approximately 15.3 to approximately 12.5 between 2005 and 2035 (Santa Cruz County Regional Transportation Commission. Although no VMT standards have been developed within the City, this preliminary project per capita VMT

estimate shows that VMT would be below existing and projected county-wide estimates, which in large part is a reflection of the project's location downtown and in proximity to transit, bicycle and pedestrian facilities.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

TABLE 4.7-5: Intersection Weekday PM Peak Hour Levels of Service with Project

#	Intersection	LOS Threshold[1]	Existing Conditions[2]			Existing Plus Project Conditions[2]		
			PM Peak Hour			PM Peak Hour		
			Movement	Delay[3]	LOS	Movement	Delay[3]	LOS
1	Front Street / Laurel Street	D	Overall	30.8	C	Overall	31.2	C
2	Pacific Avenue / Laurel Street	D	Overall	17.9	B	Overall	18.5	B
3	Front Street / Cathcart Street	D	Overall	19.0	B	Overall	18.9	B
4	Front Street / Metro Station Driveway	D	Overall	4.9	A	Overall	5.1	A
5	Pacific Avenue / Metro Station Driveway	D	Overall	1.1	A	Overall	1.1	A
		D	WB	11.4	B	WB	11.6	B
6	Pacific Avenue / Maple Street	D	Overall	8.1	A	Overall	8.2	A
7	Pacific Avenue / Front Street / Mission-Water Street	D	Overall	20.2	C	Overall	21.1	C
8	Front Street / Soquel Avenue	D	Overall	21.9	C	Overall	23.1	C
9	Pacific Avenue / Cathcart Street	D	Overall	8.8	A	Overall	8.9	A
10	Soquel Avenue / Pacific Avenue	D	Overall	3.6	A	Overall	3.6	A
		D	WB	10.3	B	WB	10.3	B
11	Ocean Street / Water Street	D	Overall	35.3	D	Overall	35.6	D
12	Highway 1 / Highway 9	C-D	**Overall**	**71.7**	**E**	**Overall**	**74.1**	**E**
13	Chestnut Street / Mission Street / Highway 1	C-D	**Overall**	**74.1**	**E**	**Overall**	**73.8**	**E**

Impact 4.7-2: **Highway Segment Impacts.** The project will result in an increase in daily and peak hour trips, but would not result in a change to an unacceptable LOS along state highway segments (7a). This is a *less-significant impact*.

The project will result in approximately 38 to 59 additional PM peak hour trips along Highway 1 and 20 additional peak hour trips along Highway 17, representing a 0.2 to 1.8 percent increase. All of the study highway segments would operate at acceptable levels of service according the LOS targets established by Caltrans as summarized on Table 4.7-6.

TABLE 4.7-6: Highway Traffic Volumes and Peak Hour Levels of Service

Segment	Direction	Number of Lanes	Max Flow Rate for C	Max Flow Rate for D	Existing		Existing plus Project			
					Volume	LOS	Project Trips	Volume	Percent Change	LOS
Route 1: Route 9 to Route 17	N	2	2,761	3,444	2,080	C	38	2,118	1.8%	C
	S	2	2,761	3,444	3,120	D	21	3,141	0.7%	D
Route 1: Route 17 to Emeline	N	2	2,761	3,444	2,820	D	24	2,844	0.9%	D
	S	2	2,761	3,444	1,880	C	14	1,894	0.7%	C
Route 17: Route 1 to Pasatiempo	N	3	3,888	5,165	3,300	C	7	3,307	0.2%	C
	S	3	3,888	5,165	2,700	C	13	2,713	0.5%	C
Peak hour volumes from Caltrans 2015 Peak hour factor-.92, free flow speed – 55, heavy vehicle factor-.985 (Exhibit 11-17 HCM 2010)										

SOURCE: Ron Marquez, Traffic Engineer Consultant

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Access and Hazards

Impact 4.7-3: **Project Access.** The project will not result in creation of hazards due to design of the project circulation system or introduction of incompatible uses (7d). Therefore, the project would result in *no impact*.

The proposed project does not include any design features that would change vehicle circulation or access. The project includes some minor changes to clarify the locations of pedestrian access to open space and areas around downtown. However, these changes do not result in hazardous features such as sharp curves or dangerous intersections. Therefore, there is no impact as a result of the project.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4,7-4: **Emergency Access.** The project will not result in inadequate emergency access (7e). Therefore, the project would result in *no impact*.

There are no proposed changes to vehicle circulation and the proposed project does not modify emergency access from existing conditions. Therefore, there is no impact related to emergency access.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Transit, Pedestrian and Bicycle Travel

Impact 4.7-5: **Transit, Pedestrian and Bicycle Travel.** The project will not conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities (7f). Therefore, the project would result in *no impact*.

The Santa Cruz City Council recently accepted an Active Transportation Plan (ATP) (City of Santa Cruz, February 2017). The ATP includes a number of recommendations including programs and projects to create an integrated network of walkways and bikeways that connect neighborhoods to employment centers, commercial land uses, educational facilities, and recreational opportunities. The recommended projects in the ATP are prioritized and ranked based on a number of criteria including crash data, proximity to trip generators, traffic counts and public comments.

The SCMTD completes a Short Range Transit Plan (SRTP) every five years that contains a review of procedures and an analysis of existing services that results in service improvements and investments. The most recent SRTP (SCMTD 2013) contains a number of policy, practice, and service recommendations. Policy and practice recommendations primarily address SCMTD infrastructure. In 2016, SCMTD underwent a comprehensive operational analysis to reduce operating expenses in order to address a structural deficit of $6.5 million. The operating analysis resulted in a number of service changes that help to reduce operating costs and superseded the recommendations in the SRTP.

The Downtown Recovery Plan has a strong emphasis on pedestrian scale design and accessibility and includes a new pedestrian connection between Pacific Avenue and Front Street in the vicinity of Elm Street as well as bicycle access at the Elm Street extension to the San Lorenzo Riverwalk. None of the design features in the Downtown Recovery Plan conflict with the ATP or the SRTP and the design emphasis on pedestrians supports the objectives and goals of the ATP. Therefore, there is no impact related to conflicts with plans or programs related to active transportation and transit.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

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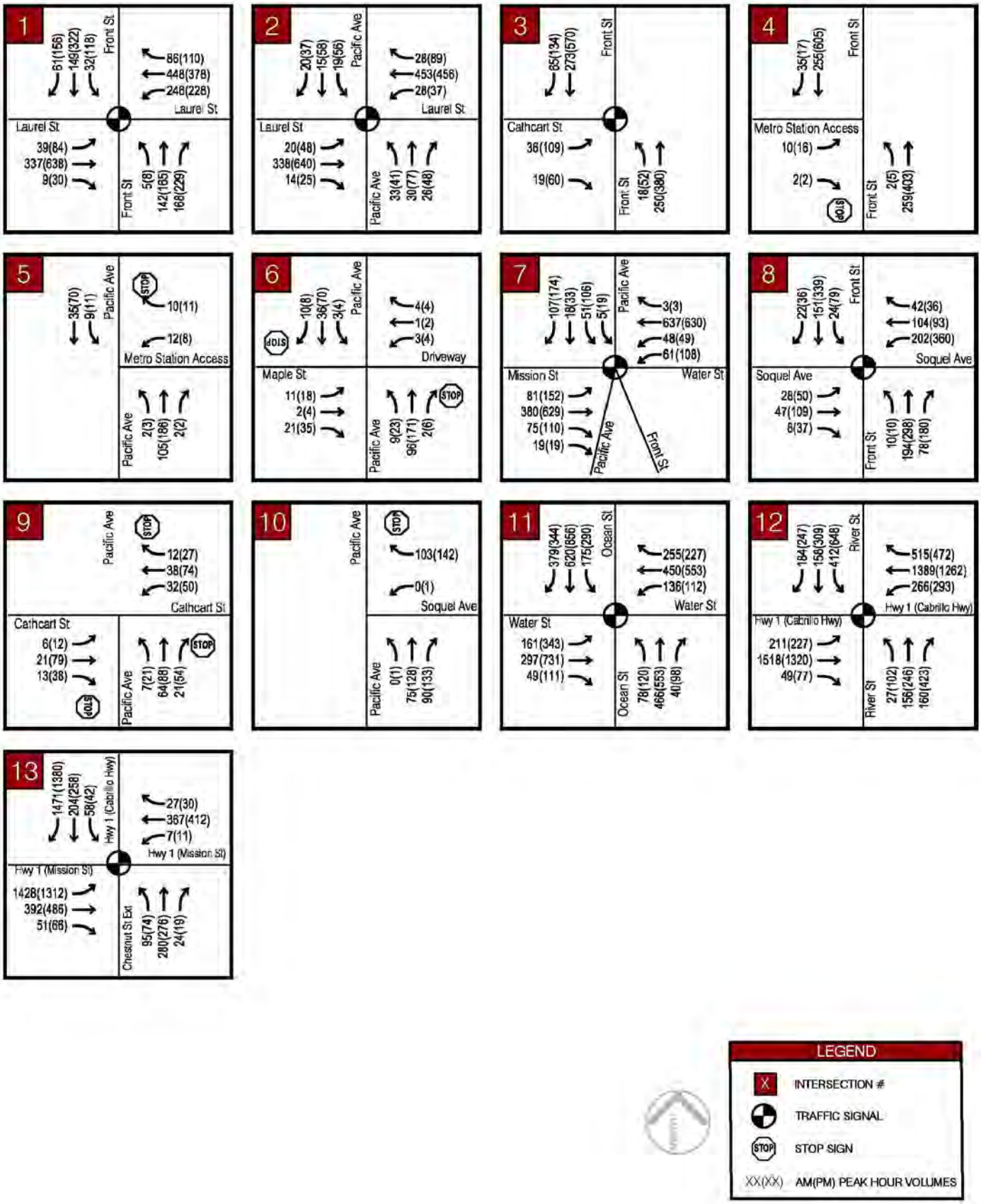

SOURCE: Kimley Horn

FIGURE 4.7-1

Existing PM Peak Hour Traffic Volumes

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City of Santa Cruz Downtown Plan Amendments EIR

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SOURCE: Kimley Horn

FIGURE 4.7-2

Project Trip Distribution

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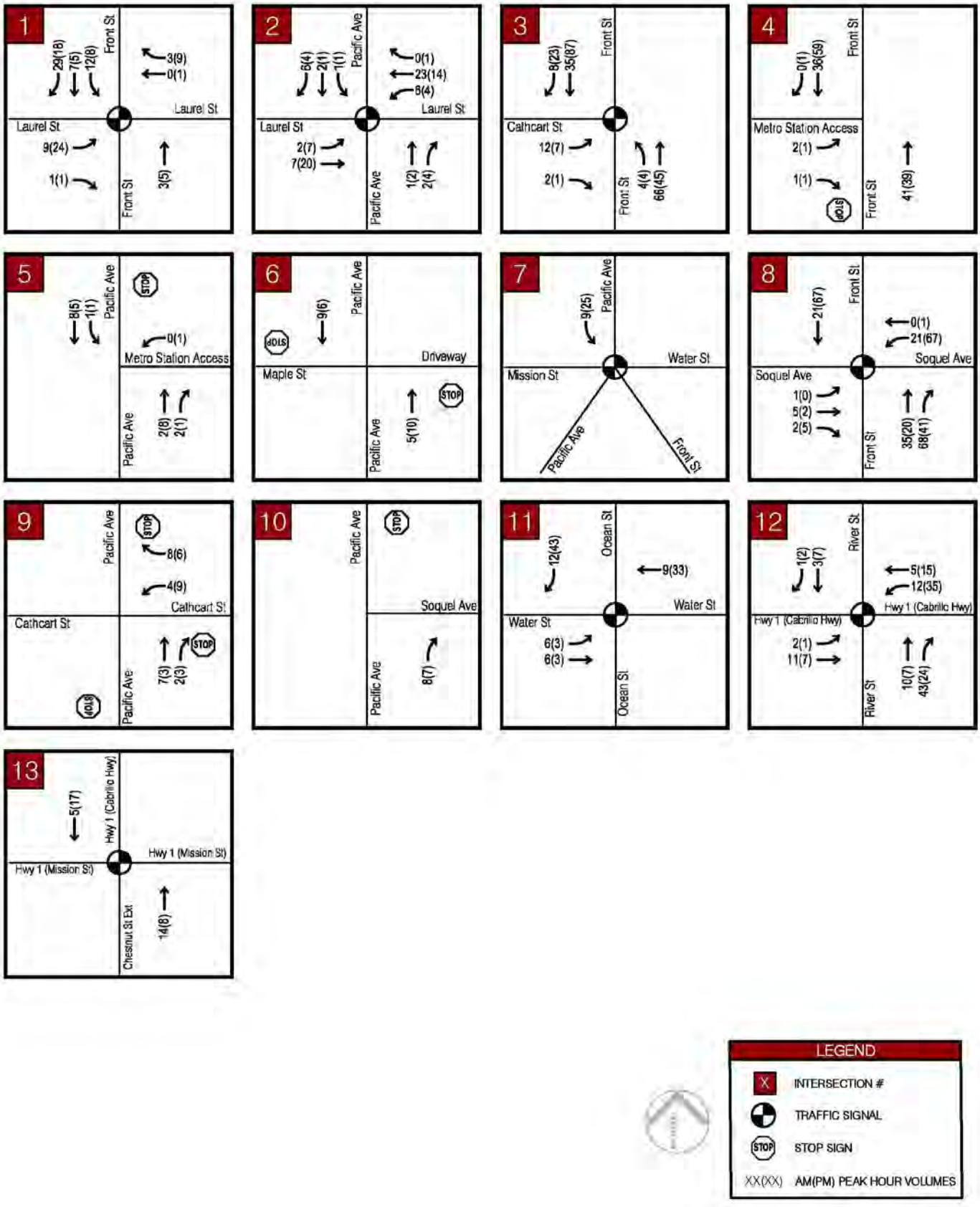

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SOURCE: Kimley Horn

FIGURE 4.7-3

Project Trip Assignment

City of Santa Cruz Downtown Plan Amendments EIR

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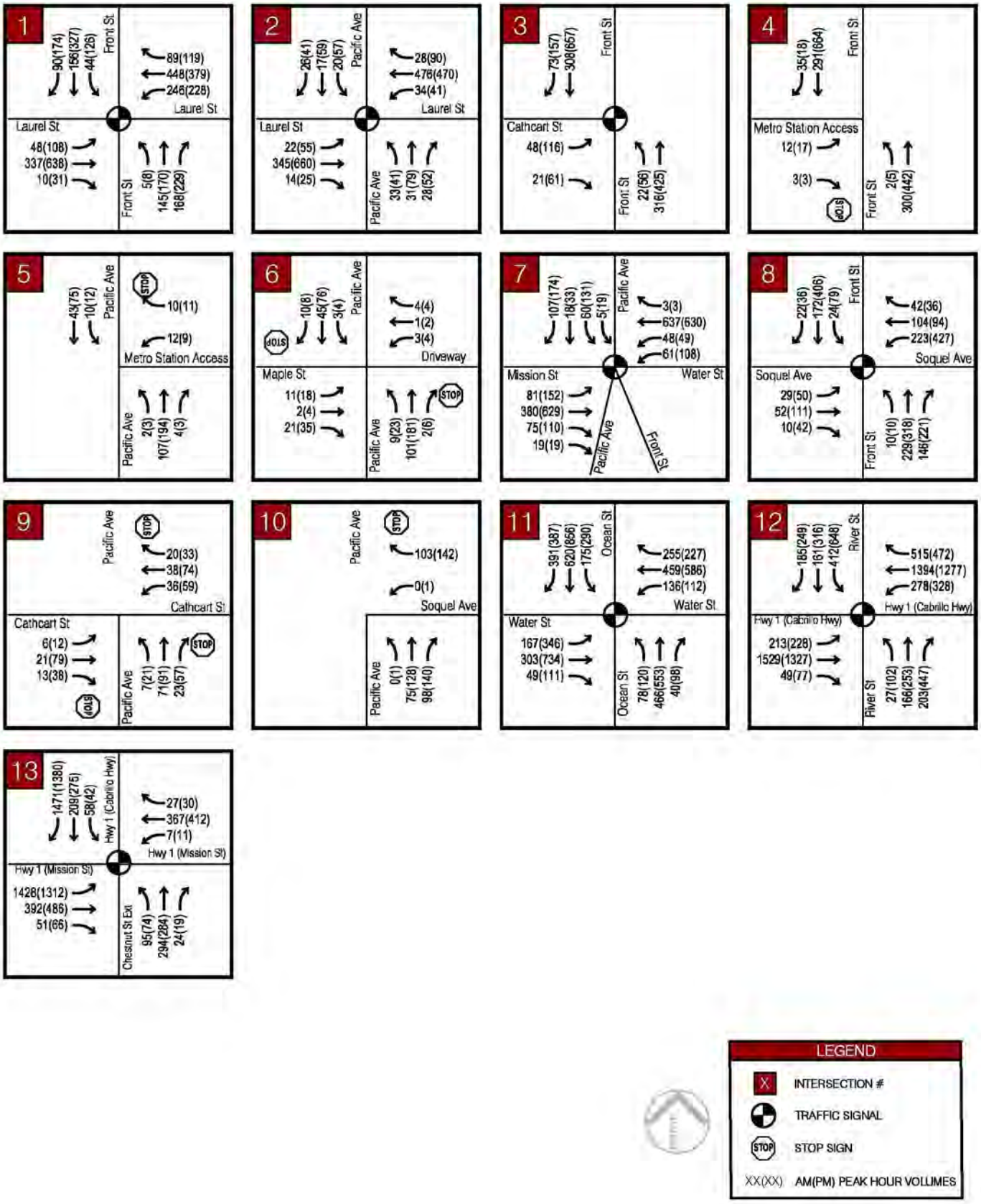

SOURCE: Kimley Horn

FIGURE 4.7-4

Peak Hour Traffic Volumes with Project

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City of Santa Cruz Downtown Plan Amendments EIR

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