113 Lincoln Street
Relocation Plan
Downtown Library & Affordable Housing Project

City of Santa Cruz

September 2024

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Introduction

The City of Santa Cruz ("City") is the project sponsor for a proposed development that includes affordable housing, a childcare center, a modernized public library, and a public parking garage with bike parking("Project") located at 113-119 Lincoln Street, Santa Cruz, CA 95060 ("Project Site"). The mixed-use Project will include approximately 124 studio, one, two, and three-bedroom units with 1 manager's unit to be offered to tenants with a mix of affordability at or below 60% below area median income ("AMI").

The entire Project Site is approximately 1.54 acres. A portion of the Project Site is improved with a +/- 5,280 square foot commercial building occupied by a single business tenant, Toadal Fitness, which is a membership-based fitness center. Until purchased by the City in April 2024, the site was owned by Christophe & Cecile Bellito Living Trust ("Seller"), who also owned Toadal Fitness. Seller requested a lease back of the Property for purposes of financing acquisition of another property. Prior to the execution of the purchase and sale agreement, the City hired RSG, Inc. as a relocation consultant and provided Seller with a General Information Notice on December 21, 2023, and a Notice of Eligibility for Relocation Benefits to Seller on February 20, 2024. Seller desired to proceed with a purchase and sale agreement because Seller had identified a property for relocation and Seller did not want to lose the opportunity to purchase the replacement property. Thus, on April 3, 2024, the City and Seller agreed on terms of a purchase and sale agreement that included compensation for the fair market value of the property and relocation benefits. As part of the negotiated purchase and sale agreement, Seller executed an agreement intended to resolve all claims and rights to relocation benefits.[1]

The City engaged RSG, Inc. to assist with providing the required relocation benefits to Seller, and prepare and implement a relocation plan ("Plan"). This Plan includes a relocation needs assessment and details of the City's proposed relocation assistance program. The displaced business owner has voluntarily selected a replacement location and began relocating the business to that new location, so a survey of replacement locations is not provided. This Plan also outlines the policies and procedures needed to comply California Governmental Code Section 7260 et. seq. ("Relocation Law"), Title 25, California Code of Regulations, Chapter 6, Section 6000 et seq. ("Guidelines"), and Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 ("URA"), as amended.

Project Area

The Project Site is in downtown Santa Cruz near Highway 1,Highway 9, and Highway 17 providing access to major routes. The project area contains a mix of commercial, residential, and mixed-use buildings. Figure 1 below provides an area map showing the regional location of the Project.

[1] The City had previously determined that a relocation plan was not necessary because the transaction involved only a single business and 25 C.C.R. § 6038 states that a relocation plan is not required for an "insignificant amount of non-residential displacement." The City was subsequently informed that the California Department of Housing and Community Development ("HCD") considers the displacement of a single business as "significant." Therefore, the City has prepared this Relocation Plan to comply with HCD's guidance.

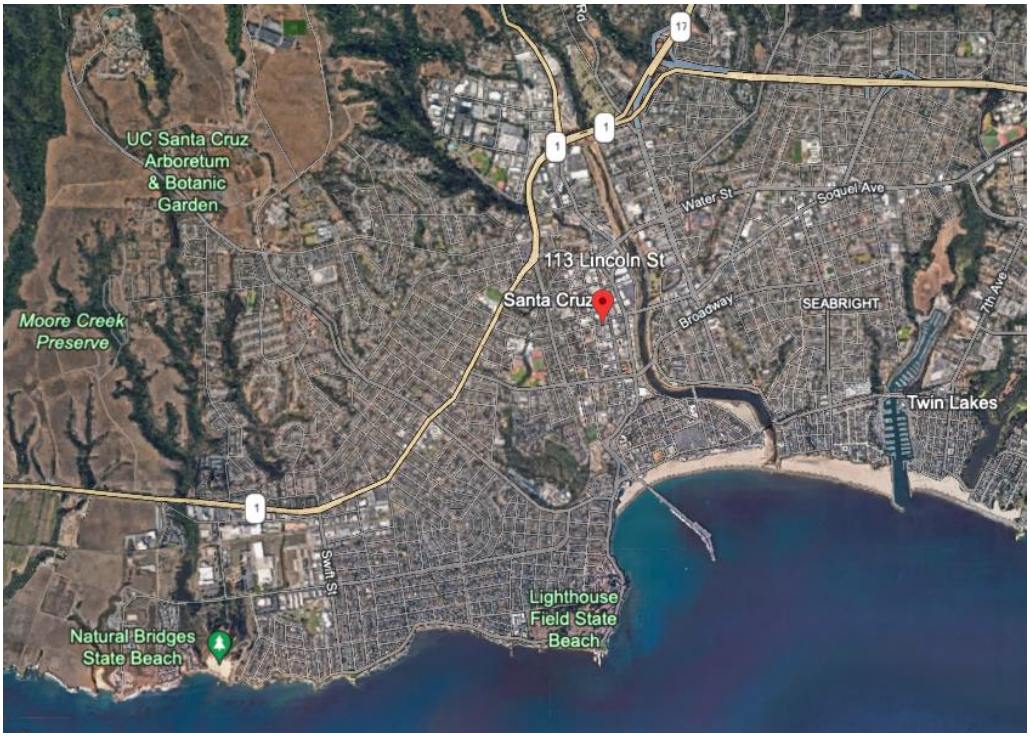


Figure 1: Regional Location of the Project (north at top of image)

The Seller's Property is +/- 0.16-acre of the Project Site, fronting Lincoln Street and is improved with one commercial building (hereafter, the "Subject Property"). The property is adjacent to a City-owned parking lot that is the remainder of the Project Site, as illustrated in Figures 2-5, below.

Figure 2: Area Map of Total Project site

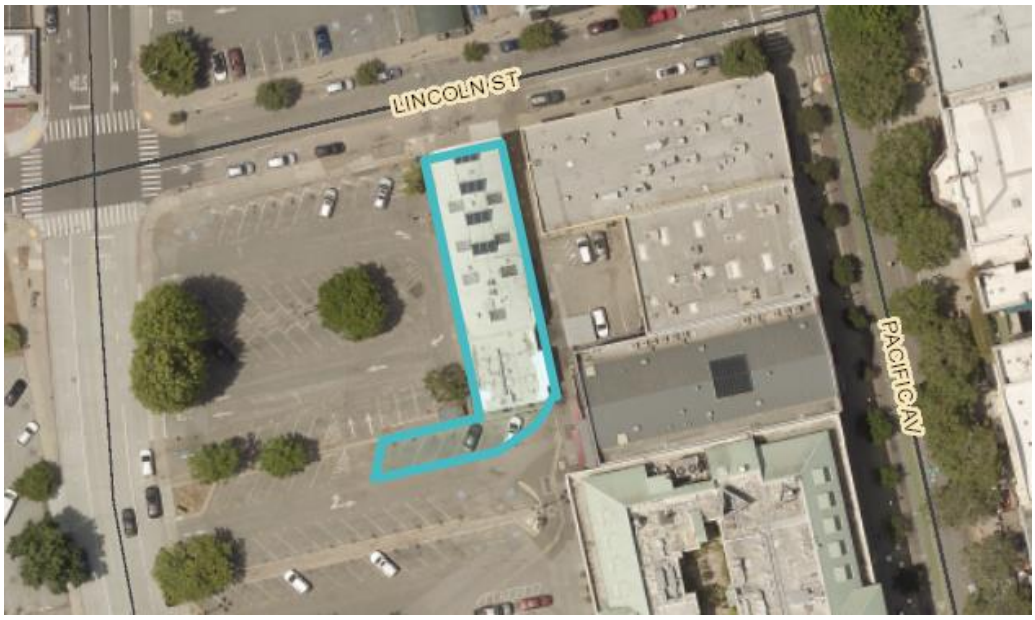


Figure 3: 113 Lincoln Street Toadal Fitness Site

Figure 4: Subject Property at 113 Lincoln Street, Santa Cruz

Figure 5: Rear of Subject Property and a Portion of the Rear Parking

Relocation Assessment of Needs

RSG conducted an interview with the Seller in October 2023 to obtain information necessary to assess their relocation needs. RSG also toured the Project Site in December 2023. On February 20th, 2024, with approval from the City, RSG provided Seller with the Notice of Eligibility for Relocation Benefits.

The Seller is also the business owner of Toadal Fitness and is the only non-residential tenant occupying the Subject Property. The business owner is now leasing the +/- 5,406 square foot commercial building from the City. Pursuant to the lease agreement between the business owner and City, the current rent is $1 for the term of the lease which expires on October 1, 2024. The Seller may remain in occupancy until November 1, 2024 consistent with the Notice of Termination of Tenancy and Notice to Vacate served on July 22, 2024.

Seller indicated it would like to lease a replacement location within the downtown Santa Cruz area and expressed importance of sufficient space, correct zoning, and availability of parking. Ultimately, Seller voluntarily and independently secured a new location for their business in downtown Santa Cruz (within 1 mile of the Project Site) before the City could offer alternative sites. The City has issued special use, sign, and demolition permits and is in the process of issuing a building permit to allow the business owner to operate their business at the replacement location. The business owner will require assistance from a moving company to move personal property including fitness equipment and related office equipment.

Following completion of the planned Project, if the City has the right to leaseback a portion of the space for Seller to re-occupy the location, the Purchase and Sale Agreement requires the City to offer a space to Seller.

Relocation Program

Program Assurances and Standards

The City has adequate funds to relocate any affected households, though no residents are being relocated by the proposed Project.

The relocation program will ensure that displacement does not result in different or separate treatment based on race, nationality, color, religion, national origin, sex, marital status, familial status, disability or any other basis protected by the federal Fair Housing Amendments Act, the Americans with Disabilities Act, Title VI of the Civil Rights Act of 1964, Title VIII of the Civil Rights Act of 1968, the California Fair Employment & Housing Act, and the Unruh Act, as well as any other unlawful discrimination. The relocation program also conforms with the standards and provisions set forth in Relocation Law, Guidelines, and URA as applicable, and all other applicable regulations and requirements.

The City authorized a General Information Notice and Informational Statement to Seller that was provided on December 21, 2023, and a Notice of Eligibility provided on February 20, 2024. Although Seller has already agreed to terms of relocation, the City served a formal 90-day notice to vacate on July 22, 2024. Seller has already located and secured a comparable replacement location, and agreed to the compensation for the acquisition of the Property and the moving expenses.

Relocation Assistance

The City engaged RSG, an experienced relocation consultant, to implement the relocation program. A Relocation Coordinator with RSG has provided ongoing technical and advisory support. RSG staff can be reached at 714-541-4585 from 8:30am-5pm Monday through Friday. RSG has distributed all required notices as of the date of this Plan. This includes the General Information Notice and Informational Statement delivered on December 21, 2023 (**Exhibit A**), Notice of Eligibility delivered on February 20, 2024 (**Exhibit B**), and Notice of Termination of Tenancy and Notice to Vacate delivered on July 22, 2024 (**Exhibit C**).

Applicable monetary relocation benefits will be disbursed to the displaced business upon submission of the required claim forms and documentation, following the City's approved procedures. Relocation benefits fall under 2 categories, as further detailed below:

- Payment for actual, reasonable moving and related expenses; and
- Fixed payment in lieu of actual, reasonable moving and related expenses.

Actual Reasonable Moving and Related Expenses

Compensation for actual reasonable and necessary moving and related expenses include:

- Transportation of personal property up to 50 miles, unless the City determines that relocation beyond 50 miles is justified.
- Packing, crating, unpacking, and uncrating of relocated property.
- Disconnecting, dismantling, removing, reassembling, and reinstalling relocated property. This includes machinery, equipment, substitute personal property, and connections to utilities available within the building. This also includes modifications to the personal property

necessary to adapt it to the replacement site or the utilities at the replacement site, and modifications necessary to adapt the utilities at the replacement site to the personal property.

- Storage of the personal property for a period not to exceed 12 months, unless the City determines that a longer period is necessary.

- Insurance in connection with the move and necessary storage.

- The replacement value of property lost, stolen, or damaged in the process of moving (not through the fault of the business owner) that is not covered by insurance.

- Any license, permit, fees or certification required of the displaced person at the replacement location. However, the payment may be based on the remaining useful life of the existing license, permit, fees or certification.

- Re-lettering signs and replacing stationery on hand at the time of relocation that are made obsolete as a result of the move.

- The reasonable cost incurred in attempting to sell an item that will not be relocated.

- Professional services as the City determines to be actual, reasonable, and necessary for planning the more, moving property, and installing relocated property at the new business location.

- Other eligible moving-related expenses that the City determines to be reasonable and necessary.

- Actual Direct Loss of Tangible Personal Property: The displaced business owner may receive payment for actual loss of property incurred as a result of moving or discontinuing their business. The payment shall consist of the lesser of (a) fair market value in place of the item less the proceeds from its sale or (b) the estimated cost of relocating the item.

    - If personal tangible property is abandoned with no clear effort being made by the business to dispose of said property, then the business shall not be eligible for any reimbursement for moving expenses or losses for said items. Proceeds realized from any sale of all, or part of the property shall be deducted from the determination of loss. The reasonable cost of an effort to sell the property shall be added to the determination of loss.

- Purchase of Substitute Property: If an item of personal property which is used as part of the business operation is not moved but is promptly replaced with a substitute item that performs a comparable function at the replacement site, the displaced business is entitled to payment of the lesser of:

    - The cost of the substitute item, including installation costs of the replacement site, minus any proceeds from the sale or trade-in of the replaced item; or
    - The estimated cost of moving and reinstalling the replaced item but with no allowance for storage.

- Search Cost Benefit: The displaced business owner may be compensated for reasonable and actual expenses related to the process of searching and locating a replacement site, not to exceed $2,500 ($1,000 under California Relocation Law and Guidelines). Valid types of Search Cost Benefits may include but are not limited to food and lodging expenses incurred for searches away from the principal place of business, transportation costs, and reasonable value of time engaged in the process of searching or fees paid to a real estate agent or broker to locate a replacement site.

- Reimbursement for High-Bulk Items with Low Value: When the personal property to be moved is of low value and high bulk (i.e. scrap metal, sand, gravel, dirt, or similar items) and the cost of moving the property would be disproportionate to its value in the judgement of the City, the allowable moving cost payment shall not exceed the lesser of (a) the amount which would be received if the property were sold at the site or (b) the replacement cost of a comparable quantity delivered to the new business location.

- Related Eligible Expenses: The following other expenses for moving personal property shall be provided if the City determines that they are actual, reasonable and necessary:

    - Connection to available nearby utilities from the right-of-way to improvements at the replacement site.
    - Professional services performed prior to the purchase or lease of a replacement site to determine its suitability for the business operation including but not limited to, soil testing, feasibility and marketing studies (excluding any fees or commissions directly related to the purchase or lease of such site).
    - Impact fees or one-time assessments for anticipated heavy utility usage, as determined necessary by the City.

- Reestablishment Expenses: Reestablishment allowance, not to exceed $25,000 ($10,000 under California Relocation Law and Guidelines), for expenses actually incurred in reestablishing the displaced business at a replacement site. Reestablishment expenses must be reasonable and necessary, as determined by the City.

Self-Moves

If the displaced business chooses to perform a self-move instead of utilizing the services of a professional moving company, the City will engage in negotiations to establish a moving payment that is typically the lesser of at least two (2) bids from qualified professional moving companies. The City may, at its discretion, approve payment on a single bid or estimate on a case-by-case basis.

Fixed Payment In Lieu of Actual Reasonable Moving Expenses

The displaced business has the option to claim a fixed payment for relocation assistance in lieu of actual reasonable moving expenses. This payment amount is determined based on the average annual net earnings over a 2-year period and has a minimum of $1,000 and maximum of $40,000 ($20,000 under California Relocation Law and Guidelines). Income will be verified via certified copy of Federal or State income tax returns, certified or audited financial statements, or W-2 forms.

The City will make a determination as to whether the business is eligible for this payment based on the following criteria:

- The nature of the business cannot be solely for the purpose of renting the site or property to others;
- The business discontinues operations, or it will lose a substantial portion of its business due to the move;
- The business is not a subsidiary or branch location part of a larger enterprise that has at least three other locations under the same ownership that is engaged in the same line of work, operation, or production; and
- The business contributed materially to the income of the displaced business.

Payment of Relocation Benefits

Claims and supporting documentation for relocation benefits must be filed with the City within 18 months from:

- The date the claimant moves from the Property; or
- The date, on which final payment for the acquisition of real property is made, whichever is later.

The procedure for preparing and filing claims and processing and delivering payments are as follows:

1) Claimant(s) will provide all necessary documentation to substantiate eligibility of relocation assistance;
2) Benefit amount will be determined in accordance with the Guidelines and URA, as applicable;
3) Claim forms will be prepared by the Relocation Coordinator on behalf of the claimant(s). Claims signed by the claimant(s) and supporting documentation will be submitted by the Relocation Coordinator to the City for review;
4) City will approve or request additional information. If claim is approved City will issue a benefit check or if applicable, a wire transfer will be made;
5) Issued benefit checks will be hand delivered to the claimant(s) by the Relocation Coordinator or City staff; and
6) Upon verifying that the claimant(s) has completely vacated the Property and has secured residency in a replacement property, final payments will be issued.

Last Resort Housing

There are no residential occupants or buildings on the site. Last resort housing does not apply.

Grievance and Appeal Procedure

The City's grievance and appeals procedure align with the standards described in Article 5, Section 6150 et seq. of the Guidelines. Briefly stated, the displaced household will have the right to ask for a review when there is a complaint regarding any of its rights to relocation and relocation assistance, such as a determination as to eligibility, the amount of payment, failure to provide a replacement location referral, or the City's property management practices.

Any request to have a claim reviewed and reconsidered will be considered by the Director of Economic Development and Housing. If needed, an informal hearing would be conducted at City Hall. The City will provide written explanation of its determination within 3 weeks of the review request. If the appeal is denied during the informal review process, the appellant may file a written request for formal review and consideration by an authorized impartial designee or City department head.

Appellant does not have to exhaust administrative remedies first; the appeal/grievance can either go directly to the City, directly to HCD or directly to the Court. Any person and/or organization directly affected by the Plan may petition the Department of Housing and Community Development (HCD), located at 2020 West El Camino Ave., Sacramento, CA 95833 to review the Plan. Appellants will retain their rights for up to 18 months following the date of displacement from the Project or receipt of final payment for relocation benefits, whichever is later.

Projected Dates of Displacement

The City issued a Notice of Termination of Tenancy and Notice to Vacate on July 22, 2024, with a vacate date of on or before November 1, 2024, providing more than 100 days' notice to vacate.

Estimated Relocation Costs

The City will use its Capital (CIP) Downtown Library Affordable Housing Project Fund to provide relocation benefits to the displaced business.

The total ***estimated*** cost to relocate the commercial displaced business is $97,000. The estimate is presented for budgeting purposes only. The estimate should not be interpreted as firm, "not to exceed", or actual entitlement costs. The estimates are based on the data obtained through interviews, estimated moving-costs, local quotes, and the judgment of City and RSG staff. The estimated costs do not include costs for the relocation consultant or other contractors.

While the URA benefit maximums increased on June 3, 2024, the purchase and sale agreement was negotiated under the stipulation of the previous benefit maximums. Therefore, the relocation benefit maximums in effect prior to June 3, 2024, and detailed in the General Information Notice and Informational Statement included as Exhibit A will be applied.

Citizen Participation

A limited amount of non-residential displacement and no residential displacement will take place because of the acquisition.[2] Therefore, formation of a relocation committee is not required. RSG and the business owner had an initial meeting in October 2023 and have maintained ongoing communication related to the relocation process.

The City will issue a general notice concerning the availability of this Plan to the business owner 30 days prior to its proposed approval by the City Council, as required by the Relocation Guidelines. The displaced business owner will receive a copy of the Plan with the notice and be advised on the 30-day comment period.

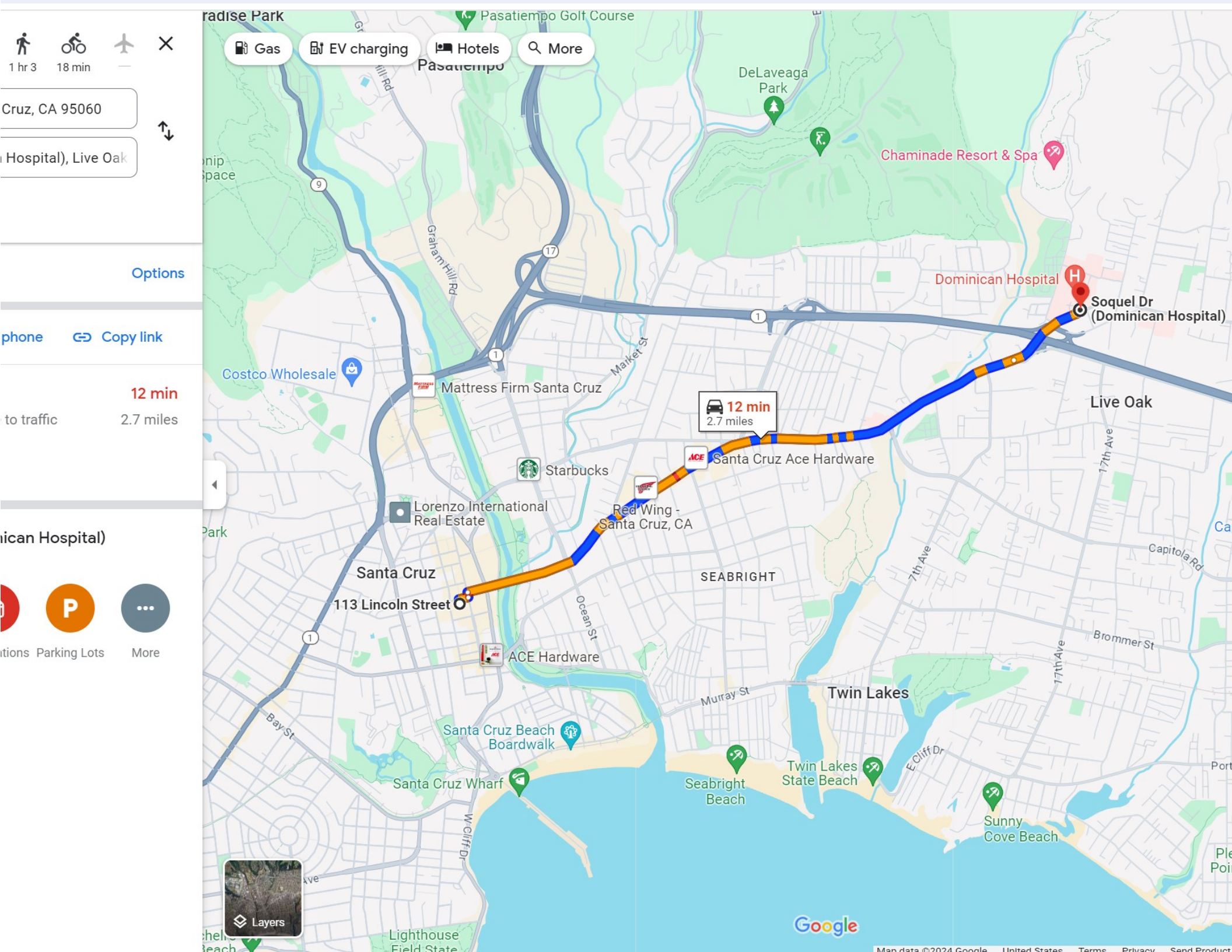
A copy of the Plan will also be available to the public, upon request. Comments to the Plan will be included as an addendum to the Plan and will be submitted to HCD for approval. The business owner and members of the public will also have timely and full access to all other documents relevant to the relocation program.

[2] Subdivision (b) of Section 6012 of Section 25 of the California Code of Regulations indicates that a relocation committee is required only for residential displacement.

EXHIBITS

Exhibit A – General Information Notice & Informational Statement
Exhibit B – Notice of Eligibility
Exhibit C – Notice of Termination of Tenancy and Notice to Vacat

Search & Select Map
Recorded Maps & Docs
Select & Query Layers
Measure & Lat/Long
Draw & Print
Links & Help
APN
Address
Street
Intersection
105 LINCOLN ST B
Select Overlay
Select Base Map
Property Report
Zoning Report
Layer List
Legend
Hazards
Geophysical
Zoning
CZU Info
Land Use
Land Use Regulatory
General Plan
Special Districts
Groundwater Sustainability Agencies
Fire Districts
Aromas FPD
Ben Lomond FPD
Boulder Creek FPD
CSA 04 Pajaro Dunes
CSA 48 Santa Cruz County Fire
Central FPD
City of Santa Cruz
City of Watsonville
Felton FPD
Pajaro Valley FPD
Scotts Valley FPD
Zayante FPD
Fire District Sphere of Influence
Parcels On/Off
PEARL AL
SOQUEL AV
PACIFIC AV
CEDAR ST
NEW ST
CATHCART ST
City of Santa
40 m
100 ft
Close
Parcel Info
Land Use
Biotic & Water Resources
Special Districts
Jurisdictional, Elections, & Census
Hazards & GeoPhysical
School Districts & CSAs
OWTS Permitting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Parking Lots
More
Gas
EV charging
Hotels
More
Pasatiempo Golf Course
Pasatiempo
DeLaveaga Park
Chaminade Resort & Spa
Graham Hill Rd
Dominican Hospital
Soquel Dr (Dominican Hospital)
Costco Wholesale
Mattress Firm Santa Cruz
Market St
12 min
2.7 miles
Live Oak
Santa Cruz Ace Hardware
Starbucks
Lorenzo International Real Estate
Red Wing - Santa Cruz, CA
17th Ave
Capitola Rd
Santa Cruz
SEABRIGHT
113 Lincoln Street
7th Ave
Ocean St
ACE Hardware
Brommer St
Murray St
Twin Lakes
Bay St
Santa Cruz Beach Boardwalk
Santa Cruz Wharf
Seabright Beach
Twin Lakes State Beach
E Cliff Dr
Sunny Cove Beach
W Cliff Dr
Layers
Lighthouse Field State
Google

Santa Cruz Medical Facilities

Results

Dominican Hospital
3.9 ★★★★☆ (484)
Hospital · 1555 Soquel Dr
Open 24 hours · (831) 462-7700
"Fantastic Emergency Room physicians and staff!"
Website Directions

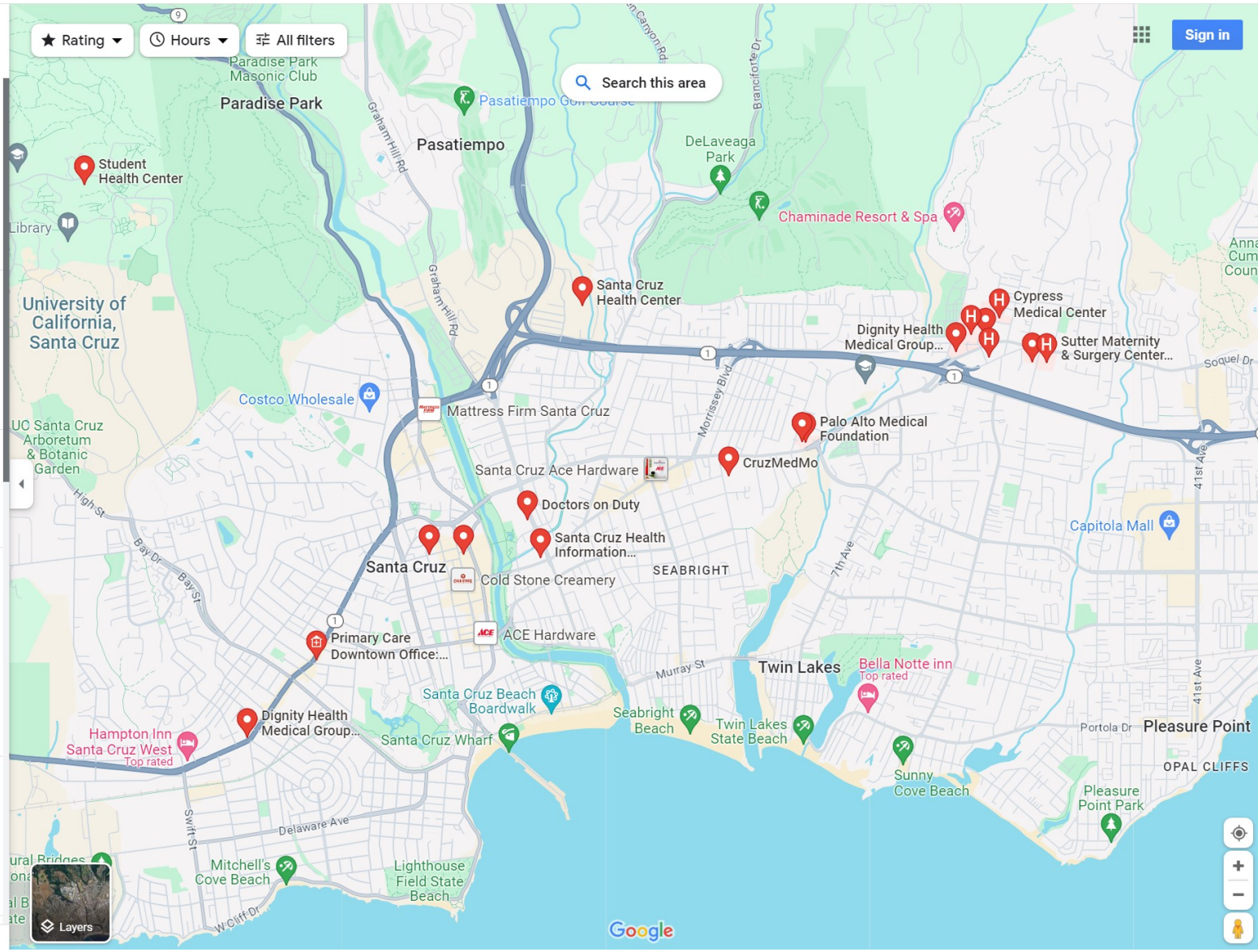
Santa Cruz Center
5.0 ★★★★★ (2)
Medical clinic · 2025 Soquel Ave
2nd Floor
Open · Closes 5PM ·
(831) 423-4111
Website Directions

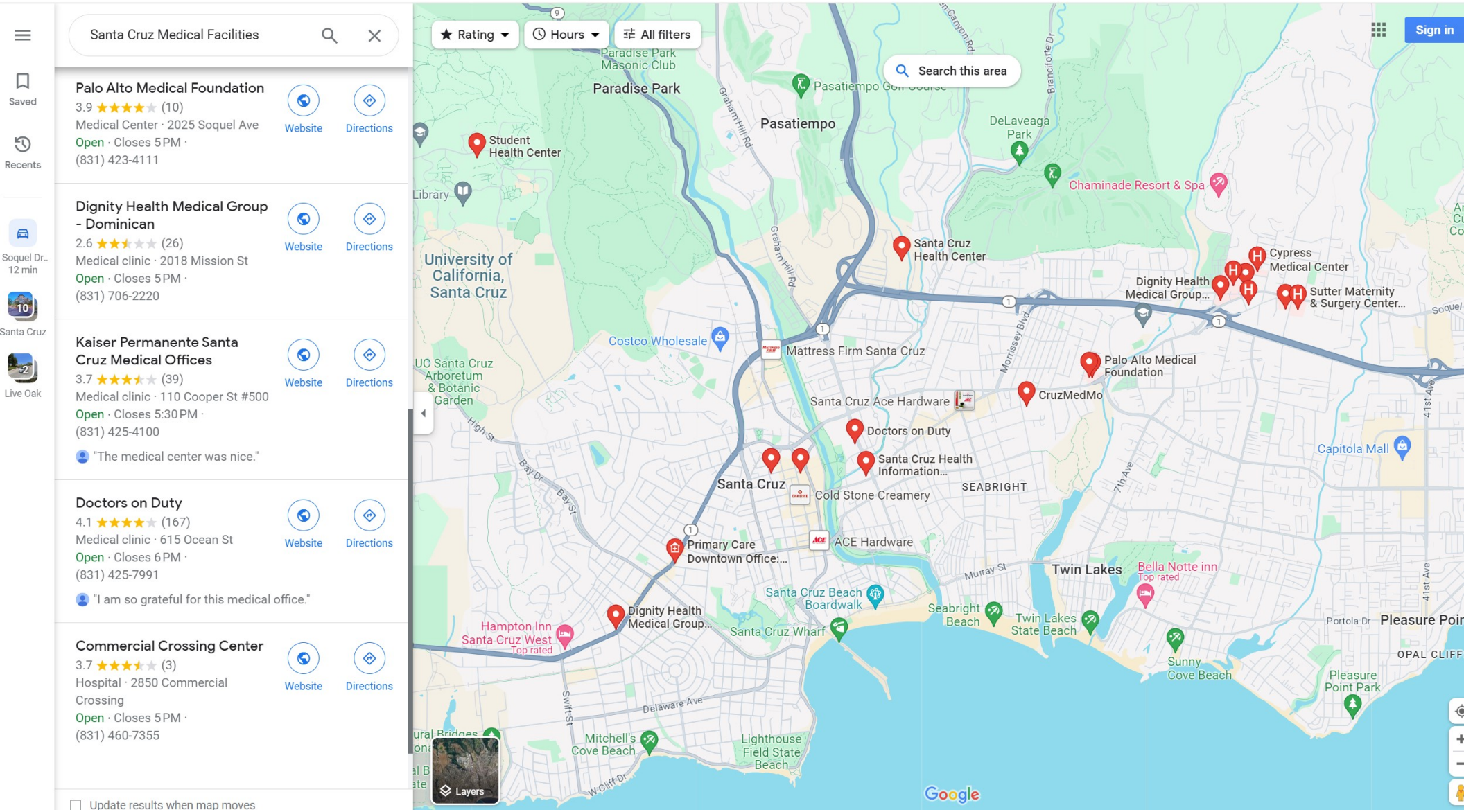
Cypress Medical Center
5.0 ★★★★★ (1)
Medical Center · 1667 Dominican Way
(831) 464-3801
Directions

Santa Cruz Health Center
3.1 ★★★☆☆ (21)
Community health centre · 1080 Emeline Ave
Open · Closes 5PM ·
(831) 454-4100
"Their integrated system keeps my medical team of my progress."
Website Directions

Santa Cruz Community Health Centers
3.7 ★★★½☆ (6)
Community health centre · 250 Locust St
(831) 427-3500
Website Directions

Update results when map moves




Santa Cruz Medical Facilities
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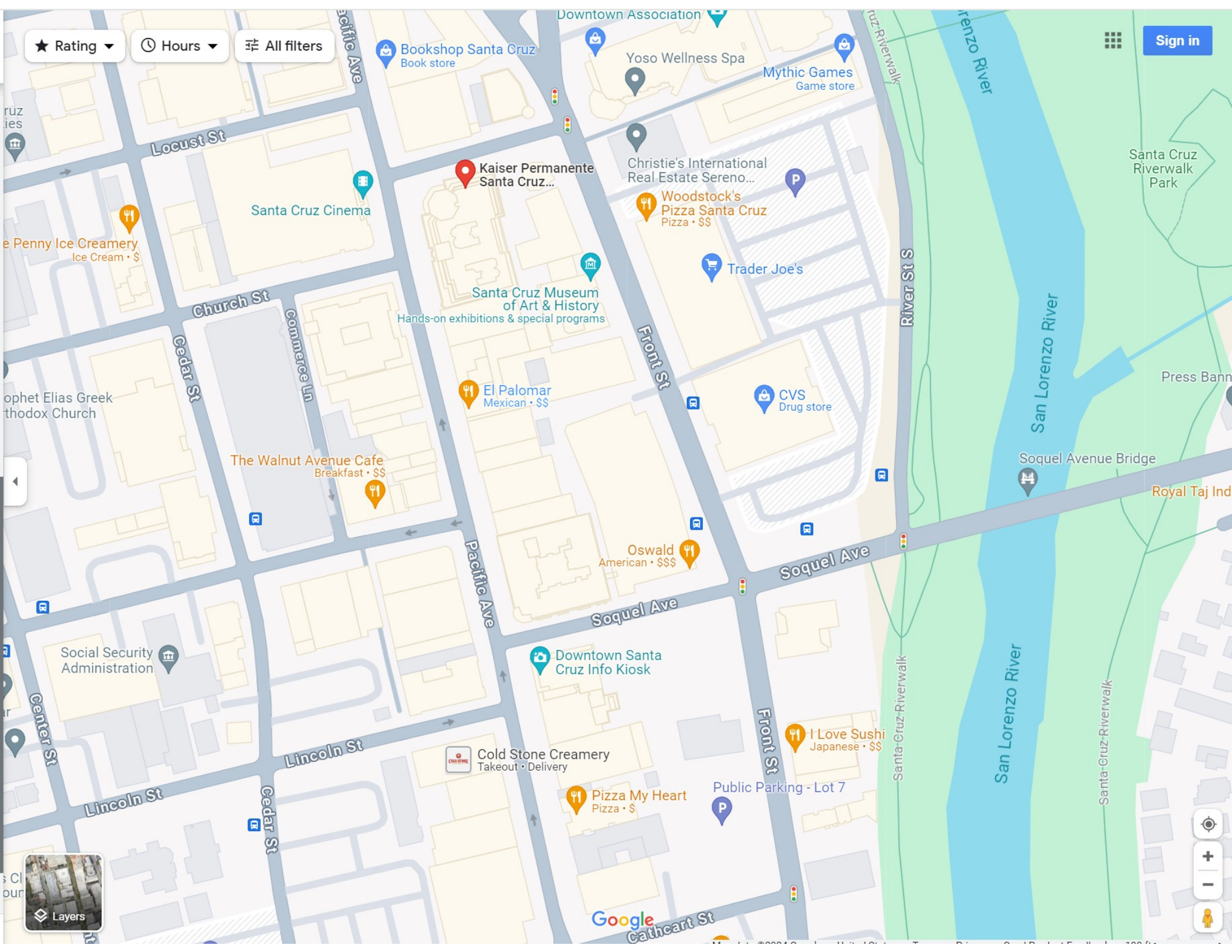
Santa Cruz
Live Oak
Palo Alto Medical Foundation
3.9 (10)
Medical Center · 2025 Soquel Ave
Open · Closes 5 PM ·
(831) 423-4111
Website
Directions
Dignity Health Medical Group - Dominican
2.6 (26)
Medical clinic · 2018 Mission St
Open · Closes 5 PM ·
(831) 706-2220
Website
Directions
Kaiser Permanente Santa Cruz Medical Offices
3.7 (39)
Medical clinic · 110 Cooper St #500
Open · Closes 5:30 PM ·
(831) 425-4100
"The medical center was nice."
Website
Directions
Doctors on Duty
4.1 (167)
Medical clinic · 615 Ocean St
Open · Closes 6 PM ·
(831) 425-7991
"I am so grateful for this medical office."
Website
Directions
Commercial Crossing Center
3.7 (3)
Hospital · 2850 Commercial Crossing
Open · Closes 5 PM ·
(831) 460-7355
Website
Directions
Update results when map moves
Rating
Hours
All filters
Search this area
Sign in
Paradise Park Masonic Club
Paradise Park
Pasatiempo
Pasatiempo Golf Course
DeLaveaga Park
Student Health Center
Library
Chaminade Resort & Spa
Santa Cruz Health Center
University of California, Santa Cruz
Cypress Medical Center
Dignity Health Medical Group...
Sutter Maternity & Surgery Center...
Graham Hill Rd
Morrissey Blvd
Costco Wholesale
Mattress Firm Santa Cruz
Palo Alto Medical Foundation
CruzMedMo
UC Santa Cruz Arboretum & Botanic Garden
Santa Cruz Ace Hardware
Doctors on Duty
Santa Cruz Health Information...
Capitola Mall
High St
Bay Dr
Bay St
Santa Cruz
Cold Stone Creamery
SEABRIGHT
7th Ave
Primary Care Downtown Office:...
ACE Hardware
Murray St
Twin Lakes
Bella Notte inn
Top rated
Santa Cruz Beach Boardwalk
Seabright Beach
Twin Lakes State Beach
Portola Dr
Pleasure Point
Hampton Inn Santa Cruz West
Top rated
Dignity Health Medical Group...
Santa Cruz Wharf
Sunny Cove Beach
OPAL CLIFF
Pleasure Point Park
Swift St
Delaware Ave
Mitchell's Cove Beach
Lighthouse Field State Beach
W Cliff Dr
Layers
Google


Rating
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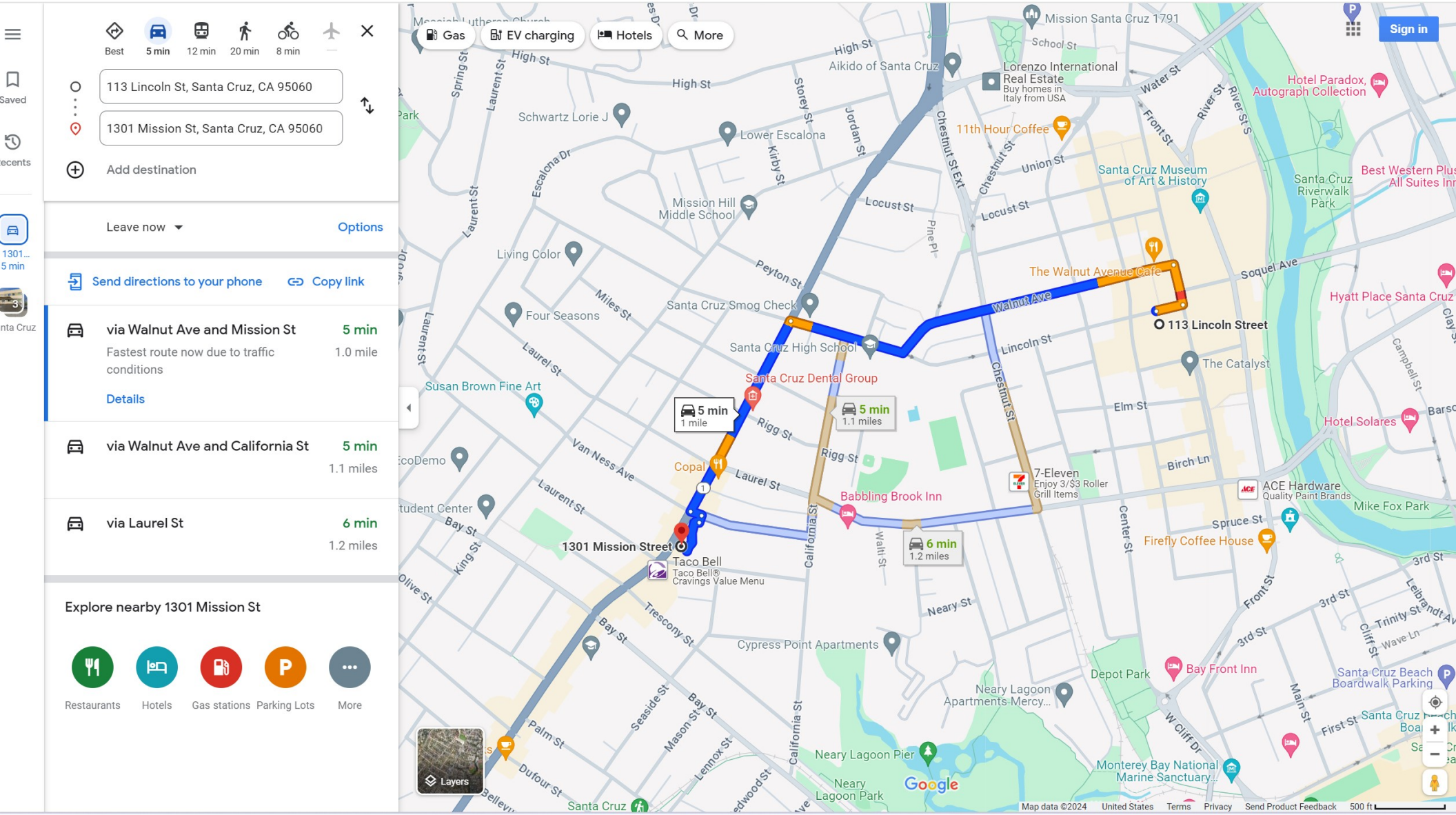
Bookshop Santa Cruz
Book store
Downtown Association
Yoso Wellness Spa
Mythic Games
Game store
Locust St
Kaiser Permanente
Santa Cruz...
Christie's International
Real Estate Sereno...
Santa Cruz Cinema
Woodstock's
Pizza Santa Cruz
Pizza • $$
Penny Ice Creamery
Ice Cream • $
Trader Joe's
Church St
Santa Cruz Museum
of Art & History
Hands-on exhibitions & special programs
Commerce Ln
Cedar St
Front St
River St S
El Palomar
Mexican • $$
CVS
Drug store
Santa Cruz
Riverwalk
Park
San Lorenzo River
Soquel Avenue Bridge
The Walnut Avenue Cafe
Breakfast • $$
Pacific Ave
Oswald
American • $$$
Soquel Ave
Social Security
Administration
Downtown Santa
Cruz Info Kiosk
Center St
Lincoln St
Cold Stone Creamery
Takeout · Delivery
I Love Sushi
Japanese • $$
Pizza My Heart
Pizza • $
Public Parking - Lot 7
Santa Cruz Riverwalk
Layers
Google
Cathcart St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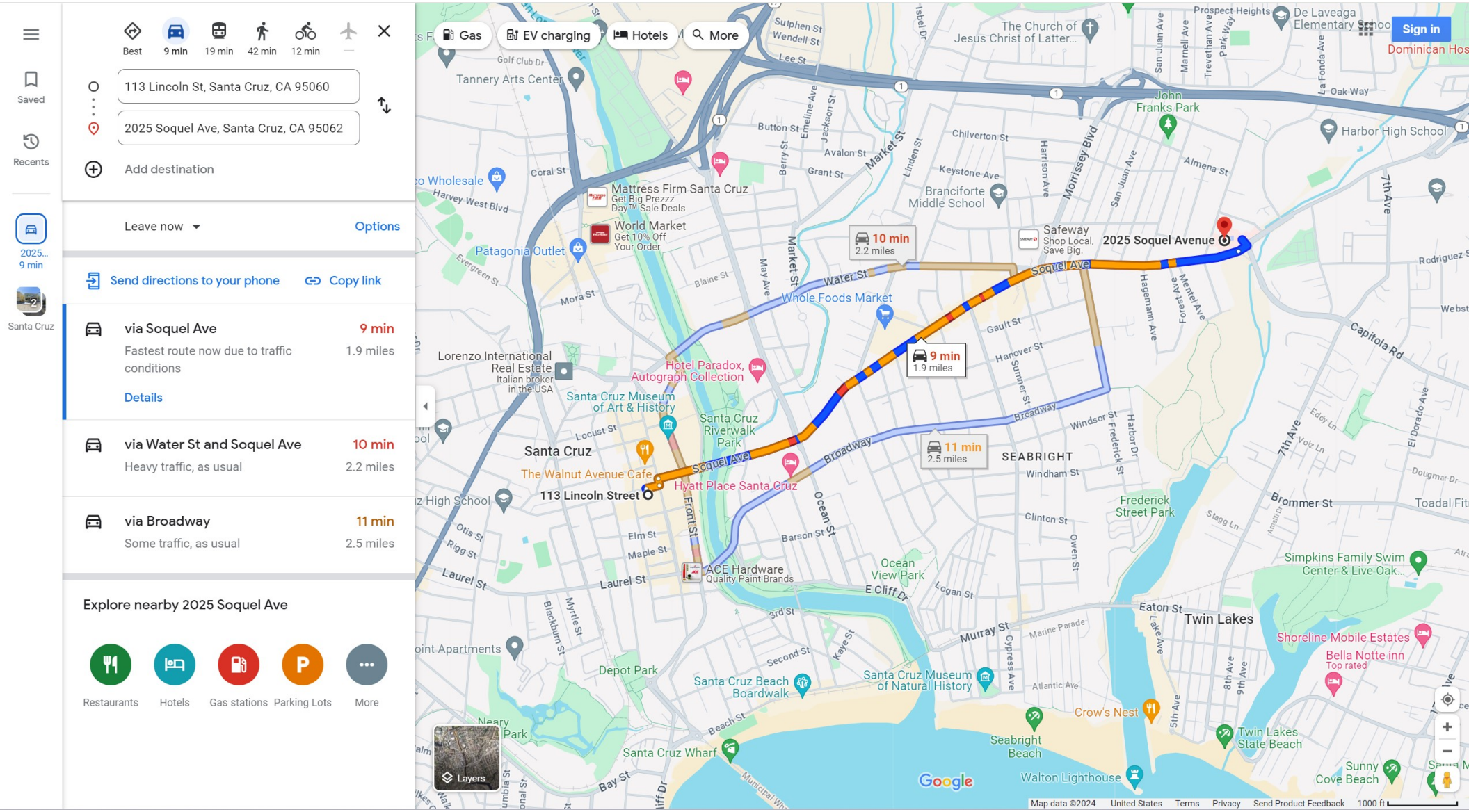
113 Lincoln St, Santa Cruz, CA 95060
1301 Mission St, Santa Cruz, CA 95060
Add destination
Leave now
Options
Send directions to your phone
Copy link
via Walnut Ave and Mission St
5 min
Fastest route now due to traffic conditions
1.0 mile
Details
via Walnut Ave and California St
5 min
1.1 miles
via Laurel St
6 min
1.2 miles
Explore nearby 1301 Mission St
Restaurants
Hotels
Gas stations
Parking Lots
More
Gas
EV charging
Hotels
More
Sign in
Mission Santa Cruz 1791
Aikido of Santa Cruz
Lorenzo International Real Estate
Buy homes in Italy from USA
Hotel Paradox, Autograph Collection
11th Hour Coffee
Schwartz Lorie J
Lower Escalona
Santa Cruz Museum of Art & History
Santa Cruz Riverwalk Park
Best Western Plus All Suites Inn
Mission Hill Middle School
Living Color
The Walnut Avenue Cafe
Hyatt Place Santa Cruz
Santa Cruz Smog Check
Four Seasons
113 Lincoln Street
Santa Cruz High School
The Catalyst
Santa Cruz Dental Group
Susan Brown Fine Art
5 min
1 mile
5 min
1.1 miles
Hotel Solares
Copal
7-Eleven
Enjoy 3/$3 Roller Grill Items
Babbling Brook Inn
ACE Hardware
Quality Paint Brands
Mike Fox Park
Firefly Coffee House
1301 Mission Street
Taco Bell
Taco Bell® Cravings Value Menu
6 min
1.2 miles
Cypress Point Apartments
Depot Park
Bay Front Inn
Santa Cruz Beach Boardwalk Parking
Neary Lagoon Apartments Mercy...
Neary Lagoon Pier
Monterey Bay National Marine Sanctuary...
Neary Lagoon Park
Google
Santa Cruz
Layers
Map data ©2024
United States
Terms
Privacy
Send Product Feedback
500 ft


Best
9 min
19 min
42 min
12 min
113 Lincoln St, Santa Cruz, CA 95060
2025 Soquel Ave, Santa Cruz, CA 95062
Add destination
Leave now
Options
Send directions to your phone
Copy link
via Soquel Ave
9 min
Fastest route now due to traffic conditions
1.9 miles
Details
via Water St and Soquel Ave
10 min
Heavy traffic, as usual
2.2 miles
via Broadway
11 min
Some traffic, as usual
2.5 miles
Explore nearby 2025 Soquel Ave
Restaurants
Hotels
Gas stations
Parking Lots
More
Gas
EV charging
Hotels
More
Saved
Recents
Santa Cruz
10 min
2.2 miles
9 min
1.9 miles
11 min
2.5 miles
2025 Soquel Avenue
Safeway
Shop Local, Save Big.
Mattress Firm Santa Cruz
Get Big Prezzz Day™ Sale Deals
World Market
Get 10% Off Your Order
Whole Foods Market
Hotel Paradox, Autograph Collection
Santa Cruz Museum of Art & History
Santa Cruz Riverwalk Park
The Walnut Avenue Cafe
Hyatt Place Santa Cruz
113 Lincoln Street
ACE Hardware
Quality Paint Brands
Lorenzo International Real Estate
Italian broker in the USA
Tannery Arts Center
Patagonia Outlet
Branciforte Middle School
John Franks Park
Harbor High School
The Church of Jesus Christ of Latter...
De Laveaga Elementary School
Sign in
Dominican Hos
Frederick Street Park
Ocean View Park
Depot Park
Santa Cruz Beach Boardwalk
Santa Cruz Museum of Natural History
Seabright Beach
Crow's Nest
Twin Lakes State Beach
Twin Lakes
Shoreline Mobile Estates
Bella Notte inn
Top rated
Simpkins Family Swim Center & Live Oak...
Sunny Cove Beach
Walton Lighthouse
Santa Cruz Wharf
Neary Park
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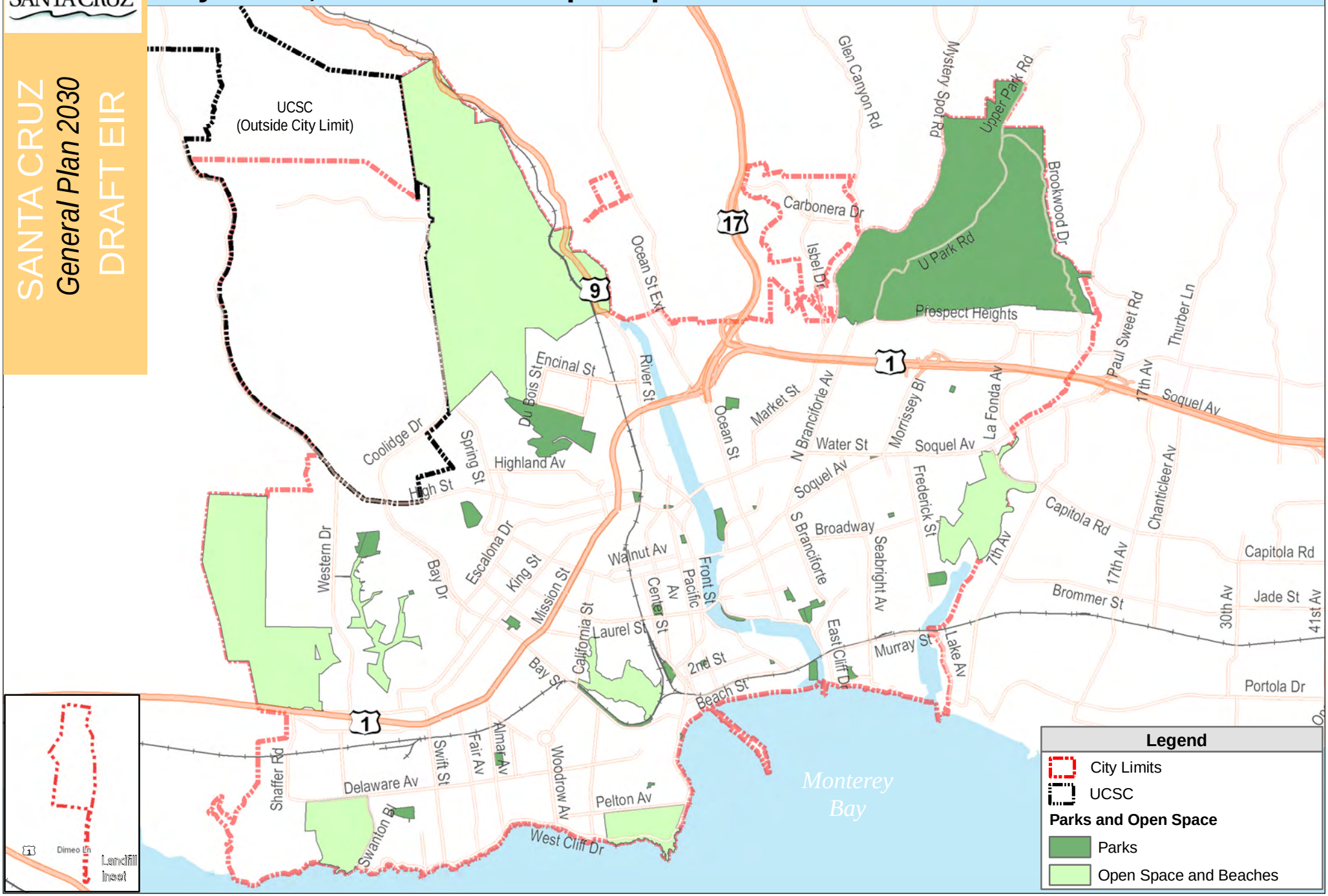
SANTA CRUZ
General Plan 2030
DRAFT EIR

Figure 4.6-2
City Parks, Greenbelt and Open Space Lands



- 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

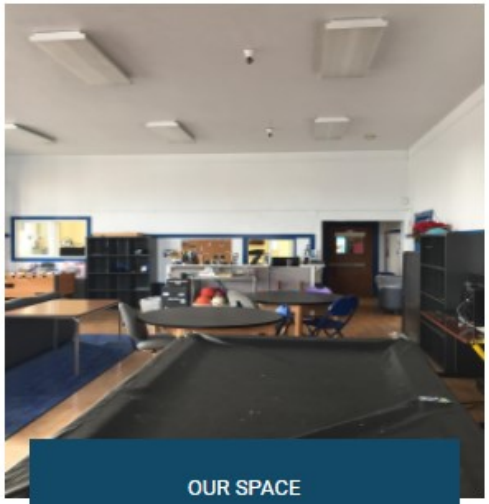
SANTA CRUZ TEEN CENTER

Government » City Departments » Parks & Recreation »

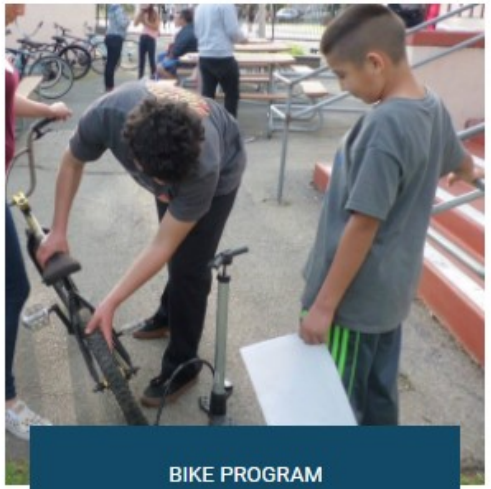
Santa Cruz Teen Center

Font Size: Share & Bookmark Feedback Print

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.

CITY COUNCILMEMBERS
Mayor Justin Cummings
Vice Mayor Donna Meyers
David Terrazas
Martine Watkins
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Richelle Noroyan
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Cece Pinheiro
Christine Palochak
Randy Widera
Kristina Kincaid Glavis
Gillian Greensite
Dawn Schott-Norris

PARKS MASTER PLAN 2030 SUBCOMITTEE MEMBERS
Cynthia Chase
David Terrazas
Christine Palochak
John Falkowski

PARKS AND RECREATION DEPARTMENT
Tony Elliot, Director of Parks and Recreation
Mauro Garcia
Dannettee Shoemaker
Travis Beck
Noah Downing
Carol Scurich
Meta Rhodeos
Clint Bohlen
Victor Albers
Heather Reiter
Leslie Keedy
Miles Hicks
Andrew Eisenberg
Steve Gomez
Andrea Botsford
Jill Bates
Josh Clevenger
Robert Acosta
Rachel Kaufman
Jon Bombaci
Angela Gray
Ashley Fisher
Maya Crelan Ray

Prepared By:
CITY OF SANTA CRUZ PARKS & RECREATION DEPARTMENT
Noah Downing

CONSULTANT TEAM
Royston Hanamoto Alley and Abey, Landscape Architects
Cordy Hill, Barbara Lundburg, Lauren Knight, Lauren Ivey & Nathanael Gray

Godbe Research, Public Opinion & Research
Bryan Godbe

Applied Development Economics, Economic Planning & Strategies
Doug Svensson

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- **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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5.5 Summary of Community Input

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

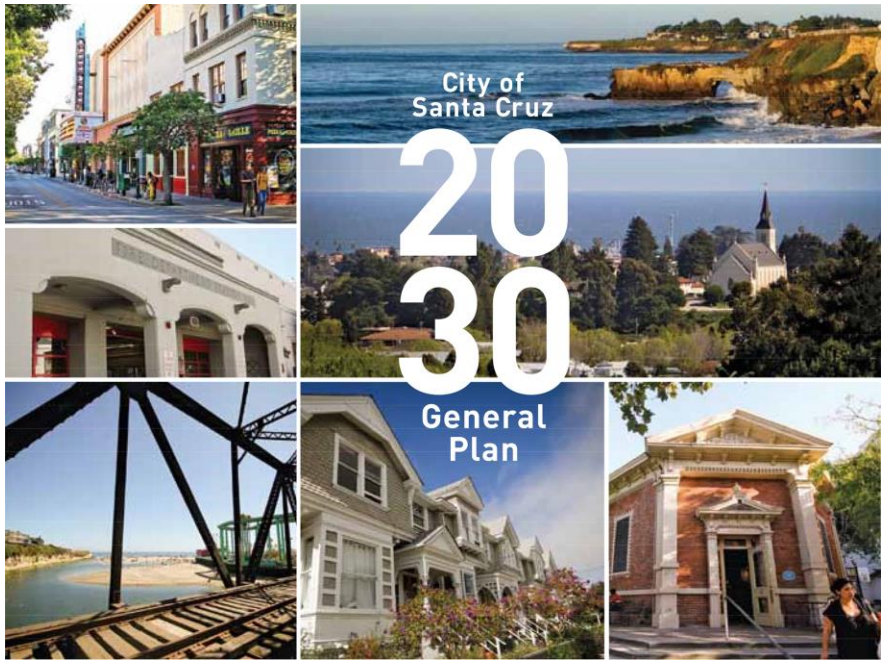
The *City of Santa Cruz Parks Master Plan 2030* (Parks Master Plan 2030) represents an opportunity to improve the existing parks system and anticipate future needs of the community while still preserving the unique character of the City's community and environment. The Parks Master Plan 2030 provides 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

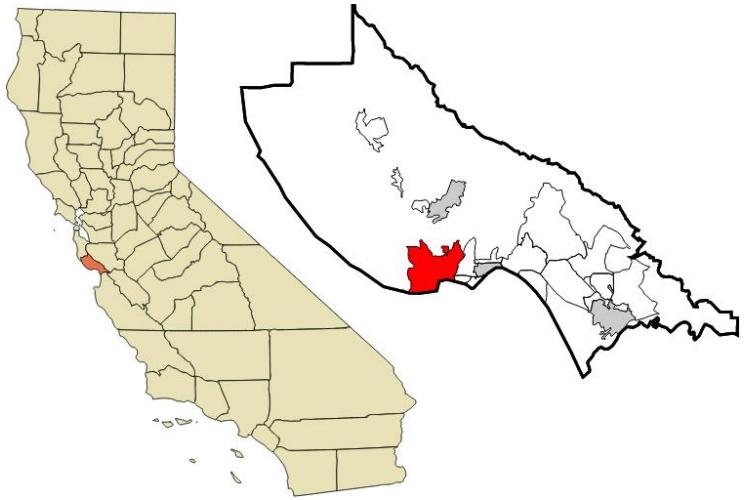
A. Location, Geography, and Climate
B. Demographics
C. Community Profile Summary

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]

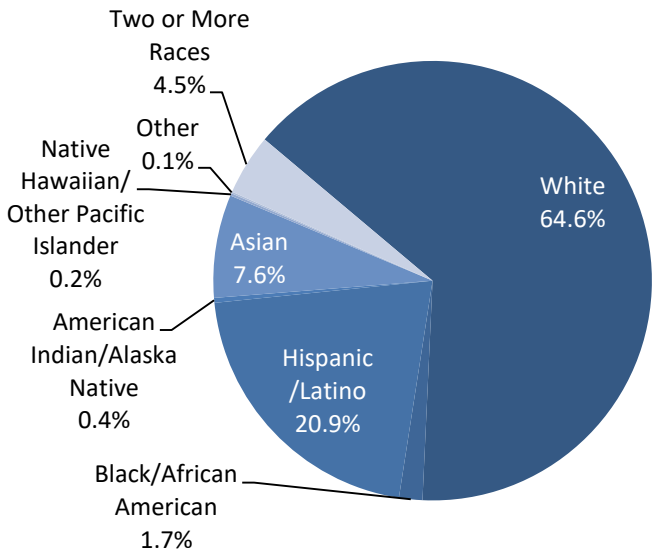
POPULATION

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.

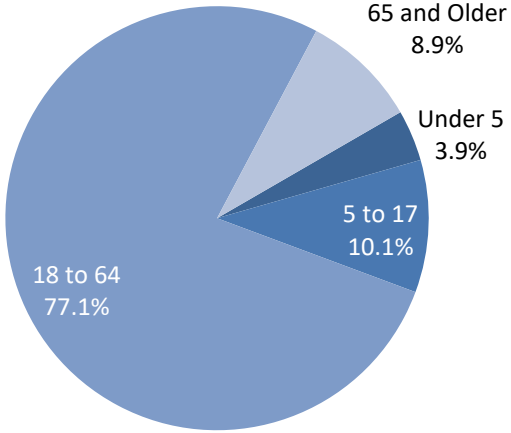
Racial Distribution in Santa Cruz



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.

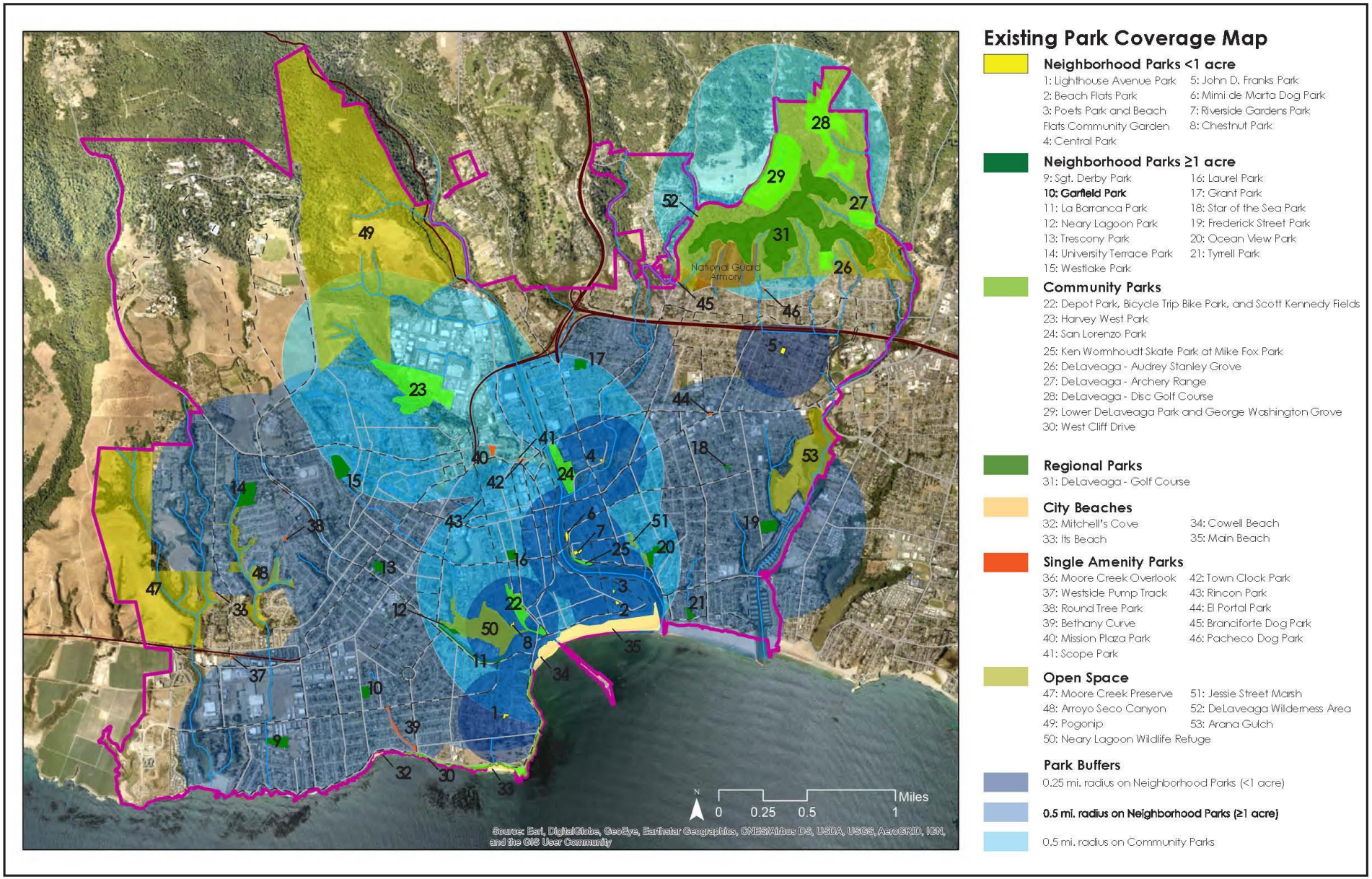
Community Parks provide recreational opportunities to surrounding neighborhoods. Applying a 1.5 mile radius from Community Parks shows that all neighborhoods in the City have access to Community Park space. Community Parks contain amenities that serve the surrounding neighborhoods. Therefore, to identify 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)

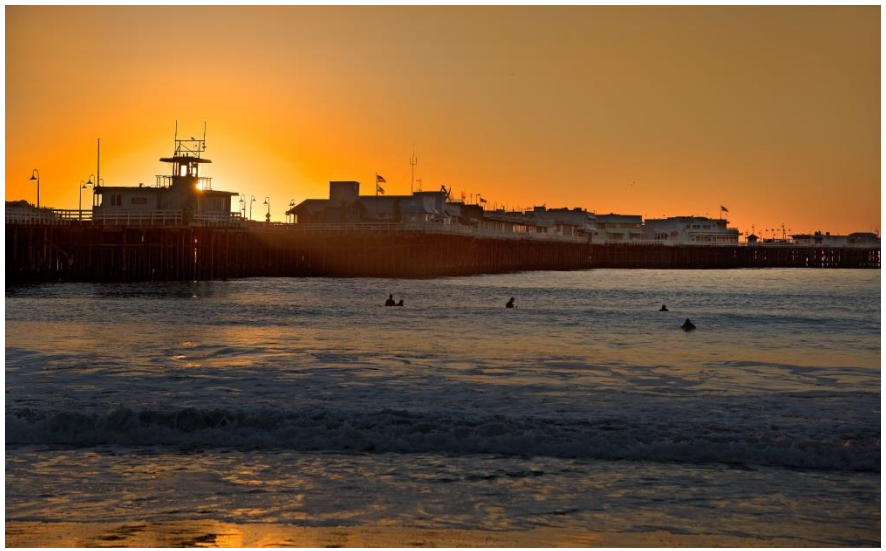
The Public Works Department hired a consultant to conduct a Facility Condition Assessment (2013) which included the study of building system needs including foundations, superstructures, exterior enclosure, interior construction, interior finishes, conveying systems, plumbing, HVAC, and fire protection 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%

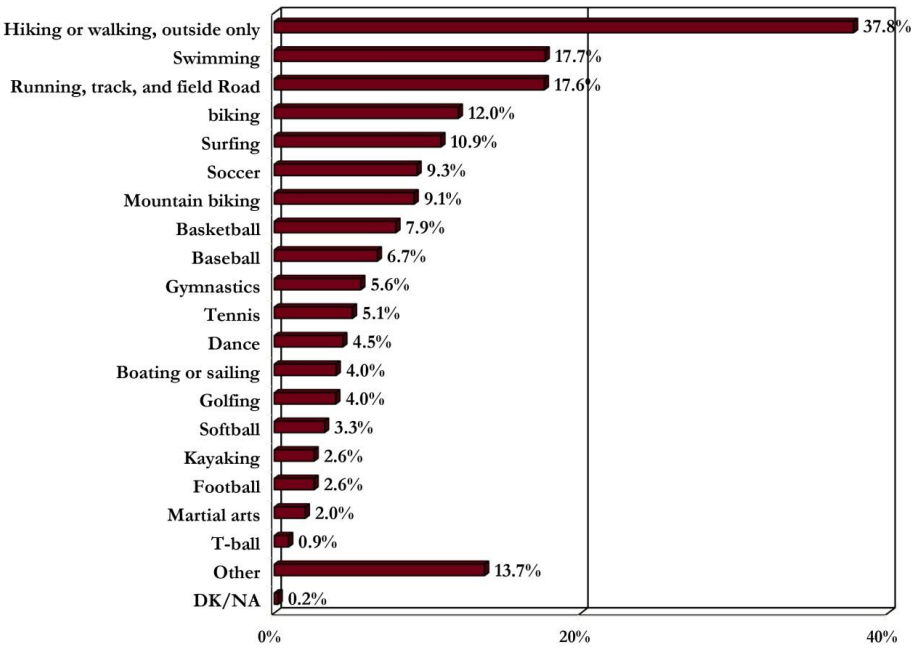
KEY FINDINGS

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

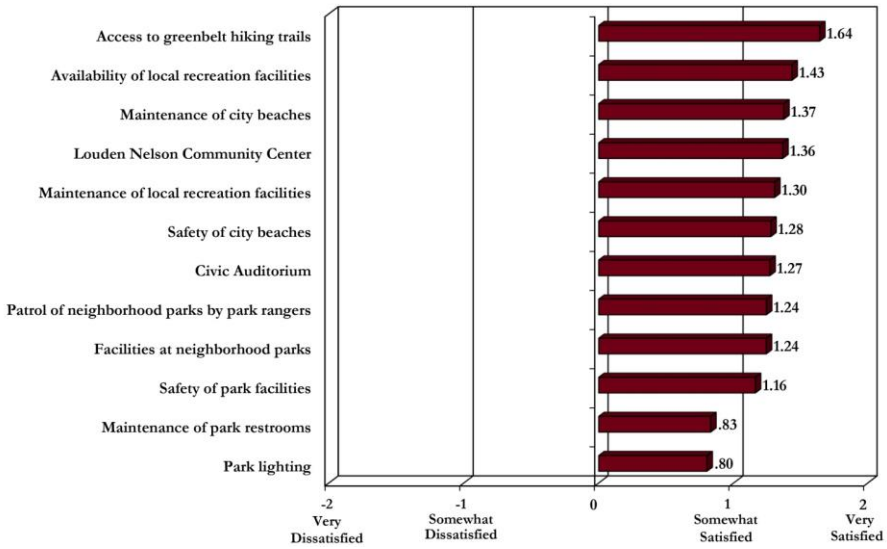
- Santa Cruz is a very active community. Respondents indicated that the top two preferences for leisure time activities include going to the beach and outdoor sports or athletic activities.
- More than three quarters of respondents indicated that a member of their household participates in an outdoor 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.

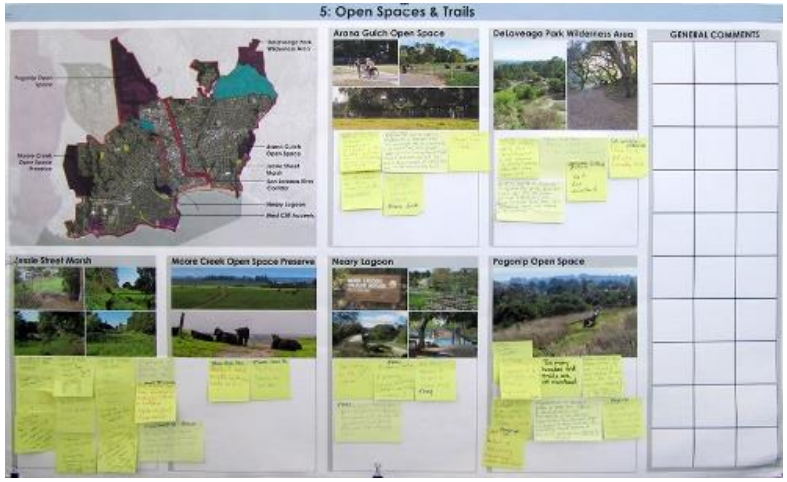
The Godbe report is available in Appendix 5.2 with a link to the report's appendices.

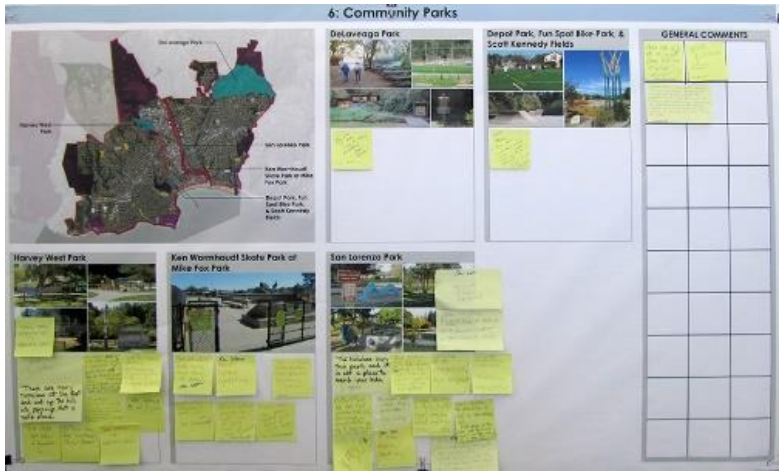
D. COMMUNITY MEETINGS

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

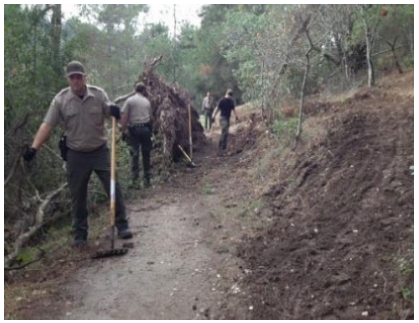
Natural willow branch play structures at Mission Bay Playground in San Francisco

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

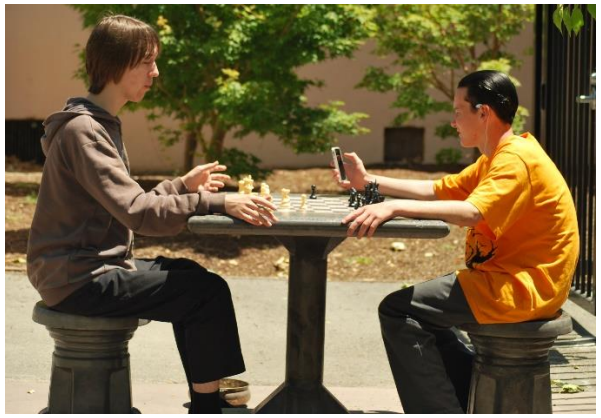
ACTION 1. Develop, improve, and enhance trails to provide for a range of uses.

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.

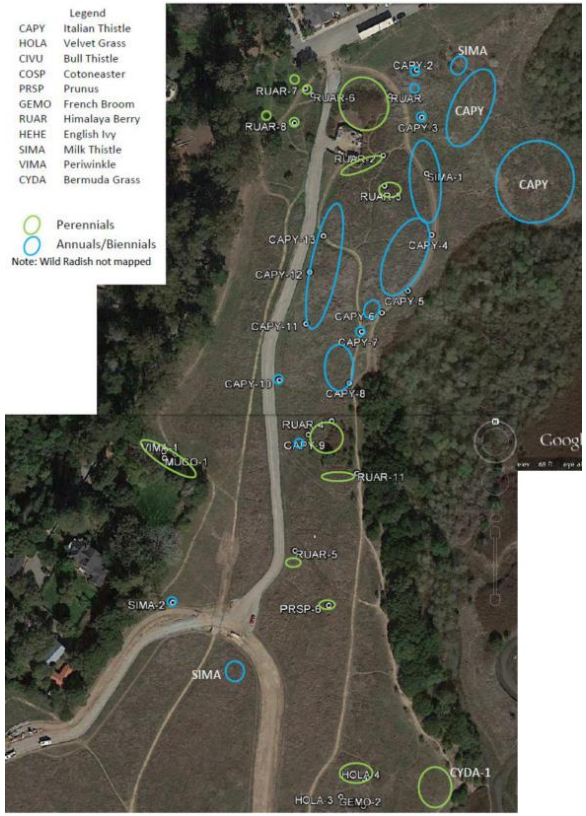
POLICY A. Maintain and enhance natural habitats to increase biodiversity and sustain long-term ecological function.

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.

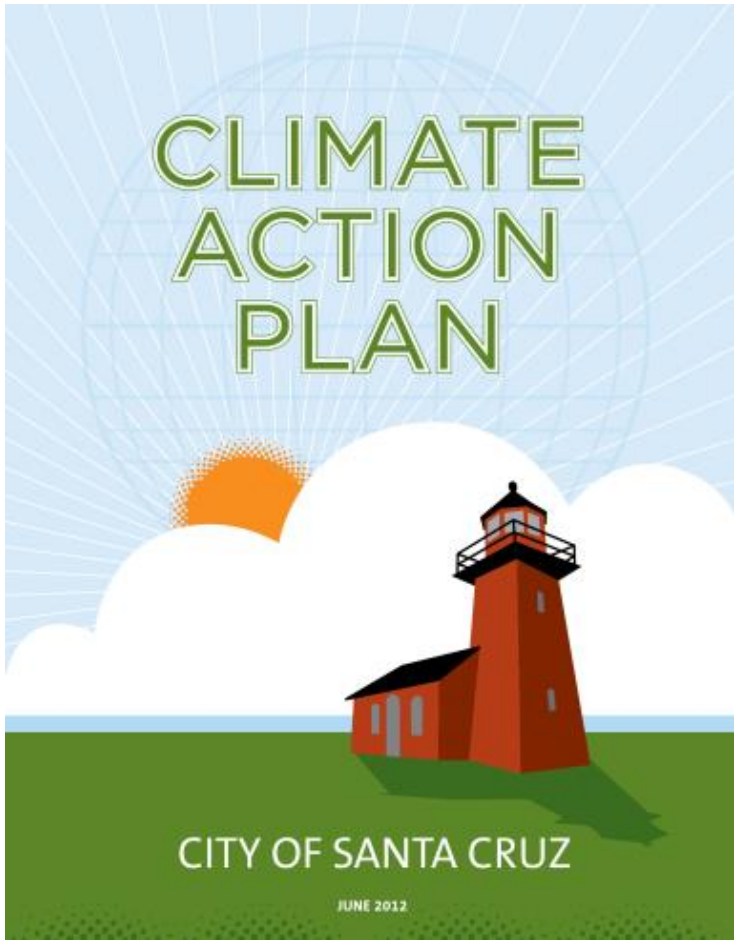
Bioswale near the Cowell Beach parking lot

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

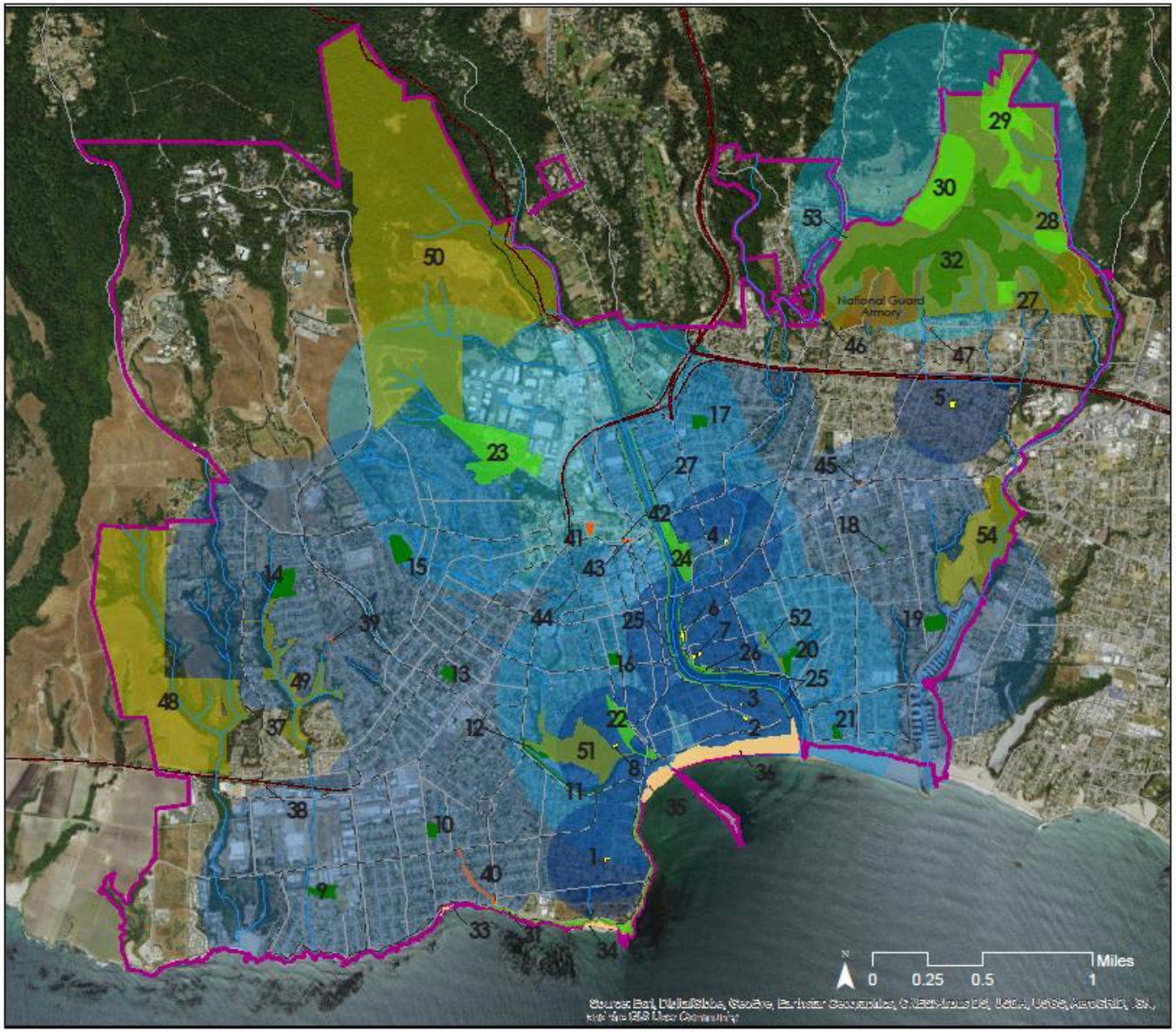
In addition to broader goals for the park system, the *Santa Cruz Parks Master Plan 2030* (Parks Master Plan 2030) has specific recommendations for each location. These recommendations are based on the input received during the community outreach process, input from City staff on current usages and condition 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.

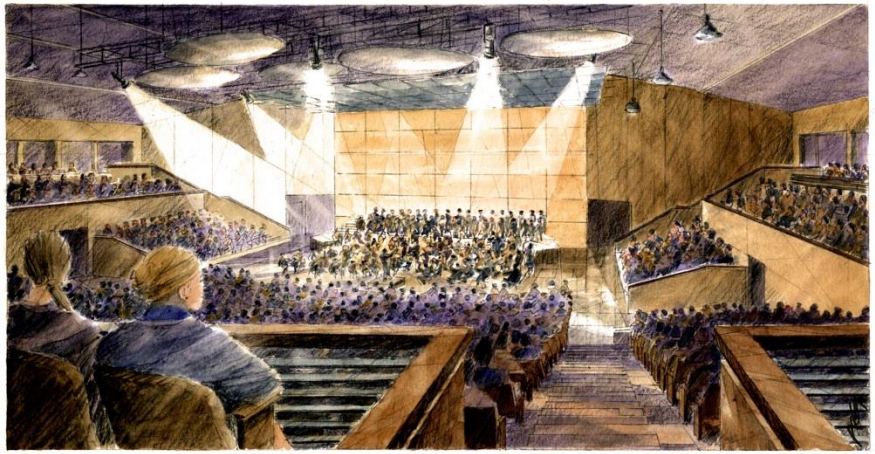
Proposed Classification: Other

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

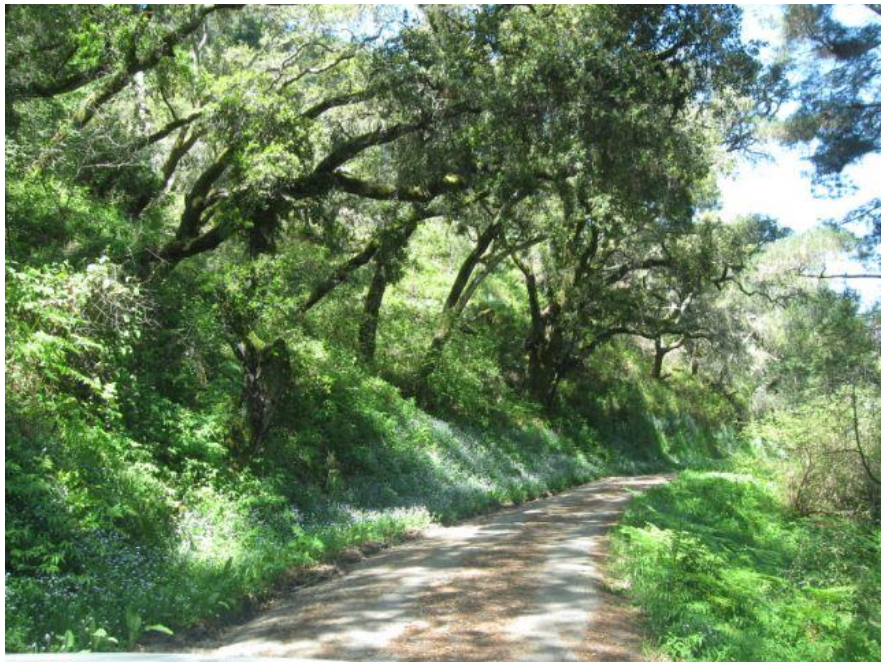
Size: 151 acres

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

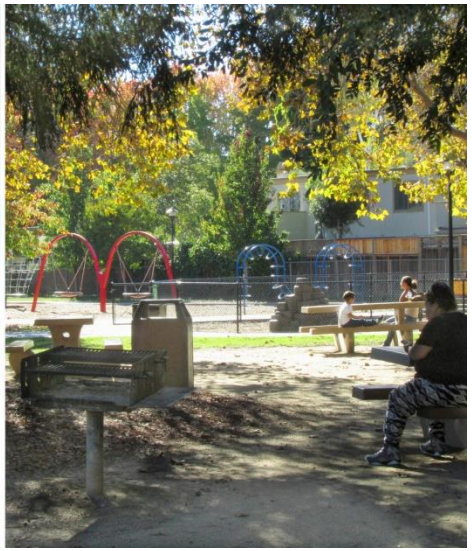
Garfield Park is a very popular park for the lower Westside Neighborhood. It offers a variety of recreational activities including a grass field, picnic tables and BBQ pits, a playground and tot-lot, two table tennis tables, and a full-size basketball court. It is the only park on the Westside of town 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

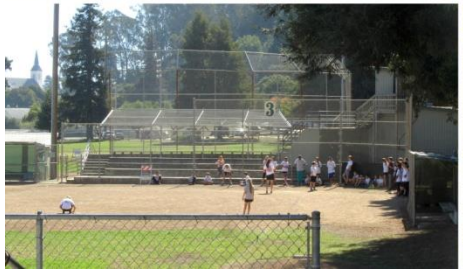
Grant Park provides a variety of recreational activities onsite and is very popular for the Upper Eastside Neighborhood. The park is fenced and locked at night. A small baseball field is sometimes used for youth league practices. A full-size basketball court is used frequently. A bocce ball court is 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

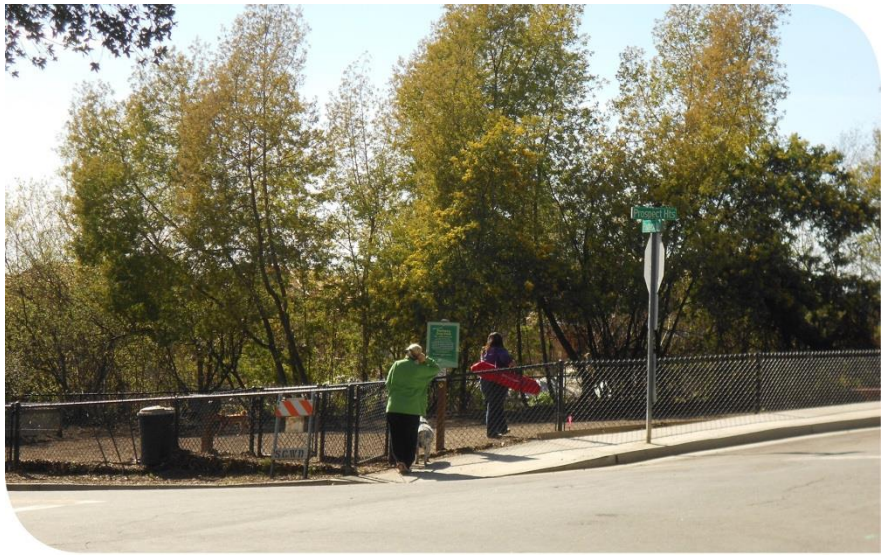
Ocean View Park is a popular family park with picnic tables, playgrounds, long slides and restrooms. Other facilities include a half-court basketball court as well as a grass field which accommodates legal, unfenced off-leash dog use when not being used for other recreational purposes. The proximity 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

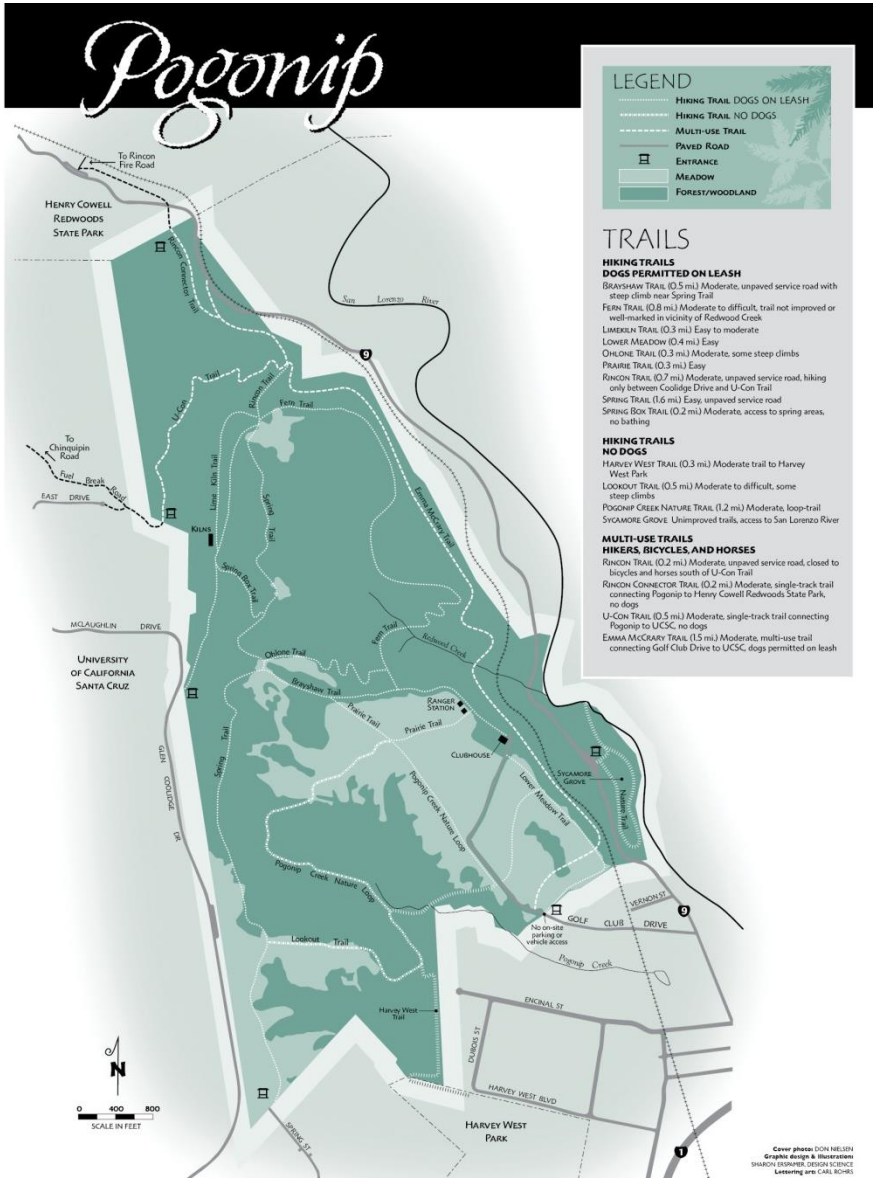
Size: 640 acres

Master Plan: Pogonip Master Plan (1998)

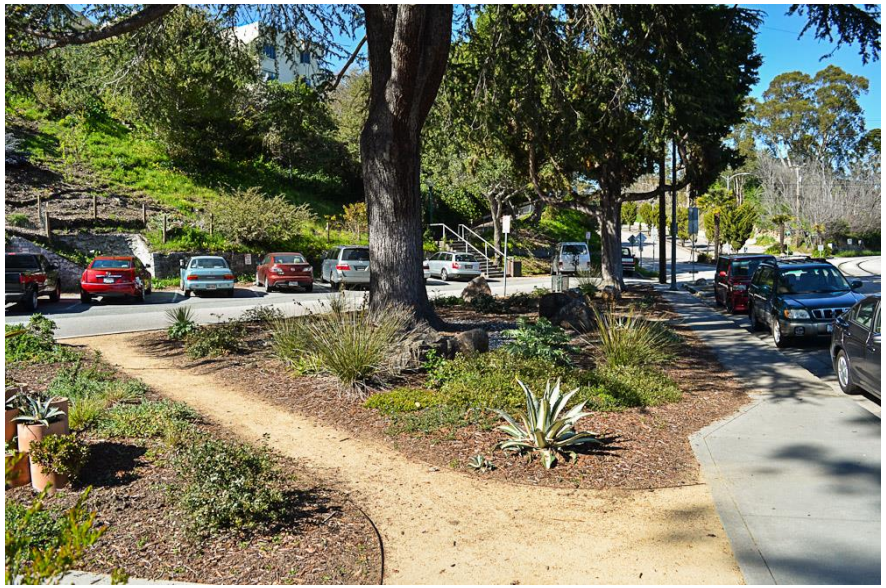
Pogonip Open Space contains approximately eight miles of hiking trails and three miles of multi-use (hiking, biking, and horseback riding) trails that weave through a variety of natural and historic sceneries. The open space is located adjacent to Harvey West Park, UCSC (which includes trails that connect 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)

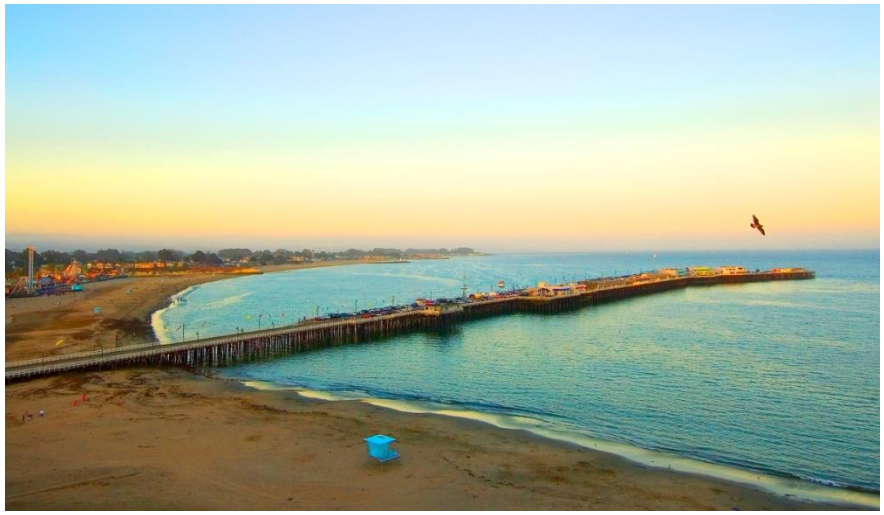
The Santa Cruz Riverwalk is a multi-use trail that encircles the San Lorenzo River south of Highway 1. On the west side of the river, the trail continues under Highway 1 to the Tannery Arts Center. The San Lorenzo Urban River Plan provides a number of recommendations for the locations and designs of 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.

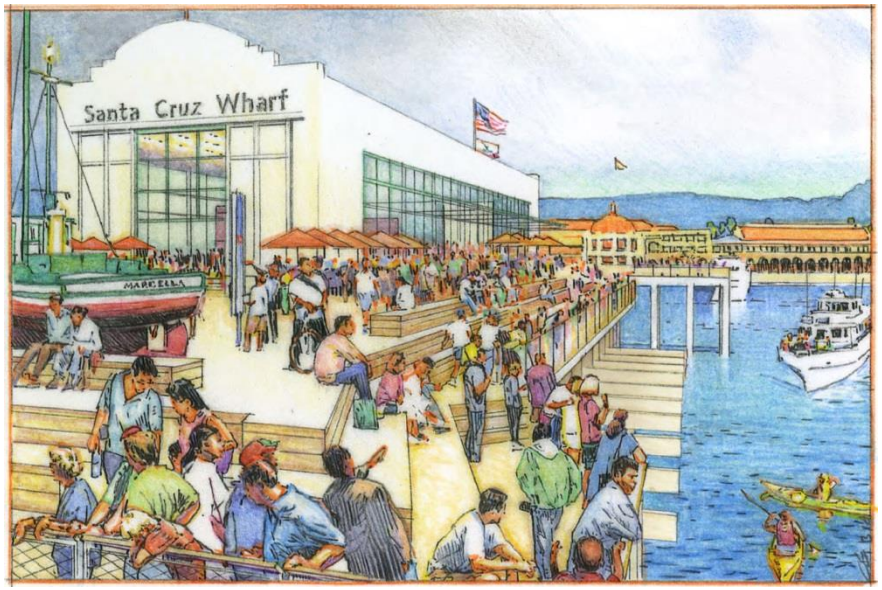
Recommendations:

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.

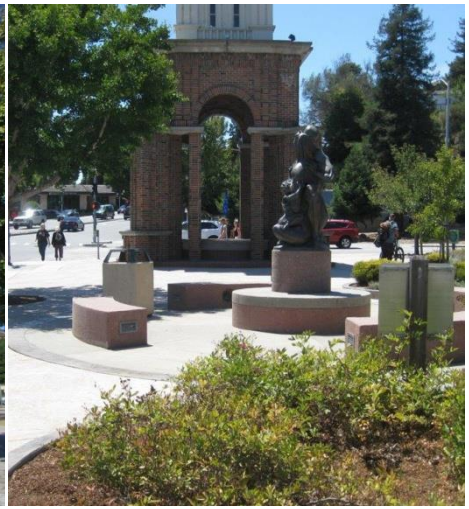
Proposed Classification: Community, Recreational, and Cultural Facility

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

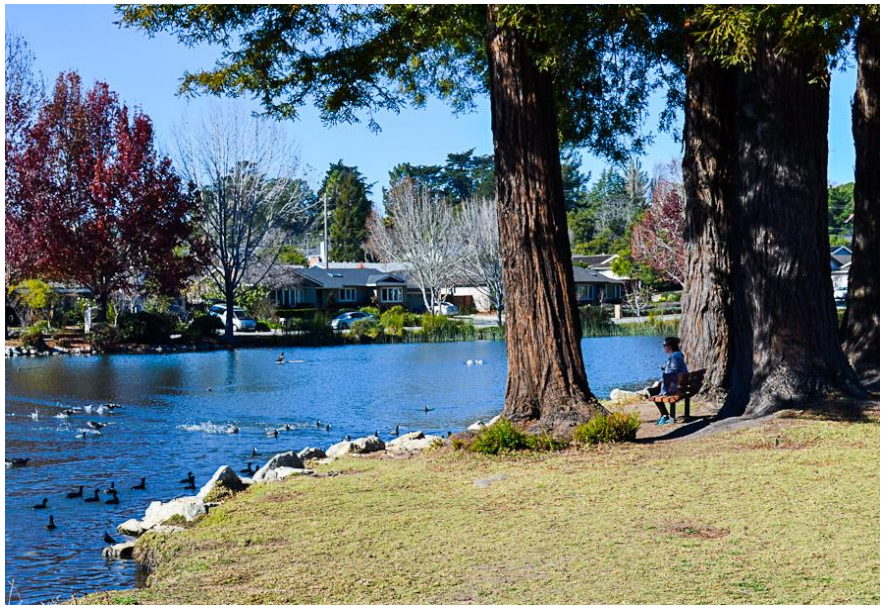
Size: 14.64 acres

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.

Santa Cruz City Parks

Beach Flats Park
Bethany Curve
Chestnut Park
City Hall Gardens
DeLaveaga Park
Depot Park
Frederick Street Park
Garfield Park
Grant Park
Harvey West Park
John Franks Park
Ken Wormhoudt Skate Park
La Barranca
Laurel Park
Lighthouse Ave Park
Lighthouse Field
Loch Lomond Recreation Area
Mission Plaza
Neary Lagoon
Ocean View Park
Riverside Gardens
San Lorenzo Park
Santa Cruz Riverwalk
Sergeant Derby Park
Star of the Sea
Trescony
Tyrrell Park
University Terrace
West Cliff
Westlake Park
West Side Pump Track

Under guidance from the County, City of Santa Cruz playgrounds are open. While we are excited to announce this, please remember to follow the recommended guidelines to help keep everyone safe:

● Practice social distancing and wear face coverings following State guidance.

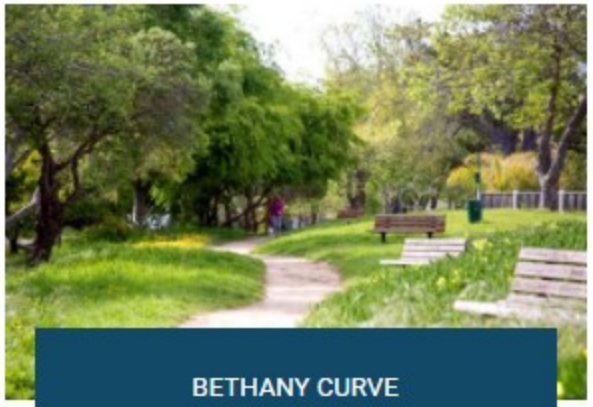
● Wash hands or use a hand sanitizer regularly, especially after playing with/on shared equipment and after using the restrooms.

● Be prepared for limited access to public restrooms.

● Stay home if you are not feeling well or showing symptoms.

● Playground equipment is not sanitized.

BEACH FLATS



BETHANY CURVE

CHESTNUT PARK

CITY HALL GARDENS

DELAVEAGA PARK

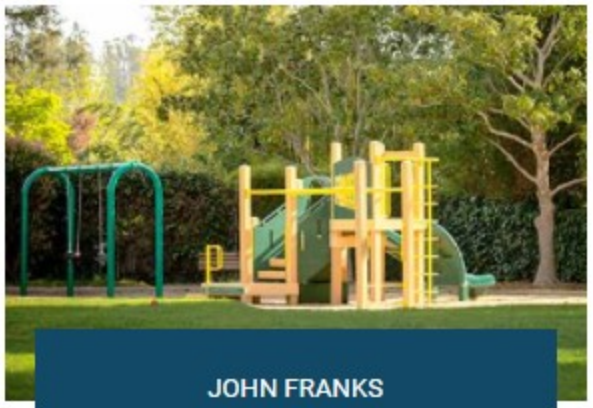
DEPOT PARK

FREDERICK STREET

GARFIELD PARK

GRANT PARK

HARVEY WEST



JOHN FRANKS

KEN WORMHOUDT

LA BARRANCA

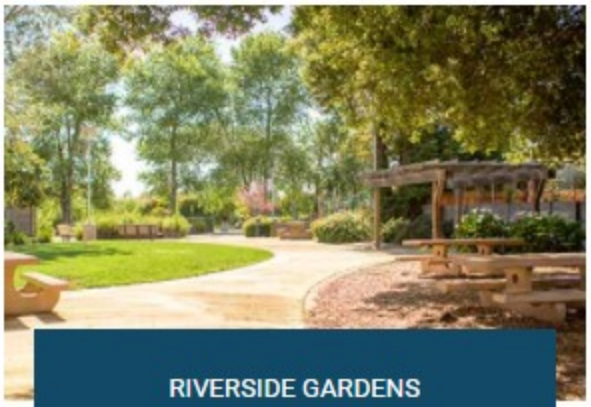
LAUREL PARK

LIGHTHOUSE AVENUE

MISSION PLAZA

NEARY LAGOON

OCEAN VIEW PARK



RIVERSIDE GARDENS

SAN LORENZO

SANTA CRUZ RIVERWALK

SERGEANT DERBY

STAR OF THE SEA

TRESCONY PARK

TYRRELL PARK

UNIVERSITY TERRACE

WEST CLIFF

WEST LAKE PARK

WESTSIDE PUMP TRACK

Dog Off Leash Areas

Branciforte Dog Park: Quarter acre fenced dog park. Open Sunrise to Sunset. Located at 200 N. Branciforte Drive.

DeLaveaga Park: Sand Pit Service Road into Lower DeLaveaga Park. Designated off-leash times are sunrise to sunset. Take Market Street past Gruenwald Court.

Frederick Street Park: The off-leash area is clearly marked by signs and fencing. Monday-Friday- 8:00am-7:00pm (or sunset, if earlier) Saturday-Sunday- 8:00am-5:00pm. The area is located at 168 Frederick Street (Frederick at Broadway).

Grant Street Park: The off-leash area is clearly marked with signs. Off-leash times are sunrise to sunset. The area is located at 180 Grant Street.

Mimi De Marta Dog Park: Half acre fenced, off leash dog area. Open sunrise to sunset. Located at 130 Broadway.

Mitchell's Cove Beach: Dogs are allowed off-leash before 10 am and after 4 pm The beach is located near West Cliff Drive and Almar Avenue.

Pacheco Dog Park: This area is completely fenced and the off-leash times are sunrise to sunset. The area is located at Pacheco Avenue and Prospect Heights.

Ocean View Park: The off-leash area is clearly marked with signs. Off-leash times are sunrise to sunset. The area is located at 102 Ocean View Avenue.

University Terrace Park: Two off-leash dog park areas: one for all dogs and a separate park for smaller dogs. Both areas are fenced and off-leash times are sunrise to sunset. The designated off-leash area is located at the second entrance at Nobel Drive and Meder Street.

- Dogs are **not allowed** at the Wharf, Cowell Beach, Main Beach, Laurel Park, or San Lorenzo Park.
- Dog owners must be in full control of their dogs at all times. Control must be immediate. Dog owners are financially responsible for any damage caused by their dog to public property. SCMC 8.14.200.2
- Dog owners must clean up all of their dog's defecation and must carry dog defecation removal devices at all times. SCMC 8.14.215

Santa Cruz County "Where Can I Take my Dog?" Brochure

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

CITY OF SANTA CRUZ

Parks & Facilities

+ 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:

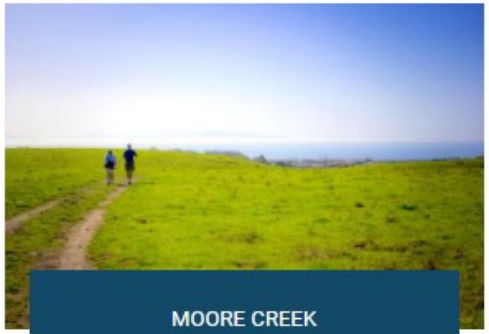
- Lower DeLaveaga Park and George Washington Grove (Trails at DeLaveaga remain open)
- Laurel Park
- San Lorenzo Park Benchlands

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.

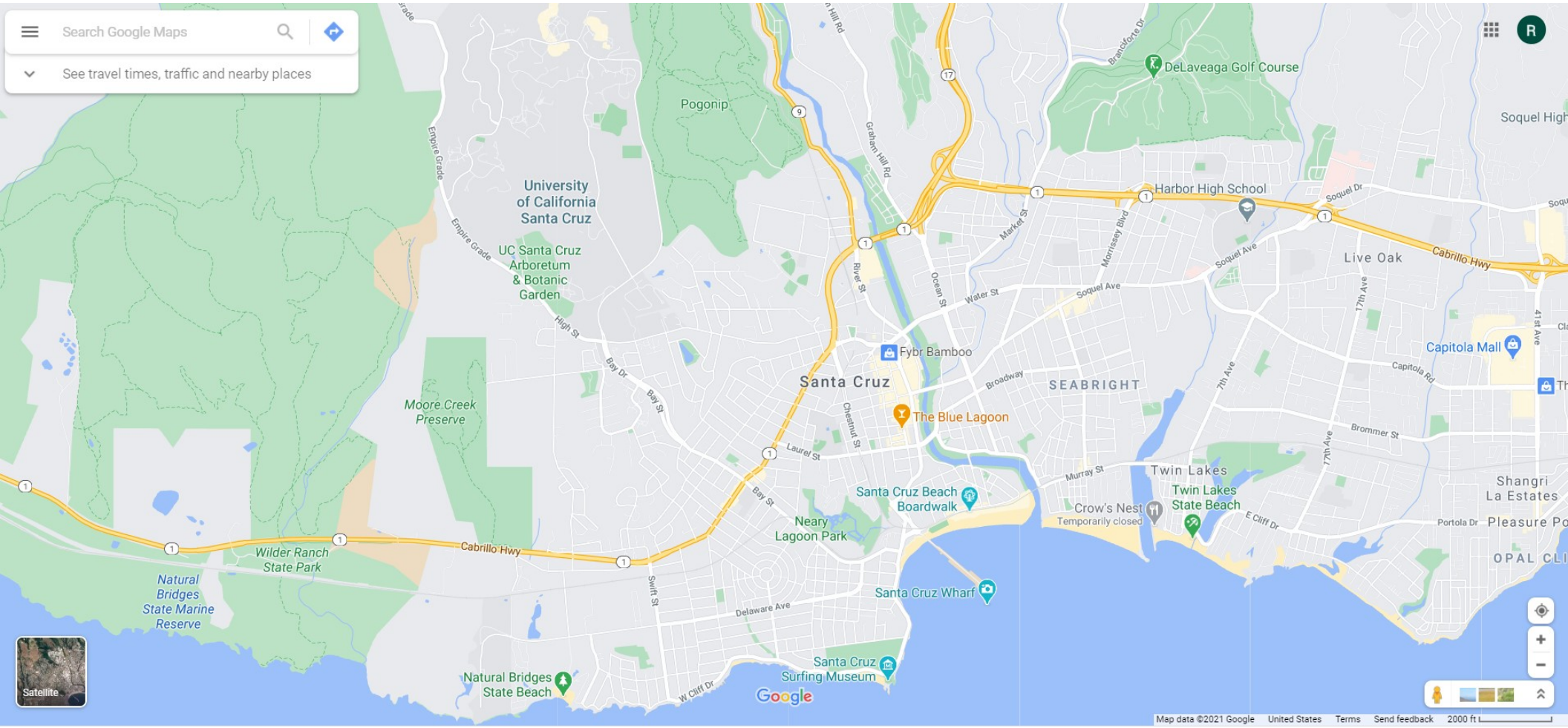
To help safeguard our community, please observe CDC guidance on stopping the spread of germs and review the Parks & Recreation COVID-19 page to keep up to date with our efforts to flatten the curve.

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
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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

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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Search & Select Map | Recorded Maps & Docs | Select & Query Layers | Measure & Lat/Long | Draw & Print | Links & Help

APN | Address | Street | Intersection

005-152-30, 005-152-31, 005-152-32, 005-152-33

Select Overlay

Select Base Map

Property Report

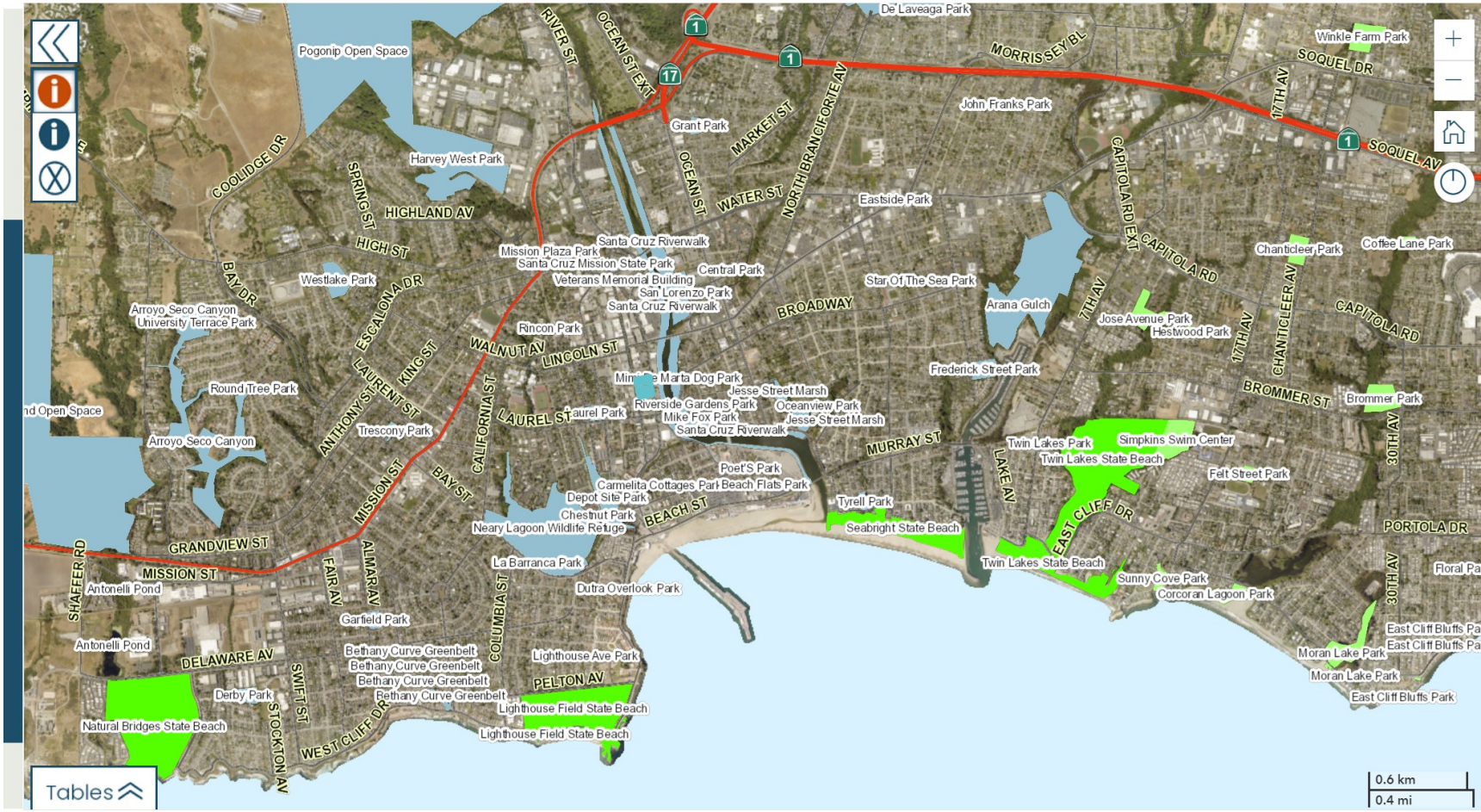
Zoning Report

- ADU parking exemption for transit proximity
- Rodeo Gulch Cannabis Overlay – SCCC 7.128/13.10
- Dispensary Exclusion Areas
- Vacation and Hosted Rentals
- Designated Areas Blocks (Vacation and Hosted Rentals)
- Designated Areas (Vacation and Hosted Rentals)
- Airport Safety Compatibility Zones
- Archeologic Reports
- Archeologic Resources
- Ag Resource Area
- Parks
  - City Park
  - County Park
  - State Park
- Important Farmlands
- Special Design Review
- No Shoot Areas
- Assessors Land Use

▸ General Plan

▸ Special Districts

▸ Jurisdictional, Elections, Census



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.

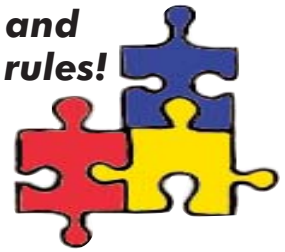
2 - Leash Your Dog

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

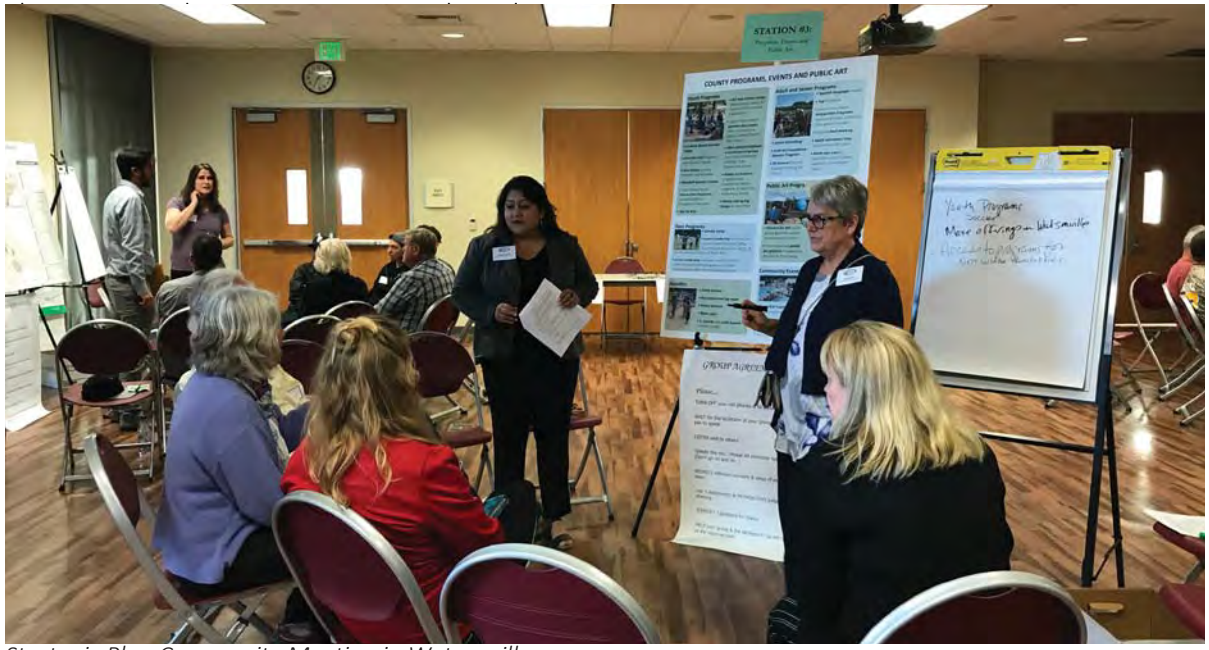
This document consolidates background information, community feedback, key findings and other information that was used to develop the vision, values, goals, objectives and strategies contained in this Strategic Plan. County Parks has gained a wealth of information about the community and the environment 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.

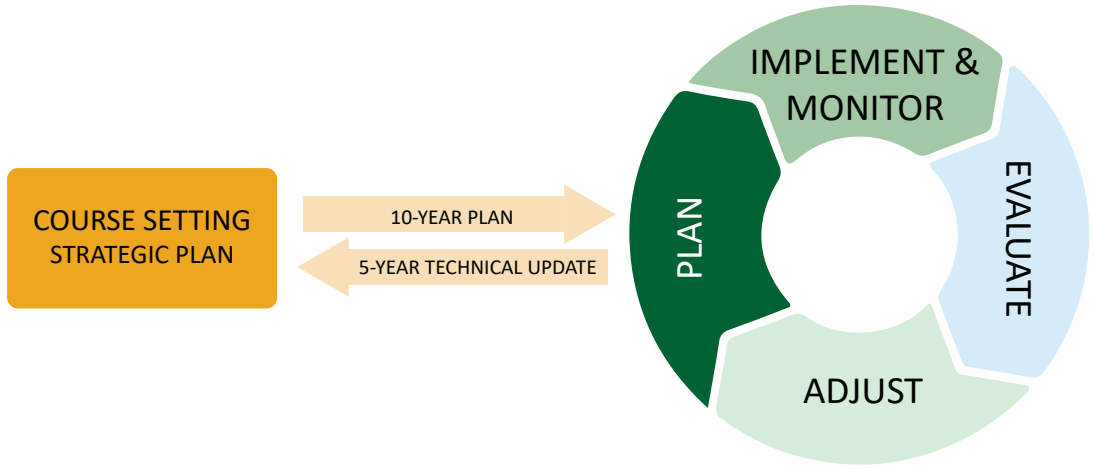
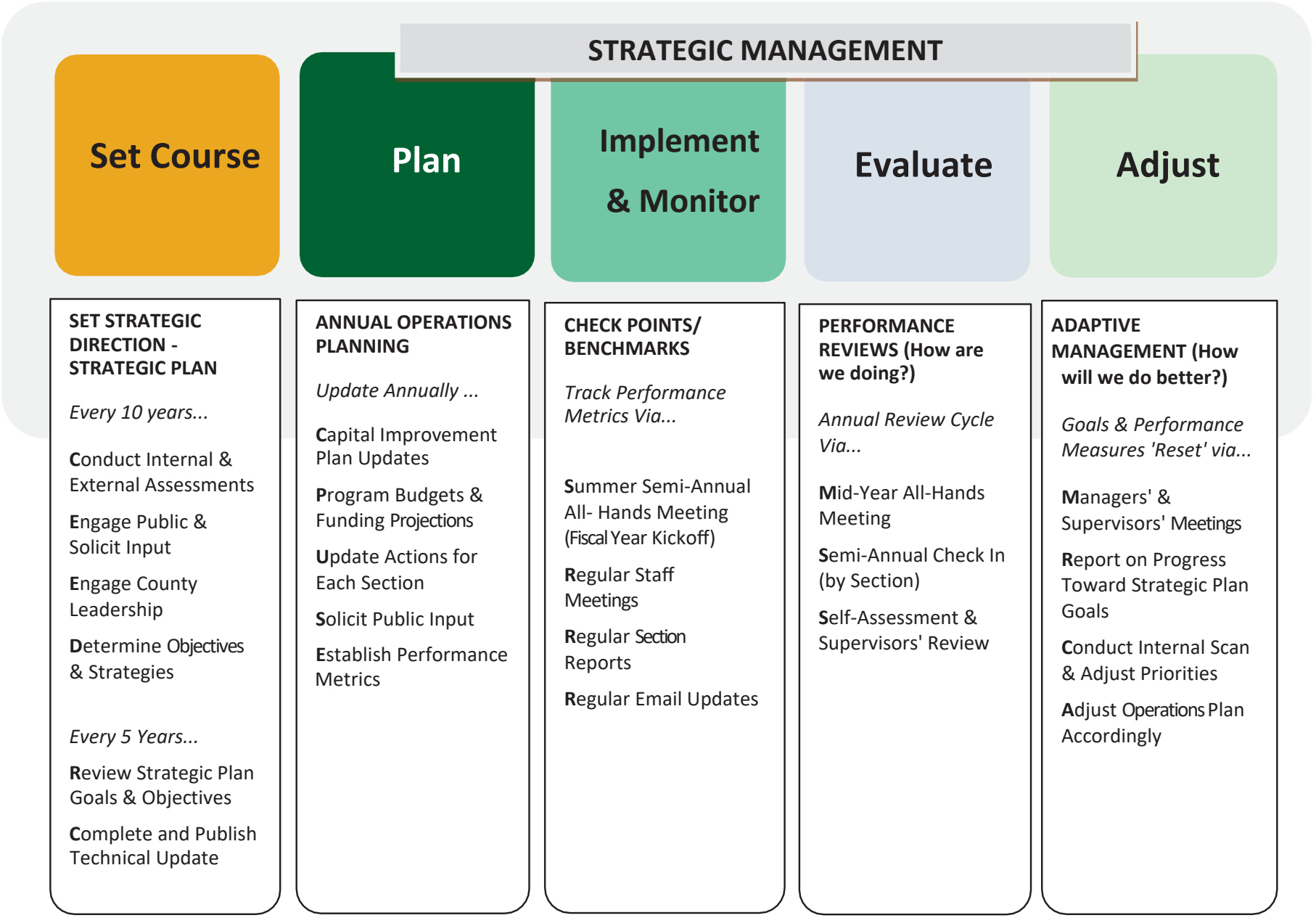


Figure 1: Strategic Improvement Cycle

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

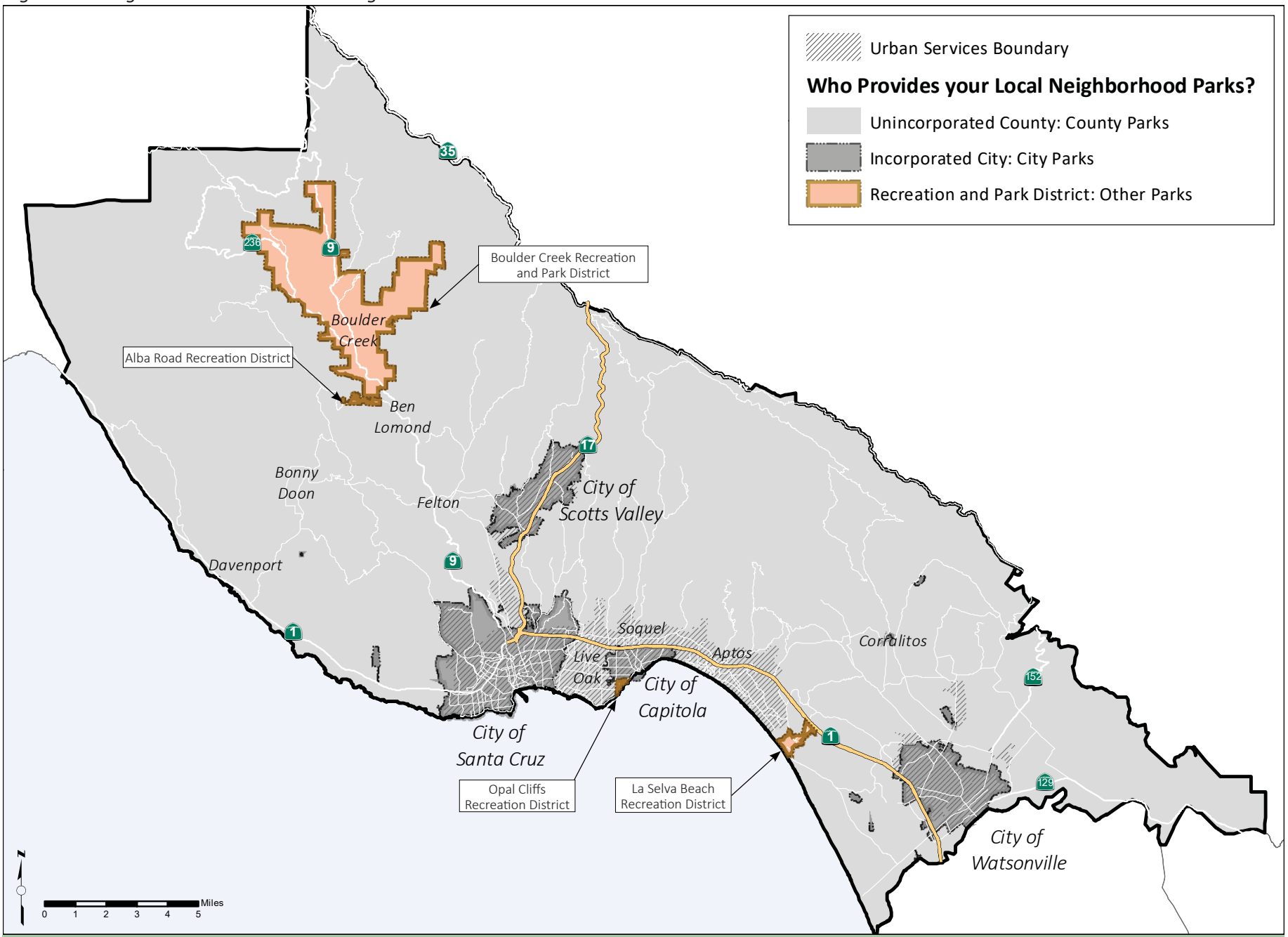
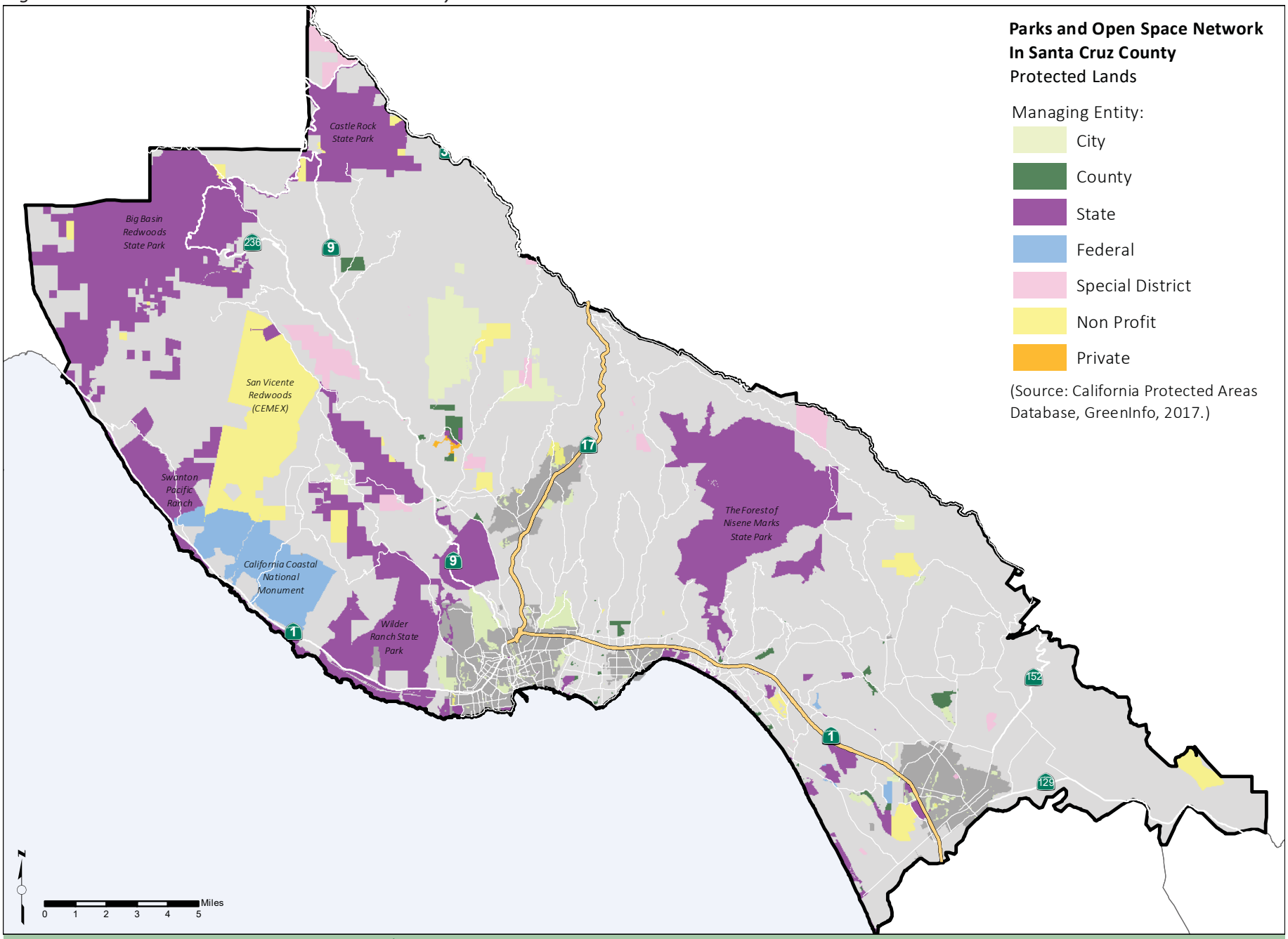


Figure 4: Protected Lands in Santa Cruz County



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.

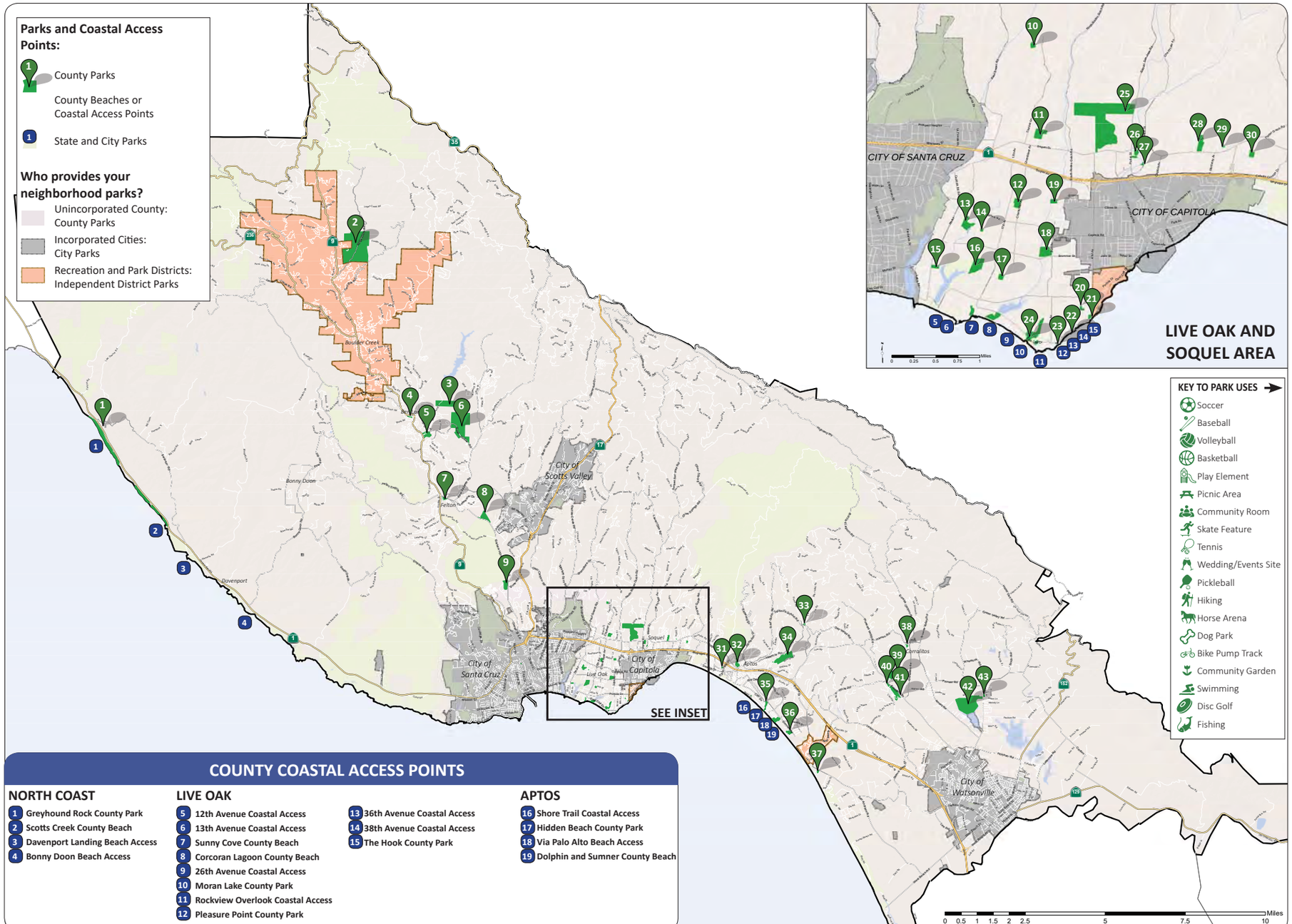
PLANNING AND DEVELOPMENT

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.

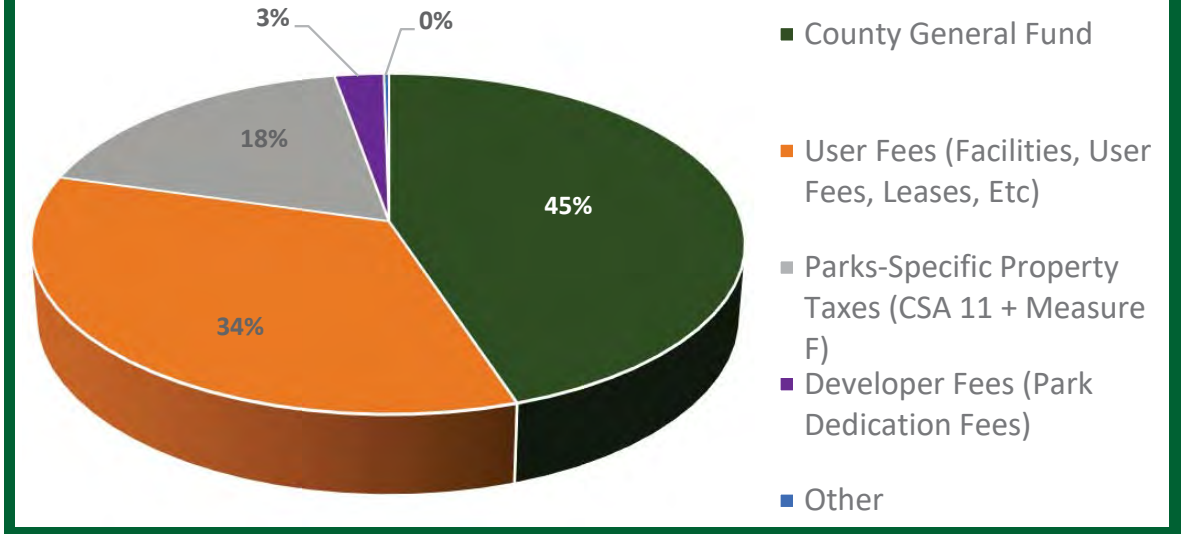


Figure 6: Parks Revenue Sources in Fiscal Year 2016/17

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.

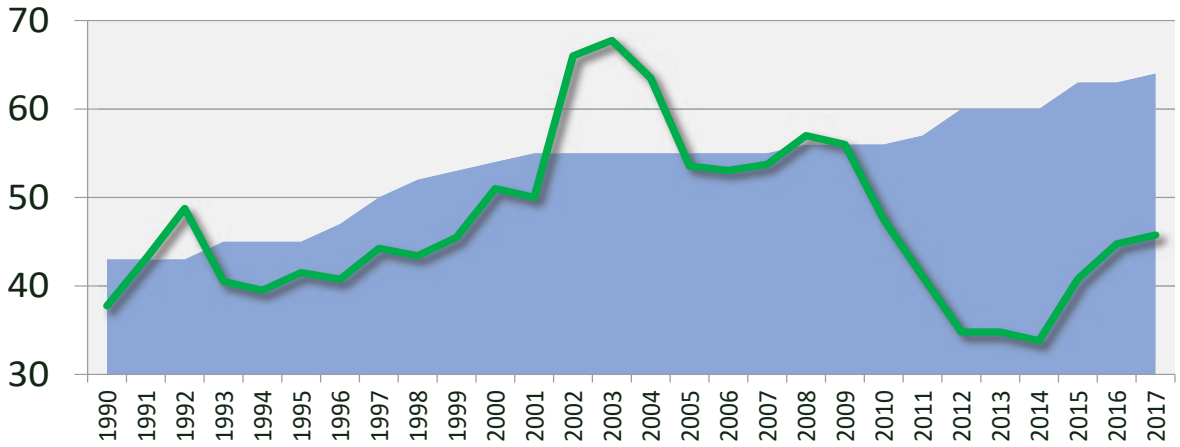
COUNTY GENERAL FUND CONTRIBUTION

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.

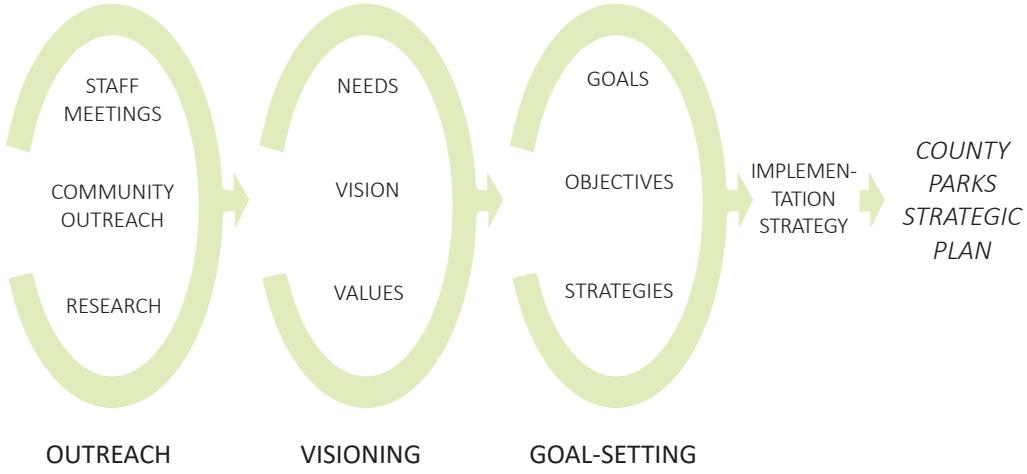


Figure 8: Strategic Plan Flow Chart

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

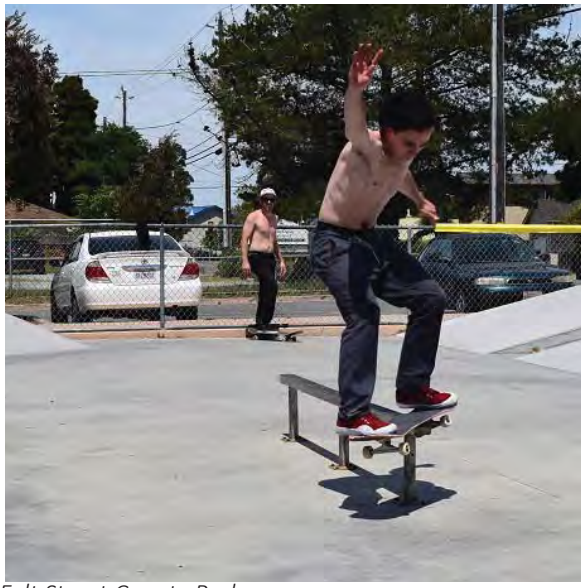
The heart of the engagement process was a series of five community meetings throughout the county on the topic of vision and priorities for the department's Strategic Plan. Over 190 people participated in these meetings, and participants shared a variety of perspectives on their vision and values and 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.

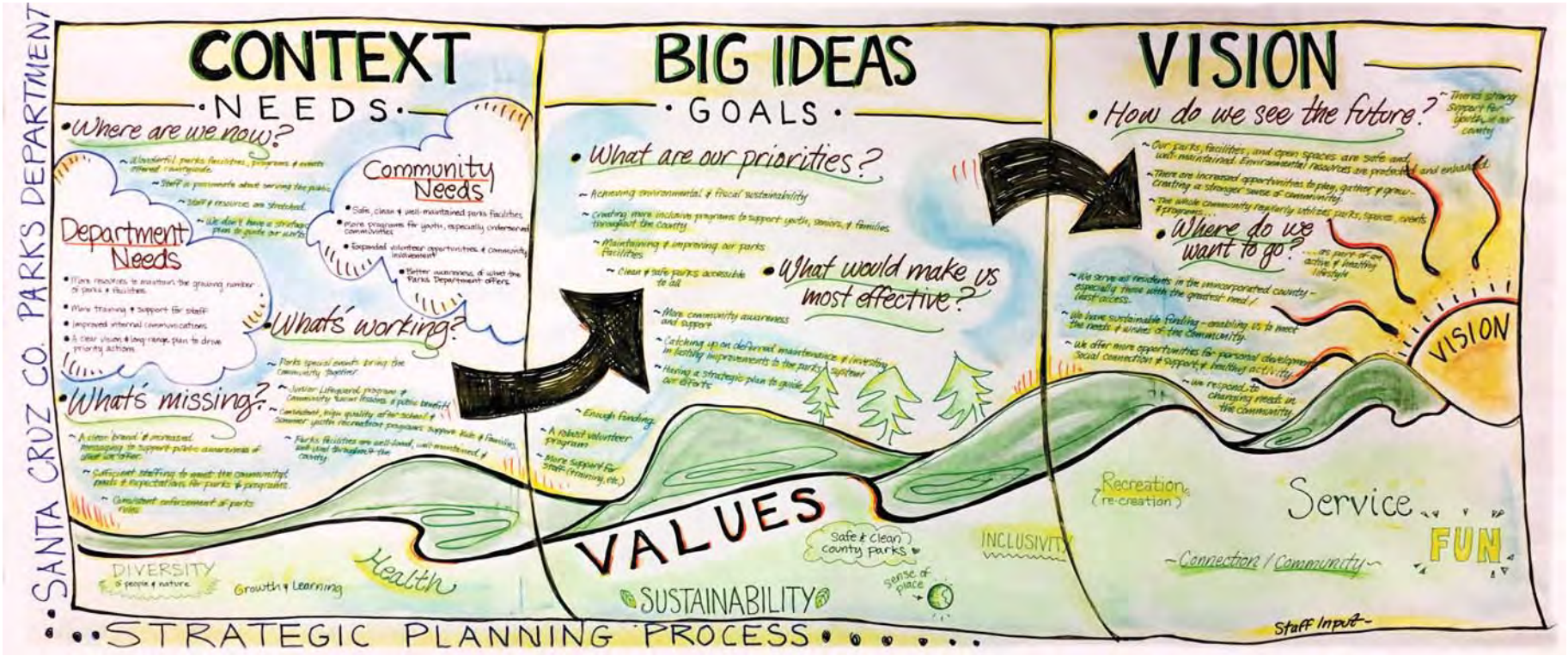


Figure 10: Key Themes and Ideas Received from Staff

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

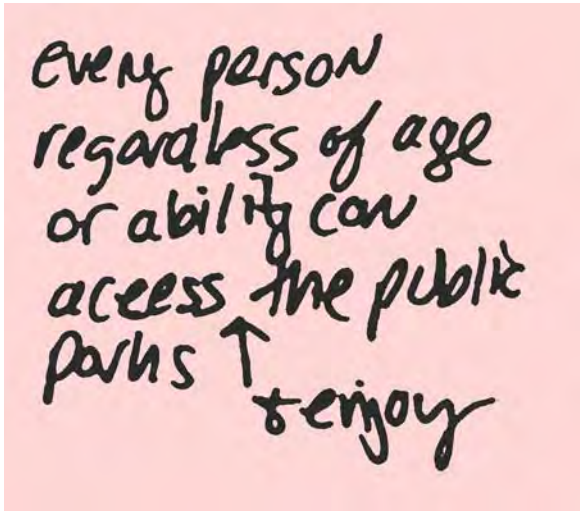
VISION

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.

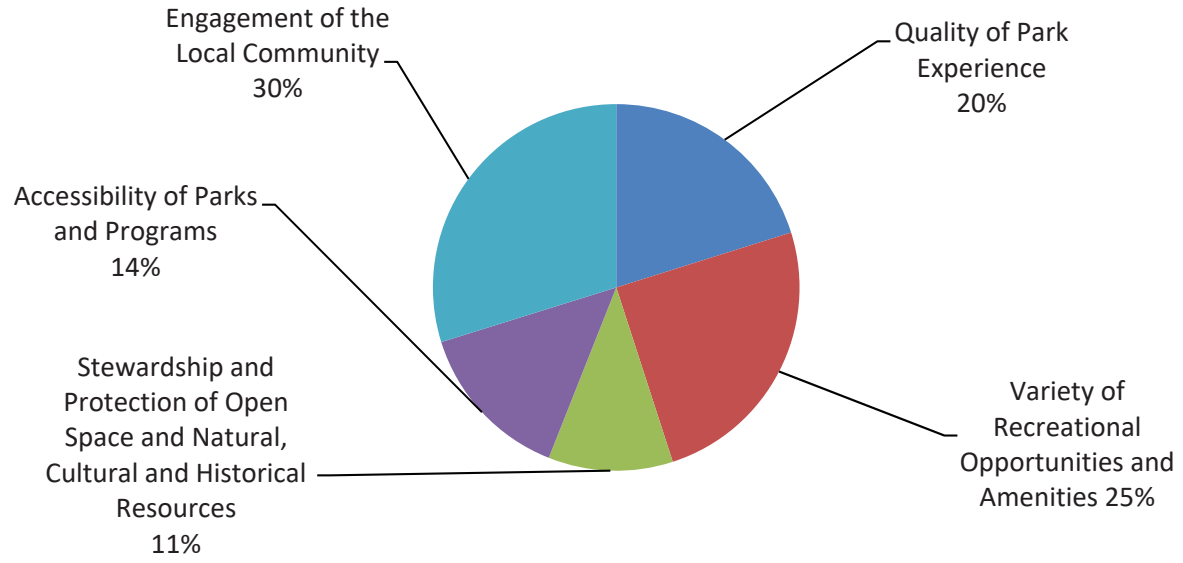
VARIETY OF RECREATIONAL OPPORTUNITIES AND AMENITIES

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

Search & Select Map | Recorded Maps & Docs | Select & Query Layers | Measure & Lat/Long | Draw & Print | Links & Help

APN | Address | Street | Intersection

005-152-30, 005-152-31, 005-152-32, 005-152-33

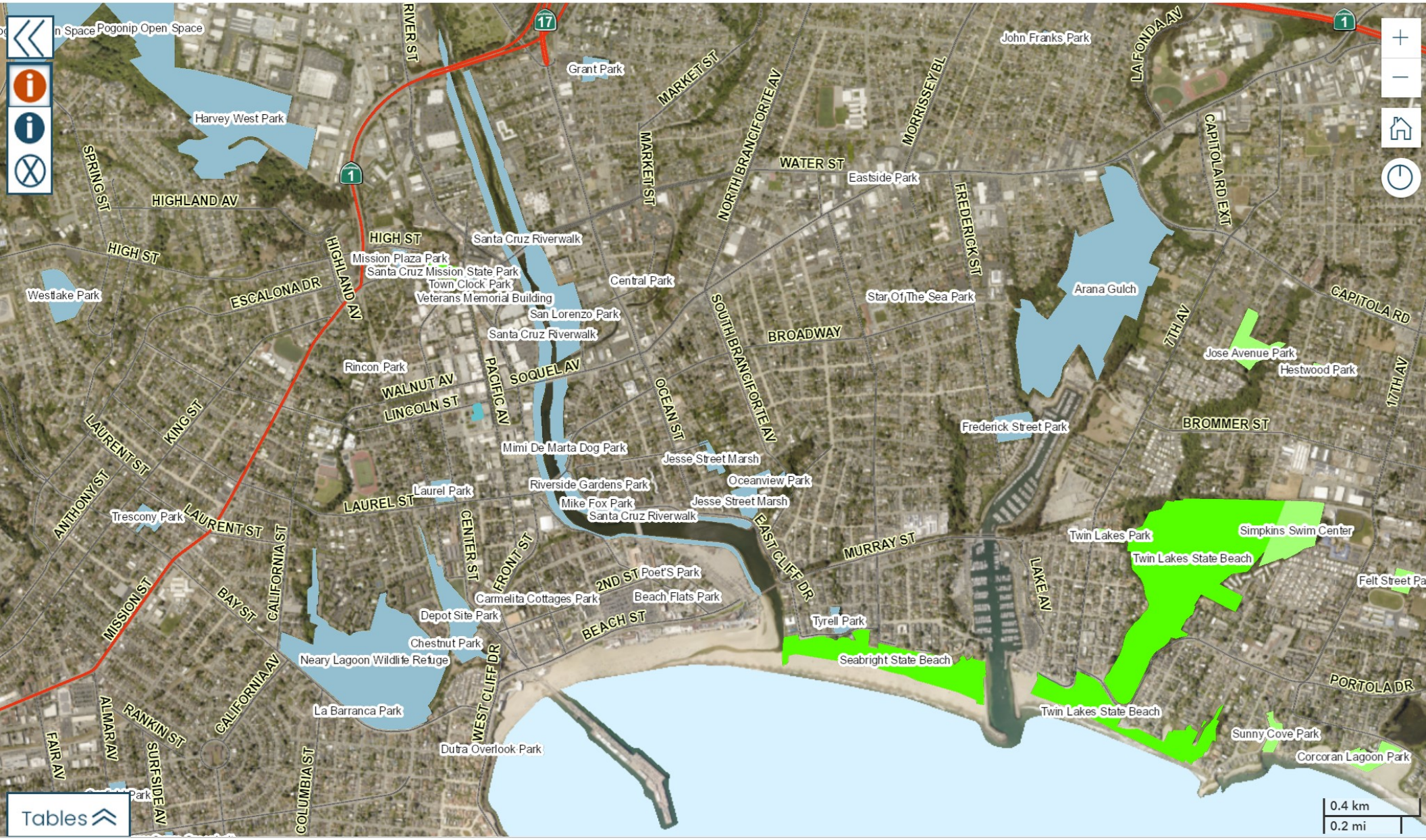
Select Overlay | Select Base Map | Property Report | Zoning Report

- ADU parking exemption for transit proximity
- Rodeo Gulch Cannabis Overlay – SCCC 7.128/13.10
- Dispensary Exclusion Areas
- Vacation and Hosted Rentals
- Designated Areas Blocks (Vacation and Hosted Rentals)
- Designated Areas (Vacation and Hosted Rentals)
- Airport Safety Compatibility Zones
- Archeologic Reports
- Archeologic Resources
- Ag Resource Area
- Parks
  - City Park
  - County Park
  - State Park
- Important Farmlands
- Special Design Review
- No Shoot Areas
- Assessors Land Use

General Plan

Special Districts

Jurisdictional, Elections, Census


Pogonip Open Space
Harvey West Park
Grant Park
John Franks Park
Eastside Park
Arana Gulch
Star Of The Sea Park
Jose Avenue Park
Hestwood Park
Frederick Street Park
Central Park
Santa Cruz Riverwalk
Mission Plaza Park
Santa Cruz Mission State Park
Town Clock Park
Veterans Memorial Building
San Lorenzo Park
Rincon Park
Westlake Park
Mimi De Marta Dog Park
Jesse Street Marsh
Oceanview Park
Riverside Gardens Park
Laurel Park
Mike Fox Park
Trescony Park
Carmelita Cottages Park
Beach Flats Park
Depot Site Park
Chestnut Park
Neary Lagoon Wildlife Refuge
La Barranca Park
Dutra Overlook Park
Poet'S Park
Tyrell Park
Seabright State Beach
Twin Lakes Park
Twin Lakes State Beach
Simpkins Swim Center
Felt Street Pa
Sunny Cove Park
Corcoran Lagoon Park
HIGHLAND AV
HIGH ST
WATER ST
BROADWAY
SOQUEL AV
WALNUT AV
LINCOLN ST
LAUREL ST
LAURENT ST
BEACH ST
MURRAY ST
BROMMER ST
PORTOLA DR
ESCALONA DR
CAPITOLA RD
CAPITOLA RD EXT
7TH AV
17TH AV
MARKET ST
NORTH BRANCIFORTE AV
SOUTH BRANCIFORTE AV
MORRISSEY BL
LA FONDA AV
FREDERICK ST
OCEAN ST
PACIFIC AV
HIGHLAND AV
RIVER ST
SPRING ST
KING ST
ANTHONY ST
MISSION ST
BAY ST
CALIFORNIA ST
CALIFORNIA AV
CENTER ST
FRONT ST
2ND ST
EAST CLIFF DR
LAKE AV
WEST CLIFF DR
RANKIN ST
ALMAR AV
FAIR AV
SURFSIDE AV
COLUMBIA ST
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APN | Address | Street | Intersection

005-152-30, 005-152-31, 005-152-32, 005-152-33

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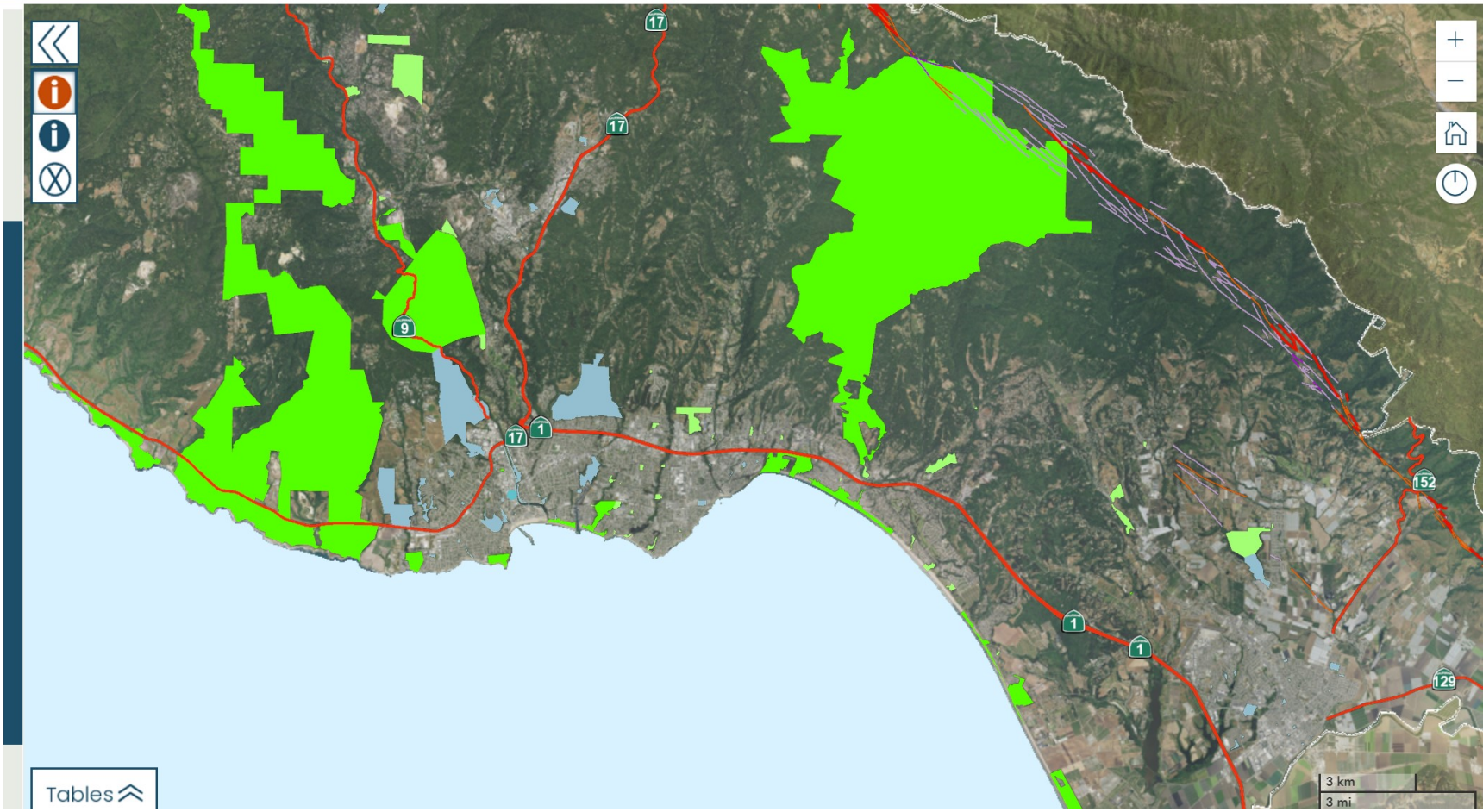
- ADU parking exemption for transit proximity
- Rodeo Gulch Cannabis Overlay – SCCC 7.128/13.10
- Dispensary Exclusion Areas
- Vacation and Hosted Rentals
- Designated Areas Blocks (Vacation and Hosted Rentals)
- Designated Areas (Vacation and Hosted Rentals)
- Airport Safety Compatibility Zones
- Archeologic Reports
- Archeologic Resources
- Ag Resource Area
- Parks
  - City Park
  - County Park
  - State Park
- Important Farmlands
- Special Design Review
- No Shoot Areas
- Assessors Land Use

General Plan

Special Districts

Jurisdictional, Elections, Census



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APN | Address | Street | Intersection

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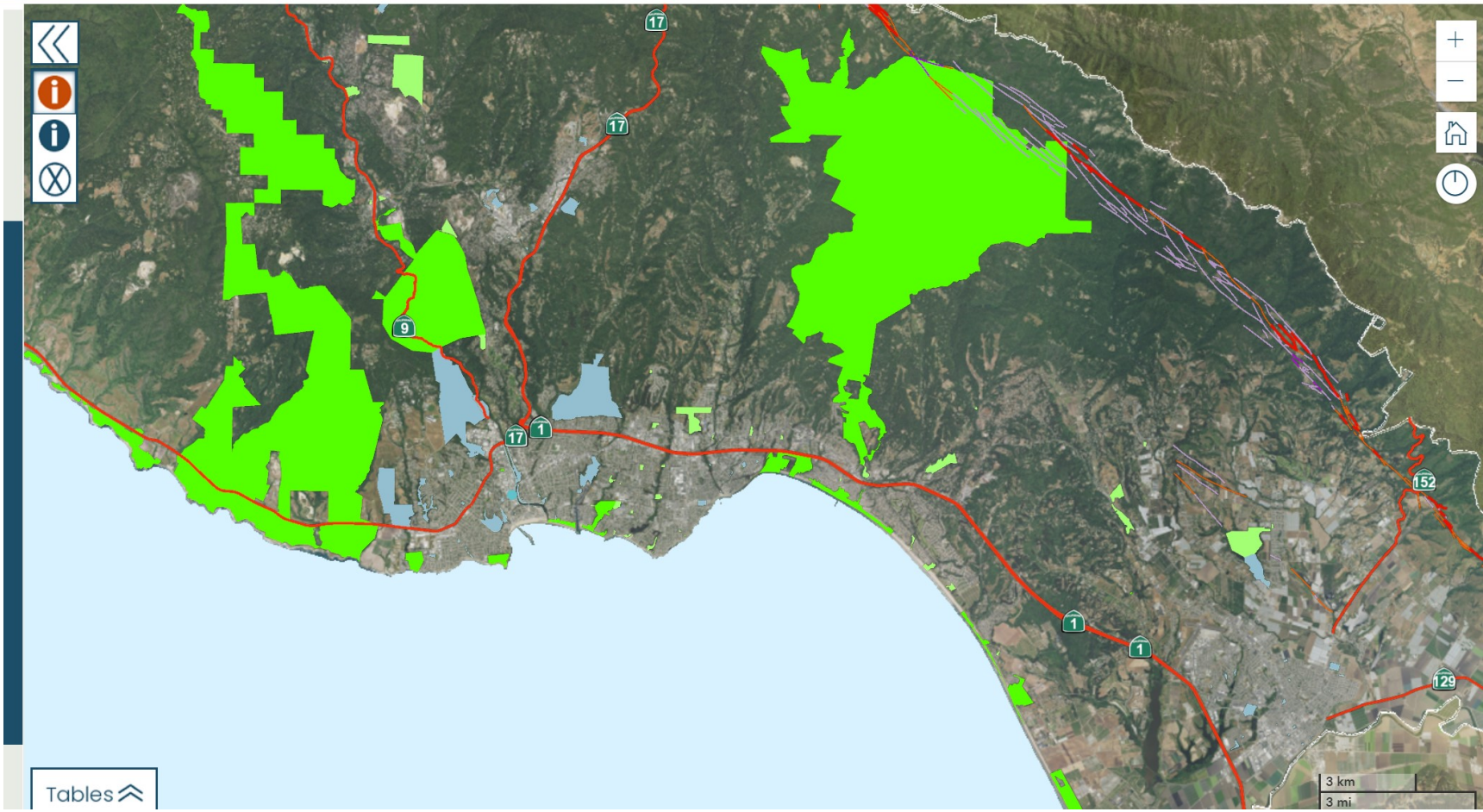

Neighborhood Policing Teams
City of Santa Cruz
About
Santa Cruz Police Department created five Neighborhood Policing Teams assigned to zones within the City of Santa Cruz. The Neighborhood Policing Teams will put more SCPD officers on the streets to increase community policing and activate crime-fighting strategies. SCPD officers are an integral part of their neighborhoods and, in partnership with the community, look to tackle the underlying causes of crime and safety issues and put sustainable solutions in place. For more information click here.
UPPER EASTSIDE NEIGHBORHOODS
UPPER WESTSIDE NEIGHBORHOODS
LOWER EASTSIDE NEIGHBORHOODS
LOWER WESTSIDE NEIGHBORHOODS
Santa Cruz
Soquel
Capitola
Twin Lakes
Baldwin Creek
Majors Creek
Moore Creek
Wilder Creek
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County of Santa Clara, County of Santa Cruz, Bureau of Land Management, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA | Esri, HERE
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Santa Cruz City Schools

113 Lincoln Street, Santa Cruz, California 95060,...

MySchool Locator

Showing Results for:

113 Lincoln Street, Santa Cruz, California 95060, United States

Explore the map:

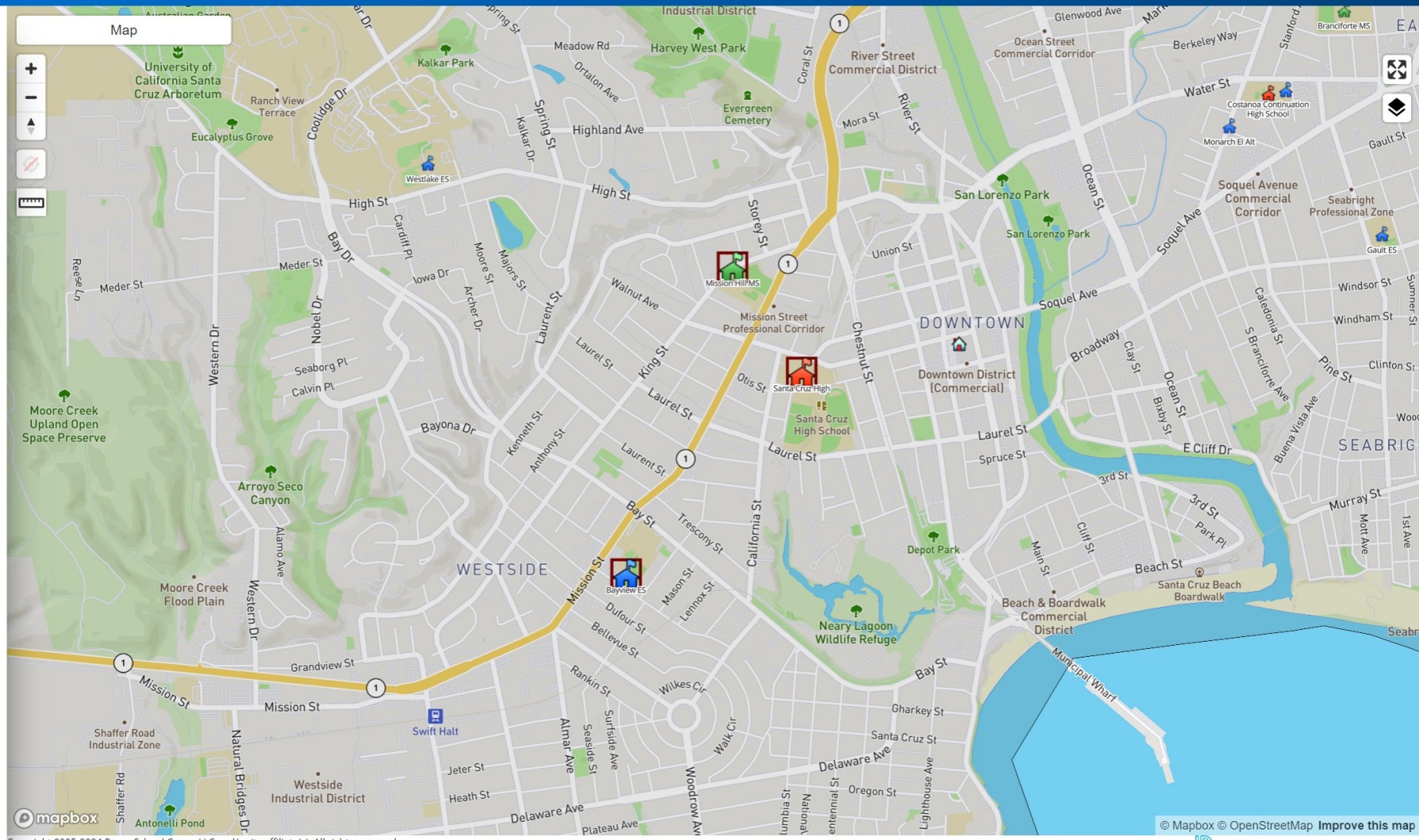
Top Left side Controls:

Top Right side Controls:

Browse assigned Schools:
Click on a school below to popup info on the map

- Bayview ES (K - 5)
  1231 Bay 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
DOWNTOWN
WESTSIDE
SEABRIG
Mission Hill MS
Santa Cruz High
Santa Cruz High School
Bayview ES
Westlake ES
Branciforte MS
Costanoa Continuation High School
Monarch El Alt
Gault ES
Industrial District
Harvey West Park
Kalkar Park
Evergreen Cemetery
University of California Santa Cruz Arboretum
Eucalyptus Grove
Ranch View Terrace
River Street Commercial District
Ocean Street Commercial Corridor
San Lorenzo Park
Soquel Avenue Commercial Corridor
Seabright Professional Zone
Mission Street Professional Corridor
Downtown District (Commercial)
Depot Park
Beach & Boardwalk Commercial District
Santa Cruz Beach Boardwalk
Neary Lagoon Wildlife Refuge
Municipal Wharf
Moore Creek Upland Open Space Preserve
Arroyo Seco Canyon
Moore Creek Flood Plain
Shaffer Road Industrial Zone
Westside Industrial District
Antonelli Pond
Swift Halt
Meadow Rd
Highland Ave
High St
Meder St
Walnut Ave
Laurel St
Bayona Dr
Seaborg Pl
Calvin Pl
Grandview St
Mission St
Bay St
Soquel Ave
Water St
Union St
Spruce St
E Cliff Dr
Beach St
Delaware Ave
Heath St
Jeter St
Plateau Ave
Oregon St
Santa Cruz St
Gharkey St
Windsor St
Windham St
Clinton St
Murray St
Park Pl
Mott Ave
1st Ave
Pine St
Broadway
Chestnut St
Ocean St
Cliff St
Main St
Water St
Gault St
Coolidge Dr
Western Dr
Natural Bridges Dr
Shaffer Rd
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Bellevue St
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Mason St
Lennox St
California St
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Anthony St
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Cardiff Pl
Iowa Dr
Moore St
Major's St
Archer Dr
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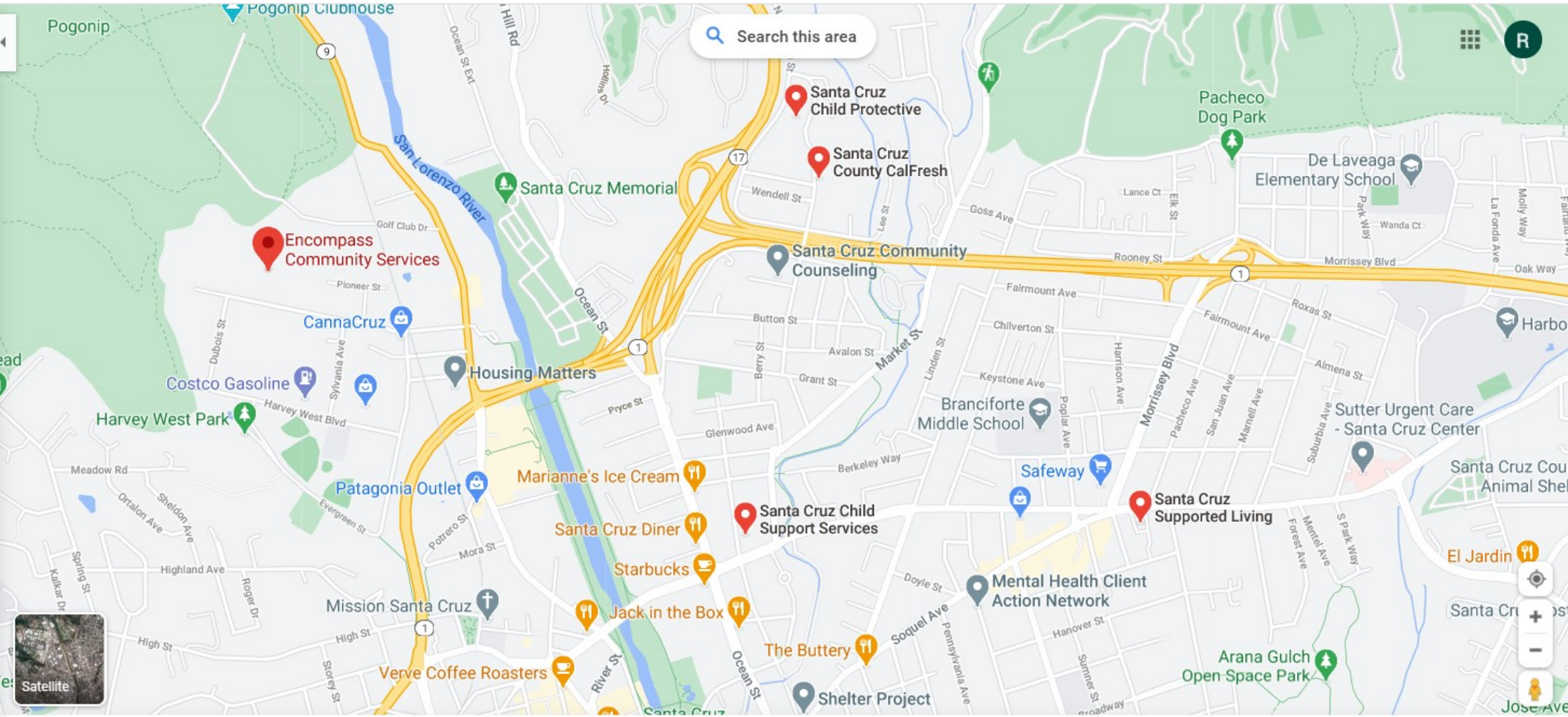

Court Community ...
No reviews
Non-profit organiz...
Website

Court Community ...
1.3 ★ (3)
Non-profit organiz...
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Santa Cruz Child S...
3.6 ★ (19)
Social services or...
Website

Santa Cruz County...
No reviews
County governmen...
Website

Encompass Com...
4.4 ★ (13)
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Website

Child and Adult Ca...
No reviews
Social services or...
Website

Pajaro Valley Loav...
4.5 ★ (46)
Social services or...
Website

Salvation Army
4.4 ★ (31) · $
Social services or...
Website

City of Santa Cruz

2020 Urban Water Management Plan

November 2021

Prepared by: City of Santa Cruz Water Department

City of Santa Cruz Water Department

Final Adopted

2020 Urban Water Management Plan

Santa Cruz City Council

Donna Meyers, Mayor
Sonja Brunner, Vice Mayor
Sandy Brown
Justin Cummings
Renee Golder
Shebreh Kalantari-Johnson
Martine Watkins

Water Commission

Sierra Ryan, Chair
Walt Wadlow, Vice Chair
Justin Burks
Tom Burns
Doug Engfer
Alejandro Páramo
Doug Schwarm

Rosemary Menard, Water Director
Heidi Luckenbach, Interim Water Director/
Deputy Water Director and Engineering Manager

Prepared by
Sarah Easley Perez, Principal Planner

Assisted by
Ben Pink, Environmental Programs Analyst II
Neal Christen, Water Conservation Representative
Margaret Haddon, Water Conservation Representative
Katy Fitzgerald, Administrative Assistant III

November 2021

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E Water/Sewer Service Affordability Analysis
F AWWA Water Audits 2015 - 2019
G SB X7-7 Compliance Verification Forms
H Santa Cruz Mid-County Groundwater Basin Groundwater Sustainability Plan
I Santa Cruz Regional Recycled Water Facilities Planning Study
J Desalination Feasibility Update Review Report
K Cooperative Water Transfer Pilot Project for Groundwater Recharge and Water Resource Management (2021 – 2026)
L Santa Cruz Water Rights Project Community Guide (English and Spanish)
M Water Supply Augmentation Strategy Schedule
N Water Department Capital Investment Program Fact Sheets
O 2021 Water Shortage Contingency Plan Appendix
P Local Hazard Mitigation Plan(s)
Q Santa Cruz Municipal Code Chapters 16.01,16.02, and 16.16
R Long-Range Financial Plan
S Proposition 2018 Notice on Proposed Rates
T Final Urban Water Management Plan Documentation

ACRONYMS AND ABBREVIATIONS

ACS	American Community Survey
AMBAG	Association of Monterey Bay Area Governments
AMI	Advanced Metering Infrastructure
AMR	Automated Meter Reading
ASR	Aquifer Storage and Recovery
AWWA	American Water Works Association
CCF	Centium Cubic Feet
CCLEAN	Central Coast Long-Term Environmental Assessment Network
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFS	Cubic feet per second
CIMIS	California Irrigation Management Information System
CMIP3	Geophysical Fluid Dynamics Laboratory Coupled Model or GFDL2.1
CMIP5	Coupled Model Intercomparison Project 5
DRA	Drought Risk Assessment
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
F	Fahrenheit
FESA	Federal Endangered Species Act
GFDL2.1	Geophysical Fluid Dynamics Laboratory Coupled Model or CMIP3
GHWTP	Graham Hill Water Treatment Plant
GPCD	Gallons per capita per day
GPF	Gallons per Flush

GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HCP	Habitat Conservation Plan
IN	Inches
IRF	Infrastructure Reinvestment Fee
IRWM	Santa Cruz Integrated Regional Water Management Group
IWA	International Water Association
LAFCO	Local Agency Formation Commission (of Santa Cruz County)
LHMP	Local Hazard Mitigation Plan
LRDP	Long Range Development Plan
MG	Million Gallons
MGA	Santa Cruz Mid-County Groundwater Agency
MGD	Million gallons per day
MGY	Million gallons per year
NMFS	NOAA National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
RUWMP	Regional Urban Water Management Plan
RWFPS	Recycled Water Facilities Planning Study
SCMU	Santa Cruz Municipal Utility
SGMA	Sustainable Groundwater Management Act
SMGA	Santa Margarita Groundwater Agency
SWMP	Storm Water Management Program
UCSC	University of California, Santa Cruz
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
WCMP	Water Conservation Master Plan

WELO	Water Efficient Landscape Ordinance
WSAC	Water Supply Advisory Committee
WSAS	Water supply Augmentation Strategy
WSCP	Water Shortage Contingency Plan
WWTF	Wastewater Treatment Facility

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 (UWMP), 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 – 10657. 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. These sections of Water Code, as of January 1, 2020, are included as Appendix A of the 2020 Urban Water Management Plan Guidebook (CA DWR, 2021).

1.2 Recent Changes to the Water Code

The Act has continued to be revised and expanded since the preparation of the 2015 UWMP driven by issues such as prolonged droughts, groundwater overdraft, regulatory modifications, and changing climatic conditions.

Recent legislative amendments to the Water Code since 2015 include the following:

- Five Consecutive Dry-Year Water Reliability. The dry-year water reliability assessment, which examines reliability over a twenty to twenty five year planning horizon was modified to consider a drought lasting five consecutive water years.

- Drought Risk Assessment. This new assessment requires examination of water supply reliability over a five-year period from 2021 to 2025 under a reasonable prediction for five consecutive dry years.

- Seismic Risk. Seismic risk to water facilities is now a required assessment.

- Energy Use Information. Readily obtainable information on estimated amounts of energy for water uses is now required to be included in the UWMP.

- Water Loss Reporting for Five Years. The UWMP now requires the past five years of water loss audit reports to be included.

- Water Shortage Contingency Plan. Specific elements are now required in the more prescriptive Water Shortage Contingency Plan.

- Groundwater Supplies Coordination. Consistency with Groundwater Sustainability Plans in areas where those plans have been completed by a Groundwater Sustainability Agency is now required.

- Lay Description. There is a new statutory requirement for an easy to understand description of the fundamental determinations of the UWMP, specifically regarding water service reliability, challenges ahead, and strategies for managing reliability risks.

A summary of the changes to the Water Code since 2015 is included as Appendix B of the 2020 Urban Water Management Plan Guidebook (DWR, 2021).

1.3 Report Format

For this 2020 submittal cycle, the City has elected to utilize the basic structure and organization used in the 2015 UWMP, which is in alignment with 2020 Urban Water Management Plan Guidebook (DWR, 2021). Required content is grouped by topic as follows:

Chapter 1 – Introduction and Overview: This chapter covers the background, purpose, and scope of an Urban Water Management Plan and includes the lay description.

Chapter 2 – Plan Preparation: This chapter covers the process used to develop the 2020 plan, including efforts in coordination and outreach.

Chapter 3 – System Description: This chapter describes the City's water service area including population, climate, and other factors affecting the City's water management planning, including governance and the City of Santa Cruz Water Department's organizational structure.

Chapter 4 – System Water Use: This chapter 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 – Conservation Target Compliance: This chapter provides information about the City's baseline per capita water use and urban water use targets and success in achieving its 2020 target.

Chapter 6 – System Supplies: This chapter describes and quantifies the current and projected sources of water available to the City, including surface water, groundwater, recycled water, transfers, and future water projects that support the City's Water Supply Augmentation Strategy including the Santa Cruz Water Rights Project, and the Santa Cruz Water Program. Climate change impacts to water supply and energy use are also addressed in this chapter.

Chapter 7 – Water Supply Reliability and Drought Risk Assessment: This chapter characterizes the reliability of the City water supply system over a 25-year planning horizon under differing hydrologic conditions including normal/average year, single dry year, and a five consecutive dry year scenarios. The five-year Drought Risk Assessment is also included in this chapter. These analyses are conducted using both historic hydrology and a projected climate change hydrology.

Chapter 8 – Water Shortage Contingency Planning: This chapter in combination with Appendix O, Water Shortage Contingency Analysis and Implementation, comprise the City's 2021 Water Shortage Contingency Plan. It summarizes the City's plan for addressing water shortages and describes actions that would be undertaken in response to a catastrophic interruption of water supplies.

Chapter 9 – Demand Management Measures: This chapter describes the measures currently being implemented by the City to promote conservation and discusses the future water conservation activities.

Chapter 10 – Plan Adoption, Submittal, and Implementation: This chapter describes the steps taken to adopt and submit the Urban Water Management Plan and Water Shortage Contingency Plan and to make the plan available for public use and reference.

1.4 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.

1.5 UWMPs and Funding Eligibility

In order for an urban water supplier to be eligible for any state water grants or loans administered by California Department of Water Resources, the agency must have a current Urban Water Management Plan on file that has been determined by California Department of Water Resources to address the requirements of the Water Code.

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 water use target and report compliance in its 2020 Urban Water Management Plan.

1.6 2020 Urban Water Management Plan Lay Description

This document constitutes the seventh update of the City's Urban Water Management Plan. Since 1986, the City has prepared the following plans:

- 1985 UWMP adopted 1986,
- 1990 UWMP, adopted 1991,
- 1995 UWMP, adopted 1996,
- 2000 UWMP, adopted 2001,
- 2005 UWMP, adopted 2006,
- 2010 UWMP, adopted 2011, and
- 2015 UWMP, adopted 2016.

The plan was most recently updated and adopted in 2016. This 2020 Urban Water Management reflects current system circumstance and events in 2020.

A lay description of the fundamental determinations of this Urban Water Management Plan is provided below:

1.6.1 System Water Use and Water Demand

Until the early 2000s, the general trend in the City of Santa Cruz water system use 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 two years of water rationing, annual water use fell to a level of about 2.5 billion gallons, similar to the level experienced during the 1970s drought. In 2020, demand was still at a similar level as 2015, about 2.6 billion gallons, despite several years above long-term average rainfall from 2016 and 2020. While demand did rebound following droughts in the 1970s and 1980s, demand has not rebounded to pre-drought conditions following 2014, contrary to previous projections. Current projections forecast that water use over the next 25 years, including projected population growth, will increase at a very slow rate to reach approximately 2.8 billion gallons per year by 2045. For additional details, see Chapter 4 of this Urban Water Management Plan.

1.6.2 Conservation Target Compliance

The Water Conservation Act of 2009, also known as SB X7-7, required the State to reduce urban per capita water use by 20 percent by the year 2020. Each retail urban water supplier was required to determine a target water use for the year 2020 in order to help the State achieve the 20 percent reduction. The City of Santa Cruz' target gross per capita water use[1] for 2020 was 110 gallons per capita per day (GPCD) as determined in accordance with California Department of Water Resources' technical methodologies. In 2020, the City's gross per capita water use was 74 GPCD. This 2020 gross per capita water use is far below the 2020 target, and the City is in compliance with all requirements of Senate Bill X7-7. For additional details, see Chapter 5 of this Urban Water Management Plan.

1.6.3 Existing System Water Supply

The Santa Cruz water system relies predominantly on local surface water supplies, which include the North Coast sources (Liddell Spring and Laguna, Majors, and Reggiardo Creeks), the San Lorenzo River, and Loch Lomond Reservoir. Together, these surface water sources represent the majority of the City's total annual water production used to meet system demand. The balance of the City's supply comes from groundwater, all of which is extracted from the Beltz Well system in the Purisima Formation in the Santa Cruz Mid-County Groundwater Basin. During the past decade, the North Coast sources represented 23 percent of the total water supply, the San Lorenzo River represented 56 percent, Loch Lomond Reservoir (Newell Creek) represented 15 percent, and the Beltz Well system contributed the remaining 5 percent.

The City does not currently operate a recycled water system in its service area; however, the Pasatiempo Golf Course, located within the City's service area, now receives disinfected secondary effluent from the City of Scotts Valley that it treats to tertiary standards at the Pasatiempo Golf Course Tertiary Plant for use as recycled water golf course irrigation. This reduces the demand for potable water from the Santa Cruz water system that would otherwise be used for irrigation.

For additional details, see Chapter 6 of this Urban Water Management Plan.

1.6.4 Future Water Projects

As described in Section 1.6.5 below, the City of Santa Cruz is vulnerable to water shortages during multiple dry year periods and as such faces potential obstacles in meeting its future water supply needs. This is primarily due to the limitation in when and how much

[1] Gross water use is the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier.

water is available to meet system demand, exacerbated by a lack of storage within the system. To address these limitations, the City is actively planning and implementing a number of projects and major investments in the water system designed to secure future water supply reliability. Major projects are described below. For additional details on these projects, see Chapter 6 of this Urban Water Management Plan.

1.6.4.1 Water Supply Augmentation Strategy

Since 2015, the City of Santa Cruz has been pursuing a Water Supply Augmentation Strategy (WSAS) developed by the Water Supply Advisory Committee. The Water Supply Advisory Committee was a citizen committee formed in 2014 by Santa Cruz City Council with the charge to analyze potential solutions to deliver a safe, adequate, reliable, affordable and environmentally sustainable water supply for the City of Santa Cruz. The WSAS portfolio elements, which are being pursued on a concurrent timeline, and current progress are summarized below:

- **Element 0: Demand Management**. Demand Management, or conservation, is not considered a water supply for the purposes of the UWMP, and is discussed in Chapter 9 of this Urban Water Management Plan.
- **Element 1: Transfers and Exchanges**. The City has been piloting water transfers to the Soquel Creek Water District since 2018, as water supplies are available, under a cooperative piloting agreement that extends through 2025. The Santa Cruz Water Rights Project Draft Environmental Impact Report, described below, examines implementation of water transfers and exchanges with local water districts, the Soquel Creek Water District, Central Water District, Scotts Valley Water District, and San Lorenzo Valley Water District, that would be facilitated by the proposed water rights modifications to place of use.
- **Element 2: Aquifer Storage and Recovery**. The City has been evaluating the feasibility of ASR in both the Santa Cruz Mid-County and in the Santa Margarita Groundwater Basins, with current work primarily focused on the portion of Santa Cruz Mid-County Basin within the City of Santa Cruz service area. Pilot testing has been conducted at the existing Beltz 8 and Beltz 12 well facilities to better understand potential water quality and operational constraints. The Santa Cruz Water Rights Project Draft Environmental Impact Report, described below, examines implementation of ASR that would be facilitated by the proposed water rights modifications. Next steps include consideration of longer-term demonstration of ASR at existing Beltz Well system facilities.

- **Element 3: Recycled Water or Desalination**. Following completion of the 2017 Desalination Feasibility Update Review Report (Appendix J), further study of recycled water has been prioritized over study of seawater desalination. The City is continuing to examine the use of recycled water through commissioned engineering studies. The 2018 Recycled Water Facilities Planning Study (Appendix I) recommendation includes two projects that would provide non-potable reuse in the City:
  - Santa Cruz Public Works Department Title 22 Upgrade Project
  - BayCycle Project

  The City is also committed to exploring other reuse opportunities, including:
    - Coordination with Soquel Creek Water District's Pure Water Soquel project
    - Explore Groundwater Replenishment Reuse at Beltz Well system
    - Explore Groundwater Replenishment Reuse in Santa Margarita Groundwater Basin

  The City of Santa Cruz is continuing to actively investigate the feasibility of recycled water though an ongoing Phase 2 Regional Recycled Water Facilities Planning Study.

1.6.4.2 Santa Cruz Water Rights Project

The Santa Cruz Water Rights Project supports the implementation of the WSAS and involves the modification of the City's existing water rights to increase the flexibility of the water system by improving the City's ability to utilize surface water within existing allocations. This project also incorporates into the City's water rights bypass flow requirements for all of the City's surface water sources which are protective of local anadromous fisheries (Agreed Flows). The success of this project is necessary for fisheries protection and to facilitate future water supply projects. The primary components of the Santa Cruz Water Rights Project include:

- **Water rights modifications** related to place of use, method of diversion, points of diversion and rediversion, underground storage and purpose of use, extension of time, and stream bypass requirements for fish habitats;
- **Water supply augmentation components**, including new aquifer storage and recovery (ASR) facilities at unidentified locations, ASR facilities at the existing Beltz Well facilities, water transfers and exchanges and intertie improvements; and
- **Surface water diversion improvements**, including the Felton Diversion fish passage improvements and the Tait Diversion and Coast Pump Station improvements.

State Water Resources Control Board noticed the City's water rights change petitions on February 10, 2021. Subsequently, the project's Draft EIR was released for public review in summer 2021. The Final EIR, to be prepared addressing comments received on the Draft EIR, is expected to be completed in late 2021 or early 2022. Once completed, the Santa Cruz City Council will consider project approval and certification of the EIR and the State Water Resources Control Board will consider action on the City's water rights change petitions. The Santa Cruz Water Rights Project Community Guide is included as Appendix L.

1.6.4.3 Santa Cruz Water Program (Capital Investment Program)

City of Santa Cruz has embarked on an ambitious capital investment program, the Santa Cruz Water Program, to secure its future water supply portfolio, to improve reliability and resiliency in the face of climate change, and to address aged infrastructure. Major investments are planned in the coming years to advance toward a twenty-first century water system. Information on all projects included in the Program is included in Appendix N. Elements of the Santa Cruz Water Program Program that will help contribute to support implementation of the WSAS and support water supply reliability include the following.

- **Graham Hill Water Treatment Plant Projects**. Upgrades to the City's Graham Hill Water Treatment Plant are critical to the implementation of the WSAS to allow treatment of higher turbidity source water that otherwise would need to be bypassed during high flow periods such as during and after storm events. Recent and ongoing projects include major maintenance repairs to the flocculation, sedimentation and filtration basins, and replacement of three of the four concrete tanks. Simultaneous with these component repair and replacement projects, staff has been developing the Facilities Improvement Project. The project is a comprehensive evaluation of the facility that identifies the most cost-effective improvements to meet water treatment objectives and improve the overall reliability and resiliency of the plant. These investments are designed to address aging infrastructure, prevent noncompliance with drinking water standards under anticipated future conditions, and support mission-critical values of supplying adequate, safe, and reliable water for the City's customers.
- **Raw Water Transmission Pipeline Projects**. The City is planning improvements to raw water conveyance by upgrades to both the Newell Creek Pipeline and segments of the North Coast system. These projects will improve reliability and reduce hydraulic constraints to improve delivery of raw water to the Graham Hill Water Treatment Plant.
- **Tait Diversion Improvements**. The City is also investigating improvements to the Tait Diversion facility that would improve reliability and fish screening. As described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, if the Tait Diversion is added as a new point of diversion to existing Felton water rights,

Tait Diversion capacity would be increased to accommodate the combined diversion of water under both the Tait and the Felton water rights at this facility.

1.6.5 Water Service Reliability Analyses

The Drought Risk Assessment (DRA) is a new requirement in the 2020 Urban Water Management Plan. The assessment includes a supply and use comparison looking ahead assuming drought conditions over the next five years, 2021 - 2025. In this Urban Water Management Plan, the period 1973 – 1977 is used as the DRA and five-consecutive-year drought in the reliability assessment because it is the period in the historic record that would pose the greatest challenge to the City's water supply system. The City also conducted a parallel analysis utilizing a projected climate change hydrology and five-year consecutive drought. Based on anticipated timing of certification of the Santa Cruz Water Rights Project Environmental Impact Report and action by the State Water Resources Control Board on proposed water rights modifications, the City's proposed water rights modifications, including implementation of the Agreed Flows which are protective of local anadromous fisheries, are assumed for 2022 through 2025 of the DRA, but are not assumed in the first year of the analysis.

Figure 1-1 presents the results of the DRA and anticipated supply from each source. This analysis shows that projected supply would meet projected demand for the first four years of the extended five-year drought, but that in the fifth year, a substantial, 27 percent, shortage is projected. This projected shortage would require aggressive reduction savings according to the City's Water Shortage Contingency Plan. During an extended drought period, however, the City would likely utilize the Water Shortage Contingency Plan and implement demand reduction requirements in earlier years before an actual shortage is experienced, to ensure adequate supplies remain in Loch Lomond Reservoir, thereby potentially reducing the depth of shortage experienced in the fifth year.

The City also conducted Drought Risk Assessment utilizing a selected climate change projection. Figure 1-1C illustrates the City's water supply by source that is projected to be utilized under this climate change projection. The vulnerability of flowing sources, the North Coast Streams and San Lorenzo River, to drought can be seen in the rapid drop of availability of these sources between years two and three in this scenario. Subsequently, the inability to refill Loch Lomond Reservoir during ensuing dry years, leads to two successive years of projected substantial supply shortages.

Figure 1-1: Drought Risk Assessment Supply by Source

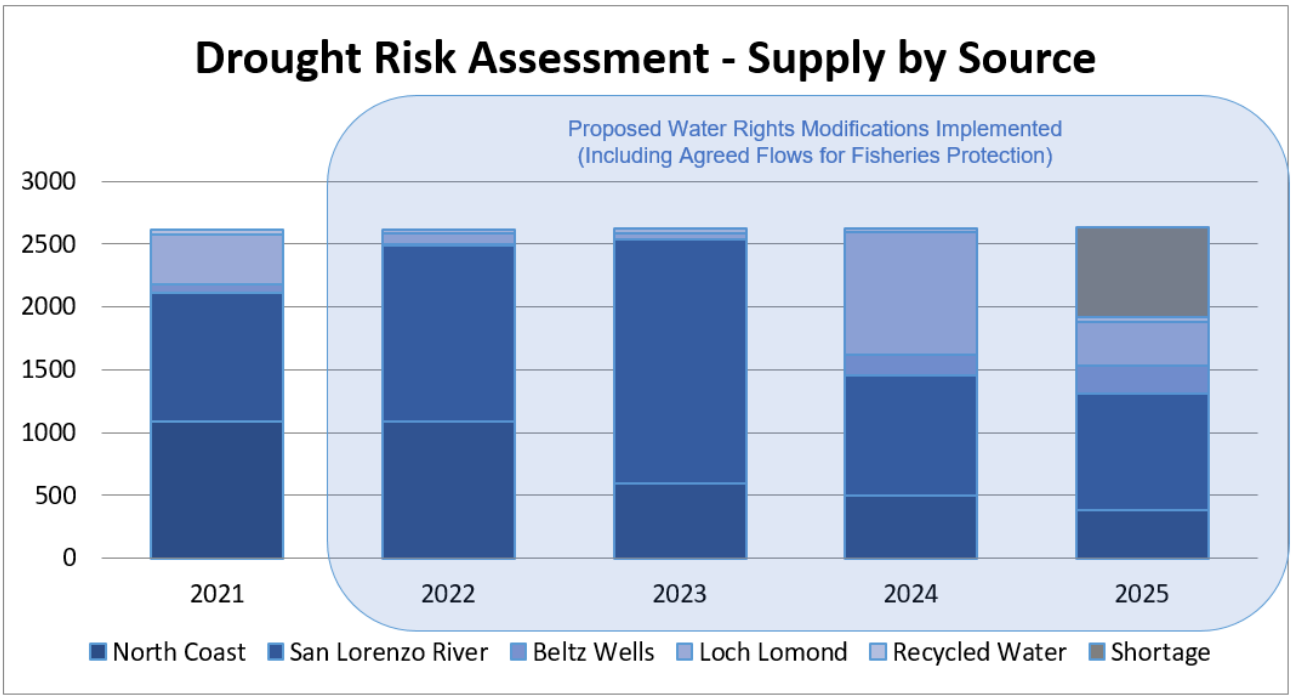
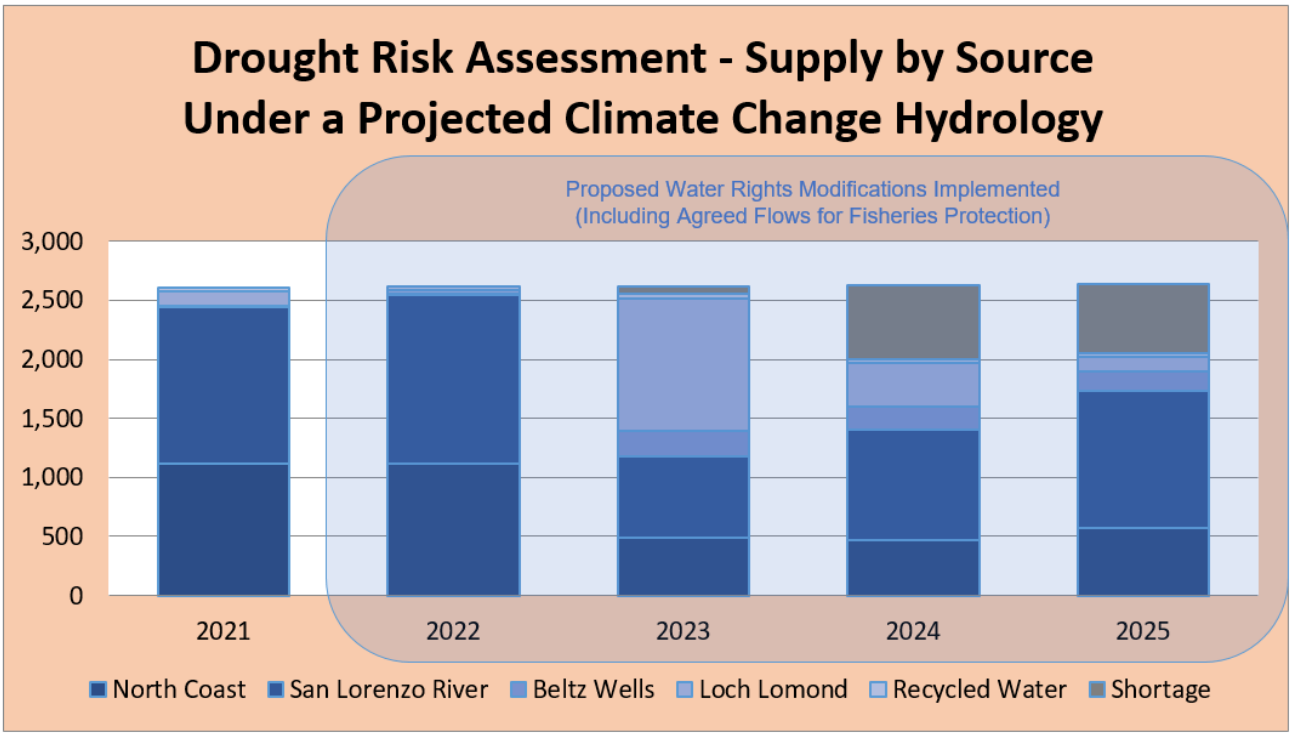


Figure 1-1C: Drought Risk Assessment Supply by Source under a Projected Climate Change Hydrology



To demonstrate supply reliability over time for under different conditions, Figure 1-2 illustrates projected supply available relative to demand over the 25-year planning horizon assessment. The City is safeguarding against future water shortages by actively implementing future water projects as described in Chapter 6, Section 6.8. Implementation of these projects is therefore assumed in the City's water supply planning process. Consistent with the WSAS, the following assumptions about future water projects have been used in developing projected water supplies over the 25-year planning horizon of this analysis.

- In 2025, the City will have implemented proposed water rights modifications, including implementation of the Agreed Flows which are protective of local anadromous fisheries, as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report (see Section 6.8.2) and
- In 2030, the City will have implemented the following components of the WSAS and planned infrastructure projects:
    - Aquifer Storage and Recovery in the Santa Cruz Mid-county Groundwater Basin and/or the Santa Margarita Groundwater Basin, sized for up to 4.5 mgd injection and 8.0 mgd extraction as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report,
    - Improvements to the Tait Diversion on the San Lorenzo River as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report and as included in the Santa Cruz Water Program (see Section 6.8.3),
    - Facility improvements at the Graham Hill Water Treatment Plan that will allow treatment of more turbid water as included in the Santa Cruz Water Program, and
    - Replacement of major transmission pipelines on the North Coast and the Newell Creek Pipeline as included in the Santa Cruz Water Program.

Under this supply and demand reliability assessment, the City projects having sufficient water supply available in normal years and single dry years to serve anticipated demand throughout the 2025 – 2045 planning period.

Under multi-year drought conditions in the near term (2025), with proposed water rights modifications but before implementation of the ASR and planned infrastructure projects, available supplies would meet projected demand in years one through four of the multi-year drought scenario, but would fall short of demand by 27 percent in year five. While the analysis characterizes this vulnerability for year five of the drought period, depending on sequencing of rain years, in reality it is possible that such a shortage could occur sooner and persist longer through a multiple dry year period. Under multi-year drought conditions after 2030, with implementation of the ASR and planned infrastructure projects, available supplies would meet projected demand in years one through four of the mutli-year drought scenario, and the year-five shortage is anticipated to be substantially reduced with projected shortages no larger than a negligible two percent.

Figure 1-2C shows the projected supply available relative to demand under the modeled climate change hydrology. Compared to historic hydrology, there is potential for decreased reliability under a single dry year and under multi-year drought conditions under the climate change scenario. The City projects having sufficient water supply available in normal years under the climate change hydrology.

In single dry year conditions under a projected climate change hydrology in the near term (2025), with proposed water rights modifications but before implementation of the ASR and planned infrastructure projects, supply would fall short of projected demand by seven percent. Under multi-year drought conditions in the near term, available supplies would meet projected demand in years one and two of the multi-year drought scenario, but would fall short of system demands by two percent in year three and by 23 percent in years four and five. However, under multi-year drought conditions after 2030, with implementation of the ASR and planned infrastructure projects, available supplies would meet projected demand in years one through four of the scenario, and the year-five shortage is anticipated to be substantially reduced with projected shortages no larger than five percent.

Figure 1-2: Projected Supply Availability as Demand Served

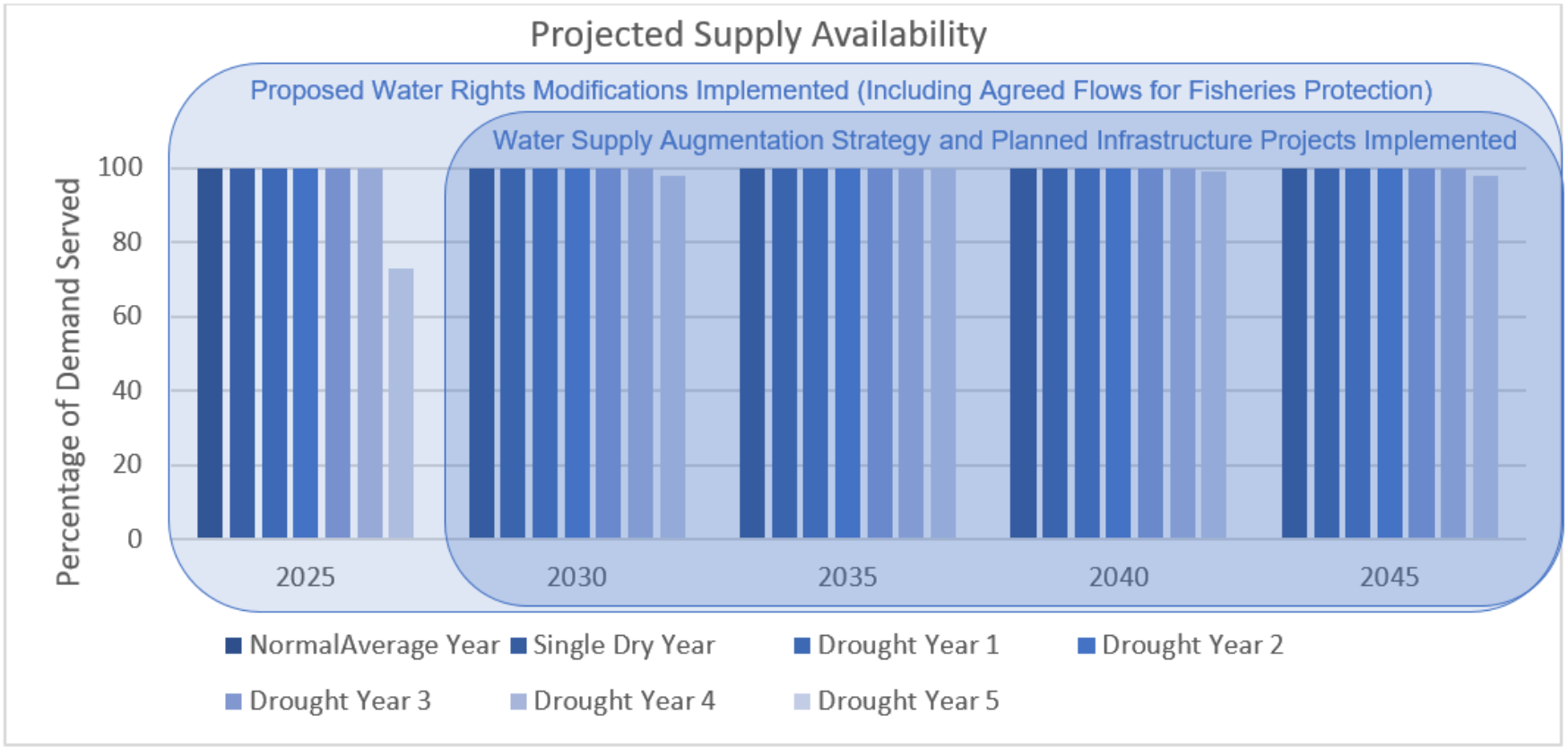
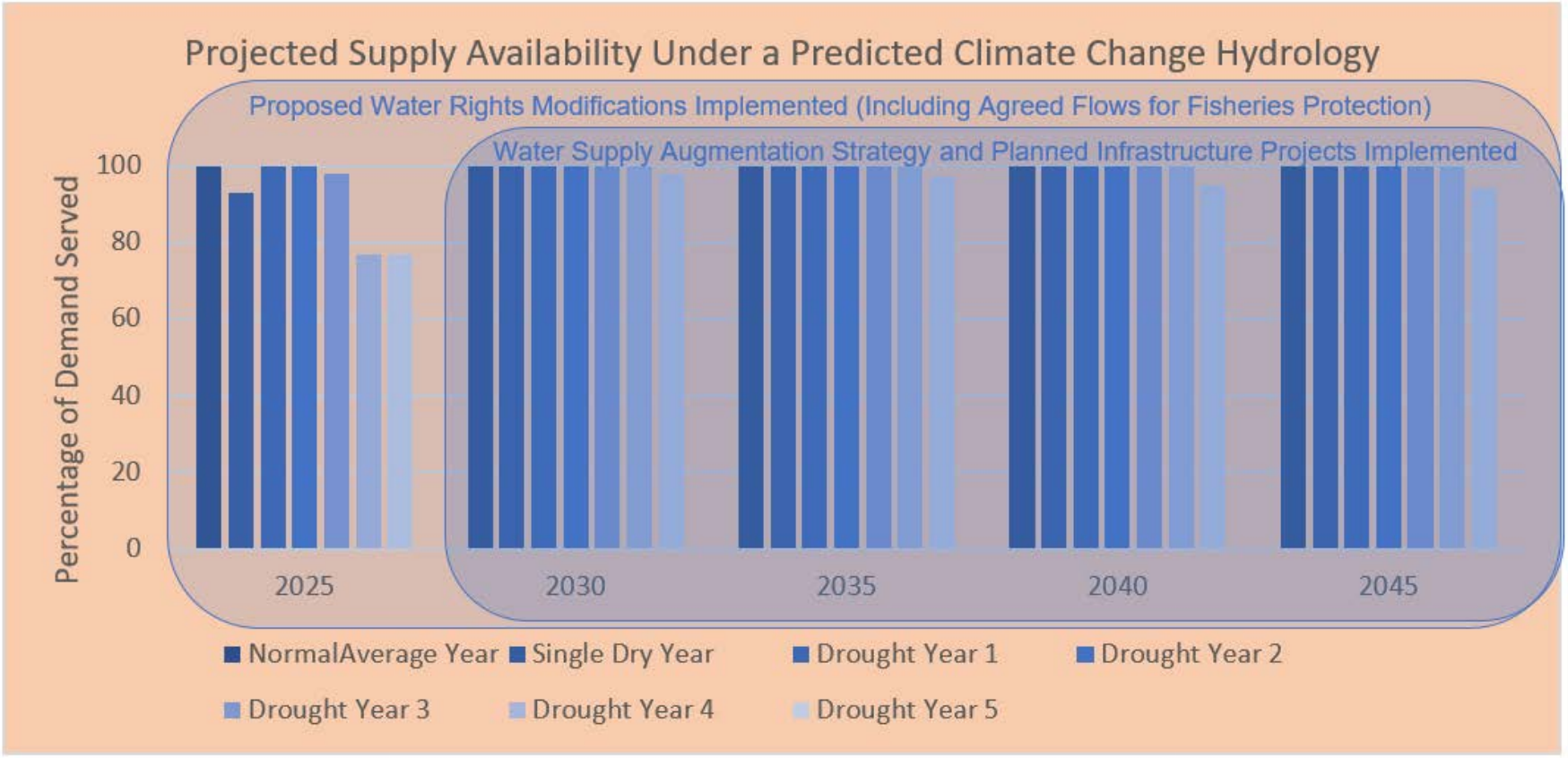


Figure 1-2C: Projected Supply Availability as Demand Served under a Projected Climate Change Hydrology



This assessment illustrates that without implementation of the future water projects described in Chapter 6, Section 6.8, the City would face critical challenges in meeting demand in a projected multi-year drought, under either hydrology consistent with historic conditions or under a climate change scenario. This is largely driven by the City's dependence on local surface water flows and the lack storage with the supply system. The ongoing implementation of the WSAS, including the Santa Cruz Water Rights Project, and Santa Cruz Water Program are critical and necessary elements to secure the City's existing and future water supply reliability.

For additional details on these analyses, see Chapter 7 of this Urban Water Management Plan.

1.6.6 Strategies for Managing Reliability Risks.

As described above, the City of Santa Cruz water system reliability is vulnerable to multiple consecutive dry years in the near term due to the high reliance on surface water sources and limited storage within the system. To address these reliability challenges, the City is pursuing the WSAS including future water projects such as the Santa Cruz Water Rights Project, and the Santa Cruz Water Program.

As required by California Water Code and to manage risks due to water supply shortages that can be expected in the future, this Urban Water Management Plan includes a Water Shortage Contingency Plan. The Water Shortage Contingency Plan 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 water supply and demand assessment procedures, compliance and enforcement strategies, and actions that would be undertaken in response to a catastrophic interruption of water supplies, including a regional power outage, earthquake, or other emergency situation, legal authority, and other topics.

The Water Shortage Contingency Plan (WSCP) includes six standard water shortage levels and actions that would be taken to reduce demand at each level. Shortage stages in this WSCP are based on peak season demand and correspond to the six standard shortage levels defined in Water Code of up to ten, twenty, thirty, forty, fifty and greater than fifty percent shortage, as summarized in Table 1-1.

Table 1-1: Water Shortage Contingency Plan Levels

Water Shortage Contingency Plan Levels		
Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	Water Shortage Warning. Stage 1 applies to relatively minor water shortage that requires up to a 10% level of demand reduction. The allocation system applies to all stages. At Stage 1, allocations are provided to customers but excess use penalties are not yet implemented.
2	Up to 20%	Water Shortage Alarm. Stage 2 applies to moderate water shortages with a demand reduction requirement of up to 20%. This condition requires more vigorous public information and outreach. The primary demand reduction measure that will be implemented at this stage and all stages going forward is the use of excess use penalties for water use above customer allocations.
3	Up to 30%	Water Shortage Emergency. Stage 3 applies to a serious water shortage with a demand reduction requirement of up to 30%. This condition is a serious situation that will require significant reductions by each customer class. Allocations will be reduced to Stage 3 levels.
4	Up to 40%	Severe Water Shortage. Stage 4 applies to a serious water shortage with a demand reduction requirement of up to 40%. This condition is a serious situation that will require significant reductions by each customer class. Allocations will be reduced to Stage 4 levels. 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.
5	Up to 50%	Critical Water Shortage. 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 and confusion, 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 basic principles and command structures of the state Standardized Emergency Management System. The City has experienced water shortages in the past but never one of such large proportion.
6	>50%	Catastrophic Water Shortage. For Stage 6, Santa Cruz takes the position that this level of shortage would most likely only occur due to a major disaster that caused significant damage to our water treatment and/or distribution infrastructure. In such a disaster, such as a large earthquake, the Santa Cruz response would not come from this WSCP, but rather from the main Santa Cruz Water Department Emergency Response Plan.

The very low system-wide water use in the City of Santa Cruz Water System described in Sections 1.6.1 and 1.6.2 above is beneficial from the perspective of meeting demands and preserving water resources, but it also represents a “hardened demand” that presents limited opportunity for further per capita demand reductions. These new demand characteristics mean that reductions at higher stages will be difficult to achieve. In the view of the Santa Cruz Water staff, curtailments beyond Stage 2 of this plan are not really feasible to implement without significant impacts to public health and safety and the Santa Cruz economy. The City is actively implementing its WSAS as the solution to dealing with larger shortages rather than demand curtailment.

Under implementation of the WSCP, the City of Santa Cruz will rely primarily on demand reduction through the implementation of allocations to address shortages at each WSCP stage, the plan also includes outreach, operational changes, mandatory restrictions, and other actions to be implemented at each stage.

For additional details on the WSCP see Chapter 8 and Appendix O of this Urban Water Management Plan.

1.6.7 Challenges Ahead

As with elsewhere in California, the challenges for managing water supply and demand in the central coast region are dynamic. This plan describes in detail the water system as of 2020 and projects future conditions based on known factors, but also acknowledges that the future is both variable and uncertain and that change will continue to occur. Continued implementation the WSAS and planned projects to support improved system reliability including the Santa Cruz Water Rights Project, and Santa Cruz Water Program is essential to securing the future of the Santa Cruz water system to face the challenges ahead.

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 24,592 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, except under a pilot transfer project as described in Chapter 6 of this document.

Table 2-1: Water System Identification (submittal table 2-1R)

Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 (MG)
CA4410010	Santa Cruz Water Department	24,592	2,606
	TOTAL	24,592	2,606
NOTES: Volume of water supplied is presented in million gallons (MG)			

2.2 Regional Planning and Compliance

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 (submittal table 2-2)

Plan Identification		
Select Only One	Type of Plan	
☑	Individual Urban Water Management Plan (UWMP)	
	☐	Water Supplier is also a member of a RUWMP
	☐	Water Supplier is also a member of a Regional Alliance
☐	Regional Urban Water Management Plan (RUWMP)	

Similarly, for the purpose of determining, reporting, and assessing compliance with its urban water use baselines and targets as 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: Supplier Identification (submittal table 2-3)

Supplier Identification	
Type of Supplier	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
Units of measure used in UWMP	
Unit	Million Gallons (MG)

2.4 Coordination and Outreach

2.4.1 Wholesale and Regional Coordination

The City of Santa Cruz does not receive a water supply from any wholesaler; therefore, wholesaler reporting is not required. Accordingly, Submittal Table 2-4, Water Supplier Information Exchange is not included in this plan.

2.4.2 Coordination with Other Agencies and the Community

Water Department staff prepared the draft urban water management plan in winter, spring, and summer of 2021 with the by following the guidance outlined in the state's *Urban Water Management Plan Guidebook 2020* (DWR, 2021). Throughout development of this plan, 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.

Written notice regarding the plan review and update was sent to both the City of Capitola and the County of Santa Cruz in January 2021, more than 60 days prior to the public hearing, as required by Section 10621(b) of the Act (Appendix B). Notices were provided both to the City Manager/County Administrative Officer and the Community Development Director/Planning Director of these two jurisdictions.

In February 2021, the City conducted outreach to all major public water agencies, wastewater utilities, and land use agencies in Santa Cruz County. This effort included the following organizations:

- Association of Monterey Bay Area Governments
- Central Water District
- City of Capitola
- City of Scotts Valley
- City of Watsonville
- City of Watsonville, Water Division
- County of Santa Cruz
- Local Agency Formation Commission of Santa Cruz County (Santa Cruz LAFCO)
- Pajaro Valley Water Management Agency
- Regional Water Management Foundation
- Resource Conservation District of Santa Cruz County
- San Lorenzo Valley Water District
- Santa Cruz Mid-County Groundwater Sustainability Agency

- Santa Margarita Groundwater Sustainability Agency
- Scotts Valley Water District
- Soquel Creek Water District

Additional coordination focusing on projected population and demand was conducted through a series of meetings with the County of Santa Cruz, City of Capitola, and the University of California, Santa Cruz. Additional coordination regarding wastewater and recycled water was conducted with County of Santa Cruz, City of Scotts Valley, Scotts Valley Water District, and the Pasatiempo Golf Course. As a department of the City of Santa Cruz, the Water Department also coordinated with staff from the City's Planning and Community Development, Economic Development, and Public Works departments during the development of this Urban Water Management Plan.

All of these entities were notified of availability of the Draft Urban Water Management Plan when it was released in September 2021 and directed to an electronic copy of the draft plan on the department website.

The active involvement of the local community within our service area was also encouraged during the development of the Urban Water Management Plan. Plan development and various specific plan elements were presented at public Santa Cruz Water Commission meetings in 2020 and 2021 where the public was given the opportunity to provide input and comment. Water Commission meetings addressing topics covered in this Urban Water Management Plan included the following:

- February 3, 2020: Water Shortage Contingency Plan Update: Data Analysis and Plan Development Process
- July 6, 2020: Analysis of the Probability and Size of Potential Future Water shortages
- September 14, 2020: Working Draft of the Water Shortage Contingency Plan
- December 7, 2020: Draft Water-Sewer Affordability Analysis
- January 4, 2021: Updated Water Shortage Contingency Plan
- February 1, 2021: Preliminary Long-Term Water Demand Forecast Update
- March 1, 2021: Urban Water Management Plan – Approach to Water Service Reliability and Drought Risk Assessment
- April 5, 2021: Urban Water Management Plan: Results of Drought Risk Assessment and Water Supply Reliability Assessment

The process of plan adoption, submittal, and implementation, including associated public hearings, is described in Chapter 10.

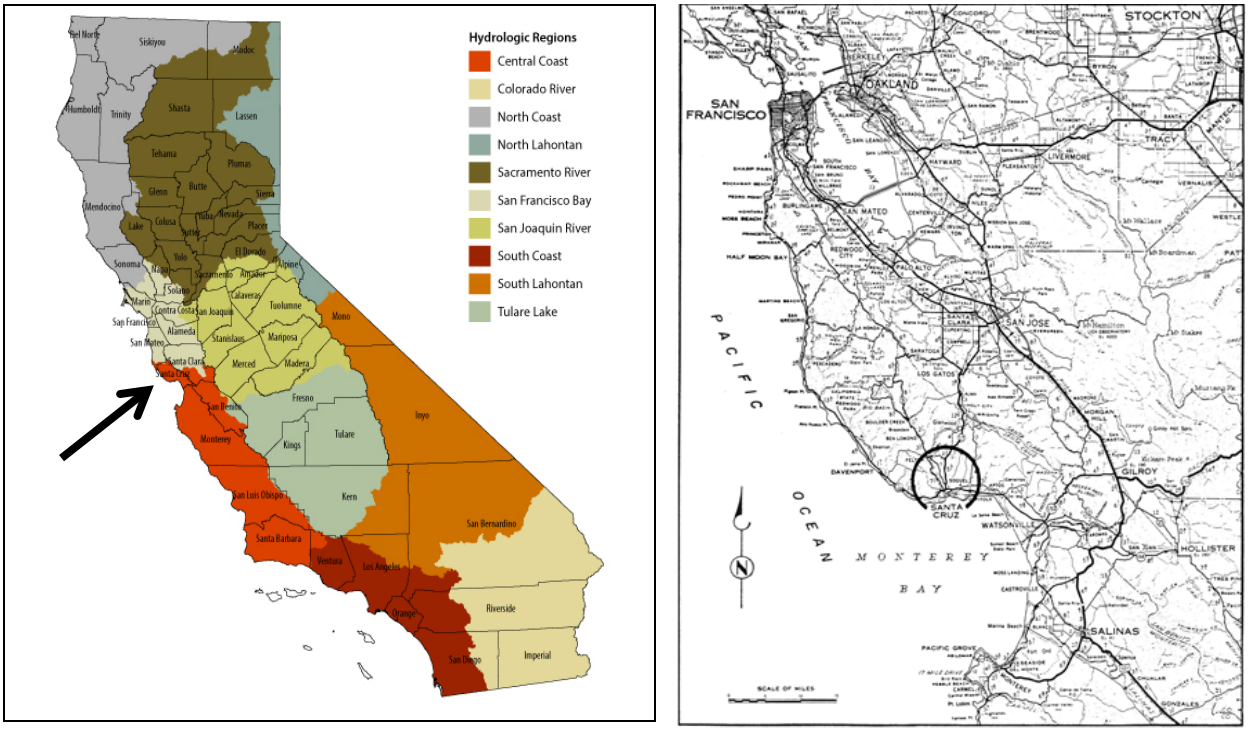
Chapter 3

SYSTEM DESCRIPTION

3.1 General Description of Service Area

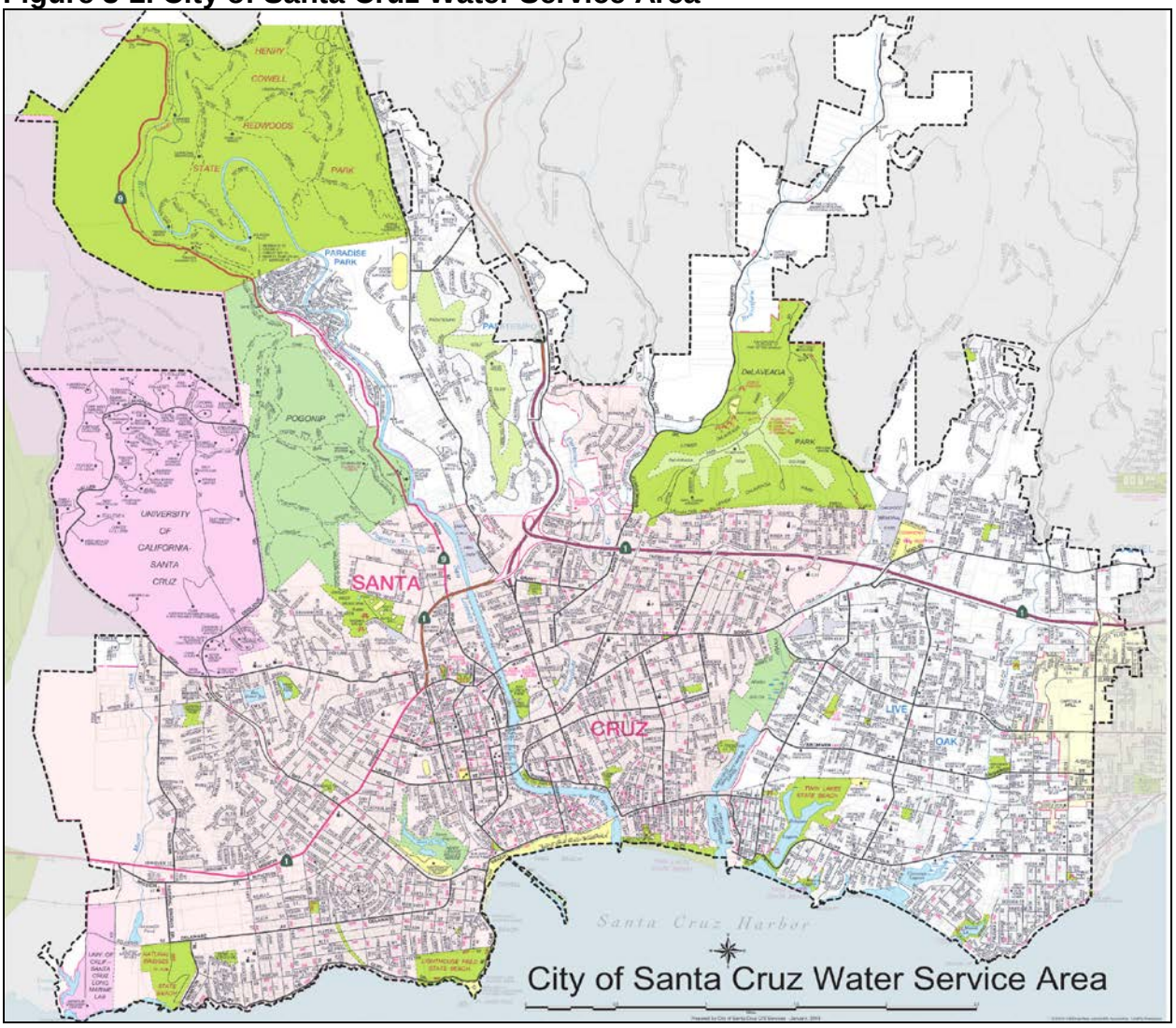
The City of Santa Cruz is located on the central coast of California along the northern shore of Monterey Bay. The City's position on the northern end of the state's Central Coast Hydrologic Region (Region 3) and vicinity relative to the San Francisco Bay Area are shown below in Figure 3-1.

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 coastal agricultural lands north of the City, 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.

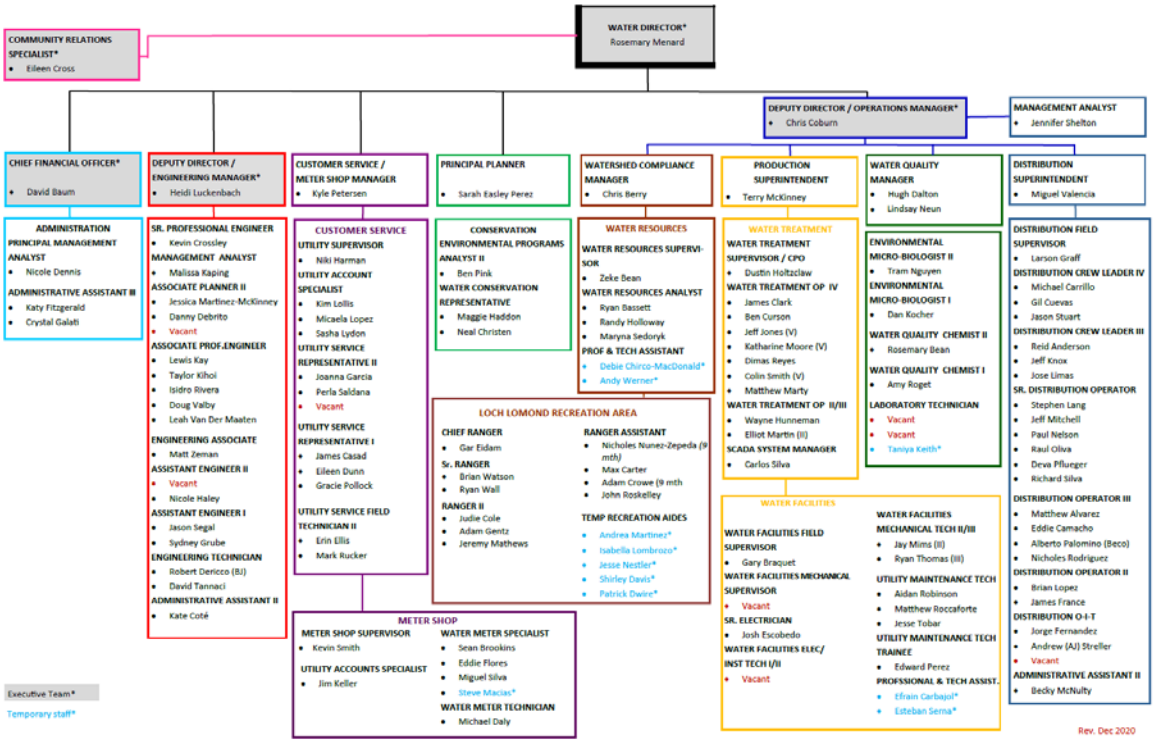
The University of California, Santa Cruz is situated atop the upper west side of the City overlooking downtown and the Monterey Bay. During the 2020 academic year, enrollment was slightly higher than 19,000 undergraduate and graduate students (UCSC, 2021).

3.2 Water Department

The Santa Cruz Water Department (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 seven-member City Council. A seven-member Water Commission advises the 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 Water Department is organized into eight sections. These include Administration, Customer Service and Meter Shop, Water Conservation, Engineering, Water Resources/Recreation, Water Production, Water Quality, and Water Distribution. There is currently the equivalent of 116.5 full-time staff positions in the Water Department. An organization chart of the Water Department in December 2020 is shown in Figure 3-3.

Figure 3-3. Water Department Organization



The Water Department's 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 Water Department's major water infrastructure facilities include three water treatment plants, including the Graham Hill Water Treatment Plant and two groundwater treatment plants related to the Beltz well system; four raw water pump stations; ten treated water pump stations; 15 distribution tanks with a total maximum capacity of 21.2 million gallons of treated water storage; seven surface water diversions; seven production wells[1]; and approximately 300 miles of treated and raw water pipelines interconnecting the entire system.

The Water 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 Water 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 C). Because these policies have not been updated since the development of the City's Water Supply Augmentation Strategy (described in Chapter 6, Section 6.8), some of these policies require updating to reflect the City's current direction for water supply planning.

[1] The City operates four groundwater production wells within the Beltz well system and three production wells at the Tait Diversion wells that are assumed to be hydraulically connected to surface water and considered to be tied to the City's appropriative rights for surface diversion.

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 52 to 65 degrees Farenheit (F), 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 as shown in Table 3-1. The bulk of seasonal rainfall occurs between November and March. In the watershed above the City's Loch Lomond reservoir in the Santa Cruz Mountains, rainfall averages nearly 50 inches per year.

Table 3-1: Climate Data for Santa Cruz (Current 30-year Normal)

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 Climatic Data Center 1981-2010 Monthly Normals; CA Department of Water Resources													

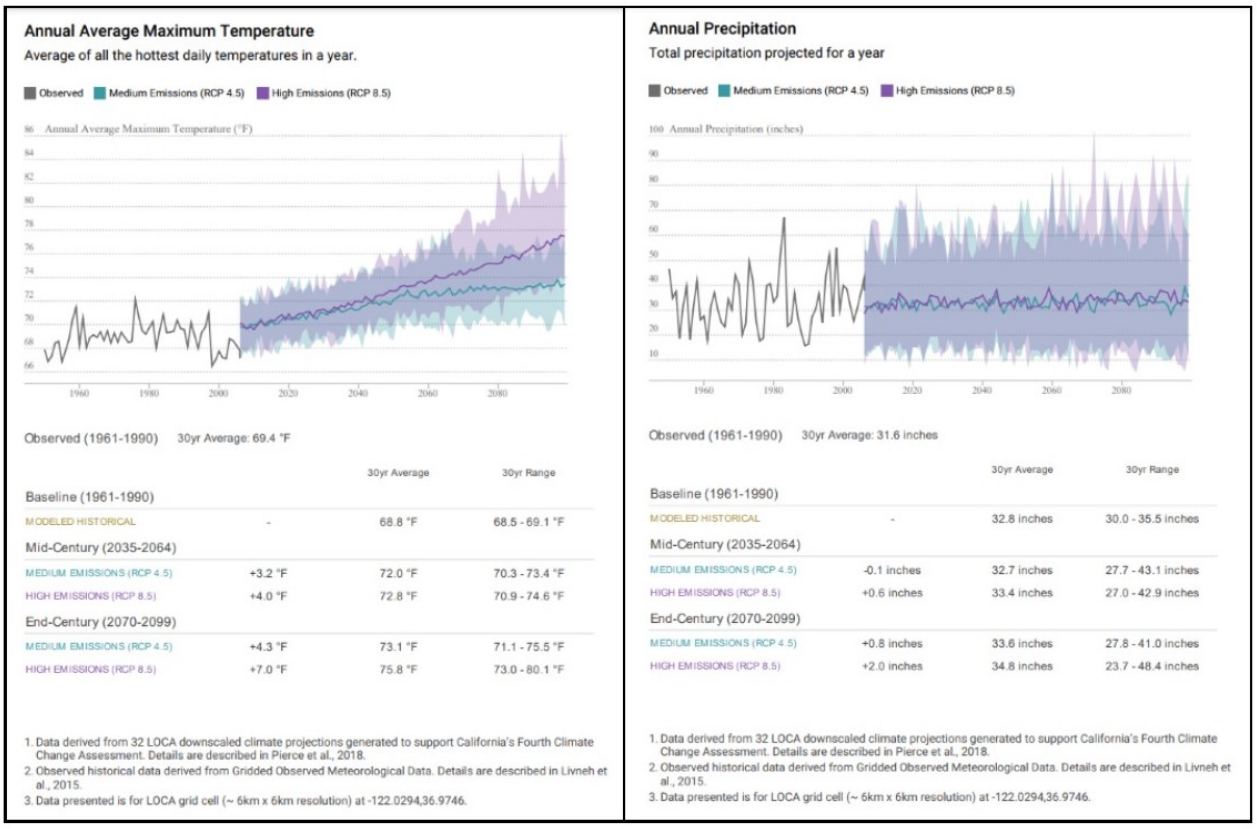
Reference evapotranspiration - a standard measurement of environmental parameters used for determining irrigation needs - averages 39.0 inches per year in Santa Cruz. Average monthly evapotranspiration varies seasonally from a low of 1.2 inches in December and January to a high of 5.1 inches in June (DWR, 2012).

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 due to the effects of climate change. Figure 3-4 below shows two projections of mean temperature to 2100 under different climate change scenarios from the Cal-Adapt Local Climate Change Snapshot (Cal-Adapt.org, 2021) [2]. A temperature increase of between 4.3 and 7.0 degrees F compared to the historic average is predicted by the end of the century. Cal-Adapt models of future mean annual precipitation also show a slight increase over time. An increase in precipitation ranging from 0.8 inches to 2.0 inches compared to the historic average is predicted by the end of the century.

Figure 3-4. Projected Mean Temperature and Annual Precipitation for Santa Cruz



Source: Cal-Adapt, 2021

[2] The Local Climate Change Snapshot tool was generated by Cal-Adapt to support California's Fourth Climate Change Assessment. For water supply planning purposes, the City utilizes the CMIP5 climate change model for analyses in this Urban Water Management as described in Chapter 6. Section 6-10.

The City's Climate Adaptation Plan Update 2018-2023, and appendix to the City's Local Hazard Mitigation Plan Five Year Update 2018-2023 indicates changing temperatures and precipitation will impact ecosystems, fire risk, water quality and quantity, human and environmental health (City of Santa Cruz, 2018). 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.

3.4 Service Area Population and Demographics

The current population residing in the Santa Cruz water service area is estimated to be 96,186 people. Approximately two thirds of the total population, over 64,000, lives inside the City limits. The University of California, Santa Cruz campus houses about 9,000 students on campus within City limits; although a majority of the campus was closed during 2020 due to the COVID-19 pandemic[3]. It is estimated that almost 32,000 people, or about one third of the service area population, live outside the City limits. Since the 2010 US Census, the water service area population has grown by almost 5,000 persons, mostly inside the City limits.

Table 3-2 shows the current and projected population for the water service area out to 2045, in five-year increments.

The 2020 population estimate is based upon California Department of Finance estimates for population within the City of Santa Cruz, and a "persons-per-connection" method for population outside City limits, consistent with methodology required to demonstrate compliance with SB X7-7 (see Chapter 5). Population projections were developed by M.Cubed as part of the Update of the City of Santa Cruz's Long-Range Water Demand Forecast (Appendix D) and are based on the Association of Monterey Bay Area Governments (AMBAG) 2022 Regional Growth Forecast (AMBAG, 2020) and coordination with local jurisdictions[4]. According to the forecast, the total number of people receiving water service is expected to grow by about 17,500 people and reach slightly more than 113,500 in 2045. This equates to a population growth rate of less than one percent per year.

[3] For information on COVID-19 related impacts to water demand in 2020, see Chapter 4, Section 4.4.
[4] Future housing growth in within the service area in City of Capitola is expected to be driven by the proposed Capitola Mall redevelopment project. The project could to add 637 new housing units, and this forecast assumes this new housing will in use by 2030.

Table 3-2: Population Current and Projected (submittal table 3-1R)

Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045
	96,168	101,964	106,072	109,193	112,853	113,650
NOTES: 2020 population from City of Santa Cruz. Population projections from Update of the City of Santa Cruz's Long-Range Water Demand Forecast prepared by M.Cubed (M.Cubed, 2021) (UWMP Appendix D).						

Demographic information is presented in Table 3-3. In addition to information for the City of Santa Cruz, information for the State of California is included for comparison.

Table 3-3: Demographics for City of Santa Cruz and California

Demographics (2019)		
	City of Santa Cruz	California
Median Age (years)	28.8	36.5
Racial Makeup – race alone or in combination with one or more other races (%)		
White	78.3	63.6
Black or African American	4.7	7.0
American Indian and Alaska Native	3.0	2.0
Asian	13.9	17.1
Native Hawaiian	0.3	0.8
Some other race	8.8	14.9
Hispanic or Latino of any race (%)	25.6	39.4
Mexican	18.8	32.6
Puerto Rican	0.8	0.6
Cuban	0.3	0.2
Other Hispanic or Latino	5.8	6.0
Educational Attainment (%)		
Bachelor's Degree or Higher	53.8	33.9
Primary Language Spoken at Home (%)		
English Only	93.8	82.2
Limited English-Speaking Households	2.7	8.9
Median Household Income ($)	77,921	75,235
Population below Federal Poverty Level (%)	20.9	13.4

Source: American Community Survey (ACS) Data: https://data.census.gov/cedsci/

3.5 Land Use and Housing

All three jurisdictions served by the Santa Cruz water system (Cities of Santa Cruz and Capitola and the County of Santa Cruz) 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 within the last ten years. The City of Santa Cruz General Plan timeline extends to 2030, and the Capitola General Plan, updated in 2019, has a 20 to 30 year planning horizon. The County is currently developing a comprehensive update to its General Plan which was adopted in 1994. The Sustainability Policy and Regulatory Update (Sustainability Update), is expected to be completed in 2022 and also includes updates to the County's Local Coastal Program and modernization of the County Code. The County has also 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, Santa Cruz 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 southwestern 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 University released an updated draft 2021 LRDP for its main campus and an associated Draft Environmental Impact Report (EIR). The University is currently in the process of finalizing the LRDP and EIR, but information from the draft 2021 LRDP was used here to inform the development of projected population and demand estimates (Appendix D).

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 (Santa Cruz LAFCO).

The City's land use patterns are the result of historic development, the establishment of the University of California, Santa Cruz campus in 1964, and more recent land use policies established by the City. The Water Department serves all areas within the City. Land use within the City consists of a mix of residential, commercial, mixed use, office, industrial, public and institutional, park, open space, parking, and vacant land uses. Within the County of Santa Cruz, the areas served by the Water Department include a portion of the Live Oak Plan area, including all of the Pleasure Point Community Plan area. Land use in this area is predominantly residential with a mix of commercial, office, light industrial, open space, parks and public facilities. Within the City of Capitola, the Water Department serves a portion of the 41st Avenue West Capitola residential neighborhood and a portion of the 41st Avenue/Capitola Mall commercial district which includes the Capitola Mall (a region serving shopping plaza), an auto plaza, two hotels as well as a variety of other retail, office, and service establishments within the service area.

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 undeveloped 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 limited amount of undeveloped land remaining. Within the City of Capitola, the Capitola Mall is a region serving shopping plaza planned for redevelopment currently including 637 new residential units proposed at conceptual level design.

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, major changes within the City water service area tend to occur slowly, if at all, and only after exhaustive public process.

According to utility billing records, there are some 37,701 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 3-4 below. Approximately 19,095, or a little over half of all

households in the service area are classified as single family accounts[5]. The other 18,606 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. A large proportion of the local housing stock (over 50 percent) is rented. 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.

Table 3-4: Housing Units within Area Served

Housing Units, by Account Type and Jurisdiction			
Jurisdiction	Single Family	Multi-family	Total
City of Santa Cruz	12,287	10,568	22,852
County of Santa Cruz	6,665	7,919	14,584
City of Capitola	146	119	265
Total within Area Served	19,095	18,606	37,701
NOTES: 2020 Annual Sales Report, EDEN Multi-residential units counts report Jul 22, 2021			

Each of the three jurisdictions served by the City has an 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 through 2023.The housing elements include regional housing goals for the three jurisdictions served by the City. 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. Capitola has a goal to construct 143 units by 2023 in its housing element. Only a portion of the housing within the County and City of Capitola is expected to be within the Santa Cruz Water Department service area. Together, these Housing Elements project a total residential development potential in the near term of about 1,149 new homes within the service area, of which an estimated 414, about one-third, are planned for low-income categories.

[5] 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.

The Update of the City of Santa Cruz's Long-Range Water Demand Forecast (Appendix D), includes an updated housing estimate for 2020 and a forecast through 2045 broken down by forecasts for housing growth in the service area by inside-City and outside-City. In 2020, total combined occupied and unoccupied housing units within the service area were estimated to be 38,751, and the total number of housing until is projected by 2045 to grow by 3,575 to 42,326.

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 projected above are already permitted and under construction. In the last five years, 70 new single-family accounts and 634 multifamily accounts have been added to the service area. The City now incentivizes smaller, more vertical, mixed-use or multifamily-type housing units along its major transportation corridors, and State law has streamlined approvals of Accessory Dwelling Units. 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.

3.6 Employment and the Economy

Overall, the University of California, Santa Cruz 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. Like other coastal communities, housing supply in the service area remains limited and housing affordability is a major economic, political, and social issue for families, residents, and employers alike.

The State Employment Development Department estimates employment within the City's water service area in the second quarter of 2020 (the most recent quarter for which complete data exists) to be about 38,061. The three largest employment sectors are health care and social assistance, educational services, and retail trade (Table 3-5). There are significant reductions in employment noted since 2015, particularly in the retail trade sector likely due to the impact of the global COVID-19 pandemic and economic shut down which occurred in spring of 2020.

Nationally, the U.S. economy lost 22 million jobs between February and April 2020, and the job loss in March and April of 2020 had no precedent since the end of World War II (U.S. Bureau of Labor Statistics, 2020). The City saw an increase in unemployment of more than 7% between the end of 2019 and the end of 2020. Likewise, the City saw decreases in new small businesses and significant decreases in hotel occupancy rates (50 to 75 percent between March and June 2020). Commercial vacancy rates in the City of Santa Cruz increased more than four-fold between the fourth quarters of 2019 and 2020, while the City of Capitola and County of Santa Cruz saw vacancy rates double over the same timeframe. COVID-19 impacts on business water use are discussed in Chapter 4.

Table 3-5: Employment within the Service Area

Employment in Santa Cruz Water Service Area, 2020 second quarter		
Major Industry NAICS Sector	Business Establishments	Employment
AGRICULTURE, FORESTRY, FISHING & HUNTING	15	97
MINING	1	**
UTILITIES	2	**
CONSTRUCTION	290	1,600
MANUFACTURING	131	1,794
WHOLESALE TRADE	104	652
RETAIL TRADE	382	4,604
TRANSPORTATION & WAREHOUSING	46	948
INFORMATION	51	288
FINANCE & INSURANCE	99	707
REAL ESTATE & RENTAL & LEASING	167	496
PROFESSIONAL, SCIENTIFIC, & TECHNICAL SERVICES	419	2,274
MANAGEMENT OF COMPANIES AND ENTERPRISES	9	627
ADMIN & SUPPORT & WASTE MGMT & REMEDIATION	134	1,291
EDUCATIONAL SERVICES	107	6,381
HEALTH CARE & SOCIAL ASSISTANCE	1,158	8,502
ARTS, ENTERTAINMENT, & RECREATION	59	885
ACCOMMODATION & FOOD SERVICES	331	3,266
OTHER SERVICES	250	1,359
NON-CLASSIFIED	*	*
GOVERNMENT	18	2,273
TOTAL	3,773	38,061

NOTES: Data and GIS analysis by Labor Market Division of the California Employment Development Department. www.labormarketinfo.edd.ca.gov . April 2021.

* No data
** Data are confidential and suppressed

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 2045. It also covers water for low-income housing units, future water savings, expected water savings from plumbing codes and standards, and information on distribution system losses.

4.1 Customer Classification System

The City divides its water customers into eight major classes and one miscellaneous category, as follows. In addition to designating accounts into various customer classes. As of 2020, the City also grouped its customers into either "inside-City" or "outside-City" categories for billing purposes.

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.

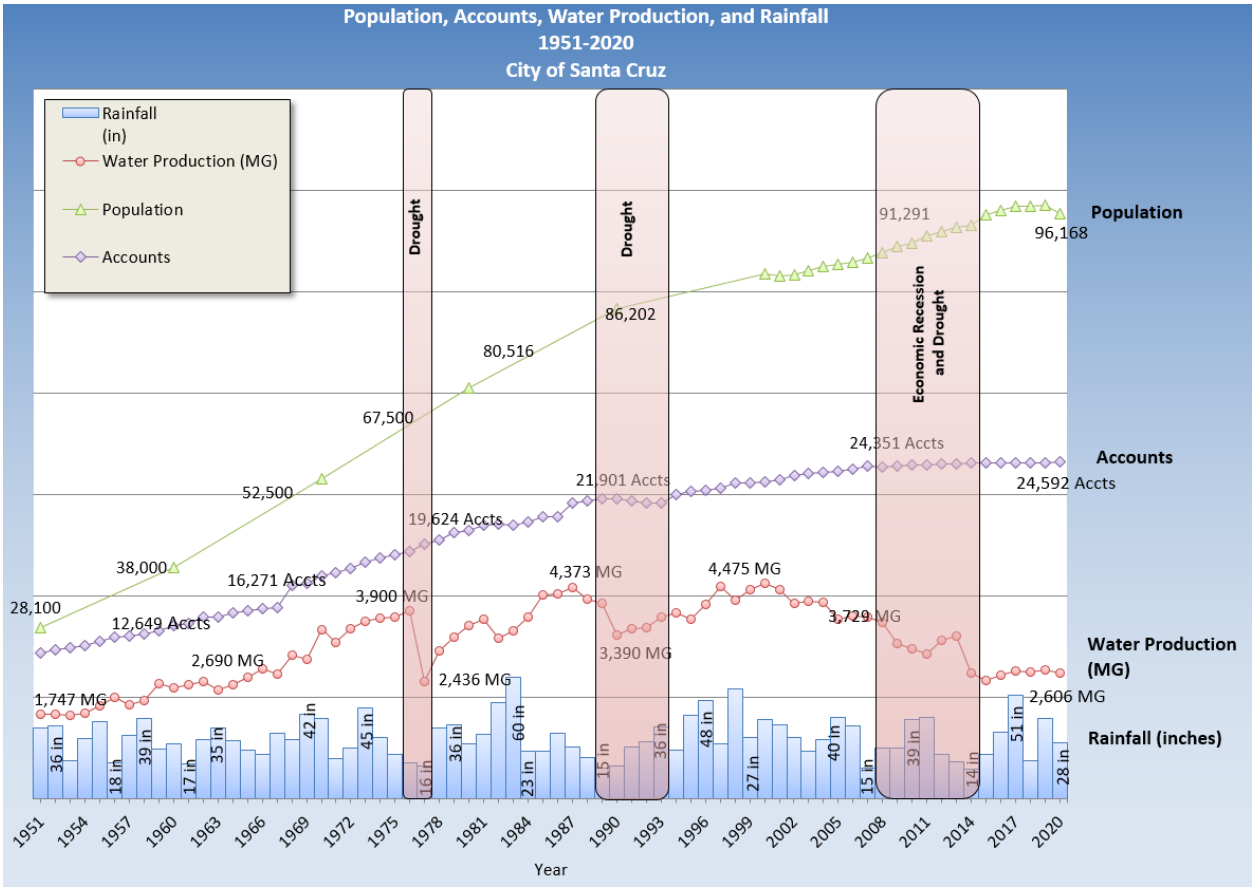
While not customer classes, water transfers and ASR are accounted for in consumption data. As part of the City’s implementation of the Water Supply Augmentation Strategy (WSAS) (see section 6.8), beginning in 2018, the City began piloting water transfers to the Soquel Creek Water District under the “Cooperative Water Transfer Pilot Project for Groundwater Recharge and Water Resource Management”, and beginning in 2019, the City began piloting aquifer storage and recovery (ASR) at existing groundwater wells in the Beltz well system.

Except for coast irrigation accounts that receives raw water, all water supplied is potable water. The City does not currently provide recycled water within its service territory; although, recycled water is supplied to the Pasatiempo Golf Course, which is within the City of Santa Cruz service area, through an agreement with the City of Scotts Valley.

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 in Figure 4-1.

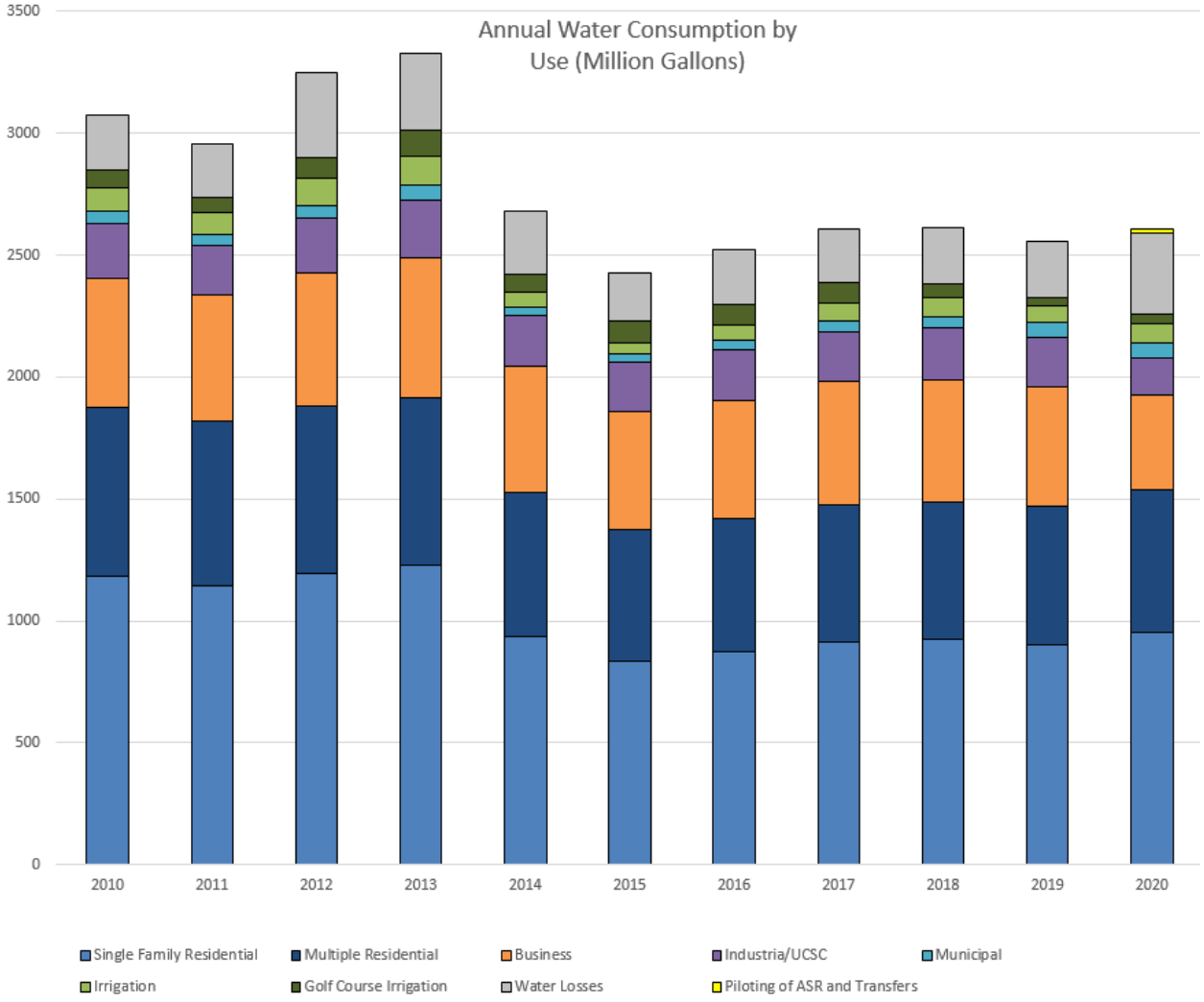
Figure 4-1: Historic Trends for City of Santa Cruz



Until the early 2000s, 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 including the influences of active conservation programs and updated plumbing codes.

In 2015, after two years of water rationing, annual water use fell to a level of about 2.5 billion gallons, similar to the level experienced during the 1970s drought. In 2020, demand was still at a similar level as 2015, about 2.6 billion gallons, despite several years above long-term average rainfall from 2016 and 2020. While demand did rebound following droughts in the 1970s and 1980s, demand has not rebounded to pre-drought conditions following 2014, contrary to previous projections. A breakdown of annual water consumption by the City's major customer classes since 2010, along with system water losses, is illustrated in Figure 4-2.

Figure 4-2: Annual Water Consumption by Use (million gallons)



4.3 2020 Demands by Sector

Actual demands for potable and non-potable water in calendar year 2020 are reported by use type in Table 4.1 below.

Table 4-1: Demand for Potable and Non-Potable Water (submittal table 4-1R)

Demands for Potable and Non-Potable[1] Water – Actual			
Use Type	2020 Actual		
	Additional Description (as needed)	Level of Treatment When Delivered	Volume (MG)
Single Family	Individually metered dwellings	Drinking Water	952
Multi-Family	2 or more dwelling units	Drinking Water	588
Commercial	Business	Drinking Water	388
Industrial		Drinking Water	39
Industrial	University of California, Santa Cruz -Main Campus	Drinking Water	4
Industrial	University of California, Santa Cruz - Coastal Campus	Drinking Water	106
Institutional/Governmental	Municipal	Drinking Water	66
Landscape	Dedicated irrigation accounts	Drinking Water	77
Landscape	Golf irrigation - potable water	Drinking Water	39
Other Potable	Piloting Aquifer Storage and Recovery at Betlz Well 8	Drinking Water	4
Sales/Transfers/Exchanges to other Suppliers	Piloting Transfers t to Soquel Creek Water District	Drinking Water	13
Losses		Drinking Water	331
		TOTAL	2,606

[1] *Recycled water demands are not reported in this table.*

NOTES: System water losses are considered provisional until 2020 annual water audit is completed. High losses could be attributable to meter failures. A system-wide meter replacement program is underway in 2021. Figures above do not include raw water sales of 6MG in 2020 for coastal irrigation. No drinking water was otherwise used for groundwater recharge, saline water intrusion barrier, or wetlands or wildlife habitat.

In addition to the potable water demand listed below, the City also supplied 6 million gallons of raw water to coast irrigation accounts in 2020. Recycled water demand at Pasatiempo Golf Course is reported separately in table 4.3 below.

Provisional water losses were reported to be 331 million gallons representing a noticeable increase over the long-term average. While, this value is considered provisional until the 2020 annual water audit is completed, the increased water loss is believed to be attributable to an increasing number of meter failures throughout the system. The City is slated to begin a system-wide replacement of its metering system in fall 2021. This project will replace all meters that are older than three years and outfit all meters with an Advanced Metering Infrastructure (AMI) radio over a 15-month period.

4.4 Water Demand Projections

The forecast of future water demand is a foundational component of any Urban Water Management Plan. In 2014 and 2015, the City of Santa Cruz worked with M.Cubed to develop a long-term water demand forecast using econometric forecasting for the first time that was used in the 2015 Urban Water Management Plan, and that demand forecast was updated in 2021 for use in this 2020 Urban Water Management Plan. Appendix D includes a summary and results from M.Cubed's forecasting work.

Econometric demand forecasting develops statistically-based models of average water use per service by customer class. The 2015 demand forecast was developed based on these models and incorporating empirical relationships between water use and key explanatory variables, including season, weather, water rates, household income, employment, conservation, and drought restrictions. Monthly models of water demand were then combined with service and housing growth forecasts to predict future water demands. The approach built 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).

Water use was rationed by the City of Santa Cruz in 2014 and 2015 due to severe drought conditions. In the years following the end of rationing, water sales remained significantly below the long-term projections included in the 2015 Urban Water Management Plan. Following up on the 2015 work, M.Cubed prepared a comparative analysis for the calendar year 2018 to analyze the divergence between projected and actual sales. After normalizing for weather, the forecast was found to be approximately 19% greater than actual sales in this year. The divergence of the forecast from actual sales coincided with changes to the City's water rate structure adopted in 2016. The

new rate structure resulted in significant increases in the marginal cost of water service. Most of the forecast error was found to be driven by the increase in the marginal cost of water service. Weather was not found to be a significant explanatory factor, nor were differences in actual and projected sales to large customers (UCSC and the two golf courses).

Subsequently, M.Cubed updated its long-term forecast for this 2020 Urban Water Management Plan in 2021, adjusting to reflect the higher marginal cost of water service and incorporating other updated information. This update included:

- Updated service area population, land use and housing projections consistent with Association of Monterey Bay Area Governments projections[1],
- Updated baseline estimates of average water use per service connection by customer class based on customer-level billing data,
- Adjustment to baseline averages use estimates to account for the effects of plumbing codes, on-going conservation, and marginal water service cost,
- Adjustment to projections for future water demands of the University of California Santa Cruz, based on their 2020 draft Long-Range Development Plan, and
- Accounting for COVID-19 pandemic on current and future water use.

The resulting water demand projection predicated on average weather and normal (predicted) income and growth, by customer class, is presented in Table 4-3. For reference, the 2015 demand forecast projected stable demand of 3.4 billion gallon per year for 2020 through 2035 with only very slight increase in demand over this period. As summarized below, current expectation for water system demands are for demand to increase at a slow rate from about 2.6 billion gallons per year in 2020 to about 2.7 billion gallons per year with total water use projected to be about 2.8 billion gallons per year in 2045.

[1] Future housing growth in within the service area in City of Capitola is expected to be driven by the proposed Capitola Mall redevelopment project. The project could to add 637 new housing units, and this forecast assumes this new housing will in use by 2030.

Table 4-2: Projected Water Use (submittal table 4-2R)

Use for Potable and Non-Potable[1] Water - Projected						
Use Type	Additional Description (as needed)	Projected Water Use (MG) *Report To the Extent that Records are Available*				
		2025	2030	2035	2040	2045
Single Family	Individually metered dwellings	954	952	958	966	974
Multi-Family	2 or more dwelling units	604	608	602	607	611
Commercial	Business	504	488	464	458	462
Industrial		37	37	37	37	37
Institutional/Governmental	Municipal	54	51	47	47	47
Landscape	Dedicated irrigation accounts	77	69	59	58	59
Landscape	Golf irrigation - potable water	44	40	36	35	35
Institutional/Governmental	University of California, Santa Cruz - Main Campus	10	15	21	26	26
Institutional/Governmental	University of California, Santa Cruz - Coastal Campus	152	199	245	292	292
Losses		197	199	200	204	206
TOTAL		**2,633**	**2,659**	**2,668**	**2,730**	**2,749**

[1] *Recycled water demands are NOT reported in this table.*

NOTES: Excludes 12 MG of projected raw water use for North Coast agriculture projected for 2025 through 2045. Raw water demand is not incorporated into the City's Confluence water supply model. Projected water use is based upon the Update of the City of Santa Cruz's Long-Range Water Demand Forecast (M.Cubed, 2021) (UWMP Appendix D).

Compared to water use in pre-pandemic years 2018-2019, water use in 2020 during the global COVID-19 pandemic was significantly lower for business use and slightly higher for residential water use. The change in business water use is thought to be a consequence of the Governor's shelter-in-place order and business restrictions put in place in response to the pandemic. Observed changes in residential water use can be attributed to both the pandemic and to weather differences. See Chapter 3, Section 3.6 for additional discussion of local economic impacts of the COVID-19 pandemic.

Current and projected total water use, including recycled water use as described in Chapter 6, are presented in Table 4-3.

Table 4-3: Total Water Use (submittal table 4-3R)

Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045
Potable Water, Raw, Other Non-potable	2,606	2,633	2,659	2,669	2,730	2,749
Recycled Water Demand	36	35	35	35	35	35
TOTAL WATER USE	2,642	2,668	2,694	2,704	2,765	2,784
NOTES: Projected water use is based upon the Update of the City of Santa Cruz's Long-Range Water Demand Forecast (M.Cubed, 2021) (UWMP Appendix D).						

4.5 Estimating Future Water Savings

Current levels of customer demand and the long term forecast indicate that the Santa Cruz community has already achieved levels of water conservation well beyond the levels of anticipated in the 2015 Urban Water Management Plan and well beyond the levels forecasted by implementation of the City's 2017 Water Conservation Master Plan (WCMP), and has done so without the anticipated spending on implementation the WCMP.

As described in Appendix D, the City of Santa Cruz Updated Long-Range Water Demand Forecast includes passive savings from plumbing code effects. In the forecast, the baseline average water use per service was developed based on observed water use in each customer category. Baseline average use was then adjusted over the forecast period for the effects of plumbing codes, and changes in marginal water service costs. Indoor residential water use was adjusted for plumbing code effects, with a floor of 36 gallons per capita day (gpcd) set. This floor is set because 36 gpcd is the average water use of highly efficient WaterSense retrofitted households, as measured by the 2016 Residential End Uses of Water Study (Water Research Foundation 2016), and average indoor water use is not expected to fall below this already highly efficient level. Non-residential baseline water use per service, other than Industrial, was also adjusted for plumbing codes effects.

In this demand projection, water savings from the City of Santa Cruz water conservation programs were assumed to be subsumed within adjustments made to marginal water costs. This is because as marginal water cost increases, customers demand less water by forgoing consumption and by substituting other factors of production. For example, households may install more efficient water using appliances or change their landscaping and irrigation practices. Utility conservation programs, such as the City of Santa Cruz Conservation program, facilitate these transitions. In other words, the price change motivates program participation. The estimates of price elasticity used in the demand forecast capture these dynamics.

Plumbing code effects in the demand projection were derived from estimates prepared by M.Cubed for the California Department of Water Resources (M.Cubed 2016). Plumbing code and appliance efficiency standards considered include:

- AB 715, enacted in 2007, requiring standards for toilets and urinals.
- Water use standards for residential and commercial clothes washers and dishwashers established by the U.S. Department of Energy.
- CalGreen Code requirements for new construction and renovation.
- SB 407, enacted in 2009, requiring compliance with plumbing fixture standards for all buildings in California by 2019. SB 407 also requires compliance or disclosure of non-compliant plumbing to a purchaser or transferee for single family, multi-family, or commercial transactions.
- SB 837 passed in 2011, which reinforces the disclosure requirement under SB 407.

Table 4-4: Inclusion in Water Use Projections (submittal table 4-5R)

Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections?	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	2020 Urban Water Management Plan Chapter 4, Section 4.5
Are Lower Income Residential Demands Included In Projections?	Yes

4.6 Water Use for Lower Income Households and Affordability

In its demand forecast, the City expects over 1,000 new housing units to be built in its service area by 2045. Chapter 3, Section 3.5, Land Use and Housing, provides details about these housing units, including 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.

The City of Santa Cruz also recently completed an updated Water/Sewer Affordability Analysis (Appendix E) to help support the City's water rate setting process. The analysis was conducted for each census block in the City's water service area and was focused on the affordability of essential water use for both single and multi-family residential customers. The analysis is planned to be updated to assess how affordability may change as a result of the proposed rate restructuring.

Key findings of the 2020 study included:

- Essential water and sewer service in Santa Cruz remain affordable for most customers.
- Approximately 20% of households served by the City of Santa Cruz are located within census blocks with high affordability ratios indicating that water and sewer service costs may constitute a financial burden.
- Approximately 16% of households are located within census blocks where the financial burden of water and sewer service costs were scored high due to both high affordability ratios and high poverty prevalence. These customers are most likely to struggle with meeting basic living expenses, of which water and sewer service are a part.

4.7 Distribution System Water Losses

The volume of total system water demand is composed primarily of metered water sales in addition to a range of authorized, metered and unmetered operational uses such as main flushing, water tank maintenance, firefighting, 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 221 million gallons per year from 2015 to 2019.

The volume of water loss for calendar year 2015 through 2019, which is the most recent five years of data available, is presented in Table 4-5. In 2018, the City concluded a four-year Water Loss Control program 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 the annual volume of Non-revenue water. Provisional water losses for 2020 are provided in Section 4.3. More information on distribution system water losses is covered in Chapter 9.

Table 4-5: Water Loss Audit Reporting (submittal table 4-4R)

Last Five Years of Water Loss Audit Reporting	
Reporting Period Start Date	Volume of Water Loss (MG)
2015	198.34
2016	226.825
2017	219.609
2018	232.296
2019	225.729
NOTES: 2020 annual audit data not yet available.	

4.8 Climate Change Impacts on Water Use

The City's analysis and exploration of potential climate change effects on water system supplies are described in Chapter 6, Section 6.10, and consideration of potential climate change effects on system reliability are further included in the analyses in Chapter 7.

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 one degree F increase in average maximum daily air temperature over the entire year (M.Cubed, 2016). The analysis showed, based on 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 s expected to have 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. Therefore, in the higher scenario for projected temperature for the end of the century (2070 – 2099) shown in Figure 3-4, if average temperature in Santa Cruz were to rise by 7 degrees, water demand could be expected according to this analysis to increase by 3.2 percent.

Table 4-6: Expected Change in Demand per Change in Monthly Temperature

Expected Percent Change in Demand per 1 Degree Fahrenheit 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.*

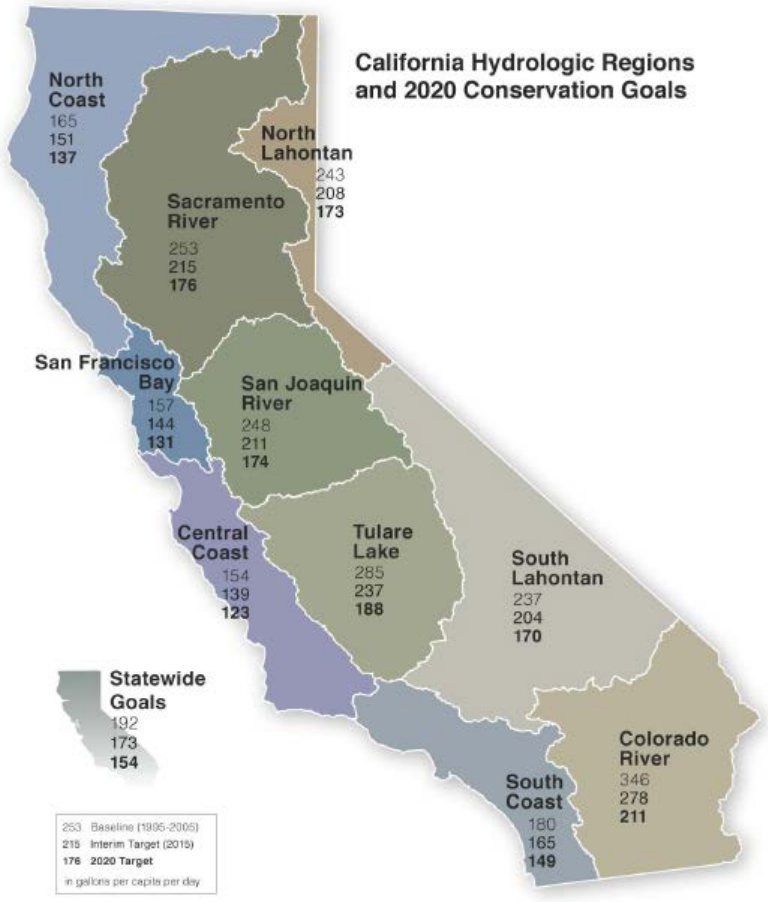
5.1 Background Information

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 final 20x2020 Water Conservation Plan was issued February 2010 (DWR, 2010). It reported urban water use varied between 152 GPCD in the Central Coast region (Region 3) to 346 gallons per capita per day (GPCD)[1] in the Colorado River region (Region 10) and averaged 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.

[1] Gallons per capita per day or GPCD is the total number of gallons used by the region divided by the population

Figure 5-1: Regional Urban Water Use Targets



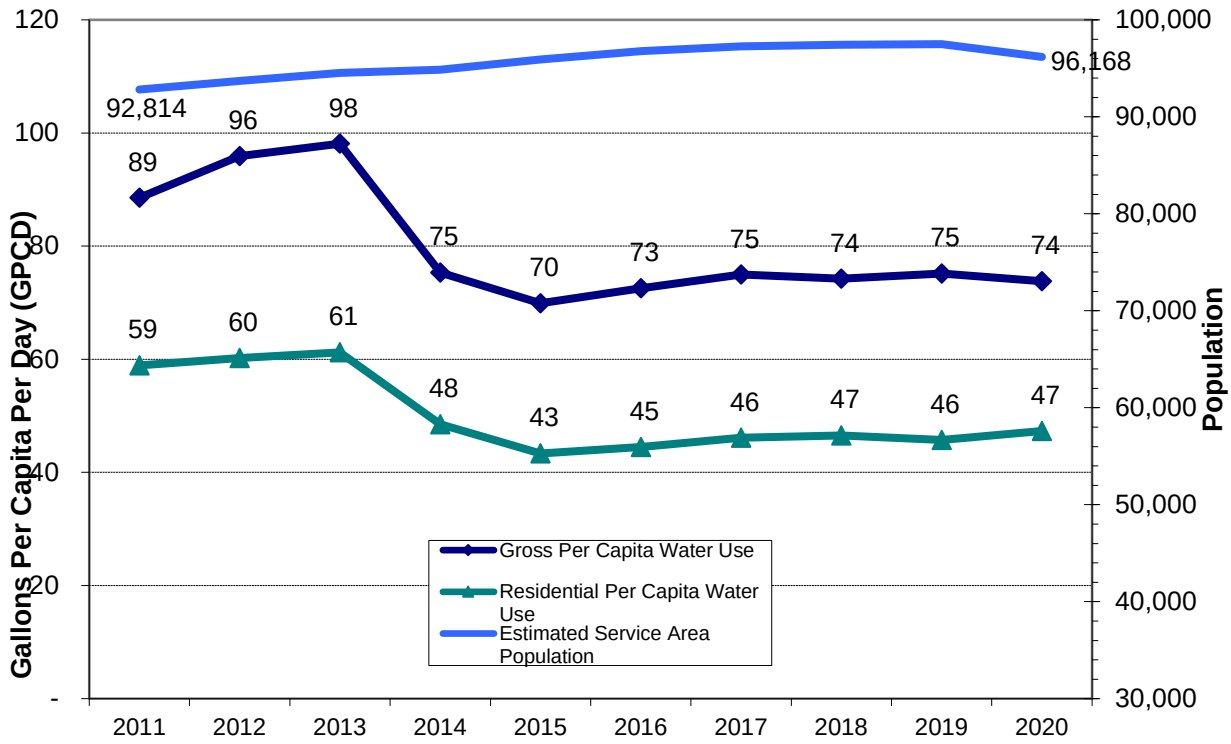
With the enactment of the Water Conservation Act of 2009, also known as SB X7-7, the state is required to set a goal to reduce urban per capita water use by 20 percent by the year 2020. Each retail urban water supplier was required to determine its baseline water use during their baseline period and also target water use for the years 2015 and 2020 in order to help the State achieve the 20 percent reduction.

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 elects to report as an individual retail supplier. In this 2020 Plan, water

agencies must demonstrate compliance with their established water use target for the year 2020. Retail water agencies are also required to separately complete and submit the standard tables in the SB X7-7 verification form (Appendix G).

Figure 5-2 below shows the City's per capita water use and estimated population since 2011. The dark blue line labeled Gross Per Capita Water Use[2] 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



[2] Gross water use is the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier.

The bottom line labeled Residential Per Capita Water Use is included for reference only. It represents the total annual metered water consumption for single and multiple residential accounts, divided by the residential population[3]. 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.

The City's gross per capita water use has declined significantly since 2000 when gross per capita water use was about 127 GPCD. In the past ten years, the gross per capita water use has ranged from a high of 98 GPCD in 2013 to a low of 70 GPCD in 2015. The City's current gross per capita water to 74 GPCD in 2020.

5.2 SB X7-7 Compliance Summary

As shown in Tables 5-1 and 5-2, the City's gross per capita water use is presently far below 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.

Table 5-1: Baselines and Targets Summary (submittal table 5-1R)

Baselines and Targets Summary From SB X7-7 Verification Form				
Baseline Period	Start Year	End Year	Average Baseline GPCD	Confirmed 2020 Target (GPCD)
10-15 year	2001	2010	113	110
5 Year	2003	2007	116	

Table 5-2: Compliance Summary Table (submittal table 5-2R)

X7-7 2020 Compliance Form				
2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020?
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD		
74	0	74	110	Yes

[3] 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.

5.3 2020 Calculated Baseline and Target

Because the Santa Cruz Water Department submitted a 2015 UWMP including the SB X7-7 Verification Form and has not had a change to its service area, the baselines and targets from the 2015 UWMP do not need to be recalculated for 2020. The City calculated its 2020 target in compliance with the Water Conservation Act of 2009 using Method 3 of the four approved methods as described in DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (For the Consistent Implementation of the Water Conservation Act of 2009). Refer to the 2015 Urban Water Management Plan for detailed information on this methodology.

5.4 2020 Population and Gross Water Use

Consistent with requirements for demonstrating SB X7-7 compliance, the 2020 population estimate was developed by the City based upon California Department of Finance estimates for 2020 population within the incorporated City of Santa Cruz and a "persons-per-connection" method for the population outside City limits (Appendix D). The water service area outside City of Santa Cruz limits, includes portions of the City of Capitola and portions of unincorporated Santa Cruz County.

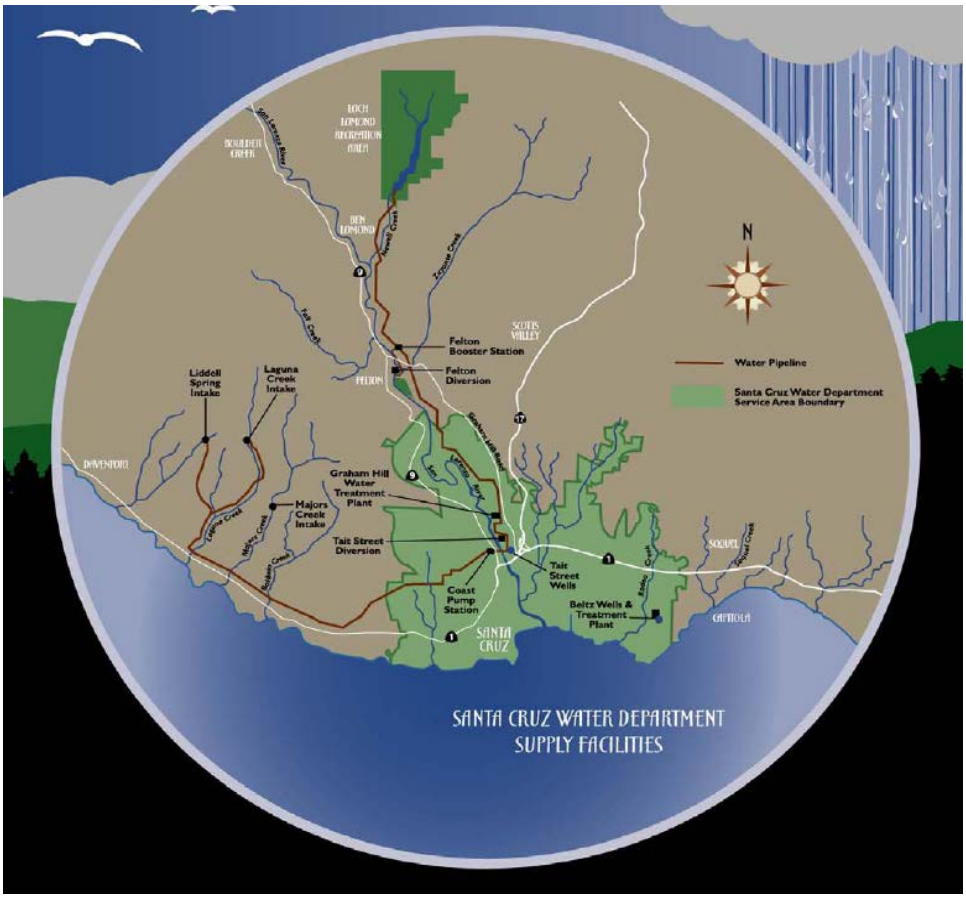
Chapter 6

SYSTEM SUPPLIES

This chapter describes the City's water supply system, discusses plans to enhance the City's existing supply portfolio, and presents current and projected supply source production volumes.

The Santa Cruz water system relies predominantly on local surface water supplies, which include the North Coast sources (Liddell Spring and Laguna, Majors, and Reggiardo Creeks), the San Lorenzo River (Felton Diversion, Tait Diversion, and Tait Wells), 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 the Beltz Well system the Santa Cruz Mid-County Groundwater Basin. These main production elements of the City's water supply system are illustrated below in Figure 6-1.

Figure 6-1. City of Santa Cruz Water Supply System



While water supply is considered to be adequate in normal and single dry years, the water supply reliability and drought risk assessments included in Chapter 7 of this plan demonstrate a potential lack of adequate supplies during near-term multiple consecutive dry years. To address this supply vulnerability, the City is implementing its Water Supply Augmentation Strategy (WSAS), in addition to ongoing water conservation, including the development of aquifer storage and recovery (ASR) facilities, transfers and/or exchanges with neighboring water districts, and increased use of recycled water as described below.

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 supplies 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.

In 2020, a small amount (2 million gallons (MG)) was imported from Soquel Creek Water District through the emergency intertie during a pipeline rupture on the City's Newell Creek Pipeline that transmits water from the Loch Lomond Reservoir to the Graham Hill Water Treatment Plant. The rupture occurred during a time of year when the City relies on the reservoir to meet demand. Upon repair of the pipeline, the import was discontinued.

6.2 Groundwater

Even though groundwater constitutes only up to about 5 percent of the entire City water supply on an annual basis, it is 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.

The Beltz Well system, or 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.

6.2.1 Basin Description

The geographical area from which the City pumps groundwater is identified as the *Santa Cruz Mid-County Groundwater Basin,* Basin Number 3-001(Basin) in *California's Groundwater, Bulletin 118 Interim Update 2016*. The Basin is described in detail in the Santa Cruz Mid-County Groundwater Sustainability Plan (GSP), adopted by the Santa Cruz Mid-County Groundwater Sustainability Agency on November 21, 2019. The adopted GSP was submitted to California Department of Water Resources (DWR) for approval on January 30, 2020. DWR approved the GSP on June 3, 2021 as being found to satisfy the requirements of the Sustainable Groundwater Management Act (DWR 2021b). The Basin GSP is included as Appendix H and is posted online at the following link: https://sgma.water.ca.gov/portal/gsp/all.

The Basin was consolidated from all or part of four previously existing basins: Soquel Valley (Basin Number 3-1), West Santa Cruz Terrace (Basin Number 3-26), Santa Cruz Purisima Formation (Basin Number 3-21), and Pajaro Valley Basins (Basin Number 3-2). The Purisima Formation and Aromas Red Sands are the two main geographic formations within the basin. The Basin is defined by both jurisdictional and geologic boundaries and is intended to include all areas that constitute the shared groundwater resources in the stacked aquifer system of the Purisima Formation, as well as the Aromas Red Sands and some other units underlying the Purisima Formation.

The Basin lies within the Central Coast hydrologic region that covers 36,290 acres and stretches from the Santa Cruz Mountains to the Pacific Ocean and from Live Oak to La Selva Beach along the coast of the Monterey Bay. The Basin is comprised of a portion of the City of Santa Cruz, all of the City of Capitola, and portions of unincorporated Santa Cruz County (Groundwater Exchange, 2021). A map of the Basin is shown in Figure 6-3. The City's Betlz Well system is the western side of the Basin, shown in the green area labeled Live Oak.

The majority of land use in the Basin is residential and open space, with limited amounts of commercial and agricultural lands. Urban and suburban areas are concentrated along the coastal terraces with rural communities and lower population densities in the foothills and mountains.

Groundwater is the primary water supply for most residents within the Basin, except for the approximately 32,000 residents that are supplied by the City water system. As described above, customers of the City water system rely primarily on surface water but with a critical portion of water supply coming from groundwater supply from the Beltz Well system in the Basin.

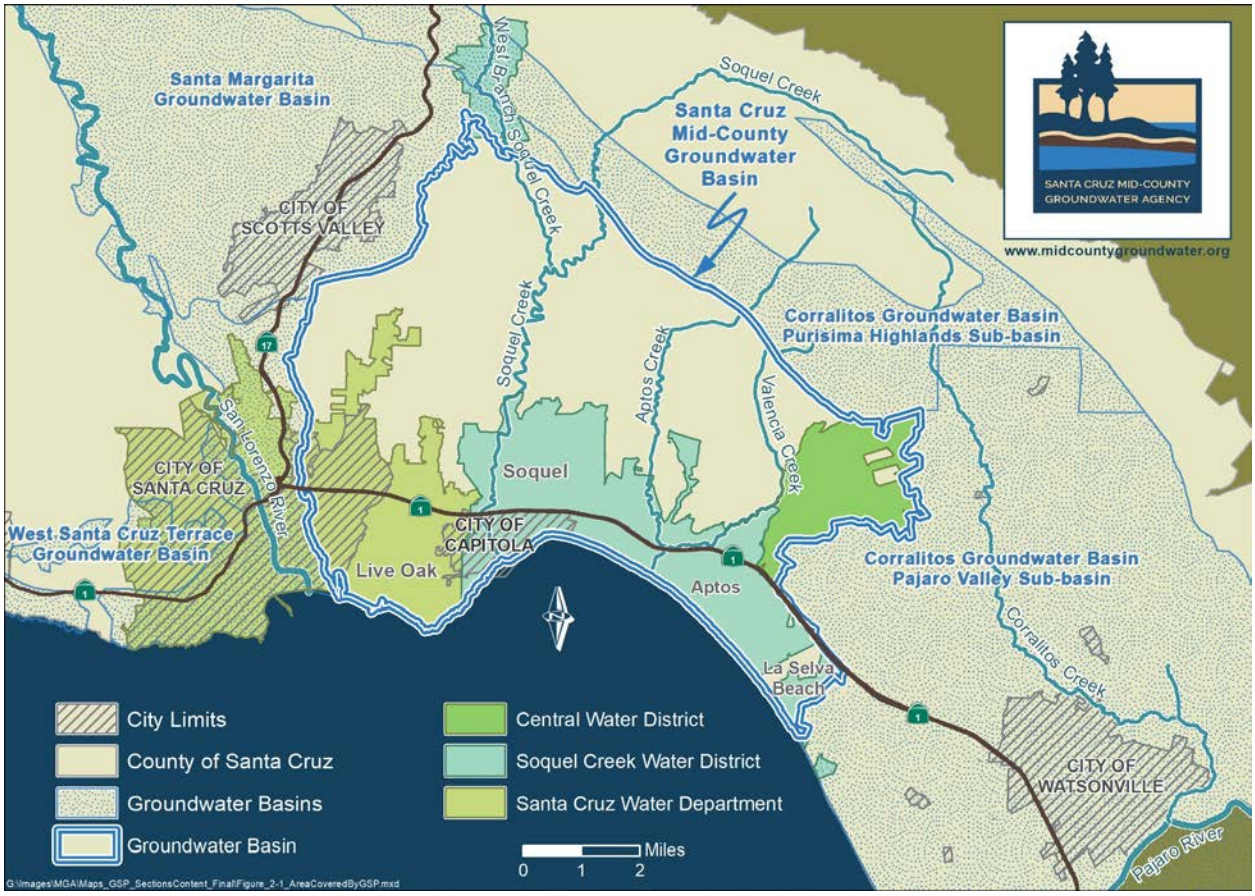
The entire production of the City's Beltz Well system is derived from the Purisima Formation, which is the primary groundwater aquifer underlying the Basin. Groundwater from the Purisima Formation is used by the City, Soquel Creek Water District, Central Water District, several small water systems, and numerous private rural water wells.

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 Beltz Well system and the Soquel Creek Water District's Service Area 1 wells and is continuous and connected between these areas of groundwater extraction. 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 36 monitoring wells at 14 sites, contributing to a network of 174 wells within the Basin that are monitored at least twice a year (MGA, 2019). Groundwater levels and water quality parameters, including chlorides, pH, total dissolved solids, general minerals, and other constituents are measured. Data collected from these monitoring wells are shared with adjoining public water agencies interested in management and planning of groundwater supply.

The Basin contains no areas with adjudicated groundwater rights.

Figure 6-3. Santa Cruz Mid-County Groundwater Basin



Source: Santa Cruz Mid-County Groundwater Sustainability Agency, 2019

6.2.2 Groundwater Management

The California Department of Water Resources (DWR) classifies the Basin as a high priority basin in a state of critical overdraft because of active seawater intrusion. Over pumping of the Basin has led to lower groundwater levels in coastal areas and seawater intrusion into coastal portions of the groundwater aquifers. Without active management, there is a threat of more widespread seawater contamination of groundwater in the Basin.

The City has participated in regional evaluation, monitoring, and management activities in the basin for over 50 years. The first major study of regional groundwater resources was conducted in late 1960s by the United States Geological Survey in collaboration with the County of Santa Cruz, the Soquel Creek Water District, and the City of Santa Cruz (Hickey, 1968). The study identified the importance of the Purisima Formation for regional water supply and recognized seawater intrusion into the aquifer as the greatest threat to regional groundwater supplies. Since that time and prior to the passage of the Sustainable Groundwater Management Act (SGMA) in 2014, the City and other agencies that rely on groundwater from the Basin have continued engagement in monitoring and pursued

various management strategies to help prevent the intrusion of seawater into groundwater supplies.

With the passage of SGMA came the formation of the Santa Cruz Mid-County Groundwater Sustainability Agency (MGA) in May 2016 under a Joint Exercise of Powers Agreement. The MGA now oversees groundwater management activities in the Basin and is comprised of four member agencies representing the principal public agencies that extract groundwater or regulate groundwater extraction and/or land use in the Basin: Central Water District, City of Santa Cruz, County of Santa Cruz, and Soquel Creek Water District .The MGA is governed by an eleven-member board of directors including two representatives from each member agency and three private well owner representatives, in addition to alternates. The City of Santa Cruz representatives are appointed by City Council. In 2020, they were former Water Commissioner David Baskin and City Councilmember Justin Cummings.

The GSP describes the projects and management actions that the MGA has developed to achieve Basin groundwater sustainability, primarily focused on avoidance of seawater intrusion, with related benefits to surface water and groundwater dependent ecosystems. Because the City's water system relies heavily on surface water, an additional focus of the project and management actions is development of a supplemental drought supply to improve the City's water supply reliability, consistent with the City's WSAS (see section 6.8) and Basin sustainability. The individual member agencies, including the City, have responsibility for implementing the various projects and management actions described in the GSP, including permitting, funding, and oversight.

The project and management actions are categorized into three groups based on how and when they will be implemented and are described below:

Baseline Projects and Management Actions (Group 1)
This group includes existing groundwater management activities and commitments by the MGA member agencies. These activities were already being implemented when the GSP was developed and are expected to continue to be implemented to help achieve groundwater sustainability in the Basin. Group 1 includes the following:

- Water conservation and demand management, implemented by all member agencies
- Installation and redistribution of municipal groundwater pumping, implemented by the City and Soquel Creek Water District

Projects and Management Actions Evaluated Against the Sustainable Management Criteria (Group 2)

This group includes projects and activities planned for near-term implementation. These activities have been developed and fully vetted by the MGA member agencies. Group 2 includes the following:

- Pure Water Soquel (Basin replenishment through injection of advanced purified water treated to drinking water standards), implemented by Soquel Creek Water District
- Aquifer storage and recovery (ASR), implemented by the City
- Water transfers/in-lieu groundwater recharge, implemented by the City and Soquel Creek Water District
- Distributed storm water managed aquifer recharge, implemented by County of Santa Cruz and Soquel Creek Water District

Identified Projects and Management Actions that May be Evaluated in the Future (Group 3)
This group includes projects and management activities that could be pursued by member agencies in the event that Group 2 activities either fail to be implemented or do not achieve the expected sustainability results. Selection from the projects and management actions in Group 3 will be pursued if and as needed. Criteria for selection and implementation would include factors such as magnitude of water shortage, speed of implementation, and the scale of regulatory and political hurtles. Group 3 projects include:

- Recycled water - groundwater replenishment and reuse
- Recycled water - surface water (reservoir) augmentation
- Recycled water - direct potable reuse
- Desalination implemented through a local or regional project
- Groundwater pumping curtailment and/or restrictions

For more detailed information on specific project and management actions, refer to the GSP (Appendix H), Section 4. For a full description of the City's current and planned activities, see descriptions of the City's water conservation and demand management program in Chapter 9 and the City's Water Supply Augmentation Strategy in Section 6.8.

6.2.3 Groundwater Pumping

The Beltz Well system is utilized during the peak season which is the months of May through September. Table 6-1 below shows the actual volume pumped from the City's Beltz Well system over the last five years. Average volume over this time was 140 million gallons per year (MGY). The current understood sustainable yield volume is 170 MGY which is utilized by the City when planning for the operation of the Beltz Well system.

Table 6-1: Groundwater Volume Pumped (submittal table 6-1R)

Groundwater Volume Pumped (MG)						
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	Santa Cruz Mid-County Basin (3-001)	156	169	165	57	147
	TOTAL	156	169	165	57	147

NOTES: Note in 2020, pilot testing of Aquifer Storage and Recovery at Beltz Well 8 included injection of 4 MG of treated surface water and subsequent extraction and disposal of 6 MG during the pilot testing. The 6 MG extraction is included in 2020 total. In 2019, pilot testing of Aquifer Storage and Recovery at Beltz 12 included injection of 21 MG of treated surface water and subsequent extraction of 25 MG. Of the 25 MG extraction volume, 7 MG was disposed of and 18 MG entered into the distribution system. The full 25 MG of extraction is included in 2019 total.

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 introductory section of the map provided in Figure 6-1 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 Spring

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 6-4. Laguna Creek Diversion Dam

6.3.2 San Lorenzo River

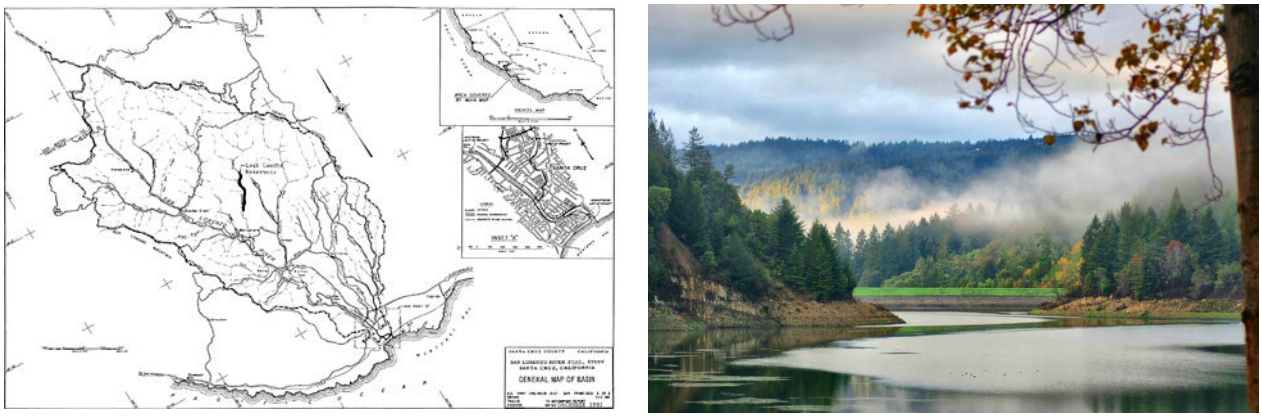
The San Lorenzo River is the City's largest source of water supply. The main surface water diversion is the Tait Diversion near the City limits just north of Highway 1. Use of this source dates back to the 1870s and was consolidated under public ownership in 1917. The Tait Diversion is supplemented by shallow, auxiliary wells located directly across the river referred to as the Tait Wells. These wells are assumed to be hydraulically connected to the river and considered to be tied to the City's appropriative rights for surface diversion. The drainage area above the Tait Diversion is 115 square miles.

Figure 6-5. San Lorenzo River Tait and Felton Diversions

The other diversion on the San Lorenzo River is Felton Diversion, which is an inflatable dam and intake structure built in 1974 that is located about six miles upstream from the Tait 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 6-6).

Figure 6-6. San Lorenzo River Watershed and Loch Lomond Reservoir



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 and Water Rights

The City of Santa Cruz 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 during 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. Water from Loch Lomond is also used during winter storms and high stream and river flows when water from surface water sources is too turbid to treat at the Graham Hill Water Treatment Plant.

The amount of water produced from each of the City surface water sources is controlled by different water rights. A summary of these existing water rights is presented below.

Summary of Water Rights Held by the City of Santa Cruz

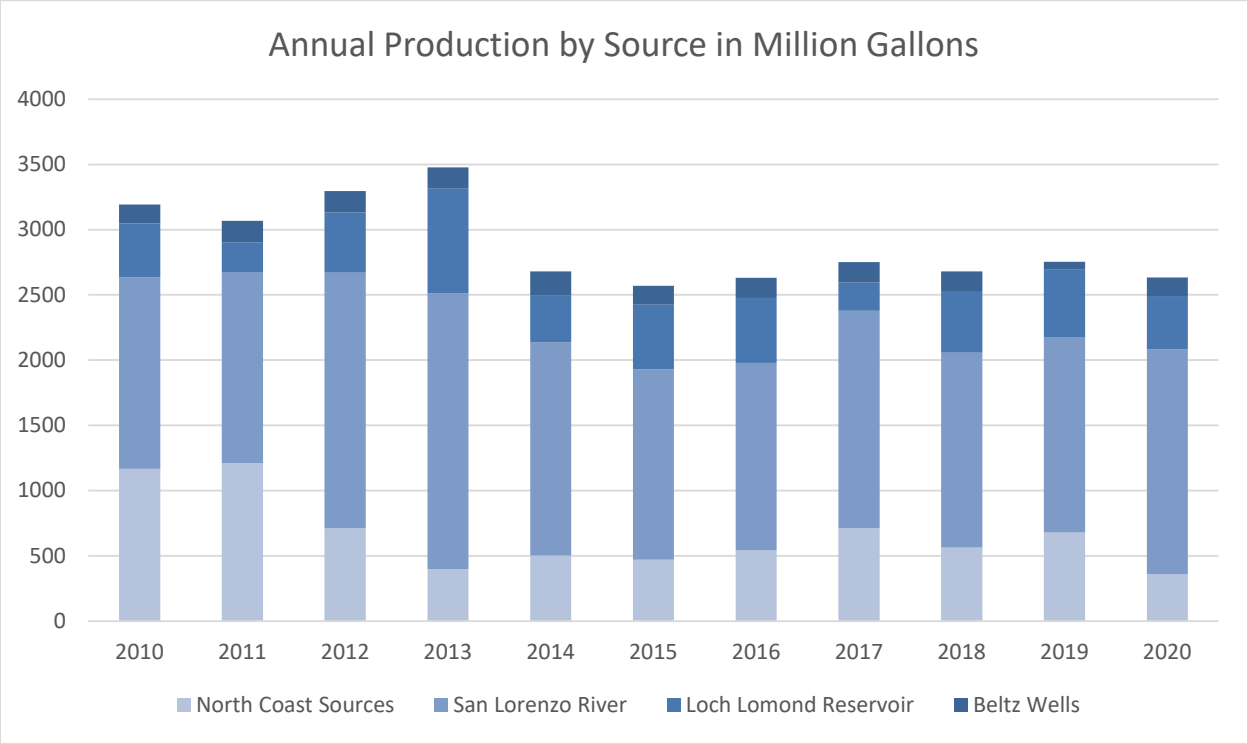
Source	Date of First Use/Priority	Season of Diversion	Maximum Diversion Rate (CFS)	Byapss Requirement (CFS)	Annual Diversion Limit (MG)
North Coast: Liddell Spring: Statement of Water Diversion and Use S002043 Laguna Creek: Statement of Water Diversion and Use S002042 Majors Creek: Statement of Water Diversion and Use S002044 Reggiardo Creek: Statement of Water Diversion and Use S008610	Pre-1914	Year round	No limit	None	None
San Lorenzo River: Tait Diversion: License 1553 (A004017) and License 7200 (A005215)	1924 and 1926	Year-round	12.2	None	None
San Lorenzo River: Felton Diversion: Permit 161233 (A022313) and Permit 166013 (A023710)	1965 and 1971	Sept	7.8	10	977
		Oct	20	25	
		Nov-May	20	20	
		Jun-Aug	0	--	
Newell Creek (Loch Lomond Reservoir): License 9847 (A017913)	1957	Sept-Jun	No limit	1 (released from Newell Creek Dam)	Max collection: 1,825 Max withdrawal: 1,042

The City In 2007, the City began voluntarily releasing in-stream flows from the North Coast system in connection with ongoing development of a Habitat Conservation Plan (HCP) for federal Endangered Species Act and California Endangered Species Act compliance for water system operations and maintenance activities that may adversely affect local special-status anadromous salmonids (coho salmon and steelhead trout). Over the last 13 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.

The City is currently working with the State Water Resources Control Board to revise the City's existing water rights to allow more options for where and how the City can use its existing rights while enhancing stream flows for local anadromous fisheries. The Santa Cruz Water Rights Project would improve flexibility in operation of the City's water system and include for all City surface water sources fish flow bypass requirements developed in coordination with the National Marine Fisheries Service and California Department of Fish and Wildlife for the HCP. See description of this project of in Section 6.8.2.

Gross annual production volumes from the City's surface and groundwater sources over the past ten years are shown in Figure 6-7, broken down by source of supply. During the past decade, the North Coast sources represented 23 percent of the total water supply, the San Lorenzo River represented 56 percent, Loch Lomond Reservoir (Newell Creek) represented 15 percent, and Beltz Well system contributed the remaining 5 percent.

Figure 6-7. Annual Production Volumes by Supply Source



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 pipeline, eight miles of surface storm water ditches, six storm water pump stations, 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 the 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.

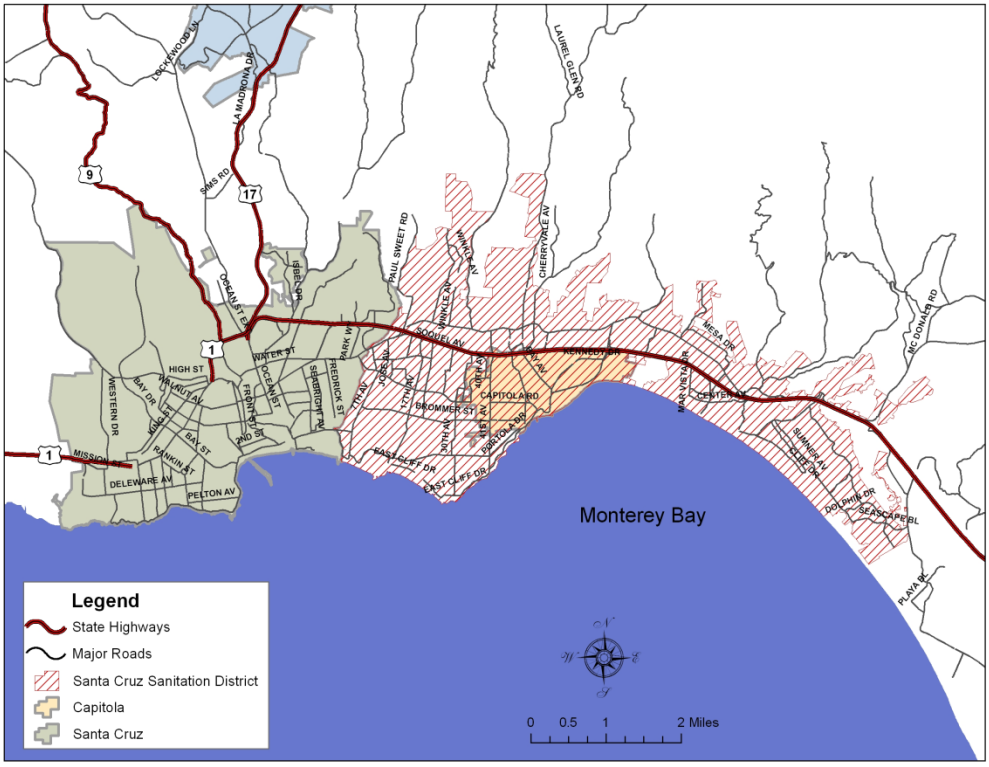
Storm water system management maintenance in the unincorporated area and Capitola is provided by the Santa Cruz County Flood Control and Water Conservation District, Zone 5, operated through the County Public Works Department. The County Board of Supervisors serves as the Board of Directors for the District. 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 6-8).

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. Soquel Creek Water District is currently designing and constructing the Pure Water Soquel Project which will utilize wastewater from the WWTF, enhancing the recycled water system in the region and allowing for potential opportunities for future expansion.

Figure 6-8. Geographic Area Served by Santa Cruz Wastewater Facility



6.5.1 Wastewater

Wastewater collection, treatment, and disposal are described below.

6.5.1.1 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 220 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.

In addition to the City and County Sanitation District, one small County Service Area serving the community of Woods Cove and a portion of the community of Rollingwoods and is 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.

A third-party organization is not operating a facility under contract in the Santa Cruz service area. With the exception of some outlying areas and individual parcels that have onsite wastewater systems, the vast majority of the estimated people residing in the City of Santa Cruz water service area are served by these two wastewater collection systems. Table 6-2 summarizes wastewater collected from these two agencies in 2020.

Table 6-2: Wastewater Collected Within Service Area in 2020 (submittal table 6-2R)

Wastewater Collected Within Service Area in 2020						
Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020 (MG)	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	1,395	City of Santa Cruz	Wastewater Treatment Facility	Yes	No
Santa Cruz County Sanitation District	Metered	1,218	City of Santa Cruz	Wastewater Treatment Facility	Yes	No
Total Wastewater Collected from Service Area in 2020:		2,613				

6.5.1.2 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 6-9).

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 6-9. 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. Due to conservation measures and reduced demand 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 2,613 million gallons in 2020.

6.5.1.3 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 - 2017 - 0030). 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.

Table 6-3 below provides the total amount of wastewater treated and disposed by the City's wastewater treatment facility in 2020.

Table 6-3: Wastewater Treatment and Discharge in 2020 (submittal table 6-3R)

Wastewater Treatment and Discharge Within Service Area in 2020							
Wastewater Treatment Plant Name	Discharge Location Name or Identifier and Discharge Location Description	Wastewater Discharge ID Number	Method of Disposal	Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes (MG)	
						Wastewater Treated	Discharged Treated Wastewater
Wastewater Treatment Facility	Monterey Bay/Pacific Ocean Bay Outfall Deep water outfall	3-440102001	Ocean outfall	yes	Secondary, Undisinfected	2,613	2,613
					Total	2,613	2,613

NOTES: Volumes for wastewater treated and discharged treated wastewater are presented as equal to satisfy the objective of this table. The recycled water that is reused wihtin the facility is not considered eligible for designation as recycled water under current Title 22 requirements. Figures presented do not include City of Scotts Valley waste discharge volumes.

6.5.2 Recycled Water

Since 2000, the City has been examining the use of recycled water through commissioned engineering studies regarding 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 (EIR) (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)
- Regional Recycled Water Facilities Planning Study, Phase 1 (Kennedy/Jenks, 2018)

The City of Santa Cruz is continuing to actively investigate the feasibility of recycled water though an ongoing Santa Cruz Recycled Water Feasibility Study Phase 2 with Kennedy/Jenks as further described below.

6.5.2.1 Recycled Water Coordination

As presented in Section 2.4, preparation of this 2020 UWMP was coordinated with all local water, wastewater, groundwater, and planning agencies throughout the water service area and Santa Cruz County. Coordination regarding recycled water use and planning studies has 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
- County of Santa Cruz
- University of California, Santa Cruz
- State Water Resources Control Board's Water Recycling Funding Program

6.5.2.2 Recycled Water System

The City does not currently operate a recycled water system in its service area. The Pasatiempo Golf Course, located within the City's service area, receives disinfected secondary effluent from the City of Scotts Valley, which it treats to tertiary standards at the Pasatiempo Golf Course Tertiary Plant for use as golf course irrigation, reducing the demand for potable water that would otherwise be used for irrigation. Additionally, Soquel Creek Water District is designing and constructing the Pure Water Soquel Project, which will enhance the recycled water system in the region and allow for potential opportunities for future expansion. See description in 6.5.4.1 below.

6.5.2.3 Recycled Water Beneficial Uses

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 beneficial uses are legally allowed. The quality of waste water 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 recycled water to potential customers.

6.5.2.4 Current Use and Planned Uses of Recycled Water

Current Use

In 2017, the Pasatiempo Golf Course, located within the City's service area, entered into an agreement with the City of Scotts Valley to provide disinfected secondary effluent to golf course where it is further treated to tertiary standards and used for golf course irrigation. City of Scotts Valley agreed to provide up to 35 million gallons per year for 30 years with the option for the golf course to purchase more if available. The golf course received and utilized the following annual quantities of recycled water:

- 2018 – 36 million gallons
- 2019 – 56 million gallons
- 2020 – 36 million gallons

The City of Santa Cruz continues to supply the remainder of the Pasatiempo golf course water demand as needed for potable water uses and as supplemental water for irrigation.

Planned Use

In 2018, the City completed a regional Recycled Water Facilities Planning Study (RWFPS) under a contract with Kennedy/Jenks Consultants (Appendix I). The RWFPS is intended to help guide the City to identify a preferred recycled water project(s) for the future.

The RWFPS was a joint project between the Santa Cruz Water Department, the Santa Cruz Public Works Department, which operates the WWTF, and the State of California, who is funding a portion of the project through the State Water Resources Control Board's Water Recycling Funding. Study Contributors include Soquel Creek Water District, Scotts Valley Water District, the University of California Santa Cruz (UCSC), the County of Santa Cruz, and the Santa Cruz County Sanitation District. The study also recognized the potential to develop future partnerships with the aforementioned regional agencies, and possibly the San Lorenzo Valley Water District, to increase reuse in the region.

The preferred project developed in the RWFPS is a phased approach that provides for near-term local action while leaving the door open for increased regional coordination in the

future as more information is available on all the alternatives. The recommendation includes two projects that would provide non-potable reuse in the City:

- **Santa Cruz Public Works Department (SCPWD) Title 22 Upgrade Project –** implement a near-term non-potable reuse project to meet in-plant demands, develop a bulk water station and serve the near-by La Barranca and Neary Parks.
- **BayCycle Project** – expand the SCPWD Title 22 Upgrade Project to increase production and non-potable reuse to serve UCSC and City customers along the way.

The City is also committed to exploring other reuse opportunities, including:

- **Coordination with Pure Water Soquel** – continue to work closely with Soquel Creek Water District to support the evaluation of the Pure Water Soquel project, described below, including, but not limited to, the delivery of source water and considerations for benefits of shared infrastructure.
- **Explore Groundwater Replenishment Reuse at Beltz Wellfield** – to replenish the Santa Cruz Mid-County Groundwater Basin in the Beltz Well system area, through a collaborative project with Pure Water Soquel or as an independent City led project.
- **Explore Groundwater Replenishment Reuse in Santa Margarita Groundwater Basin**– continue regional discussions related to the benefits and limitations for a regional groundwater replenishment reuse project in the Santa Margarita Groundwater Basin, which has the potential to make the region more resilient in the long term.

Additionally, in 2018, further study of recycled water was prioritized over seawater desalination in a motion by the City Council, with direction to perform additional analysis on identified recycled water projects and to support continued evaluation of improvements to the WWTF to provide tertiary treatment that would be necessary for any beneficial use of recycled water.

Following this direction, the City is continuing to investigate the feasibility of recycled water though an ongoing Santa Cruz Recycled Water Feasibility Study Phase 2. This includes ongoing evaluation of potential regional reuse project supported by Soquel Creek Water District's Pure Water Soquel Project. Other planned and potential uses for recycled water are landscape irrigation, bulk-water fill stations, and to fulfill onsite needs at the wastewater treatment facility.

Soquel Creek Water District is currently in design and initial phases of constructing the Pure Water Soquel Project, which will utilize wastewater from the City's wastewater treatment facility that has been treated to drinking water standards for groundwater replenishment within the Santa Cruz Mid-County Basin. The project includes an advanced purification water treatment facility and upgrades to the City's wastewater treatment facility,

conveyance infrastructure, and the construction of three seawater intrusion prevention wells and associated monitoring wells.

Soquel Creek Water District has identified 490 million gallons per year as the goal for groundwater replenishment, and has sized the Pure Water Soquel conveyance infrastructure to accommodate up to 980 million gallons per year for possible future expansion and potential partnership with the City and other local water suppliers.

The current and projected uses of recycled water within the City's service area are presented in Tables 6-4a and 6-4b.

Table 6-4a: Recycled Water Direct Beneficial Uses (submittal table 6-4R)

Recycled Water Direct Beneficial Uses Within Service Area								
Name of Supplier Producing (Treating) the Recycled Water:				City of Scotts Valley and Pasatiempo Golf Course				
Name of Supplier Operating the Recycled Water Distribution System:				City of Scotts Valley				
Beneficial Use Type	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Golf course irrigation	Pasatiempo Golf Course	Golf course irrigation	36	35	35	35	35	35
		Total:	36	35	35	35	35	35

Table 6-4b: Recycled Water Direct Beneficial Uses (submittal table 6-4R)

Recycled Water Direct Beneficial Uses Within Service Area		
Name of Supplier Producing (Treating) the Recycled Water:		City of Santa Cruz and/or Soquel Creek Water District
Name of Supplier Operating the Recycled Water Distribution System:		City of Santa Cruz and/or Soquel Creek Water District and/or City of Scotts Valley
Beneficial Use Type	**Potential** Beneficial Uses of Recycled Water	Amount of **Potential** Uses of Recycled Water
Landscape irrigation (exc golf courses)	**Title 22 Upgrade Project** - landscape irrigation at La Barranca and Neary Parks, and **BayCycle Project** - landscape irrigation at City Facilities and University of California, Santa Cruz (UCSC)	57.9 MG per year
Golf course irrigation	**Coordination with Pure Water Soquel** - Delavega Golf Course Irrigation	42 MG per year
Commercial use	**Title 22 Upgrade Project** - Bulk Water Station	1.8 MG per year
Industrial use	**BayCycle Project** - UCSC cooling towers and dual-plummed institutional buildings at UCSC	7.5 MG per eyar
Groundwater recharge (IPR)	**Groundwater Replenishment** Reuse at Beltz Wellfield and/or in Santa Margarita Groundwater Basin	328.5 MG per year

6.5.2.5 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 2015. The 2015 projected recycled water use for 2020 was 40 MG. While the 35 MG of projected golf course irrigation use was achieved, the 1 MG and 4 MG respectively for landscape irrigation and commercial uses were not achieved. A comparison of actual versus projected use is provided in Table 6-5.

Table 6-5: Recycled Water Use Projection Compared to Actual (submittal table 6-5R)

2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
Beneficial Use Type	2015 Projection for 2020 (MG)	2020 Actual Use (MG)
Landscape irrigation (excluding golf courses)	1	
Golf course irrigation	35	36
Commercial use	4	
Total	40	36

6.5.2.6 Actions to Encourage 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.

Table 6-6: Methods to Expand Future Recycled Water Use (submittal table 6-6R)

Methods to Expand Future Recycled Water Use			
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Santa Cruz Recycled Water Feasibility Study Phase 2	Contract with Kennedy/Jenks to further evaluate potential uses of recycled water	TBD	TBD

6.6 Desalinated Water Opportunities

For a decade or more, the City pursued a 2.5 mgd desalination facility as a regional project with Soquel Creek Water District to diversify both agencies' water supply portfolio. The WSAS, described in Section 6.8, includes desalinated water, but only as a last resort, and after exhausting several other preferred options (City of Santa Cruz, 2015).

In 2017, the City embarked on development of a Desalination Feasibility Update Review Report to evaluate the feasibility, cost, timeliness, and approach for pursuing a seawater desalination facility. While the 2018 report (Appendix J) found such a project to be technically feasible, additional feasibility review of a collector well system would be required, and it was further determined that the City's timeliness objective would not be met. Subsequently, further study of recycled water has been prioritized over seawater desalination.

6.7 Exchanges or Transfers

In 2016, the City and Soquel Creek Water District entered into 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 excess surface water from the North Coast is available. The pilot agreement was extended in 2021 through 2026 (Appendix K). The agreement represents a first step in the implementation of the Water Supply Augmentation Strategy, described in Section 6.8, and serves to further study and determine the potential benefits of local exchanges and transfers as a groundwater management tool and supply reliability strategy.

Following successful completion of preliminary water quality studies, pilot transfers began in December 2018 and continued into March 2019. Ongoing water quality monitoring was conducted throughout the transfers and these data confirmed the results of the pre-transfer studies. Some additional transfers occurred in the winter of 2019-2020. Dry conditions have limited the City's ability to transfer water since the end of January 2020. Yearly totals for transfers of treated surface water to Soquel Creek Water District are as follows:

- In 2018, a total of 9 MG was transferred,
- In 2019, a total of 68 MG was transferred, and
- In 2020, a total of 13 MG of was transferred.

6.8 Future Water Projects

Future water projects are a critical to ensuring future water supply reliability for City of Santa Cruz Water customers. These projects are described below.

6.8.1 Water Supply Augmentation Strategy

Since 2015, the City of Santa Cruz has been pursuing its WSAS developed by the Water Supply Advisory Committee as described in the 2015 Urban Water Management Plan. The Water Supply Advisory Committee was formed in 2014 when the City Council approved formation and membership of the citizen committee with the charge 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" (WSAC, 2015). The committee developed the Water Supply Advisory Committee Final Report on Agreements and Recommendations (October 2015), which was accepted by the City Council in November 2015. The Final Report was incorporated by reference into the 2015 Urban Water Management Plan, and the guiding recommendations continue to serve as the water supply management strategy for the City.

The WSAC recommendations are designed to address the "Problem Statement" included in the WSAC Final report:

> "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…" (WSAC, 2015)

The overarching goal of the WSAS is to provide significant improvement in the sufficiency and reliability of the City water supply. As presented in the 2015 UWMP, the WSAS portfolio elements include the following (WSAC 2015):

- Element 0: Demand Management. Additional water conservation with a goal of achieving an additional 200 to 250 million gallons per year (MGY) of demand reduction by 2035 by expanding water conservation programs.
- Element 1: Transfers and Exchanges. Passive recharge of regional aquifers by working to develop agreements for delivering surface water to the Soquel Creek Water District and/or the Scotts Valley Water District so they can rest their groundwater wells, help the aquifers recover, and potentially store water for use by the City in dry periods.
- Element 2: Aquifer Storage and Recovery. Active recharge of regional aquifers by using existing infrastructure and potential new infrastructure in the Purisima aquifer in the Soquel-Aptos Basin (now referred to as the Santa Cruz Mid-County Groundwater Basin), in the Santa Margarita/Lompico/Butano aquifers (now referred to as the Santa Margarita Groundwater Basin) in the Scotts Valley area, or in both to store water that can be available for use by the City in dry periods.
- Element 3: Recycled Water or Desalination. 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 in Element 1 and Element 2 prove insufficient to meet the goals of cost-effectiveness, timeliness, or yield. In the event advanced-treated recycled water does not meet the City's needs, desalination would become Element 3.

The Santa Cruz Water Department has been actively pursuing these recommendations since 2015 and continues to make steady progress. Conservation, or demand management, is not considered a water supply for the purposes of the UWMP. Details on this program can be found in Chapter 9. The current WSAS implementation schedule is included as Appendix M. Progress toward implementation of Elements 1 through 3 is described below.

6.8.1.1 Implementation of Transfers and Exchanges (Element 1)

The City has been working with Soquel Creek Water District to evaluate the feasibility of water transfers and exchanges since 2015 through the development of a formal pilot agreement, studies to assess the compatibility of surface and groundwater resources in distribution systems, and eventually piloting of water transfers in 2018 – 2020 as described in Section 6.7. The transfer agreement has been extended for an additional five years, 2021 – 2026, and additional piloting will continue as water supply conditions allow.

Future transfers and exchanges with local agencies, including Soquel Creek Water District, Central Water District, Scotts Valley Water District, and San Lorenzo Valley Water District would be facilitated by the water rights modifications to place of use proposed in the Santa Cruz Water Rights Project described in Section 6.8.2 below. The Santa Cruz Water Rights Project Draft EIR additionally examines implementation of water transfers and exchanges with local agencies. Limitations of this strategy include that it is limited both by availability of surface water for transfer and by the demand of other-agency systems to utilize transferred water when available. Transfers with Soquel Creek Water District may be further limited by the implementation of Pure Water Soquel due to potential operational constraints that are still being explored.

6.8.1.2 Implementation of Aquifer Storage and Recovery (Element 2)

The City has been evaluating the feasibility of ASR in both the Santa Cruz Mid-County and in the Santa Margarita Groundwater Basins, with current work primarily focused on the portion of Santa Cruz Mid-County Basin within the City of Santa Cruz service area. The City has completed groundwater modeling of over 20 scenarios, a well siting study, and a geotechnical study. Pilot testing has been conducted at the existing Beltz 12 well facility in 2019 and the existing Beltz 8 well facility in 2020 to better understand potential water quality and operational constraints. Additionally, the effects of implementation of the Pure Water Soquel Project, which was not anticipated when the WSAS was developed but is expected to improve basin sustainability, on future ASR project are being explored.

ASR in both basins would be facilitated by the water rights modifications proposed in the Santa Cruz Water Rights Project described in Section 6.8.2 below. The Santa Cruz Water

Rights Project Draft EIR additionally examines implementation of ASR. Next steps include consideration of longer-term demonstration of ASR at existing Beltz Well system facilities.

6.8.1.3 Implementation of Recycled Water or Desalination (Element 3)

As described in Section 6.7, further study of recycled water has been currently prioritized over seawater desalination. The City's evaluation of recycled water use is covered in detain in Section 6.4.

Table 6-7: Expected Future Water Supply Projects or Programs (submittal table 6-7R)

Expected Future Water Supply Projects or Programs					
Name of Future Projects or Programs	Joint Project with other suppliers?	Description	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier (MG)
Water Supply Augmentation Strategy (WSAS): • Element 1: In Lieu. This alternative could include the sale of water to other agencies with or without the assumption of additional water back to the City during droughts. • Element 2: Aquifer Storage and Recovery. Evaluations of both the Mid-County and Santa Margarita Groundwater Basins are being conducted. • Element 3: Advanced Treated Recycled Water or Seawater Desalination.	Yes. Some elements could be developed in coordination with neighboring water districts including Soquel Creek Water District, Scotts Valley Water District, and/or San Lorenzo Valley Water District	See 2020 UWMP Section 6.8 for full description	2030	All Year Types	0 - 1200
NOTES: Some future water supply projects are not compatible with this table and are described in the narrative.					

6.8.2 Santa Cruz Water Rights Project

This project supports the implementation of the WSAS and involves the modification of the City's existing water rights to increase the flexibility of the water system by improving the City's ability to utilize surface water within existing allocations. This project also adds into the City's water rights Agreed Flows bypass flow requirements for all of the City's surface water sources which are protective of local anadromous fisheries. (See Chapter 7, Section 7.1.2 for additional description of the Agreed Flows). The success of this project is necessary for fisheries protection and to facilitate future water supply projects. The primary components of the Santa Cruz Water Rights Project include:

1. Water rights modifications related to place of use, method of diversion, points of diversion and rediversion, underground storage and purpose of use, extension of time, and Agreed Flows stream bypass requirements for fish habitats;
2. Water supply augmentation components, including new aquifer storage and recovery (ASR) facilities at unidentified locations, ASR facilities at the existing Beltz well facilities, water transfers and exchanges and intertie improvements; and
3. Surface water diversion improvements, including the Felton Diversion fish passage improvements and the Tait Diversion and Coast Pump Station improvements.

State Water Resources Control Board noticed the City's water rights change petitions on February 10, 2021. Subsequently, the project's Draft EIR was released for public review in summer 2021. The Final EIR, to be prepared addressing comments received on the Draft EIR, is expected to be completed in late 2021 or early 2022. Once completed, the Santa Cruz City Council will consider project approval and certification of the EIR and the State Water Resources Control Board will consider action on the City's water rights change petitions. The Santa Cruz Water Rights Project Community Guide is included as Appendix L.

6.8.3 Santa Cruz Water Program (Capital Investment Program)

City of Santa Cruz has embarked on ambitious capital investment program, the Santa Cruz Water Program, to secure our future water supply portfolio, to improve reliability and resiliency in the face of climate change, and to address aged infrastructure. Major investments are planned in the coming years to advance toward a twenty-first century water system. Staff has been working with HDR Engineering to implement the Water Program. Some elements of the program will help contribute to the WSAS and and support water supply reliability such as improvements to the Graham Hill Water Treatment Plant, raw water pipeline improvements, Tait diversion, as described below. Information on all projects included in the Program is included in Appendix N.

6.8.3.1 Graham Hill Water Treatment Plant Projects

Upgrades to the City's Graham Hill Water Treatment Plant are critical to the implementation of the WSAS to allow treatment of higher turbidity source water that otherwise would need

to be bypassed during period high flow periods such as during and after storm events. Recent and ongoing projects include major maintenance repairs to the flocculation, sedimentation and filtration basins, and replacement of three of the four concrete tanks. Simultaneous with these component repair and replacement projects, staff has been developing the Facilities Improvement Project. This project is a comprehensive evaluation of the treatment plant that identifies the most cost-effective improvements to meet water treatment objectives and improve the overall reliability and resiliency of the plant. Staff have been working since December 2017, completing a comprehensive condition assessment of the facility, evaluating alternative treatment processes, performing pilot testing, jar testing, and bench-top studies to analyze treatment alternatives as well as developing a plan for identified non-treatment items such as deficient office space and seismic upgrades to the operations building. These investments are designed to address aging infrastructure, prevent noncompliance with drinking water standards under anticipated future conditions, and support mission-critical values of supplying adequate, safe, and reliable water for the City's customers.

6.8.3.2 Raw Water Transmission Pipeline Projects

The City is planning improvements to raw water conveyance by upgrades to both the Newell Creek Pipeline and segments of the North Coast system. These projects will improve reliability and reduce hydraulic constraints to improve delivery of raw water to the Graham Hill Water Treatment Plant.

6.8.3.3 Tait Diversion Improvements

The City is also investigating improvements to the Tait Diversion facility that would improve reliability and fish screening. As described in the Santa Cruz Water Rights Project Draft EIR, if the Tait Diversion is added as a new point of diversion to existing Felton water rights, Tait Diversion capacity would be increased to accommodate the combined diversion of water under both the Tait and the Felton water rights at this facility.

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 2020 are presented in Table 6-8. The figures represent production volumes experienced during the exception COVID-19 global pandemic. As analyzed in Appendix D, 2020 saw residential water use in Santa Cruz slightly higher and business water use significantly lower than expected. The change in business water is thought to be a consequence of the shelter-in-place order and business restrictions mandated in response to the pandemic. Pandemic-related changes in residential water use on the order of 3-5 gallons per capital per day in other parts of California were measured (DWR, 2021a). Observed increases in Santa Cruz residential

water use between 2017-19 and 2020 were on the order of two gallons per capital per day. Some of this increase may also be attributed to weather differences.

Table 6-8: Water Supplies – Actual (submittal table 6-8R)

Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2020	
		Actual Volume*	Water Quality
Surface water (not desalinated)	North Coast	360	Drinking Water
Surface water (not desalinated)	San Lorenzo River	1,724	Drinking Water
Supply from Storage	Loch Lomond	408	Drinking Water
Groundwater (not desalinated)	Beltz Well System	141	Drinking Water
Purchased or Imported Water	Emergency Intertie	2	Drinking Water
Recycled Water	Produced by City of Scotts Valley/ Pasatiempo Golf Course	35	Recycled Water
	Total	2,670	
NOTES: Net production. Source: Annual production data 2020.			

6.9.2 Planned Sources of Water

Table 6-9 provides an estimate of the volume of water, by source, that is reasonably projected to be available from 2025 to 2045. These volumes are based on deliveries for average years, projected water demands, available surface water flows consistent with ecosystem protection goals, and future water projects according to the City's water supply planning operations model, Confluence ®.

The City is safeguarding against future water shortages by and actively implementing future water projects as described in Section 6.8. Implementation of these projects is therefore assumed in the City's water supply planning process. Consistent with the WSAS, the following assumptions about future water projects have been used in developing projected water supplies described in this Urban Water Management Plan.

- In 2025, the City will have implemented proposed water rights modifications, including implementation of the Agreed Flows which are protective of local anadromous fisheries, as described in the Santa Cruz Water Rights Project Draft EIR (see Section 6.8.2) and
- In 2030, the City will have implemented the following components of the WSAS and planned infrastructure projects:
    - Aquifer Storage and Recovery in the Santa Cruz Mid-county Groundwater Basin and/or the Santa Margarita Groundwater Basin, sized for up to 4.5 mgd injection and 8.0 mgd extraction as described in the Santa Cruz Water Rights Project Draft EIR,
    - Improvements to the Tait Diversion on the San Lorenzo River as described in the Santa Cruz Water Rights Project Draft EIR and as included in the Santa Cruz Water Program (see Section 6.8.3),
    - Facility improvements at the Graham Hill Water Treatment Plan that will allow treatment of more turbid water as included in the Santa Cruz Water Program, and
    - Replacement of major transmission pipelines on the North Coast and the Newell Creek Pipeline as included in the Santa Cruz Water Program.

Table 6-9: Water Supplies – Projected (submittal table 6-9R)

Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	Projected Water Supply				
		2025	2030	2035	2040	2045
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Surface water*	North Coast	346	346	346	346	346
Surface water*	San Lorenzo River	1,847	1,877	1,887	1,948	1,967
Supply from Storage	Loch Lomond	349	331	331	331	331
Groundwater*	Beltz Well System	91	87	87	87	87
Recycled Water	Produced by City of Scotts Valley/ Pasatiempo Golf Course	35	35	35	35	35
Other	Aquifer Storage and Recovery	0	18	18	18	18
	Total	2,668	2,694	2,704	2,765	2,784
***Not desalinated**						

NOTES: Projected water supply values shown in this table represent output values from the City's Confluence (water supply) model utilizing historic hydrology. The Confluence model utilizes system demands to model water supply from City sources. Projected water supply is based on normal year type. Consistent with the WSAS, the following assumptions about future water projects have been used in developing projected water supplies. In 2025, the City will have implemented proposed water rights modifications as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, and in 2030, the City will have implemented the following components of the WSAS and planned infrastructure projects: Aquifer Storage and Recovery in the Santa Cruz Mid-county Groundwater Basin and/or the Santa Margarita Groundwater Basin, sized for up to 4.5 mgd injection and 8.0 mgd extraction as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, improvements to the Tait Diversion on the San Lorenzo River as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report and as included in the Santa Cruz Water Program, Facility improvements at the Graham Hill Water Treatment Plan that will allow treatment of more turbid water as included in the Santa Cruz Water Program, and replacement of major transmission pipelines on the North Coast and the Newell Creek Pipeline as included in the Santa Cruz Water Program.

6.10 Climate Change Impacts to Water 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. Prior to approximately 2013, water supply planning and the estimation of future water shortages for the City of Santa Cruz (City) were based solely on the 73 years of hydrologic record available for the Santa Cruz region. Using temperature and precipitation data and resulting hydrology from the past 73 years, the City used available tools and experience to predict future conditions. While this approach allowed the City to simulate longer droughts by synthetically creating time-sequences of dry periods, it was not capable of incorporating more severe droughts in terms of dryer, warmer climates.

Ongoing studies including evaluations of paleoclimate records and future climate model projections indicate that longer-term drought conditions have occurred in the past and are likely to occur again. Additionally, the 73-year period of record is characterized by rainfall patterns well above long-term averages and therefore the worst droughts reflected in the past 73 years likely understate future conditions.

During the Water Supply Advisory Committee process, which concluded in 2015, the City began incorporation of consideration of possible climate change hydrologies, in addition to the historic hydrology, into water supply planning. A goal of the process was to develop a supply augmentation work plan that was adaptable to future climate conditions. Through the supply planning work and the initial development of the pending HCP, the City focused on a worst-case climate change dataset, which for the Cal-Adapt datasets was the downscaled Geophysical Fluid Dynamics Laboratory Coupled Model (GFDL2.1 or CMIP3) for the A2 emissions scenario. It should be noted that the Cal-Adapt program was just getting up and running at that time to help state agencies respond to climate change.

The experiences and insights of the Water Supply Advisory Committee technical team have shown that the City's current supply system is vulnerable to future climate conditions projected in this region. By relying on local sources that are dominated by surface water and limited by a single reservoir, the City water system is vulnerable to any combination of conditions that result in drier or warmer climate, more intense rainfall over shorter periods of time, etc.

After completion of the process, the City has continued the evaluation of supply reliability under climate change conditions with additional model scenarios including but not limited to the use of the Coupled Model Intercomparison Project 5 (CMIP5) data set, including modified scenarios. An objective of this work is to understand the reasonable boundaries of future climate conditions with respect to timing, duration, and depth of supply deficits. The findings, whereas different in terms of magnitude of shortage and reliability of existing

supplies among the scenarios, all conclude that the City's current water supply situation is inadequate for meeting the longer-term challenges of climate change.

For the purposes of assessing climate change considerations in this Urban Water Management Plan, the water supply modeling for the supply reliability assessments presented in Chapter 7 were prepared using the City's water supply operations model, Confluence, utilizing both historic hydrology and CMIP5 climate change hydrology. The CMIP scenario used in the CMIP5 50-99 scenario which has been adjusted to include warmer air temperatures. It is important to note that this CMIP5 climate change hydrology represents a single possible future under climate change conditions that the City has selected to represent a reasonable prediction of future conditions. In this way, it is one useful way to think about climate change, but actual climate change could unfold in many different ways.

To address this type of uncertainty, moving forward, the City is adopting a new approach working with the Hydrosystems Group at the University of Massachusetts, Amherst to conduct a vulnerability assessment and develop an adaptation plan to understand the limitations of the current water supply system and evaluate adaptation options to mitigate effects of climate change to meet the City's water demand. This is being conducted through assessing the vulnerability of our system through an extensive exploration of future conditions to stress test the water system. What is expected to come from this analysis is a better understanding of the capabilities of the current system to meet future climate conditions, and under what conditions the current system begins to break down. This work, which is expected to ultimately replace the City's Confluence water supply operations model, is currently underway.

6.11 Energy Use

The City of Santa Cruz tracks municipal energy use, including Water Department energy use, on an online public energy dashboard as part of the City's ongoing climate action program. As summarized in Table 6-10, the City utilized about 5,800,000 kilowatt hours of energy system wide in 2020. This energy was used in the production, conveyance, treatment, and distribution of water within the water system. This results in a calculated energy intensity of 2,227 kilowatt hours per million gallons. Additionally, the Water Department generated about 600,000 kilowatt hours of self-generated renewable energy from solar arrays at the Graham Hill Water Treatment Plant and Bay Street Tanks site in 2020.

Table 6-10: Energy Reporting (submittal table O-1b) Recommended Energy Reporting - Total Utility Approach

Enter Start Date for Reporting Period	1/1/2020	Sum of All Water Management Processes		
End Date	12/31/2020			
		Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (MG)		*2604*		*2604*
Energy Consumed (kWh)		*5,799,263*		*5799263*
Energy Intensity (kWh/vol. converted to MG)		*2227.1*	*0.0*	*2227.1*

Quantity of Self-Generated Renewable Energy:
637,882 kWh

Data Quality:
Metered Data. No upstream data embedded.

Data from City of Santa Cruz Energy Dashboard for water production during the year 2020. The energy dashboard is publicly available online at:
https://app.powerbi.com/view?r=eyJrIjoiYTk4Yzk0NjctYTcyZC00YzYyLTkzYzUtMjY4M2JhNzM4NjE0IiwidCI6IjRjYTJkNDI0LTBlMmYtNDM3My04MGQwLTdiZjMwNWQwYmRiOCIsImMiOjZ9&pageName=ReportSection

Narrative for All Water Supply:
~Extraction and Diversion - energy is use to operate equipment at diversion facilities and wells
~Conveyance - energy is use at booster and pump stations to convey raw water
~Treatment - energy is used at surface water and groundwater treatment facilities
~Distribution - energy is used at pump stations to convey treated water and at reservoir/tank sites within the distribution system
~Self-generated renewable energy is produced from solar arrays at the Graham Hill Water Treatment Plant and the Bay Street Tanks site (distribution system)

Chapter 7

WATER SUPPLY RELIABILITY AND DROUGHT RISK ASSESSMENT

This chapter characterizes the City's water service reliability through assessments of forecasted supply relative to forecasted demand. 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, and Appendix O, Water Shortage Contingency Analysis and Implementation.

7.1 Constraints on Water Sources

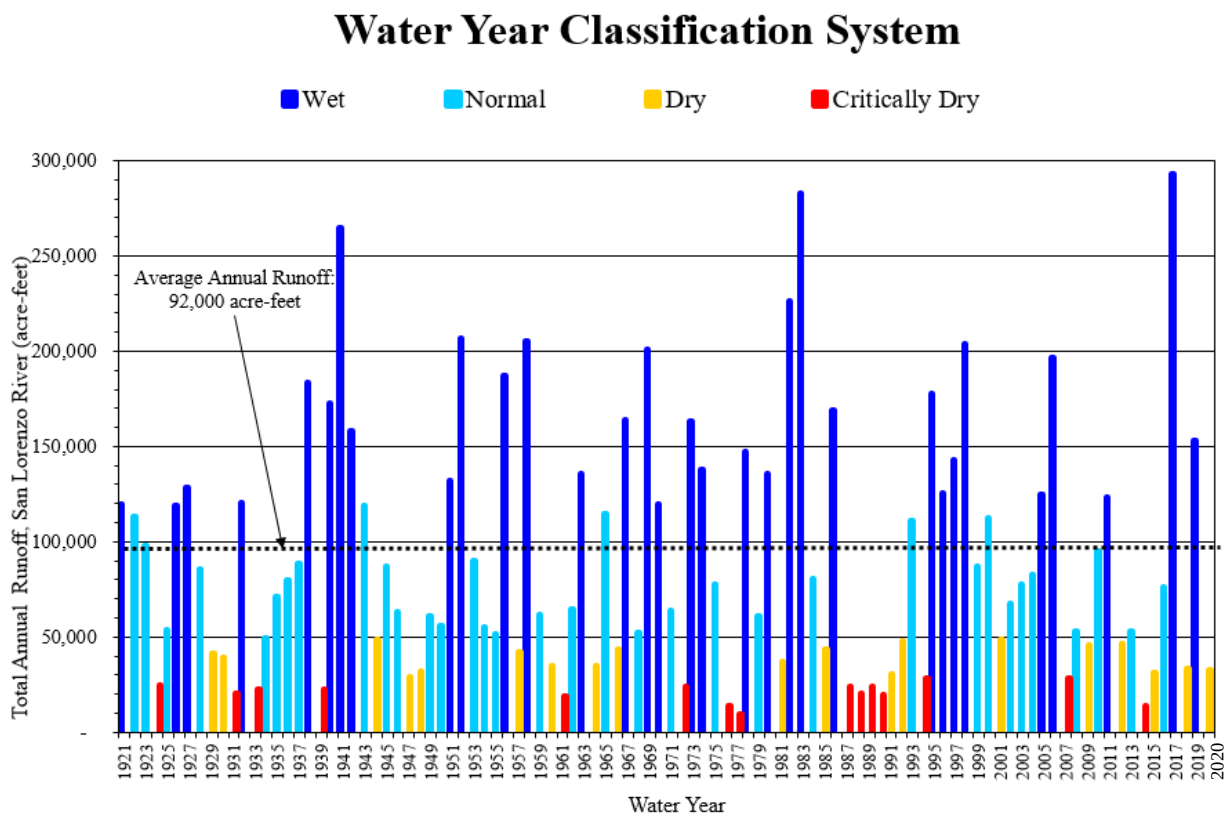
The City of Santa Cruz faces several obstacles in meeting its present and future water supply needs that necessitate future water supply projects. While each constraint presents a unique set of water management challenges, the common theme is the limitation in when and how much water is available to meet the area's water service needs, particularly during years when rainfall is below average, exacerbated by a lack of storage within the system. The following sections outline the known constraints on supply. Refer to Chapter 6, Section 6.8 for a discussion of the future water projects that the City is actively engaged in to address these identified constraints.

7.1.1 Local Supply Variability and Limited Storage

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.

Figure 7-1 below shows the total annual runoff for the San Lorenzo River over the 90-year period from 1921 to 2020 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.

Figure 7-1 Total Annual Stream Discharge from the San Lorenzo River



The system is highly vulnerable to shortage 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. Emergency interconnections with neighboring districts is limited by the lack of existing interties with neighboring districts. Due to the nature of the critically over drafted Santa Cruz Mid-County Groundwater Basin, the primary function of the existing intertie with the Soquel Creek Water District has been to send water to the District rather than from the District to the City.

Water is currently stored in the City's single reservoir, Loch Lomond Reservoir (impounded by the Newell Creek Dam), to serve peak season demands. This reservoir 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. Storage is also used in winter months during storm events when water quality concerns prevent the use of the City's flowing sources.

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 that 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 (*Oncorhynchus mykiss*) and the San Lorenzo River and Laguna Creek support coho (*Oncorhynchus kisutch*). Within the Central California Coast Region, steelhead is currently listed as "threatened" and coho 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.

The HCP conservation strategy has been designed to avoid, minimize, and fully mitigate the effects of the City's "Covered Activities" on "Covered Species" (steelhead and coho) and their habitat in support of the long-term viability of these populations within streams

affected by the HCP Covered Activities.[1] The ultimate fate of these populations depends on the actions of many other entities and natural processes both within and beyond areas under the City's control. The conservation strategy recognizes that the City's efforts will support and coordinate with overarching efforts to preserve these species within Santa Cruz County and the larger habitat boundaries for these species. The HCP biological goals and objectives address key limiting conditions in the Santa Cruz Mountains diversity stratum, particularly the effects of surface water diversions, as identified in the recovery plans for steelhead and coho (NMFS 2012, 2016).

The City has negotiated long-term minimum bypass flow requirements (Agreed Flows) for all City surface water sources with California Department of Fish and Wildlife (CDFW) and National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) as part of the HCP process. In particular, the HCP seeks to optimize habitat conditions for all life-stages of the subject species within the natural variability of the hydrologic regime. Any impacts to coho would be of particular concern because coho populations south of the Golden Gate Bridge are on the brink of extirpation. Provision of the Agreed Flows would generally require reduced diversions from the North Coast sources and from the San Lorenzo River at certain times and corresponding increased use of stored water from Loch Lomond Reservoir and use of groundwater. This would result in reduced storage in Loch Lomond Reservoir available for use during dry and drought periods. Overall, the implementation of the Agreed Flows would further reduce the City's dry-year water supply reliability, as it would further limit the amount of water that the City can divert.

The HCP was submitted to CDFW and NMFS for agency review in spring 2021 (City of Santa Cruz, 2021). Initiation of environmental review for the HCP and associated permit applications is expected to commence in fiscal year 2022 with the goal of permit process completion by late 2022 or early 2023.

The City's adoption of the HCP will be subject to review under the California Environmental Quality Act, and NMFS's processing of the HCP as a Section 10 permit application will be subject to a separate environmental review under the National Environmental Policy Act. However, as both CDFW and NMFS have tentatively agreed on the bypass flow requirements, the City has independently committed to implement the Agreed Flows as part of the Santa Cruz Water Rights Project (see Section 6.8.2), regardless of the final outcome of the HCP process. Under the Agreed Flows, less water will be available from the City's flowing sources for supply in future years

[1] The HCP Covered Activities include operation, maintenance, and rehabilitation of the City's water supply and water system facilities, including surface water diversions, operation and maintenance of the City's municipal facilities, and management of City lands.

compared, and as such, there will be greater reliance on water stored in Loch Lomond Reservoir to meet the community's annual water needs and the aforementioned vulnerability to shortage could be exacerbated.

7.1.3 Water Rights Constraints

As described in Chapter 6, the City of Santa Cruz holds pre-1914 water rights to its North Coast Sources and post-1914 licenses and permits for its water rights on the San Lorenzo River and Newell Creek. Through planning processes including the development of the draft HCP and City's Water Supply Augmentation Strategy (WSAS), the City has identified the need to improve flexibility in operation of the City's water system while enhancing stream flows for local anadromous fisheries. Incorporating the Agreed Flows into all City water rights is necessary to benefit local fisheries, specifically for coho and steelhead, but will further constrain the City's limited surface water supply. Consequently, the City has a need to improve the operational flexibility of the water system within existing rights, permits, and licenses to allow more effective use of limited water resources. To do this, the City is proposing water rights modifications to its existing rights, permits, and licenses to expand the authorized place of use (POU), to better utilize existing diversions, and to extend the City's time to put water to full beneficial use.

The Santa Cruz Water Rights Project, described in Chapter 6, Section 6.8.2, includes the following objectives to address current water rights constraints:

1. Improve the flexibility with which the City operates the water system to facilitate the City's ability to meet drinking water demand while providing flow conditions protective of coho and steelhead.
2. Provide flow conditions that are protective of coho and steelhead within all streams from which the City diverts water, as negotiated with CDFW and NMFS during the preparation of the pending HCP, which is the habitat conservation plan being developed under the federal ESA and CESA.
3. To improve the City's limited storage and support the implementation of the City's WSAS Element 1 (passive recharge of regional aquifers via water transfers and exchanges) and Element 2 (active recharge of regional aquifers via aquifer storage and recovery (ASR)) in order to deliver a safe, adequate, reliable and environmentally sustainable water supply.
4. Facilitate opportunities within the City and regionally for conjunctive use[2] of the City's surface water rights in combination with groundwater, including by addressing significant barriers to implementing conjunctive use due to the place of use associated with the City's water-right permits and licenses to, among other

[2] Conjunctive use refers to a range of actions and projects that provide for the coordinated management of surface water and groundwater supplies to increase total supplies and enhance water supply reliability. Conjunctive use actions and projects can also be used to sustainably manage groundwater supplies.

things, assist in implementation of the "Water Transfers/In Lieu Groundwater Recharge" element of the Santa Cruz Mid-County Groundwater Basin Groundwater Sustainability Plan (GSP).

5. Provide more options for where and how the City can utilize its existing appropriative water rights.
6. Provide for the underground storage of surface water primarily to support more reliable and improved water supply by allowing the City to use such stored water during dry periods and also to contribute to the protection of groundwater quality from seawater intrusion per the Santa Cruz Mid-County Groundwater Basin GSP and to allow for the implementation of the "Aquifer Storage and Recovery" element of the Santa Cruz Mid-County Groundwater Basin GSP.
7. Remove potential operational constraints on City water rights that do not explicitly recognize direct diversion.
8. Allow additional time for the City to fully reach beneficial use under existing water-right permits at Felton.
9. Improve fish screening at the Felton Diversion and Tait Diversion and improve fish passage at the Felton Diversion. Consideration of fish passage improvements at Tait Diversion would be incorporated into future projects as required.
10. Address reliability and operational deficits at the Tait Diversion and Coast Pump Station to meet other project objectives.
11. Implement state policy favoring integrated regional water management by involving the City and other local agencies in "significantly improving" the "reliability of water supplies" by "diversifying water portfolios, taking advantage of local and regional opportunities, and considering a broad variety of water management strategies," specifically by making more extensive conjunctive use of the surface-water, groundwater and groundwater-storage resources available to the City and, when Agreed Flows and City demands are met, making excess surface water under the City's surface-water rights available to neighboring agencies who are dependent on overdrafted groundwater basins. (Water Code Section 10531[c].)
12. Consider other related actions or activities that would be foreseeable as a logical part in a chain of contemplated actions should the project be approved, including facilities that would provide for ASR, water transfers, and water exchanges.

7.1.4 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 and the State Water Resources Control Board Division of Drinking Water. 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 treatment challenges posed by future changes in our source water mix driven in part by ecosystem protection requirements and to accommodate the WSAS. The treatment plant is a conventional surface water treatment plant that was commissioned in 1960 as a 12 million gallons per day (MGD) plant and has undergone an expansion and a number of improvements over the last 50 years. Except for groundwater from the Beltz Well system, 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 24 MGD. Currently, the plant's ten-year average production is between 7 MGD and 8 MGD.

In addition to addressing aging infrastructure at the treatment plant, the City has been evaluating improvements to address a variety of changing conditions, including climate change considerations. This includes changing the mix of source water when accommodating the Agreed Flows, treating more turbid flows and providing potential higher daily plant output in winter to support the WSAS, accommodating changing storm patterns that may deliver regional rainfall in higher volumes over shorter periods of time, and evolving water quality regulations.

7.2 Drought Risk Assessment

The Drought Risk Assessment (DRA) is a new requirement in the 2020 Urban Water Management Plan. The assessment includes a supply and use comparison looking ahead assuming drought conditions over the next five years. The DRA can be modified or updated on an interim cycle, as such, it is required to include a description of the basis for assessment, an analysis of reliability for individual water sources, as well as a comparison of total water supply and use comparison over a five year drought period, even if this information is provided in detail elsewhere in the Urban Water Management Plan.

7.2.1 Basis for Assessment

The data, methods, and basis for assumed water shortage conditions are consistent with those used throughout this 2020 Urban Water Management Plan. Specifically, projected demand is based upon the long-term demand forecast prepared for the City by M.Cubed. In 2014 and 2015, the City of Santa Cruz worked with M.Cubed to develop a long-term water demand forecast using econometric forecasting, and that demand forecast was updated in 2021 for use in this Urban Water Management Plan (Appendix D).

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 also used to generate the results for the 2010 and 2015 UWMP. 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 drought risk and water supply reliability based on accepted assumptions and projected conditions in the water system under historic hydrology and a selected climate change hydrology.

In this Urban Water Management Plan, the period 1973 – 1977 is used as the DRA and five-consecutive-year drought in the reliability assessment described below because it is the period in the historic record that would pose the greatest challenge to the City's water supply system. Even though the sequence began with wet and normal years, the extremely dry period that occurred in the final two years of the sequence in 1976 and 1977 would result in greatest water supply shortages of any five-year period in the historical record. The sequencing of year types in this period is as follows:

- Year One (1973) – Wet
- Year Two (1974) – Wet
- Year Three (1975) – Normal
- Year Four (1976) – Critically Dry
- Year Five (1977) – Critically Dry

By way of comparison, the drought of 1987 – 1991 was a period of more consecutive years classified as either dry or critically dry, but the hydrology of the period of 1973 – 1977 would result greater supply shortages for the City's supply system.

The City has chosen to conduct this analysis using both historic hydrology and a selected climate change hydrology, CMIP-5, similar to the approach utilized for the reliability assessment described below. The scenario used is the CMIP5 50-99 scenario which has been adjusted to include warmer air temperatures. The five-year consecutive drought period was selected as the driest period identified from the climate change hydrology resulting in the greatest projected supply shortages.

Based on anticipated timing of certification of the Santa Cruz Water Rights Project Environmental Impact Report and action by the State Water Resources Control Board on proposed water rights modifications, the City's proposed water rights modifications as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report (see Chapter 6, Section 6.8.2), including implementation of the Agreed Flows which are protective of local anadromous fisheries, are assumed for 2022 through 2025 of the DRA, but are not assumed in the first year of the analysis. Neither implementation of ASR of planned infrastructure projects are assumed to be implemented within the timeframe of this analysis.

7.2.2 Total Water Supply and Use Comparison

Table 7-1 presents the results of the DRA. This analysis shows that projected supply would meet projected demand for the first four years of the extended five-year drought, but that in the fifth year, a substantial, 27 percent, shortage is projected. This projected shortage would require aggressive reduction savings according to the City's Water Shortage Contingency Plan. During an extended drought period, however, the City would likely utilize the Water Shortage Contingency Plan and implement demand reduction requirements in earlier years before an actual shortage is experienced, to ensure adequate supplies remain in Loch Lomond Reservoir, thereby potentially reducing the depth of shortage experienced in the fifth year.

Table 7-1C presents the DRA under the selected climate change hydrology. Under these conditions, a minor shortage of 3% would be expected in the second year, but substantial shortages of 25 percent and 23 percent would be expected during the fourth and fifth years of the extended drought scenario respectively. These projected shortages would require high levels reduction savings implemented per the Water Shortage Contingency Plan.

These near-term drought risks underline the City's need for water supply augmentation and for the pursuit of its WSAS and Water Program described in Chapter 6, Section 6.8.

Table 7-1: Five-Year Drought Risk Assessment (submittal table 7-5R)

Five-Year Drought Risk Assessment	
2021	Total
Total Water Use (MG)	2,646
Total Supplies (MG)	2,646
Surplus/Shortfall w/o Action (MG)	0
Planned WSCP Actions (use reduction)	
WSCP - use reduction savings benefit (MG)	
Resulting % Use Reduction from Action	0%
2022	Total
Total Water Use (MG)	2,652
Total Supplies (MG)	2,652
Surplus/Shortfall w/o Action (MG)	0
Planned WSCP Actions (use reduction)	
WSCP - use reduction savings benefit (MG)	
Resulting % Use Reduction from action	0%
2023	Total
Total Water Use (MG)	2,657
Total Supplies (MG)	2,657
Surplus/Shortfall w/o Action (MG)	0
Planned WSCP Actions (use reduction)	
WSCP - use reduction savings benefit (MG)	
Resulting % Use Reduction from Action	0%
2024	Total
Total Water Use (MG)	2,663
Total Supplies (MG)	2,663
Surplus/Shortfall w/o Action (MG)	0
Planned WSCP Actions (use reduction)	
WSCP - use reduction savings benefit (MG)	
Resulting % Use Reduction from Action	0%
2025	Total
Total Water Use (MG)	2,668
Total Supplies(MG)	1,948
Surplus/Shortfall w/o Action (MG)	(720)
Planned WSCP Actions (use reduction)	
WSCP - use reduction savings benefit (MG)	720
Resulting % Use Reduction from Action	27%

Table 7-1C: Five Year Drought Risk Assessment Table under a Projected Climate Change Hydrology

Five-Year Drought Risk Assessment Under a Projected Climate Change Hydrology	
2021	Total
Total Water Use (MG)	2,646
Total Supplies (MG)	2,646
Surplus/Shortfall w/o Action (MG)	0
Planned WSCP Actions (use reduction)	
WSCP - use reduction savings benefit (MG)	
Resulting % Use Reduction from Action	0%
2022	Total
Total Water Use (MG)	2,652
Total Supplies (MG)	2,652
Surplus/Shortfall w/o Action (MG)	0
Planned WSCP Actions (use reduction)	
WSCP - use reduction savings benefit (MG)	
Resulting % Use Reduction from Action	0%
2023	Total
Total Water Use (MG)	2,657
Total Supplies (MG)	2,586
Surplus/Shortfall w/o Action (MG)	(71)
Planned WSCP Actions (use reduction)	
WSCP - use reduction savings benefit (MG)	71
Resulting % Use Reduction from Action	3%
2024	Total
Total Water Use (MG)	2,633
Total Supplies (MG)	2,005
Surplus/Shortfall w/o Action (MG)	(628)
Planned WSCP Actions (use reduction)	
WSCP - use reduction savings benefit (MG)	628
Resulting % Use Reduction from Action	25%
2025	Total
Total Water Use (MG)	2,668
Total Supplies (MG)	2,089
Surplus/Shortfall w/o Action (MG)	(581)
Planned WSCP Actions (use reduction)	
WSCP - use reduction savings benefit (MG)	581
Resulting % Use Reduction from Action	23%

7.2.3 Individual Water Source Reliability and Determination

The DRA includes an assessment of the reliability of and determination on each water source over the five-consecutive year drought. The DRA captures a period when the City will be implementing Agreed Flows, which are protective of local anadromous fisheries, but before WSAS projects to augment water supply are operational. Figure 7-2 illustrates the water supply by source for each year in the drought risk assessment. The City's flowing sources, the North Coast streams and San Lorenzo River, comprise the majority of the City's water supply. After 2022, assuming implementation of proposed water rights modifications, these sources will be managed according to Agreed Flows bypass requirements which are protective of local anadromous fisheries and will limit the ability for the City to divert from flowing sources compared to historical practices. These flowing sources are also highly susceptible to reduced flow availability during drought conditions.

Reduced water availability from the flowing sources results in increased reliance during dry years on the Beltz Well system for groundwater and Loch Lomond Reservoir for supply from storage. The Beltz Well system, however, is constrained by the limited capacity of the four groundwater wells and is managed as a basin in critical overdraft per the Santa Cruz Mid-County Groundwater Basin Groundwater Sustainability Plan (Appendix H). Furthermore, Loch Lomond Reservoir is currently the City's only supply storage, and as such, it must be managed conservatively to ensure sufficient supplies are available to address the possibility of extended drought. Because of this, the City will typically activate its Water Shortage Contingency Plan as described in Chapter 8 during single dry years, when supplies may otherwise be sufficient to meet current-year demand, to hold as much storage as possible for possible subsequent dry years without opportunity to refill the reservoir during winter rains.

Recycled water used within the system is currently limited to irrigation of the Pasatiempo Golf Course and is supplied from the City of Scotts Valley. This recycled water supply is not expected to be impacted by drought conditions.

The City additionally conducted the Drought Risk Assessment utilizing the selected climate change projection. Figure 7-2C illustrates the City's water supply by source that is projected to be utilized under this scenario. The vulnerability of flowing sources, the North Coast Streams and San Lorenzo River, to drought can be seen in the rapid drop of availability of these sources between years two and three in this scenario. Subsequently, the inability to refill Loch Lomond Reservoir during ensuing dry years, leads to two successive years of significant projected supply shortages.

Figure 7-2: Drought Risk Assessment Supply by Source

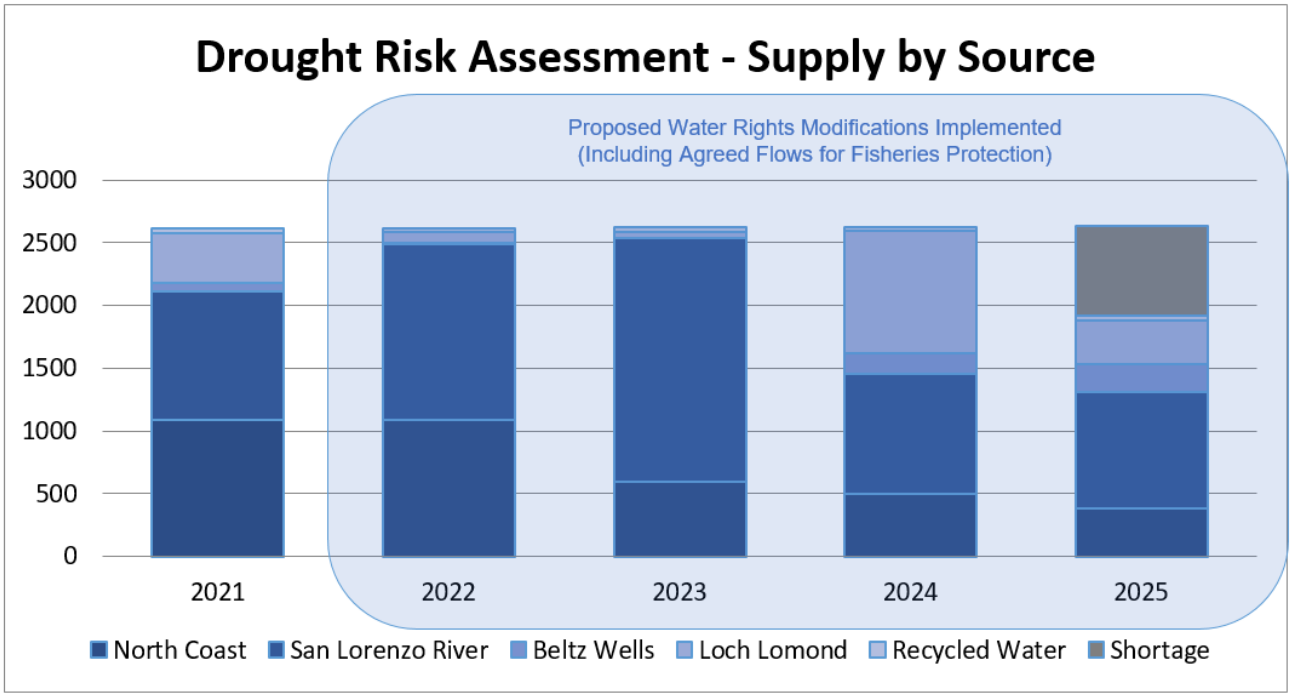
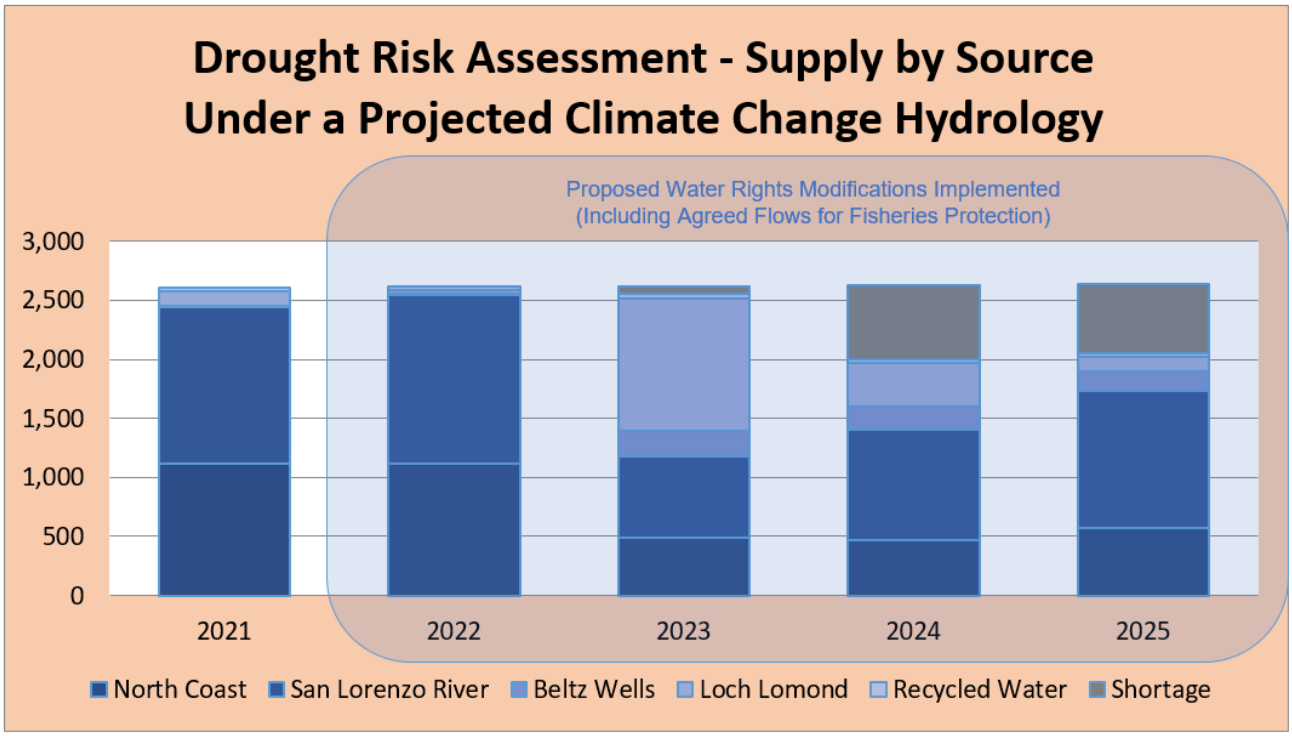


Figure 7-2C: Drought Risk Assessment Supply by Source under a Projected Climate Change Hydrology



7.3 Reliability by Type of Year

For the purposes of assessing water system reliability, the California Department of Water Resources uses the following definitions for determining year type:

Average/Normal Year: This condition represents the water supplies available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available. In this reliability assessment, the year 2010 is used to represent the average year because flows in the San Lorenzo River during this year were very close to the historical average.

Single-dry Year: A year that represents the lowest water supply available to the agency. In this reliability assessment, the year 1977 is used as the single dry year because it was the single driest year in this historical record.

Five-Consecutive-Year Drought: The five-consecutive-year drought represents the driest five year historical period for the supplier. In this reliability assessment, the period 1973 – 1977 is used as the five-consecutive-year drought because it is the period in the historic record that was most challenging from a water supply perspective, particularly due to the extremely dry two years of 1976 to 1977 as described in Section 7.2.1 above.

While the Urban Water Management Plan requires that reliability assessments be conducted utilizing the historic record as the basis for analysis, the City also elected to conduct the reliability assessments using a selected climate change hydrology, a modified CMIP-5 scenario, as described in Chapter 6, Section 6.10. Average, single-dry, and a five-year consecutive drought period were selected as representative from the climate change hydrology, and are presented in Table 7-1C.

Table 7-2: Basis of Water Year Data (submittal table 7-1)

Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		☐	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.
		☑	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available (MG)	% of Average Supply
Average Year	2010	2785	100%
Single-Dry Year	1977	2785	100%
Consecutive Dry Years 1st Year	1973	2785	100%
Consecutive Dry Years 2nd Year	1974	2785	100%
Consecutive Dry Years 3rd Year	1975	2785	100%
Consecutive Dry Years 4th Year	1976	2684	96%
Consecutive Dry Years 5th Year	1977	1954	70%

NOTES: Projected water supply values shown in this table represent output values from the City's Confluence (water supply planning) model utilizing historic hydrology. The Confluence model utilizes system demands to model water supply from City sources. The Confluence model utilizes system demands to model water supply from City sources. Consistent with the WSAS, the following assumptions about future water projects have been used in developing projected water supplies. In 2025, the City will have implemented proposed water rights modifications as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, and in 2030, the City will have implemented the following components of the WSAS and planned infrastructure projects: Aquifer Storage and Recovery in the Santa Cruz Mid-county Groundwater Basin and/or the Santa Margarita Groundwater Basin, sized for up to 4.5 mgd injection and 8.0 mgd extraction as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, improvements to the Tait Diversion on the San Lorenzo River as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report and as included in the Santa Cruz Water Program, Facility improvements at the Graham Hill Water Treatment Plan that will allow treatment of more turbid water as included in the Santa Cruz Water Program, and replacement of major transmission pipelines on the North Coast and the Newell Creek Pipeline as included in the Santa Cruz Water Program. Projected demand is based upon the Update of the City of Santa Cruz's Long-Range Water Demand Forecast (M.Cubed, 2021) (Appendix D).

Table 7-2C: Basis of Water Year Data under a Projected Climate Change Hydrology

Basis of Water Year Data (Reliability Assessment) Under a Projected Climate Change Hydrology			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		☐	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.
		☑	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available (MG)	% of Average Supply
Average Year	n/a	2785	100%
Single-Dry Year	n/a	2486	89%
Consecutive Dry Years 1st Year	n/a	2785	100%
Consecutive Dry Years 2nd Year	n/a	2785	100%
Consecutive Dry Years 3rd Year	n/a	2607	94%
Consecutive Dry Years 4th Year	n/a	2060	74%
Consecutive Dry Years 5th Year	n/a	2060	74%

NOTES: Projected water supply values shown in this table represent output values from the City's Confluence (water supply) model utilizing a modeled climate change hydrology (CMIP-5). The Confluence model utilizes system demands to model available water supply from City sources. Consistent with the WSAS, the following assumptions about future water projects have been used in developing projected water supplies. In 2025, the City will have implemented proposed water rights modifications as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, and in 2030, the City will have implemented the following components of the WSAS and planned infrastructure projects: Aquifer Storage and Recovery in the Santa Cruz Mid-county Groundwater Basin and/or the Santa Margarita Groundwater Basin, sized for up to 4.5 mgd injection and 8.0 mgd extraction as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, improvements to the Tait Diversion on the San Lorenzo River as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report and as included in the Santa Cruz Water Program, Facility improvements at the Graham Hill Water Treatment Plan that will allow treatment of more turbid water as included in the Santa Cruz Water Program, and replacement of major transmission pipelines on the North Coast and the Newell Creek Pipeline as included in the Santa Cruz Water Program. Projected demand is based upon the Update of the City of Santa Cruz's Long-Range Water Demand Forecast (M.Cubed, 2021) (Appendix D).

7.4 Supply and Demand Reliability Assessment

To demonstrate supply reliability over time for each base year type modelled, Figure 7-3 illustrates projected supply available relative to demand over the 25-year planning horizon of this assessment. As further described below and consistent with the City's WSAS, implementation of pending water rights modifications, including Agreed Flows which are protective of local anadromous fisheries, is assumed after 2025. Improved reliability is projected after 2030 due to implementation of ASR and planned infrastructure projects.

As will be expanded on in the following section, the City projects having sufficient water supply available in normal years and single dry years to serve anticipated demand throughout the 2025 – 2045 analysis period.

Under multi-year drought conditions in the near term (2025), with proposed water rights modifications but before implementation of the ASR and planned infrastructure projects, available supplies would meet projected demand in years one through four of the multi-year drought scenario, but would fall short of demand by 27 percent in year five. While the analysis characterizes this vulnerability for year five of the drought period, depending on sequencing of rain years, in reality it is possible that such a shortage could occur sooner and persist longer through a multiple dry year period. Under multi-year drought conditions after 2030, with implementation of the ASR and planned infrastructure projects, available supplies would meet projected demand in years one through four of the mutli-year drought scenario, and the year-five shortage is anticipated to be substantially reduced with projected shortages no larger than a negligible two percent.

Figure 7-3C shows the projected supply available relative to demand under the modeled climate change hydrology. Compared to historic hydrology, there is potential for decreased reliability under a single dry year and under multi-year drought conditions under the climate change scenario. The City projects having sufficient water supply available in normal years under the climate change hydrology.

In single dry year conditions in the near term (2025), with proposed water rights modifications but before implementation of the ASR and planned infrastructure projects, supply would fall short of projected demand by seven percent. Under multi-year drought conditions in the near term available supplies would meet projected demand in years one and two of the multi-year drought scenario, but would fall short of system demands by two percent in year three and by 23 percent in years four and five. However, under multi-year drought conditions after 2030, with implementation of the ASR and planned infrastructure projects, available supplies would meet projected demand in years one through four of the scenario, and the year-five shortage is anticipated to be substantially reduced with projected shortages no larger than five percent.

Figure 7-3: Projected Supply Availability as Demand Served

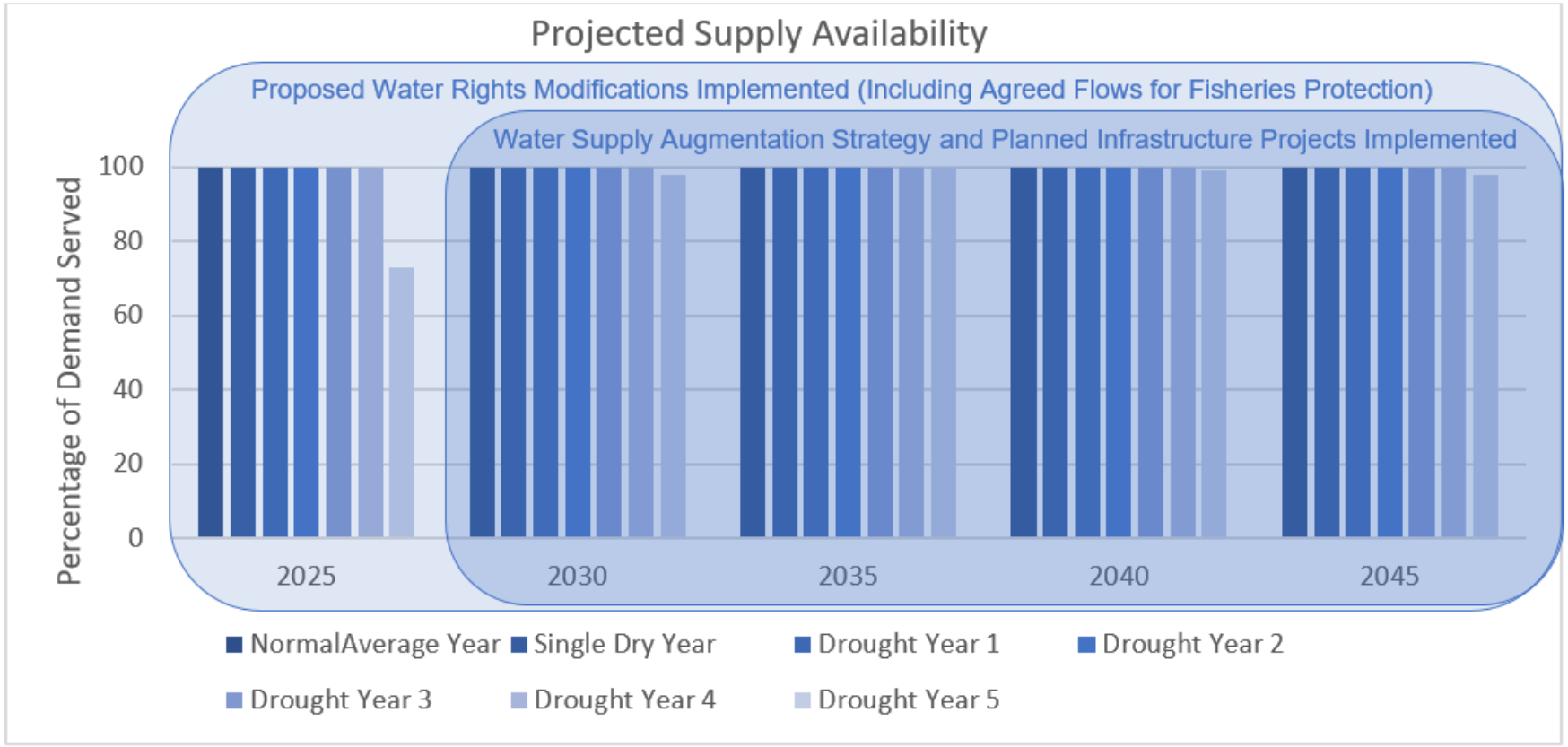
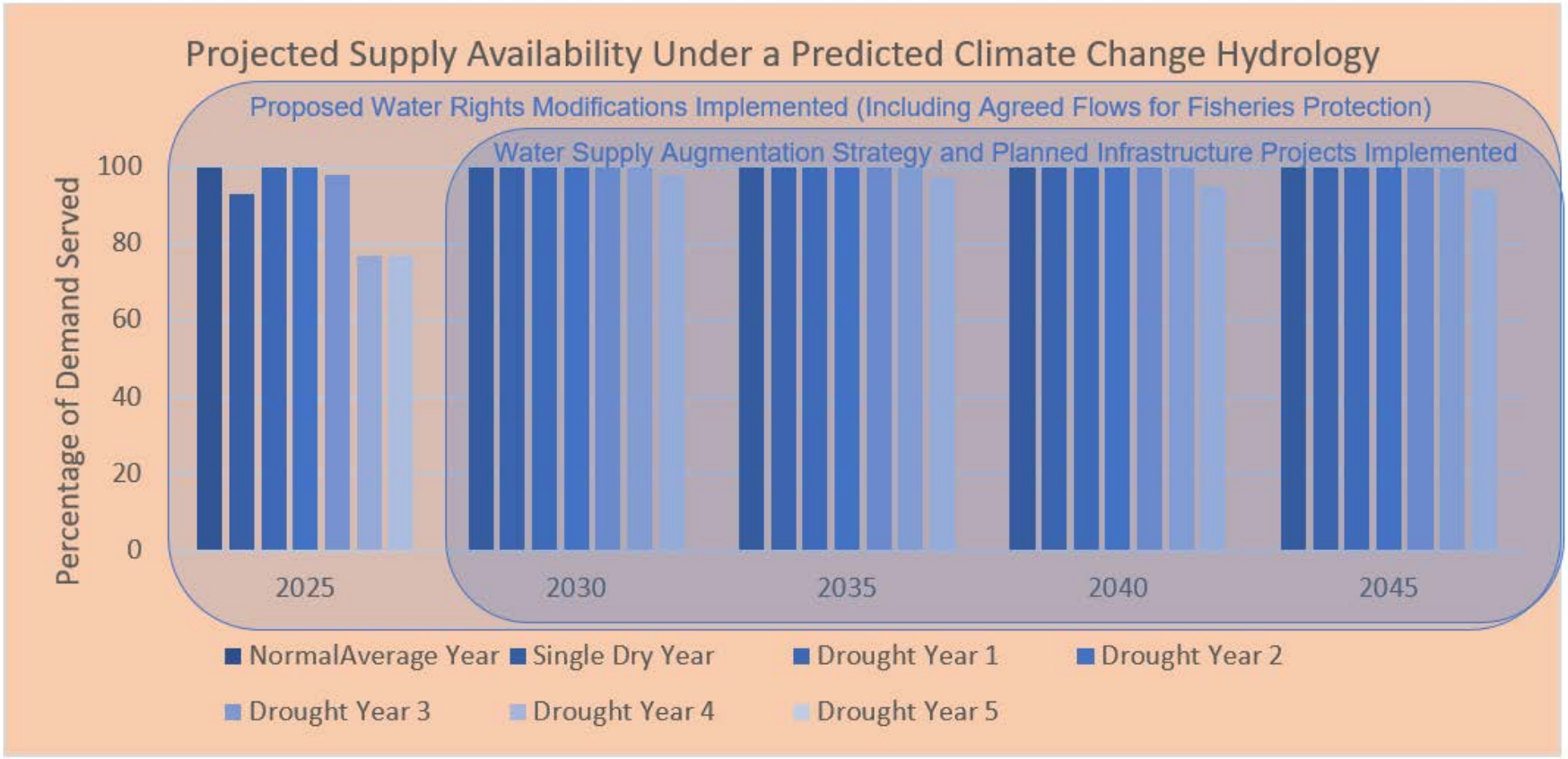


Figure 7-3C: Projected Supply Availability as Demand Served under a Projected Climate Change Hydrology



As described in Section 7.2.1, the City of Santa Cruz utilizes the Confluence® model to analyze the variability of water supplies to determine potential water supply shortages. 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 provide perspective on the City's water supply reliability based on accepted assumptions and projected conditions in the water system. Similar to the DRA, 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 under historic hydrology and a selected climate change hydrology.

The City is safeguarding against future water shortages by actively implementing future water projects as described in Chapter 6, Section 6.8. Implementation of these projects is therefore assumed in the City's water supply planning process. Consistent with the WSAS, the following assumptions about future water projects have been used in developing projected water supplies over the 25-year planning horizon of this Urban Water Management Plan.

- In 2025, the City will have implemented proposed water rights modifications, including implementation of the Agreed Flows which are protective of local anadromous fisheries, as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report (see Section 6.8.2) and
- In 2030, the City will have implemented the following components of the WSAS and planned infrastructure projects:
    - Aquifer Storage and Recovery in the Santa Cruz Mid-county Groundwater Basin and/or the Santa Margarita Groundwater Basin, sized for up to 4.5 MGD injection and 8.0 MGD extraction as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report,
    - Improvements to the Tait Diversion on the San Lorenzo River as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report and as included in the Santa Cruz Water Program (see Section 6.8.3),
    - Facility improvements at the Graham Hill Water Treatment Plan that will allow treatment of more turbid water as included in the Santa Cruz Water Program, and
    - Replacement of major transmission pipelines on the North Coast and the Newell Creek Pipeline as included in the Santa Cruz Water Program.

7.4.1 Normal/Average Water Year

After selecting the representative normal year (2010) from the 78-year period of record, average conditions were projected for the future five-year intervals through 2045. The summary results of this assessment, showing no shortages over the planning period with implementation of future water projects, are presented in Table 7-2 below for historic hydrology and Table 7-2C for the projected climate change hydrology.

Table 7-3: Normal Year Supply and Demand Comparison (submittal table 7-2R)

Normal Year Supply and Demand Comparison					
	2025 (MG)	2030 (MG)	2035 (MG)	2040 (MG)	2045 (MG)
Supply totals	2,668	2,694	2,704	2,765	2,784
Demand totals	2,668	2,694	2,704	2,765	2,784
Difference	0	0	0	0	0

NOTES: Projected water supply values shown in this table represent output values from the City's Confluence (water supply) model utilizing historic hydrology. The Confluence model utilizes system demands to model water supply from City sources. Consistent with the WSAS, the following assumptions about future water projects have been used in developing projected water supplies. In 2025, the City will have implemented proposed water rights modifications as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, and in 2030, the City will have implemented the following components of the WSAS and planned infrastructure projects: Aquifer Storage and Recovery in the Santa Cruz Mid-county Groundwater Basin and/or the Santa Margarita Groundwater Basin, sized for up to 4.5 mgd injection and 8.0 mgd extraction as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, improvements to the Tait Diversion on the San Lorenzo River as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report and as included in the Santa Cruz Water Program, Facility improvements at the Graham Hill Water Treatment Plan that will allow treatment of more turbid water as included in the Santa Cruz Water Program, and replacement of major transmission pipelines on the North Coast and the Newell Creek Pipeline as included in the Santa Cruz Water Program. Projected demand is based upon the Update of the City of Santa Cruz's Long-Range Water Demand Forecast (M.Cubed, 2021) (Appendix D).

Table 7-3C: Normal Year Supply and Demand Comparison under a Projected Climate Change Hydrology

Normal Year Supply and Demand Comparison Under a Projected Climate Change Hydrology					
	2025 (MG)	2030 (MG)	2035 (MG)	2040 (MG)	2045 (MG)
Supply totals	2,668	2,694	2,704	2,765	2,784
Demand totals	2,668	2,694	2,704	2,765	2,784
Difference	0	0	0	0	0

NOTES: Projected water supply values shown in this table represent output values from the City's Confluence (water supply) model utilizing a modeled climate change hydrology (CMIP-5). The Confluence model utilizes system demands to model water supply from City sources. Consistent with the WSAS, the following assumptions about future water projects have been used in developing projected water supplies. In 2025, the City will have implemented proposed water rights modifications as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, and in 2030, the City will have implemented the following components of the WSAS and planned infrastructure projects: Aquifer Storage and Recovery in the Santa Cruz Mid-county Groundwater Basin and/or the Santa Margarita Groundwater Basin, sized for up to 4.5 mgd injection and 8.0 mgd extraction as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, improvements to the Tait Diversion on the San Lorenzo River as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report and as included in the Santa Cruz Water Program, Facility improvements at the Graham Hill Water Treatment Plan that will allow treatment of more turbid water as included in the Santa Cruz Water Program, and replacement of major transmission pipelines on the North Coast and the Newell Creek Pipeline as included in the Santa Cruz Water Program. Projected demand is based upon the Update of the City of Santa Cruz's Long-Range Water Demand Forecast (M.Cubed, 2021) (Appendix D).

7.4.2 Single Dry Water Year

This assessment presents water supply available to the City as reflecting conditions comparable to water year 1977, which was the driest year in the historical record. As shown in Table 7-3, water supply during a single dry year is sufficient to meet the demand over the planning horizon through 2045 with implementation of future water projects.

The same analysis using the driest year in the projected climate change hydrology indicates a potential supply shortage of about seven percent in the near term, 2025 as indicated in Table 7-3C. As described above, in 2025, the analysis assumes proposed water rights modifications including implementation of the Agreed Flows bypass requirements which are protective of local anadromous fisheries and will limit the ability for the City to divert from flowing sources compared to historical practices, but implementation of the WSAS and planned infrastructure projects is not anticipated or assumed in the analysis until the year 2030. With both the proposed water rights modifications and water supply augmentation in place in 2030 and beyond, no water supply shortages are expected under the single dry year scenario under projected climate change hydrology conditions.

Table 7-4: Single Dry Year Supply and Demand Comparison (submittal table 7-3R)

Single Dry Year Supply and Demand Comparison					
	2025 (MG)	2030 (MG)	2035 (MG)	2040 (MG)	2045 (MG)
Supply totals*	2,668	2,694	2,704	2,765	2,784
Demand totals*	2,668	2,694	2,704	2,765	2,784
Difference	0	0	0	0	0

NOTES: Projected water supply values shown in this table represent output values from the City's Confluence (water supply) model utilizing historic hydrology. The Confluence model utilizes system demands to model water supply from City sources. Consistent with the WSAS, the following assumptions about future water projects have been used in developing projected water supplies. In 2025, the City will have implemented proposed water rights modifications as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, and in 2030, the City will have implemented the following components of the WSAS and planned infrastructure projects: Aquifer Storage and Recovery in the Santa Cruz Mid-county Groundwater Basin and/or the Santa Margarita Groundwater Basin, sized for up to 4.5 mgd injection and 8.0 mgd extraction as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, improvements to the Tait Diversion on the San Lorenzo River as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report and as included in the Santa Cruz Water Program, Facility improvements at the Graham Hill Water Treatment Plan that will allow treatment of more turbid water as included in the Santa Cruz Water Program, and replacement of major transmission pipelines on the North Coast and the Newell Creek Pipeline as included in the Santa Cruz Water Program. Projected demand is based upon the Update of the City of Santa Cruz's Long-Range Water Demand Forecast (M.Cubed, 2021) (Appendix D).

Table 7-4C: Single Dry Year Supply and Demand Comparison under a Projected Climate Change Hydrology

Single Dry Year Supply and Demand Comparison Under a Projected Climate Change Hydrology					
	2025 (MG)	2030 (MG)	2035 (MG)	2040 (MG)	2045 (MG)
Supply totals*	2,486	2,694	2,704	2,765	2,784
Demand totals*	2,668	2,694	2,704	2,765	2,784
Difference	182	0	0	0	0

NOTES: Projected water supply values shown in this table represent output values from the City's Confluence (water supply) model utilizing a modeled climate change hydrology (CMIP-5). The Confluence model utilizes system demands to model water supply from City sources. Consistent with the WSAS, the following assumptions about future water projects have been used in developing projected water supplies. In 2025, the City will have implemented proposed water rights modifications as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, and in 2030, the City will have implemented the following components of the WSAS and planned infrastructure projects: Aquifer Storage and Recovery in the Santa Cruz Mid-county Groundwater Basin and/or the Santa Margarita Groundwater Basin, sized for up to 4.5 mgd injection and 8.0 mgd extraction as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, improvements to the Tait Diversion on the San Lorenzo River as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report and as included in the Santa Cruz Water Program, Facility improvements at the Graham Hill Water Treatment Plan that will allow treatment of more turbid water as included in the Santa Cruz Water Program, and replacement of major transmission pipelines on the North Coast and the Newell Creek Pipeline as included in the Santa Cruz Water Program. Projected demand is based upon the Update of the City of Santa Cruz's Long-Range Water Demand Forecast (M.Cubed, 2021) (Appendix D).

7.4.3 Multiple Dry Water Year Period

The City chose to present the estimated water supply available during the multiple-dry water-year period of a five-year drought sequence using hydrology from 1973 through 1977 even though the first two years of this period were categorized as wet . As described above, the extreme critical dry years in years four and five (1976 and 1977) of the scenario make this period the most challenging period for the City's water supply system in the historical record. The results of the multiple dry year supply and demand comparison are provided as totals and overall differences in Table 7-5.

In an extreme five-year drought similar to the 1973 to 1977 event, the estimated water supply available to the City in the near term, 2025, during the fourth year would meet over 99 percent of projected demand, but during the fifth year only 73 percent of projected demand would be met. As described above, the analysis assumes proposed water rights modifications including implementation of the Agreed Flows bypass requirements which are protective of local anadromous fisheries and will limit the ability for the City to divert from flowing sources compared to historical practices, but implementation of the WSAS and planned infrastructure projects is not anticipated or assumed in the analysis until the year 2030. While the analysis characterizes this vulnerability to shortage for the final year of the extended drought period, depending on sequencing of rain years, in reality such a shortage could occur sooner and persist longer through a multiple dry-year period. Additionally, during an extended drought period, the City would likely implement demand reduction requirements per the City's Water shortage Contingency Plan in earlier years before an actual shortage is experienced to ensure adequate supplies remain in Loch Lomond Reservoir, thereby potentially reducing the depth of shortage experienced in later year(s).

With implementation of both WSAS and planned infrastructure projects, along with the proposed water rights modifications, in all place by 2030 and beyond, projected supply would meet projected demand, except for very small projected shortages during the fifth year of the extended drought during the 2040 – 2045 timeframe. During this period in the fifth year of the extended drought, supply is projected to be able to meet 98 percent of demand.

Under the projected climate change hydrology, greater shortages are projected in both the near and long term as compared to the analysis using historic hydrology. Under this scenario, shortages would be expected during years three through five of the five-year drought in the near term, 2025. Shortages would range from two percent in the third year to 23 percent in years four and five. In the period from 2030 to 2045, with subsequent implementation of proposed water supply augmentation and planned infrastructure projects, the City could expect small shortages of two to five percent during the fifth year of the extended drought sequence under the selected climate change conditions. The results of the multiple dry year supply and demand comparison under the selected climate change scenario are provided as totals and overall differences in in Table 7-4C.

Table 7-5: Multiple Dry Year Supply and Demand Comparison (submittal table 7-4R)

Multiple Dry Years Supply and Demand Comparison						
		2025 (MG)	2030 (MG)	2035 (MG)	2040 (MG)	2045 (MG)
First year	Supply totals	2,668	2,694	2,704	2,765	2,784
	Demand totals	2,668	2,694	2,704	2,765	2,784
	Difference	0	0	0	0	0
Second year	Supply totals	2,668	2,694	2,704	2,765	2,784
	Demand totals	2,668	2,694	2,704	2,765	2,784
	Difference	0	0	0	0	0
Third year	Supply totals	2,668	2,694	2,704	2,765	2,784
	Demand totals	2,668	2,694	2,704	2,765	2,784
	Difference	0	0	0	0	0
Fourth year	Supply totals	2,660	2,694	2,704	2,765	2,784
	Demand totals	2,668	2,694	2,704	2,765	2,784
	Difference	(8)	0	0	0	0
Fifth year	Supply totals	1,954	2,694	2,704	2,723	2,723
	Demand totals	2,668	2,694	2,704	2,765	2,784
	Difference	(714)	0	0	(42)	(61)

NOTES: Projected water supply values shown in this table represent output values from the City's Confluence (water supply) model utilizing historic hydrology. The Confluence model utilizes system demands to model water supply from City sources. Consistent with the WSAS, the following assumptions about future water projects have been used in developing projected water supplies. In 2025, the City will have implemented proposed water rights modifications as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, and in 2030, the City will have implemented the following components of the WSAS and planned infrastructure projects: Aquifer Storage and Recovery in the Santa Cruz Mid-county Groundwater Basin and/or the Santa Margarita Groundwater Basin, sized for up to 4.5 mgd injection and 8.0 mgd extraction as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, improvements to the Tait Diversion on the San Lorenzo River as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report and as included in the Santa Cruz Water Program, Facility improvements at the Graham Hill Water Treatment Plan that will allow treatment of more turbid water as included in the Santa Cruz Water Program, and replacement of major transmission pipelines on the North Coast and the Newell Creek Pipeline as included in the Santa Cruz Water Program. Projected demand is based upon the Update of the City of Santa Cruz's Long-Range Water Demand Forecast (M.Cubed, 2021) (Appendix D).

Table 7-5C: Multiple Dry Years Supply and Demand Comparison under a Projected Climate Change Hydrology

Multiple Dry Years Supply and Demand Comparison Under a Projected Climate Change Hydrology						
		2025 (MG)	2030 (MG)	2035 (MG)	2040 (MG)	2045 (MG)
First year	Supply totals	2,668	2,694	2,704	2,765	2,784
	Demand totals	2,668	2,694	2,704	2,765	2,784
	Difference	0	0	0	0	0
Second year	Supply totals	2,668	2,694	2,704	2,765	2,784
	Demand totals	2,668	2,694	2,704	2,765	2,784
	Difference	0	0	0	0	0
Third year	Supply totals	2,607	2,694	2,704	2,765	2,784
	Demand totals	2,668	2,694	2,704	2,765	2,784
	Difference	(6`)	0	0	0	0
Fourth year	Supply totals	2,060	2,681	2,693	2,755	2,773
	Demand totals	2,668	2,694	2,704	2,765	2,784
	Difference	(608)	0	0	0	0
Fifth year	Supply totals	2,060	2,630	2,630	2,630	2,630
	Demand totals	2,668	2,694	2,704	2,765	2,784
	Difference	(608)	(64)	(74)	(135)	(154)

NOTES: Projected water supply values shown in this table represent output values from the City's Confluence (water supply) model utilizing a modeled climate change hydrology (CMIP-5). The Confluence model utilizes system demands to model water supply from City sources. Consistent with the WSAS, the following assumptions about future water projects have been used in developing projected water supplies. In 2025, the City will have implemented proposed water rights modifications as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, and in 2030, the City will have implemented the following components of the WSAS and planned infrastructure projects: Aquifer Storage and Recovery in the Santa Cruz Mid-county Groundwater Basin and/or the Santa Margarita Groundwater Basin, sized for up to 4.5 mgd injection and 8.0 mgd extraction as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report, improvements to the Tait Diversion on the San Lorenzo River as described in the Santa Cruz Water Rights Project Draft Environmental Impact Report and as included in the Santa Cruz Water Program, Facility improvements at the Graham Hill Water Treatment Plan that will allow treatment of more turbid water as included in the Santa Cruz Water Program, and replacement of major transmission pipelines on the North Coast and the Newell Creek Pipeline as included in the Santa Cruz Water Program. Projected demand is based upon the Update of the City of Santa Cruz's Long-Range Water Demand Forecast (M.Cubed, 2021) (Appendix D).

This assessment illustrates that without implementation of the future water projects described in Chapter 6, Section 6.8, the City would face critical challenges in meeting demand in a projected multi-year drought, under either hydrology consistent with historic conditions or under a climate change scenario. This is largely driven by the City's dependence on local surface water flows and the lack storage with the supply system. The ongoing implementation of the WSAS and associated Santa Cruz Water Rights Project and Santa Cruz Water Program are critical and necessary elements to secure the City's existing and future water supply reliability.

7.5 Regional Supply Reliability

The City of Santa Cruz continues to focus its supply planning and reliability efforts on programs and projects that emphasize the maximization of available resources. To date, the City has not pursued supply planning that included importing water from outside the Central Coast hydrologic region but is 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 and the types of tools being proposed and evaluated at present seek to benefit multiple stakeholders.

At this point in time, the City is actively participating in regional teams formed to increase coordination of activities among resource agencies. Further, the City's WSAS necessitate collaborative work with regional partners and benefits from participation of stakeholders that include government and non-government resource management agencies. The City is one of four members of the Santa Cruz Mid-County Groundwater Agency (MGA), as discussed in Chapter 6, and participates on the Board of Directors for the Santa Margarita Groundwater Agency (SMGA). The City is also engaged with the Santa Cruz Integrated Regional Water Management Group (IRWM), an organization made up of nine local agencies.

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 water supply and demand assessment procedures, actions that would be undertaken in response to a catastrophic interruption of water supplies, including a regional power outage, earthquake, or other emergency situation, legal authority, and other topics.

This Chapter 8, Water Shortage Contingency Planning, and Appendix O, Water Shortage Contingency Analysis and Implementation, together comprise the City of Santa Cruz's complete Water Shortage Contingency Plan (WSCP), in compliance with the California Water Code Section 10632 and incorporated guidance from the State of California Department of Water Resources (DWR) Urban Water Management Plan Guidebook (DWR, 2021).

8.1 Water Supply Reliability Analysis

This 2020 Urban Water Management Plan includes in Chapter 7 a supply reliability analysis for a normal/average water year, a single dry water year, and a multiple dry water five-year period based on historical hydrology for the forecast period which extends through 2045. The City is safeguarding against future water shortages by actively implementing future water projects as described in Chapter 6, Section 6.8. Implementation of these projects is therefore assumed in the City's water supply planning process. In the water supply reliability analysis, consistent with the City's Water Supply Augmentation Strategy (WSAS), implementation of pending water rights modifications, including Agreed Flows which are protective of local anadromous fisheries, is assumed after 2025. Furthermore, improved reliability is projected after 2030 due to implementation of Aquifer Storage and Recovery (ASR) and planned infrastructure projects.

The water supply reliability analysis finds that the City projects having sufficient water supply available in normal years and single dry years to serve anticipated demand throughout the 2025 – 2045 planning period. Under multi-year drought conditions in the near term (2025), with proposed water rights modifications but before implementation of ASR and planned infrastructure projects, available supplies would meet projected demand in years one through four of the multi-year drought scenario, but would fall short

of demand by 27 percent in year five. Under multi-year drought conditions after 2030, with implementation of the ASR and planned infrastructure projects, available supplies would meet projected demand in years one through four of the multi-year drought scenario, and the year-five shortage is anticipated to be substantially reduced with projected shortages no larger than a negligible two percent.

While the analysis characterizes vulnerability to shortage for the fifth year of the extended drought period, depending on sequencing of water year types, in reality such a shortage could occur sooner and persist longer through a multiple dry year period. Additionally, during an extended drought period, the City would likely implement demand reduction requirements in earlier years before an actual shortage is experienced to ensure adequate supplies remain in Loch Lomond Reservoir, thereby potentially reducing the depth of shortage experienced in later year(s).

This Urban Water Management Plan also includes in Chapter 7 a Drought Risk Assessment including a supply and use comparison assuming drought conditions from 2021 through 2025. This analysis assumes implementation of pending water rights modification (including implementation of the Agreed Flows which are protective of local anadromous fisheries) in years 2022 through 2025 and shows that projected supply would meet projected demand in years 2021 through 2024 of the extended five-year drought, but that in 2025, a 27 percent shortage is projected. Neither implementation of ASR of planned infrastructure projects are assumed to be implemented within the timeframe of this analysis as they not projected to be fully accomplished until 2030.

The City recognizes that the challenge of meeting demand through a multi-year drought period as the key reliability issue facing the water system. The City is actively addressing this issues through the ongoing implementation of the City's WSAS to improve system operating flexibility and long term reliability. In the short term, reliance on this Water Supply Contingency Plan may be required to reduce demand during periods of shortage.

8.2 Annual Water Supply and Demand Assessment Procedures

Every year during the winter season, the City of Santa Cruz Water Department (the Department) monitors local rainfall, runoff, and reservoir storage levels. At the end of January, which represents the mid-point of the winter wet season, staff prepares a written statement that describes current water conditions and discusses the water supply outlook for the year ahead. This initial water supply outlook is typically presented as a written memo to the Water Director and then to the Water Commission. Later on in the season, typically toward the end of March or early April, a more formal final "Water Supply and

Demand Assessment" is prepared and also presented to the Director and Water Commission. If, based on this analysis, a water shortage is anticipated, the information would be presented to the Santa Cruz City Council which could then declare a water shortage and authorize implementation of a specific stage of the WSCP. The Department has been conducting this annual water supply and demand assessment on its own for its internal purposes for decades. Now however, the same type of assessment is being required of all water suppliers. Specifically, beginning in 2022, California state law requires that all urban water suppliers prepare this type of assessment and submit it to the California Department of Water Resources (DWR) on an annual basis. DWR is in the process of developing guidance for suppliers to conduct an annual assessment, including key data inputs and the decision making process for determining if a water shortage is indicated. Although State guidance is in development, the City currently has its own procedure and format for conducting the assessment and producing the written reports that summarize the results. Santa Cruz Municipal Code Section 16.01.020 includes the following (Appendix Q):

> "The provisions of this chapter shall take effect whenever the director, upon 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 peak season through October 31st, unless rescinded earlier or extended by city council."

8.2.1 Decision Making Process

This section describes the general inputs and process for evaluating the adequacy of supply to meet demand for year ahead and, in particular, for the peak season.

8.2.1.1 Decision Making Inputs

Rainfall, runoff, water year type, and reservoir storage are the key hydrologic indicators used by the City to evaluate water conditions. These factors affect the City's water supply and the forecasting process and management considerations used in dry years to determine whether a water shortage is expected for the year ahead.

In Santa Cruz, a water shortage occurs when the combination of low surface flows in the north coast and San Lorenzo 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 would 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 might occur when the central coast region experiences multiple dry winter seasons in a row.

Rainfall

The water supply of the City of Santa Cruz 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.

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.

Runoff

Under normal operating conditions, the north coast streams 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 United States Geological Survey (USGS) gauges located at Henry Cowell Redwoods State Park near Felton and downstream next to the Tait Diversion. The gauge in Felton is particularly important for assessing water supply conditions because the river is the City's single largest supply source and because of the long historic record that exists for the site. Real time flow records are available on the USGS website. The USGS also prepares printed reports that provide a record of average daily and monthly flows, in cubic feet per second, and stream discharge, expressed in acre-feet. Water Department staff charts monthly flows and compares them with 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 will become valuable in future years for assessing water conditions of these sources.

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.

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. This classification system is shown in Figure 8-1 below.

Table 8-1: Water Year Classification System

Classification	Total Annual Discharge (in acre-feet)
Wet	> 119,000
Normal	49,000 - 119,000
Dry	29,000 – 49,000
Critically Dry	< 29,000

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 measure below than would otherwise be expected.

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 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 Felton Diversion on the San Lorenzo River. In a normal year, the reservoir will start the dry season full with 2.8 billion gallons in storage.

8.2.1.2 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. The City undertakes an annual 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 the 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 as defined as May 1 through October 31, is considered the critical period for the purpose of defining the potential 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, potentially creating a summer water supply shortage. 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.

8.2.2 Methodology

A detailed description of the City of Santa Cruz Annual Assessment methodology is presented below.

8.2.2.1 Forecasting Water Production

To determine the degree of shortfall, the City follows a three-step process:

1. Develop a monthly forecast of supply available from flowing sources and wells and compare the supply available from flowing sources and wells to the expected water demand and estimate production needed from Loch Lomond.
2. 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.

Of primary importance to the system operation is the ability to forecast 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 dry and critically dry years, natural flows can drop below bypass flow requirements at the Tait Street intake during summer, requiring diversions 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. This technique helps to identify at what point in the year river production will likely be reduced and by how much.

Forecasting supplies available from north coast sources involves less certainty due to the lack of historic stream flow information. The technique used to forecast supplies on the North Coast supplies 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 Beltz Well system is projected as a function of the production capacity for any wells in operation and duration that the wells will be operated.

The City necessarily uses a conservative estimate of yield to ensure the supply forecast for flowing sources and groundwater production is reliable. 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 from the Loch Lomond Reservoir 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 expected lake level at the end of October; and the expected carryover storage for the following year.

8.2.2.2 Evaluation Criteria

The determination of whether a shortage exists is essentially a risk assessment regarding the predicted end of season lake level and carryover storage needed in Loch Lomond Reservoir. The City'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?
- 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?

There is no set formula to determine the optimal allocation. Rule curves were developed in the past 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 consideration for lake storage is that the bottom 1.0 billion gallons (35 percent of capacity) in the reservoir is regarded as

minimum carry over storage necessary to hedge against a subsequent dry year. This ensures that there is always some limited amount of supply preserved in storage for the following year.

In the real world, with a water system largely dependent on surface water sources and no reliable ability to predict when a drought may end, prudent management dictates a conservative approach to shortage declarations to maintain as much water storage in the system as possible. This means generally favoring implementation of the WSCP during single dry years so that the carryover storage amount would 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.

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.

With the low levels of water demand that have been sustained since the end of the 2014-2015 drought, the water system and the City can better withstand dry conditions like the current drought of 2020-2021. The one caveat, though, is that because present use is already so conservative, there is a declining ability for increased conservation when the next shortage arises.

8.2.2.3 Modeling

The primary tool the City uses is assess water supply and demand is an Excel spreadsheet that performs a mass balance on a monthly time step to solve for the end of season storage in Loch Lomond Reservoir using a three-step process:

1. Develop a monthly forecast of supply available from flowing sources (North Coast sources and the San Lorenzo River) and the Beltz Well system;
2. Compare the supply available from the flowing sources and Beltz Well system to the expected unrestricted water demand; and
3. Calculate the monthly change in storage and end of season storage in Loch Lomond Reservoir.

Other than the beginning of season lake volume, which is a known variable, the model inputs are all estimates based on imperfect information that are subject to error and uncertainties. However, some variables are more significant than others in terms of influencing the results.

The model is to be used to create several different supply and demand scenarios to test the sensitivity of different assumptions, and to assist in decision-making. The primary purpose of this model to assist management staff in determining if a water shortage declaration is appropriate for the year ahead, and to help decide on the level of curtailment needed. Other factors used in this consideration include infrastructure constraints such as infrastructure limitations due to planned work or from known or expected facility outages.

8.2.2.4 Timing

The forecast is typically prepared in late March, when most of wet weather has already occurred for the year, but before the end of the rainy season. This is done in order to prepare a recommendation for consideration by the Water Commission to the City Council in the month of April. There is always the chance that later winter rains will improve the water supply outlook. Thus, the situation remains dynamic through the end of April and into May. The longer the forecast can be delayed, the more accurate the results will be.

The approximate times of the year when the City evaluates water supply conditions are as follows:

- October through December: 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 to Water Commission
- Early March: Present revised estimate of water supply availability for year ahead to Water Commission
- Mid-March: Determine existence of water shortage (if applicable)

If it is necessary to declare a water shortage, the following approximate timing is followed, with some variability depending on weather conditions:

- Mid to late March: Determine monthly water production budget and assess the need for response
- Early April: Present shortage response recommendation to Water Commission; City Council notice of public hearing published
- Mid-April: City Council formally declares water supply shortage, adopts emergency ordinance
- May: Water shortage regulations become effective

8.3 Six Standard Water Shortage Levels

In Santa Cruz, it is typically the peak summer season during which water supplies are limited because the system's flowing surface water sources, north coast streams and San Lorenzo River which together represent about eighty percent of total system supply, are less available during the peak season than they are in the wet season, and because stored water is very limited. If winter rains have not replenished Loch Lomond's storage in a given year, peak season usage reductions are typically applied in order to ensure that water for essential uses will continue to be available throughout the peak season and into the following water year as well. Until implementation of the City's WSAS, demand management through restrictions is the only real tool the City has to manage this risk.

The peak season is defined to include the six-month period from May 1 to October 31, which is reflected in the consumption shown on the June through November utility bills. The peak season is defined within this range because water supplies are historically adequate to meet demand in November through April. In addition, water shortage regulations usually are not put into effect until May 1st or June 1st during a shortage year.

Shortage stages in this WSCP are based on peak season demand and correspond to the six standard shortage levels defined in Water Code of up to ten, twenty, thirty, forty, fifty, and greater than fifty percent shortage, as shown in Table 8-2.

Table 8-2: Water Shortage Contingency Plan Levels (submittal table 8-1)

Water Shortage Contingency Plan Levels		
Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	Water Shortage Warning. Stage 1 applies to relatively minor water shortage that requires up to a 10% level of demand reduction. The allocation system applies to all stages. At Stage 1, allocations are provided to customers but excess use penalties are not yet implemented.
2	Up to 20%	Water Shortage Alarm. Stage 2 applies to moderate water shortages with a demand reduction requirement of up to 20%. This condition requires more vigorous public information and outreach. The primary demand reduction measure that will be implemented at this stage and all stages going forward is the use of excess use penalties for water use above customer allocations.
3	Up to 30%	Water Shortage Emergency. Stage 3 applies to a serious water shortage with a demand reduction requirement of up to 30%. This condition is a serious situation that will require significant reductions by each customer class. Allocations will be reduced to Stage 3 levels.
4	Up to 40%	Severe Water Shortage. Stage 4 applies to a serious water shortage with a demand reduction requirement of up to 40%. This condition is a serious situation that will require significant reductions by each customer class. Allocations will be reduced to Stage 4 levels. 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.
5	Up to 50%	Critical Water Shortage. 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 and confusion, 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 basic principles and command structures of the state Standardized Emergency Management System. The City has experienced water shortages in the past but never one of such large proportion.
6	>50%	Catastrophic Water Shortage. For Stage 6, Santa Cruz takes the position that this level of shortage would most likely only occur due to a major disaster that caused significant damage to our water treatment and/or distribution infrastructure. In such a disaster, such as a large earthquake, the Santa Cruz response would not come from this WSCP, but rather from the main Santa Cruz Water Department Emergency Response Plan.

8.4 Shortage Response Actions

The City of Santa Cruz used a core set of principles to guide the WSCP planning process. These principles, with minor adjustments, are based on the core principals developed for the 2009 WSCP. The 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 gives priority to health and safety uses of water and targets non-essential uses for reductions first. However, even some amounts of essential use are reduced under this plan at higher stages due to the overall low levels of demand.
- **Preserve jobs and the local economy to the extent possible**: Given today's demand characteristics, the business customer class will be subject to the allocation system at each stage of shortage. However, the amount of water the business customer class will need to reduce at each stage is relatively low given that there is a substantial amount of health and safety related use in the overall usage by business customers.
- **Existing conservation measures recognized**: Customers who have already been conserving will have an easier time maintaining consumption below the allocation levels set out in the plan. This will be especially true in earlier stages of shortage. Customers who haven't conserved as much or at all will find it harder to stay within allocation amounts.
- **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.
- **Flexibility**: The Department will gauge the necessity of implementing each set of actions at each stage of shortage and evaluate whether they make sense at the time. Not all actions must be implemented simply by virtue of being listed in the plan at that stage.
- **Even-handedness**: The policies and rules developed under this plan to manage a shortage will be applied to all customer groups in a consistent, even-handed manner.

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. Due to the degree of ongoing water use efficiency practices adopted by Santa Cruz consumers, staff determined that the more typically used strategies for curtailing water use would not be likely to produce the demand reductions associated with each stage of the WSCP. This reality drove the decision to use customer water allocations rather than other approaches during all stages of the plan.

The allocation system in this WSCP produces specific demand reduction/delivery goals for each major customer category at each level of shortfall based on the unique usage characteristics of each customer category.

To determine how much water would need to be curtailed for each WSCP stage[1], overall and from each customer group, the following methodology was utilized. These four steps were used to generate both the reductions required and the water remaining for use at each WSCP shortage stage. These were in turn used to develop delivery goals for each customer class at each WSCP stage.

1. Examine the level and seasonality of water use in each customer class, by breaking down water use in each sector into indoor uses and outdoor/seasonal components;
2. Divide the peak season usage into three usage priorities: 1) health and safety, 2) commerce, and 3) irrigation and other outdoor usage;
3. Determine the level of reductions required at each shortage level and from each use priority; and
4. Calculate the percentage reductions needed to develop a specific reduction goal for each customer class at each shortage stage.

Specific application of this approach is further described in Appendix O, 2021 WSCP Appendix. The resulting delivery goals for each customer class derived by required reductions are presented in Table 8-3.

[1] Curtailments were not developed for Level 6. For Level 6, Catastrophic Water Shortage, this would most likely only occur due to a major disaster causing significant damage to the water treatment and/or distribution system. In such a disaster, such as a large earthquake, the Santa Cruz response would be guided by the Water Department's Emergency Response Plan rather than this WSCP.

Table 8-3: Customer Class Delivery Goals by WSCP Stages

Customer Class	Normal Demand (Million Gallons) Jun-Nov	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
		Delivery (%)	Delivery (%)	Delivery (%)	Delivery (%)	Delivery (%)
		Volume (MG)	Volume (MG)	Volume (MG)	Volume (MG)	Volume (MG)
Single Family Residential	517	89%	79%	68%	58%	51%
		463	408	354	299	262
Multiple Residential	297	92%	84%	76%	68%	59%
		273	249	225	202	176
Business	297	95%	90%	85%	79%	60%
		282	267	252	234	178
UC Santa Cruz	91	91%	81%	72%	62%	55%
		82	74	65	57	50
Municipal	33	79%	58%	38%	17%	15%
		26	19	12	6	5
Irrigation	59	75%	50%	25%	0%	0%
		44	30	15	0	0
Golf Course Irrigation	50	82%	64%	45%	26%	10%
		41	32	23	13	5
North Coast Agriculture	13	95%	90%	85%	75%	30%
		12	12	11	10	4
Other	1	95%	90%	100%	100%	100%
		1	1	1	1	1
Overall Delivery Each Stage						
Total – All Classes	1,358	90%	80%	70%	60%	50%
		1,225	1,092	959	820	677

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In a serious shortage, it will be critical to have a system in place that not only is fair to all customer groups but is also likely to succeed. As described in chapter 4 of this Urban Water Management Plan, current and forecasted levels of customer demand indicate that the Santa Cruz community has already achieved high levels of water conservation. This very low system-wide water use is beneficial from the perspective of meeting demands and preserving water resources, but it also represents a “hardened demand” that presents limited opportunity for further per capita demand reductions. These new demand characteristics mean that reductions at higher stages will be difficult to achieve. In the view of the Water Department staff, curtailments beyond Stage 2 of this plan are not really feasible to implement without significant impacts to public health and safety and the Santa Cruz economy. The City is actively implementing its WSAS as the solution to dealing with larger shortages.

8.4.1 Demand Reduction Actions

The approach to demand reduction in this WSCP is to provide customer allocations starting at Stage 1 of the plan and reducing these allocations at each successive stage of the plan. This approach gives customers an amount of water to use each month and allows them to use that water as they see fit to meet their needs. The allocations are based upon the customer class delivery goals at each stage presented in Table 8-4. The allocation approach is designed to maximize the probability that the demand reductions required at each stage will be achieved.

Table 8-4: Allocations by WSCP Stage

Customer Class	Stage 1 Allocation (%)	Stage 2 Allocation (%)	Stage 3 Allocation (%)	Stage 4 Allocation (%)	Stage 5 Allocation (%)
Single Family Residential	89%	79%	68%	58%	51%
Multiple Residential	92%	84%	76%	68%	59%
Business	95%	90%	85%	79%	60%
UC Santa Cruz	91%	81%	72%	62%	55%
Municipal	79%	58%	38%	17%	15%
Irrigation	75%	50%	25%	0%	0%
Golf Course Irrigation	82%	64%	45%	26%	10%
North Coast Agriculture	95%	90%	85%	75%	30%
Other	95%	90%	100%	100%	100%
All Classes Combined	90%	80%	70%	60%	50%

These demand reduction allocation and other demand reduction actions to be implemented in parallel are documented in Table 8-5 below.

Table 8.5: Demand Reduction Actions (submittal table 8-2)

Demand Reduction Actions				
Shortage Level	Demand Reduction Actions.	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?[1]
Stage 1 - Water Shortage Warning	Implement or Modify Drought Rate Structure or Surcharge	10 percent demand reduction	• Implement water allocations for all customers at the Stage 1 allocation level	No
Stage 1 - 5	Expand Public Information Campaign	Supports demand reduction to be achieved through implementation of water allocations	• Create communication pieces including social media posts, direct mail, paid advertising • Create dedicated webpage • Dedicate monthly SCMU email newsletters to disseminating water shortage information • Utilize bi-annual utility newsletter • Inform large landscape/property manager/green industry of irrigation restrictions • Disseminate information for customers to learn how to read their meters	No
Stage 1 - 5	Increase Water Waste Patrols	Supports demand reduction to be achieved through implementation of water allocations	• Delegate water waste patrol duties to all field personnel	No
Stage 1 - 5	CII - Restaurants may only serve water upon request	Supports demand reduction to be achieved through implementation of water allocations	• Prohibit serving drinking water by restaurant or food service establishments except upon request	No
Stage 1 - 5	CII - Lodging establishment must offer opt out of linen service	Supports demand reduction to be achieved through implementation of water allocations	• Require hotel, motel, and other commercial lodging establishments to offer option of not laundering towels and linen daily	No

Demand Reduction Actions				
Shortage Level	Demand Reduction Actions.	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?[1]
Stage 1 - 5	Other - Prohibit use of potable water for washing hard surfaces	Supports demand reduction to be achieved through implementation of water allocations	• Prohibit use of potable water for washing driveways, patios, parking lots or other paved surfaces	No
Stage 1 - 5	Other - Require automatic shut of hoses	Supports demand reduction to be achieved through implementation of water allocations	• Require hoses used for any purpose to have shut off nozzles	No
Stage 1 - 5	Other	Supports demand reduction to be achieved through implementation of water allocations	• Step up enforcement of water waste ordinance • Undertake contingency planning for continuing/escalating shortage • 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	No
Stage 2 - Water Shortage Alarm	Implement or Modify Drought Rate Structure or Surcharge	20 percent demand reduction	• Implement mandatory water allocations for all customers at the Stage 2 allocation levels • Implement excess use penalties for use over allocation	Yes

Demand Reduction Actions				
Shortage Level	Demand Reduction Actions.	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?[1]
Stage 2 - 5	Expand Public Information Campaign	Supports demand reduction to be achieved through implementation of water allocations	• Disseminate PSAs to targeted local radio and television stations • Regularly update the public on consumption and supply numbers • Include information in City Manager's monthly email newsletter • Initiate presentations to local Chambers of Commerce, business associations, board of realtors, etc. • Inform large landscape/property managers/green industry of water budget reductions • Consult with major customers to develop conservation plans • Conduct workshops on large landscape requirements for property owners, contractors, and maintenance personnel • Disseminate PSAs to targeted local radio and television stations • Regularly update the public on consumption and supply numbers • Include information in City Manager's monthly email newsletter • Initiate presentations to local Chambers of Commerce, business associations, board of realtors, etc. • Inform large landscape/property managers/green industry of water budget reductions • Consult with major customers to develop conservation plans • Conduct workshops on large landscape requirements for property owners, contractors, and maintenance personnel	No
Stage 2 - 5	Increase Water Waste Patrols	Supports demand reduction to be achieved through implementation of water allocations	• Hire, train dispatch water waste patrol	No
Stage 2 - 5	Decrease Line Flushing	Supports demand reduction to be achieved through implementation of water allocations	• Suspend main flushing except as required for emergency and essential operations	No

Demand Reduction Actions				
Shortage Level	Demand Reduction Actions.	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?[1]
Stage 2 - 5	Reduce System Water Loss	Supports demand reduction to be achieved through implementation of water allocations	• Intensify distribution system leak detection and repair	No
Stage 2 - 5	Other	Supports demand reduction to be achieved through implementation of water allocations	• Develop strategy to mitigate revenue losses • Stop issuing bulk water permits	No
Stage 3 - Water Shortage Emergency	Implement or Modify Drought Rate Structure or Surcharge	30 percent demand reduction	• Implement mandatory water allocations for all customers at the Stage 3 allocation level • Continue to implement excess use penalties for use over allocation	Yes
Stage 3 - 5	Expand Public Information Campaign	Supports demand reduction to be achieved through implementation of water allocations	• Provide regular, prescriptive media briefings • Provide regular and ongoing briefings to Water Commission, City Council, and other key stakeholders • Prepare communication pieces for possible future service connection moratorium	No
Stage 3 - 5	Increase Water Waste Patrols	Supports demand reduction to be achieved through implementation of water allocations	• Expand size and coverage of water waste patrol	No

Demand Reduction Actions				
Shortage Level	Demand Reduction Actions.	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?[1]
Stage 3 - 5	Moratorium or Net Zero Demand Increase on New Connections	Supports demand reduction to be achieved through implementation of water allocations	• Institute a temporary water service connection ban	No
Stage 3 - 5	Reduce System Water Loss	Supports demand reduction to be achieved through implementation of water allocations	• Increase monitoring of unauthorized use from hydrants and other sources.	No
Stage 3 - 5	Other	Supports demand reduction to be achieved through implementation of water allocations	• Further increase of water waste enforcement • Require all commercial customers to prominently display “save water” signage with specified language at specified location • Increase customer service training to address high bills and irate customers • Expand, strengthen water conservation education, activities, and program • Increase frequency of monitoring and reporting of water production and consumption • Undertake contingency planning for continuing/escalating shortage • Shut down all bulk water stations • Stop issuing construction hydrant meters	No
Stage 4 - Severe Water Shortage	Implement or Modify Drought Rate Structure or Surcharge	40 percent demand reduction	• Reduce water allocations for all customer classes to Stage 4 levels • Continue to implement excess use penalties for use over allocation	Yes
Stage 4 - 5	Expand Public Information Campaign	Supports demand reduction to be achieved through implementation of water allocations	• Contract with outside PR agency to manage comprehensive public awareness campaign, including paid ads, earned media, direct mail, etc. • Promote zeroscape landscaping • Partner with other water agencies to promote appropriate grey water use, etc. • Prepare emergency messaging for possible critical water shortage utilizing Nixel, CodeRed, reverse 911	No

Demand Reduction Actions				
Shortage Level	Demand Reduction Actions.	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?[1]
Stage 4 - 5	Other - Prohibit use of potable water for construction and dust control	Supports demand reduction to be achieved through implementation of water allocations	• Rescind hydrant and bulk water permits, prohibit use except by special permission	No
Stage 4 - 5	Other	Supports demand reduction to be achieved through implementation of water allocations	• Scale up administrative appeals staff to support hearing officer(s) • Expand water waste enforcement to 24/7	No
Stage 5 - Critical Water Shortage	Implement or Modify Drought Rate Structure or Surcharge	50 percent demand reduction	• Further reduce allocations for all customer classes • Continue to implement excess use penalties for use over allocation	Yes
Stage 5	Expand Public Information Campaign	Supports demand reduction to be achieved through implementation of water allocations	• Implement crisis/emergency communications including establishment of a Joint Information Center (JIC) • Deploy prepared emergency messaging on Nixel, CodeRed, reverse 911	No
Stage 5	Landscape - Prohibit all landscape irrigation	Supports demand reduction to be achieved through implementation of water allocations	• Prohibit all outdoor irrigation	No

Demand Reduction Actions				
Shortage Level	Demand Reduction Actions.	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?[1]
Stage 5	Other water feature or swimming pool restriction	Supports demand reduction to be achieved through implementation of water allocations	• No water for outdoor washing or recreational purposes; close pools, public showers	No
Stage 5	Other	Supports demand reduction to be achieved through implementation of water allocations	• Continue water waste enforcement 24/7 • Consider shifting to EOC model of command management for overall policy guidance and coordination • Coordinate with CA Division of Drinking Water, District Engineer and other emergency response agencies regarding water quality, public health issues • Coordinate with law enforcement agencies to address enforcement challenges • Delegate field staff to assist in enforcement (shut offs, flow restrictors) • Continue close monitoring and reporting of water production and consumption • Coordinate with local sanitation agencies regarding sewer line maintenance • Investigate potential for reduced in-stream release • Procure resources to utilize dead storage, if needed • Undertake emergency planning for continuing/escalating shortage	No
Stage 6 - Catastrophic Water Shortage	Other	Greater than 50 percent demand reduction	• Activate the Santa Cruz Water Department Emergency Response Plan	No

Notes:

1. The City of Santa Cruz is utilizing an allocation system as the primary means to reduce demand at all shortage levels. Excess use penalties for exceeding allocations are applied at Level 2 and higher. The allocation approach is designed to maximize the probability that the demand reductions will be achieved.

8.4.2 Other Actions to Address Shortages

As described in Chapter 6, Section 6.8, the City is actively pursuing water supply augmentation to improve long-term reliability through implementation of its WSAS, including water rights modifications (which includes Agreed Flows bypass requirements protective of local fisheries) and implementation of ASR and planned infrastructure projects such as upgrades to the Graham Hill Water Treatment Plant . Because these efforts are well underway, they are considered as future water projects and are incorporated into the reliability assessments included in Chapter 7 of this Urban Water Management Plan rather than as elements of this WSCP. With implementation the WSAS, water supply reliability will be significantly improved by 2030, eliminating projected shortages that would require implementation of this WSCP. However, in the event of projected near-term shortages before the WSAS components are fully realized, the City would pursue early implementation of strategies included in the WSAS, such as ASR and exchanges, to the extent feasible.

Table 8.6: Supply Augmentation (submittal table 8-3)

Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference
NOTES: City of Santa Cruz is actively pursuing a Water Supply Augmentation Strategy to alleviate the City's projected water supply gap, reduce the frequency and severity of shortage experienced, and limit the need to implement this Water Shortage Contingency Plan. These activities are underway and ongoing, and as such, are not included as actions within this Water Shortage Contingency Plan.			

When implementing this WSCP, the City will rely primarily on demand reduction through the implementation of allocations to address shortages at each level. Proposed operational changes and mandatory restrictions to be implemented at each WSCP stages are embedded in Table 8-2 above. Other actions triggered by WSCP levels are described below.

8.4.3 Emergency Response Plans

The City of Santa Cruz maintains a confidential Emergency Response Plan per the requirements of the America's Water Infrastructure Act of 2018 that includes response plans to a wide range of emergency conditions including earthquake, flood/atmospheric river, landslide, and human-caused catastrophes. The procedures in this plan would be followed in the event of a catastrophic water shortage or other emergency. To comply with Water Code requirements regarding seismic risk assessment, this Urban Water

Management Plan includes as appendices following the Local Hazard Mitigation Plans (LHMP) as Appendix P:

- City of Santa Cruz LHMP Five Year Update 2018 – 2023
- City of Capitola LHMP Five Year Update 2020
- County of Santa Cruz Five 2015 – 2020 - The County of Santa Cruz was in the process of updating their LHMP at the time of drafting this Urban Water Management Plan

8.5 Communications Protocols

Timely and effective communication is a key element of the City of Santa Cruz WSCP. Specific communications protocols are documented in Table 8-2 above. The City would inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications. Communication protocols are further detailed in Appendix O.

8.6 Compliance and Enforcement

The City of Santa Cruz utilizes a variety of compliance and enforcement strategies to facilitate compliance with the requirements of the WSCP as described below.

8.6.1 Excess Use Penalties

The foundation of the demand reduction measures in this plan is the water allocation system. In order for an allocation system to work, a financial disincentive is required for customers to stay within their allocation. This is achieved through the use of Excessive Use Penalty fees for use above customer allocations. These penalties are applied to a customer's water bill when the billing system detects that usage in a month exceeds the customer's allocation. The excess use penalties begin at Stage 2 and continue on with higher stages.

Administrative enforcement of excessive use penalties is codified in Santa Cruz Municipal Code, Chapter 16.01 (Appendix Q). Specifically, Section 16.01.110 states:

> "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."

The schedule for the administrative penalties is two-tiered system as shown below in Table 8-7.

Table 8-7: Administrative Penalties

Excess Use Range	Water Use in Excess of Allotment	Excessive Us Penalty Fee[1]
A	100 cubic feet (1 CCF) over allotment up to 10%	$25
B	Greater than 10% over allotment	$50

Note:. Fee is per 1 CFF of water used in excess of allotment, in addition to all regular water consumption charges

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 is designed to be very steep.

8.6.2 Water School

In the drought of 2014 and 2015, the City of Santa Cruz implemented a novel approach for working with customers who had incurred large excess use penalties. A process was set up to allow for a one-time forgiveness of excess use penalties while under water rationing. To be considered for such forgiveness, the customer was required to sign up and complete a short weekend or evening course that became known as "water school". This course covered topics such as basic meter reading, leak detection, and other topics relevant to the water restrictions in place at the time. This provides financial relief to customers receiving high bills, and most importantly, gives them the opportunity, education, and tools they need to achieve ongoing compliance with water use rules and regulations for the remainder of the shortage. The process of providing penalty forgiveness for customers by attending water school will continue under this WSCP.

8.6.3 Flow Restriction

Some customers will continue to exceed their allotment regardless of the amount of their water bill. In such instances, the City 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 City would not use this method where fire suppression sprinklers are on the same supply line as domestic water.

8.6.4 Disconnection and 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.

8.6.5 Enforcement of Water Waste Prohibitions

During a water shortage, in addition to complying with water allocations, customers will also need to comply with existing requirements related to water waste. In cases such as a report of water waste, City staff will take steps to communicate with the customer by telephone, letter, door tag, or by making personal contact in the field to provide information about water waste 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 waste restrictions and regulations. These methods are described below.

Penalty fees for Water Waste: For repeated violations of the City's water waste ordinance, a penalty fee may be issued to a customer's utility bill. This would occur after a written notice has been 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

8.6.6 Exceptions

No water shortage plan can account for all situations. The exception procedure allows the City 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 is allocated to other similarly situated customers and when consistent with the intent of the water shortage regulations, while providing equal treatment of all customers. For detailed explanation of the exception process, refer to Appendix O.

8.7 Legal Authority

The City of Santa Cruz is legally authorized to implement this WSCP pursuant to California Water Code Section 10632, Santa Cruz Municipal Code Chapter 16.01 (attached as Appendix Q to the Urban Water Management Plan), and pursuant to the provisions of the WSCP itself which is adopted pursuant to City Council resolution. In the event of a water shortage, the City Council shall declare a water shortage emergency, the City shall thereupon activate and implement the WSCP, and in doing so, shall coordinate with the City of Capitola and the County of Santa Cruz for their respective local water shortage proclamations.

8.8 Financial Consequences of the Water Shortage Contingency Plan

Water shortages and implementation of a WSCP have the potential to impact both expenditures and revenues of a water supplier. Expenditures can be increased due to the time and materials necessary to implement demand reduction measures, other actions necessary to address shortages, and as well as for compliance and enforcement activities to discourage excessive water use. These expenditures can range from additional staff with associated salary, benefits, office space, computer, and vehicle needs, to increased public information costs including postage, additional printed materials, new advertising on various media, and other outreach expenses. At the same time, revenues can be impacted by reduced water sales due to successful water conservation and demand reduction actions, with impacts varying depending on the water supplier's rate structure.

The City has estimated costs for implementing staffing changes associated with implementation of Stage 1 and Stage 2 shortage levels. At Stage 1, three additional temporary staff are anticipated to be needed to implement the WSCP measures. These staff and other associated expenses are estimate to be approximately $400,000 per year. At Stage 2, fourteen temporary staff in addition to the temporary staff needed at Stage 1 are anticipated to be needed to implement plan measures. Costs for these additional staff and other associated expenses are estimated to be approximately $670,000 per implementation cycle, with the assumption that all additional staff can be accommodated within existing office space. Implementation of higher plan stages, Stage 3 and above, if needed would be challenging for the community to carry out due to hardened local demand and City implementation would be expected to be even more expensive to implement.

The City of Santa Cruz mitigates for the financial consequences of implementation of the WSCP primarily through a Drought Cost Recovery Fee structure that is developed as part of its Proposition 218-compliant water rate schedule. Drought Cost Recovery Fees are stage specific and designed to recover the lost revenues associated with lowered water consumption that results from implementation of curtailments. These fees are collected as a fixed charge based on meter size and are collected over a full 12 month period to mitigate the impacts to monthly bills. Refer to Appendix O for additional information on the Drought Cost Recovery Fees.

8.9 Monitoring and Reporting

There are two general components to monitoring and reporting. One is the City's ongoing monitoring and subsequent reporting to the State. The Water Department tracks production through the water supply and distribution system on a daily, monthly, and annual time step. Water use is tracked through the customer billing system on a time step dependent on meter type and water loss is audited on an annual basis.

The City compiles, analyzes, and submits monthly production reporting to the State Water Resources Control Board covering both overall production as well as a calculation of water use in gallons per capita per day. This reporting would continue throughout any water shortage that may occur. This data is publicly available and accessible online.

Monitoring and reporting utilized specifically during a shortage includes online month-by-month presentation of usage data to customers. During a shortage of Stage 2 or higher, a dedicated drought webpage would be created to display usage data and progress on meeting reduction goals. This would be in addition to the communications protocols that would be implemented during the activation of any WSCP stage of shortage as described in Section 8.4.

8.10 Refinement Procedures

The City of Santa Cruz will review its WSCP after each year that a shortage stage is implemented and as necessary based on any identified needs for refinement. This review will focus on areas of the plan that require refinement or adaption to existing circumstances or otherwise need to be adjusted. Upon completion of such a review, staff will determine if an update to the WSCP is needed. If so, a new draft WSCP will be developed and circulated for public review as required by law before any public hearings or consideration of adoption by the Santa Cruz City Council.

8.11 Special Water Features Distinction

Water Code Section 20632 requires the separate evaluation of special water features separately from pools and spas. The City of Santa Cruz WSCP demand reduction actions rely primarily on an allocation system that requires water customers to maintain water use within a given allotment rather than providing prescriptive use restrictions. Special water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains are not specifically restricted at any WSCP stage if they are maintained with a given customer allotment. Similarly, pools and spas are not restricted at any WSCP stage if they are maintained with a given customer allotment; although, public pools and showers would be closed at Stage 5.

8.12 Plan Adoption, Submittal, and Availability

The City of Santa Cruz developed an Updated Interim WSCP in early 2021 in order to be prepared to implement the plan in the event of water shortage in the peak season of 2021. The timeline for review and adoption of that interim plan were as follows:

- Recommended by the Santa Cruz Water Commission to Santa Cruz City Council for adoption on January 4, 2021.
- Adopted by City Council on February 23, 2021 at a duly noticed public hearing.
- Implementing amendments to Chapter 16.01 of the Santa Cruz Municipal Code were adopted by City Council on April 13, 2021.

This WSCP, updated since the adoption of the Updated Interim WSCP, is comprised of this Chapter 8 and Appendix O of this Urban Water Management Plan. It is currently being made available for public review in conjunction with the public review of this Urban Water Management Plan. Details on the public hearing, adoption, public availability, and submittal to the California Department of Water Resources will be added to this Urban Water Management Plan upon completion of these processes.

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. Since the 1980s, the City has offered a highly effective variety of programs, informational materials, and incentives to become more water-efficient, putting the City water customers among the lowest per capita water users in California. The City's very low system-wide water use is highly beneficial from the perspective of meeting demands and preserving water resources, but it also represents a "hardened demand" that presents limited opportunity for further per capita demand reductions moving forward. This section describes the City's current water demand management measures.

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

This section presents the City of Santa Cruz demand management measures, including water waste prevention ordinances, metering, conservation pricing, public outreach and education, programs to assess and manage distribution system losses coordination and staffing support, and other measures.

9.2.1 Water Waste Prevention Ordinances

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 Q). 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:

- 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,
- use of water for new non-recirculating industrial clothes wash systems, and
- 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.

During declared water shortages, the City's Water Shortage Contingency Plan takes effect as codified in Santa Cruz Municipal Code 16.02 (Appendix Q). The aforementioned restrictions are repeated in 16.01, and are enforceable by a first warning, followed by a progressive series of fines from $100 to $500.

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. Software acquired in 2009 was used to help document, track and manage water waste complaints, including the photo evidence of water waste incidents.

Water waste prevention is also implemented through the City's Landscape Water Conservation Ordinance as codified in 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 (Appendix Q). Further description of this ordinance can be found in section 9.3.1.3 of this plan.

9.2.2 Metering

All of the City's 24,592 water connections are fully metered with most using Automated Meter Reading (AMR) technology. Approximately 33 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 equipped with AMI 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.

In 2010, the City adopted a new Meter Testing, Repair, and Replacement Policy that accelerated large meter replacement and should help improve overall meter accuracy. In 2013, the City 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.

The City is slated to begin a system-wide replacement of its metering system in fall 2021. This project will replace all meters that are older than 3 years, and outfit all meters with an AMI radio. Pending final negotiations with various contractors, installation is scheduled to last about 15 months.

This project began in earnest with a business case evaluation from May 2018 that found strong financial justification, as well as compelling qualitative benefits for customers and staff, to pursue a full replacement of the City's aging metering system. Key financial justifications include replacement of stuck and under-registering meters, wholesale discounts on bulk purchases of meters and radios, and capture of lost revenue due to a reduction of billing adjustments due to leaks. Qualitative benefits for customers and staff include improved understanding of water use and related charges, reduced carbon footprint from drive-by meter reading, improved drought response, and standardization of metering equipment and software.

Following the installation phase of the project, the City will begin work on incorporating the myriad benefits of interval meter read data, including optimization of the meter-to-cash operation, further calibration of the hydraulic model, and expansion of distribution water loss analysis. Additionally, the City will incentivize use of an online customer portal by integrating interval data with customized leak alerts, budget-based alerts, or—during declared water shortages—over-allotment alerts.

9.2.3 Conservation Pricing

The Santa Cruz Water Department 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 five components: 1) a fixed, monthly "Readiness-to-Serve" charge, 2) a volumetric charge, 3) an infrastructure reinvestment fee, 4) a rate stabilization fee and 5) for customers residing in elevated pressure zones, an elevation charge applies.

The 2020 Readiness-to-serve charge varies by meter size and location (see Table 9-1).

Table 9-1: 2020 Readiness to Serve Changes

Readiness to Serve Charges (2020)		
Meter Size	Inside City (monthly)	Outside City (monthly)
5/8	$10.71	$12.26
3/4"	$10.99	12.59
1"	$11.83	$13.55
1.5"	$12.94	$14.83
2"	$16.02	$18.35
3"	$38.71	$44.34
4"	$47.11	$53.96
6"	$66.71	$76.42
8"	$89.11	$102.09
10"	$114.32	$130.95

For the volumetric charges, the City has an inclining rate structure in place for residential and irrigation customers. Residential tiers are based on CCF used, and irrigation tiers are based on assigned budgets. The Infrastructure Reinvestment Fees (IRFs) for these customer classes follows the same tiered structure. The current residential rates and fees as of July 1, 2019 are listed in Table 9-2, and irrigation rates and fees are listed in Table 9-3. For all other customers, including, business, industrial, municipal, and golf customers, water is billed at a uniform rate of $8.01/CCF inside the city and $9.18/CCF outside the City. These customer classes are billed an Infrastructure Reinvestment Fee of $2.96/CCF inside the city and $3.38 outside the city.

Table 9-2: Fiscal Year 2021 Residential Water Rate Structure

Residential Water Rate Structure (2021)				
Tier	Inside City Volumetric Charge	Outside City Volumetric Charge	Inside City IRF	Outside City IRF
1 (0-5 CCF)	$7.01	$8.04	$2.02	$2.33
2 (6-7 CCF)	$7.83	$8.99	$3.03	$3.49
3 (8-9 CCF)	$9.04	$10.41	$3.74	$4.31
4 (10+ CCF)	$10.72	$12.38	$5.02	$5.80

Table 9-3: Fiscal Year 2021 Landscape/Irrigation Water Rate Structure

Landscape/Irrigation Water Rate Structure (2021)				
Tier	Inside City Volumetric Charge	Outside City Volumetric Charge	Inside City IRF	Outside City IRF
1 (<100% of budget)	$8.36	$9.58	$3.67	$4.21
2 (101%-150%)	$11.16	$12.79	$5.50	$6.30
3 (150% and above)	$12.52	$14.34	$5.57	$6.38

All customers are charged a rate stabilization fee of $1.00/CCF to mitigate the risk associated with the volumetric based rates structure that encourages conservation. Customers in elevated pressure zones also pay an elevation surcharge of $0.51/CCF inside the city and $0.59 outside the city for the cost of being served by an elevated storage reservoir.

In October of 2016, the rate structure moved 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 changes at that time included:

- Established the IRF that collects 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.
- Established a $1.00/centium cublic feet[1] (CCF) surcharge on water use beginning in July 2017 to increase the Department's Rate Stabilization Fund. This fund is used to mitigate the potential revenue instability associated with the volumetric based rate structure, and augment revenues in normal years.
- Transitioned multi-family and irrigation accounts to a tiered, rather than fixed, rate structure, and transitioned irrigation accounts to a simple budget-based rate structure.

The Water Department is currently in the processes of updating water rates and the Long Range Financial Plan for Fiscal Year 2022. No changes are being recommended to the water rate structure. The proposed water rate structure includes the following priority water pricing policy objectives for use in evaluating water rate structure options. The selected objectives included:

- Ensures water for essential use is affordable to all customers;
- Maintains transparency and equity for capital and water reliability needs; and
- Provides sufficient revenues to meet operating, capital, and customer service level needs.

On September 21, 2021, the City Council took action to adopt the 2021 Water Department Long Range Financial Plan, to accept the recommended proposed schedule of water rate increases for FY 2023 through FY 2027 and the recommended proposed FY 2022 through FY 2027 Drought Cost Recovery Fee schedule, and to authorize the Water Department to issue a Proposition 218 compliant public notice of the 45-day protest period and November 23, 2021 public hearing. The 2021 Water Department Long Range Financial Plan is included as Appendix R and the Proposition 218 Notice to the public about the proposed rates in included as Appendix S.

The financial plan and recommended rates are needed to ensure the long-term financial health of the utility. These enable the Water Department to support ongoing operations and maintenance of the water system and to make the capital investments required to comply with regulations, ensure adequate water supply, and rehabilitate and replace aging infrastructure. Table 9-4 includes recommended water rates for Fical Year 2023 – Fiscal Year 2027.

[1] A centum cubic foot is one hundred cubic feet of water.

Table 9-34: Recommended Water Rates Fiscal Year 2023 - 2027

Commodity Charges (dollars per CCF) - Consumption Charge, Infrastructure Reinvestment Fee, Rate Support Fund						
Customer Class	Current	As of 7/1/22	As of 7/1/23	As of 7/1/24	As of 7/1/25	As of 7/1/26
Residential*						
Tier 1	$9.60	$9.74	$11.33	$13.17	$14.09	$15.07
Tier 2	$11.58	$14.23	$16.54	$19.23	$20.57	$22.00
Tier 3	$13.64	$18.75	$21.80	$25.34	$27.10	$28.98
Tier 4	$16.83					
Commercial**						
Uniform	$11.70	$11.37	$13.23	$15.38	$16.45	$17.60
UCSC						
Uniform	$12.06	$12.07	$14.04	$16.33	$17.46	$18.67
Landscape Irrigation***						
Tier 1	$12.86	$20.53	$23.87	$27.75	$29.68	$31.74
Tier 2	$17.82	$28.59	$33.24	$38.63	$41.31	$44.17
Tier 3	$19.33	$36.32	$42.22	$49.07	$52.47	$56.10
North Coast Agriculture						
Maintain Reliability	$8.98	$6.45	$7.51	$8.74	$9.35	$10.00
Decrease Reliability	$8.98	$2.88	$3.36	$3.92	$4.20	$4.50
Rate Stabilization Fee	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00
***Includes Single Family and Multi-Family, tier width is per dwelling unit**						
****Includes Business, Industrial, Restaurant, Hotel, Golf, Municipal, Bulk, Fire Service Leaks, and Temporary**						
*****Tiers based on percent of water budget for each customer**						

9.2.4 Public Education and Outreach

The City of Santa Cruz Water Department values and actively 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, and 3) billing and customer service.

The City uses media coverage 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;
- Formal water supply outlook published at least once 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:

- 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, Water-Smart Gardening Faire, 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;
- Messages and information on customer's bills showing daily consumption and a graph charting monthly consumption for the entire year;
- A new web portal for customers to view and track their water use, receive custom conservation recommendations, and ask questions. Customers with AMI can access their hourly and daily data through this portal; 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 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;
- 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. 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 in penalties.

The City of Santa Cruz also offered a separate Water School for large landscape accounts that exceeded their water budgets created from the 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.

Water School has not been implemented since 2014 and 2015. The Water Department is currently updating its Water School curriculum and redesigning the structure of the course to be offered online. The purpose of Water School will remain the same in that it will continue to educate customers about where their water comes from, help customers stay within their allotments, and provide relief for penalties incurred for exceeding their allotment.

9.2.5 Programs to Assess and Manage Distribution System Losses

As mentioned in Chapter 4, Section 4.7, the City has conducted an annual water audit of the City's water distribution system since 1997 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. 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.

Water audit results indicate average annual system water loss from 2015 to 2019 is 221 million gallons per year (MGY). Of this amount, it is estimated that an average of 161 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. On average, it is estimated that another 59 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. 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. Water Systems Optimization's proposed scope of work is organized into three tasks, involving the following elements:

- 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;
- 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
- Water loss control program design, to outline the most cost-effective strategies for reducing both real and apparent losses over time.

The recommendations produced from this year-long study are used to guide a robust water loss control strategy and serve as a foundation for completing and reporting future annual water audits to the state that began in 2017 under the requirements of SB 555 of 2015.

Currently, the City 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 Department budgeted on average a total of about $2.5 million annually between 2016 and 2020 in its capital investment program for water main replacement projects. Projected annual spending on water main replacements through 2030 is estimated to be approximately $1.6 million annually. 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 Santa Cruz Water Department Water Conservation section is responsible for promoting efficient water use, administering conservation programs, and implementing drought response measures outlined in the Water Shortage Contingency Plan. This section includes one Environmental Programs Analyst and two Water Conservation Representatives. The section is responsible for coordination of conservation activities with the public and with the Administration, Engineering, Production, Distribution, and Customer Service sections of the Water Department. The Environmental Programs Analyst and Water Conservation Representatives are responsible for operating existing programs and assisting with new program development.

9.2.6.1 Water Conservation Program Activities

The responsibilities and major activities of the Water Conservation Section 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.

During periods of drought or water supply shortages, drought management becomes the Conservation section's primary function, accelerating public education and outreach activities as well as addressing increased public interest and participation in long-term conservation programs.

9.2.6.2 Program Funding

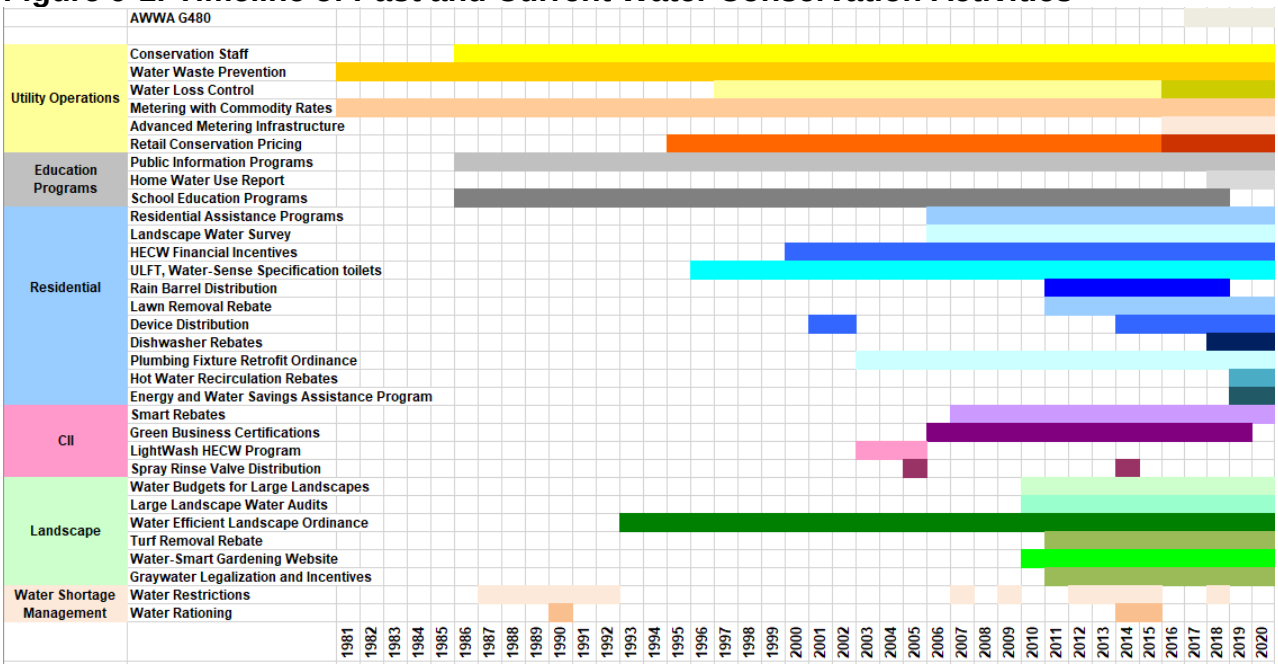
The City's water conservation program is funded by a combination of water rates, system development charges, and miscellaneous service fees. With regard to water conservation, revenues from system development charges are used primarily for various rebate programs, including residential and commercial toilets, urinals, clothes washers, dishwashers, hot water recirculation pump, Smart Rebates, and lawn removal rebates, which account for the majority of long-term water savings generated each year. The total budgeted resources for the Water Conservation Section in FY 2022 is $923 thousand.

9.2.7 Other Demand Management Practices

The City offers a suite of programs to residential, commercial, and irrigation customers to help and encourage them to manage their water consumption. Figure 9-1 below provides a summary and timeline of past and current water conservation activities. The following is a list of programs that were active from 2016 to 2020. The nature and extent of these measures are described in Section 9.3.

- Residential
    - Toilet, dishwasher, clothes washer, hot water recirculation pump, turf removal, and graywater rebate programs
    - Rain Barrel distribution program
    - Free water saving device distribution, including showerheads, aerators, hose timers, and automatic shutoff nozzles for hoses
    - Energy and Savings Assistance program, offering free toilet replacements to low-income qualifying customers
    - Plumbing fixture retrofit ordinance, requiring the replacement of inefficient toilets and showerheads
    - Home water surveys and home water use reports
- Commercial, Industrial, and Institutional
    - Smart business rebates for toilets, clothes washer, and urinals
    - Green business certification
- Irrigation
    - Water budgets for large landscapes
    - Water Efficient Landscape Ordinance (WELO)
    - Turf removal rebates
    - Water-smart gardening website
    - Greywater rebates

Figure 9-1: Timeline of Past and Current Water Conservation Activities



9.3 Reporting Implementation

Demand management program implementation is described in the section below including implementation over the past five years and implementation to achieve water use targets.

9.3.1 Implementation over the Past Five Years

Implementation over the past five years of the City of Santa Cruz residential, commercial and landscape programs are described in the subsequent sections.

9.3.1.1 Residential Programs

Residential water use constitutes almost two thirds of system consumption and therefore is a main focal point of the City's water conservation efforts. Current 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) Dishwasher rebates 5) Hot Water Recirculation Pump rebates, 6) Laundry to Landscape Rebate Programs, 7) Plumbing Fixture Retrofit Ordinance, and 8) Energy and Water Savings Assistance Program.

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, they play an important role in providing education and customer service. This program was temporarily suspended in 2020 due to the COVID-19 pandemic, and has not yet been reinstated.

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, and $200 for Energy Star Most Efficient Models. The Energy Star Most Efficient models have the lowest water factor and energy factor of all clothes washers. By increasing the rebate amount for these specific models, the City hopes to encourage customers to use clothes washers that have the lowest water factors. Between 2016 and 2020, the City approved rebates for over 800 water efficient clothes washers, with about half of those being Most Efficient models, saving approximately 6.4 MG of water annually.

The City has operated a rebate program to promote the installation of ultra-high-efficiency 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 WaterSense[2] 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, 1,447 water efficient toilets were installed under the program saving approximately 4.3 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 Greywater Alliance. The requirement to attend a workshop is intended to ensure systems are installed in accordance with the guidelines listed in the California plumbing code. The program has attracted only very sporadic participation.

Up until 2019, the City offered a Rain Barrel Program for a 50-gallon rain barrel catchment system at a subsidized rate of $50 per barrel. Customers were able to order online during the rainy season from Rainwater Solutions to reserve rain barrels for the upcoming distribution event. Several distribution events were held during the rain barrel

[2] WaterSense is a voluntary partnership program sponsored by the U.S. Environmental Protection Agency, is both label for water-efficient products and a resource to help consumers save water.

sale for customers to pick up their orders at the City's corporation yard. A total of 293 rain barrels have been sold from 2016 to 2019, resulting in an estimated water savings of 193.5 thousand gallons annually. Due to a decrease in participation, the program was discontinued in early 2019. A new rain catchment program is being considered that would offer a rebate to customers still interested in pursuing water savings through rain catchment.

In 2003, the City adopted a plumbing fixture retrofit ordinance, codified as Santa Cruz Municipal Code Chapter 16.03 (Appendix Q). 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, 2,031 properties have been certified under the program, saving about 25.2 million gallons per year.

In 2018 the City began offering a $50 rebate to customers for the purchase and installation of a new Energy Star rated dishwasher. An Energy Star rated dishwasher uses equal to or less than 3.5 gallons per cycle. Between 2018 and 2020, 216 dishwashers have been installed saving approximately 37.5 total gallons per year.

Lastly, in 2019 the City partnered with the Pacific Gas and Electric Energy Savings Assistance Program to offer free water saving assistance to qualifying low-income customers. Through this program, customers received literature, toilet assessments, and toilet replacements for toilets that used 1.6 gallons per flush or greater with Niagara Stealth 0.8 gallon per flush models. The water-saving measures of this program are funded by the Water Department and Pacific Gas and Electric contractors are responsible for the administration of the program. Since the start of this program in 2019, 200 toilets have been replaced, saving approximately 4 million gallons per year.

9.3.1.2 Commercial Programs

The City provides water to about 1,900 commercial and industrial accounts within the service area, which together represents about 20 percent of total system water use. The City offers a Smart Business Rebate programs to encourage commercial customers to become more water efficient by using water-saving technology.

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 gallons per flush (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, the City has approved 88 applications, saving an estimated 1.4 million gallons per year.

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.

9.3.1.3 Landscape Programs

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 $1.00 per square foot of lawn removed for single family, multi-family, and commercial customers. Single-family residences are eligible to receive up to $1,000 (1,000 square feet) and multi-family or commercial are eligible for up to $5,000 (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.

In 2016, the City increased the rebate from $0.50 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 hope was to encourage more lawn conversions by offering a higher rebate. Over the last five years, this program has resulted in a total of 298,000 square feet of turf to be removed, saving an estimated 5.7 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 its launch, participation in the program has expanded to include 305 sites representing 435 acres or 19 million square feet of irrigated area. There are an addition 99 analytics-only accounts, representing 11.3 acres of irrigated area. 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 (California Irrigation Management Information System (CIMIS) Station 104). Customers receive monthly reports via mail or email comparing their actual consumption to the irrigation budget over a one to three year-long period. Because City irrigation customers have experienced numerous interventions over the last ten years including Waterfluence, drought, advanced metering infrastructure, and water rate increases among other factors, the effects from Waterfluence program along cannot be isolated. The key performance indicator for the irrigation class over time is overwatering. Over the last ten years, overwatering was observed to decrease from 0.86 to 0.39 feet per year over all irrigated landscape. The 0.47 feet per year decrease in overwatering translates into water savings of an estimated 68.5 million gallons per year.

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'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. Since then it has been rewritten and revised in 2001, 2010, and 2016. It is codified in Santa Cruz Municipal Code Chapter 16.16 (Appendix Q). 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. The ordinance covers all new and renovated, commercial, industrial and public projects, and 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 the following:

- Dedicated irrigation meters for new landscapes or expansion of existing landscapes over 5,000 square feet in area;
- Landscape water budgets 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 Section staff reviews the landscape plans for compliance with the ordinance, coordinates plan review with the Santa Cruz Water Department Engineering Section and other City departments and jurisdictions, and once installed, performs final inspections of the completed landscape.

9.3.2 Implementation to Achieve Water Use Targets

In 2013, the City contracted with Maddaus Water Management, Inc. to develop an updated Water Conservation Master Plan. The goal of the updated plan was to define the next generation of water conservation activities through 2035 and serve as a roadmap to help the community achieve maximum, practical water use efficiency. Strengthening water conservation efforts has been identified as a priority by the City Council, the City's Water Commission, and the City's Water Supply Advisory Committee in its effort aimed at delivering a safe, adequate, affordable, and environmentally sustainable water supply.

The plan included a total of 35 measures for implementation between 2015 and 2035. Many were already underway at the time the plan was written, though some were implemented in the last five years. The City Council accepted the plan in concept as a Technical Memorandum in April 2016, and the final report was completed in 2017. Based on the calculated water savings resulting from the implementation of the plan, the City would achieve its water use target in 2020. The demand management measures in Section 9.2 were considered in the Water Conservation Master Plan, and were implemented to help reach and maintain the City's reduction goals.

Current levels of customer demand and the Updated Long-Range Water Demand Forecast (Appendix D) indicate that the Santa Cruz community has achieved levels of water conservation well beyond the levels of anticipated as a product of the programmatic conservation included in the Water Conservation Master Plan, and has done so without the associated spending on program implementation that the Water Conservation Master Plan had envisioned. The water conservation realized over the last five years have been achieved primarily through the effects of a combination of increased water rates and customer water use behavior changes as a result of the 2014-2015 drought. At the time the 2015 Urban Water Management Plan was written the City had already achieved its 20x2020 goal of 110 GPCD. At the time of this 2020 Urban Water Management Plan, the City has maintained level of water use well below this target, with customers using just 74 GPCD in 2020. This very low system-wide water use is highly beneficial from the perspective of meeting demands and preserving water resources, but it also represents a "hardened demand" that presents limited opportunity for further per capita demand reductions moving forward.

9.4 Water Use Objectives

Water use objectives based on specific standards for certain water use sectors will be developed by 2023 as required by California Water Code. While a framework for the new standards has been published by the California Department of Water Resources, parts of the framework remain unfinished. Given the City of Santa Cruz well-demonstrated track record of water conservation and its customers being among the lowest per capita water users in California, the City expects to be able to maintain compliance with upcoming standards.

Chapter 10

PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

This chapter summarizes the process of adoption, submittal, and implementation of the 2020 Urban Water Management Plan and 2021 Water Shortage Contingency Plan, including the steps for amendment if it becomes necessary. The process of preparing the Urban Water Management Plan is described in Chapter 2, and process of preparing the Water Shortage Contingency Plan is described in the Water Shortage Contingency Analysis and Implementation (Appendix O).

10.1 Inclusion of all 2020 Data

As mentioned in Section 2.3, the City is reporting on a calendar year basis. The plan was prepared in 2021 and accordingly includes water use and planning data for the entire calendar year of 2020, except where noted.

10.2 Notice of Public Hearing

Water suppliers must hold a public hearing before adopting an Urban Water Management Plan and a Water Shortage Contingency Plan. The public hearing provides an opportunity for the public to provide input before these plans are adopted by City Council.

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, in accordance with the Section 10621(b) of the Act. These notices are included in Appendix B.

Table 10-1: Notification to Cities and Counties

Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
City of Capitola	Yes	Yes
City of Santa Cruz	Yes	Yes
County Name	60 Day Notice	Notice of Public Hearing
Santa Cruz County	Yes	Yes

Prior to the public hearing, the draft plans were 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 on September 30, 2021.

The draft plans were also circulated, 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 draft 2020 Urban Water Management Plan and Water Shortage Contingency Plan could be viewed, the hearing schedule, and contact information of the preparer for the City. Copies of these letters are included in Appendix T.

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 plans were made available for public review. A copy of the notices of the public hearing published in the Santa Cruz Sentinel newspaper are included in Appendix T.

10.3 Public Hearing and Adoption

The City Council is planned to hold a public hearing on the Urban Water Management Plan and Water Shortage Contingency Plan in accordance with California Water Code section 10642. Copies of any written comments received during the public review process, a summary of minor changes after circulation of the draft Urban Water Management Plan, official minutes of the public hearing, and the adoption resolutions for the plans are included in Appendix T.

10.4 Plan Submittal

The final adopted Urban Water Management Plan and Water Shortage Contingency Plan will be submitted electronically to DWR and the California State Library within 30 days of adoption, and transmitted to all jurisdictions receiving water service from the

City of Santa Cruz within 60 days of its submission to California Department of Water Resources, in accordance with California Water Code sections 10644 and 10635. Additionally, all final data tables will be submitted to California Department of Water Resources using the Water Use Efficiency data portal.

10.5 Plan Availability

The final, adopted Urban Water Management Plan and Water Shortage Contingency Plan will be made available to the public in accordance with California Water Code sections 10645 and 10632 by posting on the City's web site within 30 days of submission to the California Department of Water Resources.

Table 10-1 lists the cities and counties that receive water service from the City of Santa Cruz. These entities will be provided copies of the plans within 30 days of plan submittal to California Department of Water Resources.

10.6 Amendment Process

If the City of Santa Cruz chooses or needs to amend the adopted 2020 Urban Water Management Plan or Water Shortage Contingency Plan, proper notification, including copies of the amendments, will be provided in accordance with sections 10621, 10640, and 10644 in a manner set forth for the notification, public hearing, adoption and submittal.

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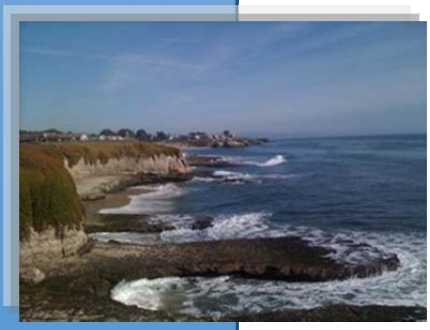
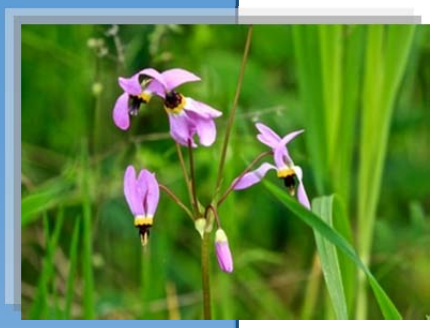
City of Santa Cruz





Water Conservation Master Plan

January 2017

Prepared by:

MADDAUS WATER MANAGEMENT INC.

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LIST OF ACRONYMS

AB	Assembly Bill
AF	acre-feet
AFY	acre-feet per year
AMI	Advanced Metering Infrastructure
AMR	Automatic Meter Reading
AWE	Alliance for Water Efficiency
AWWA	American Water Works Association
BG	billion gallons
BGY	billion gallons per year
BMP	Best Management Practice
CEC	California Energy Commission
CII	Commercial, Industrial and Institutional
CIS	Customer Information System
COM	commercial
CP	Cathodic protection
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DMM	Demand Management Measures
DOF	California Department of Finance
DSS	Least Cost Planning Decision Support System Model
DWR	California Department of Water Resources
EPA	Environmental Protection Agency (United States)
GHG	Greenhouse Gases
GIS	Geographic Information System
GPCD	gallons per capita per day
gpf	gallons per flush
gpm	gallons per minute
HECW	High-Efficiency Clothes Washer
HET	High-Efficiency Toilet
IND	industrial
IRR	irrigation
IWA	International Water Association
MFR	Multifamily Residential
MG	million gallons
mgd	million gallons per day
MGY	million gallons per year
MOU	Memorandum of Understanding Regarding Water Conservation in California
MUN	municipal
MWELO	Model Water Efficient Landscape Ordinance
MWM	Maddaus Water Management, Inc.
NRW	non-revenue water
PG&E	Pacific Gas & Electric
psi	pounds per square inch
PWSS	Public Water System Statistics
SB	Senate Bill

SB X7-7	Water Conservation Bill of 2009
SCWD	Santa Cruz Water Department
SF	Single Family
UCSC	University of California Santa Cruz
UHET	Ultra-High Efficiency Toilet
ULFT	Ultra-Low Flow Toilet
USBR	U.S. Bureau of Reclamation
UWMP	Urban Water Management Plan
WCMP	Water Conservation Master Plan
WF	water factor
WS	WaterSense (EPA Program)
WSAC	Water Supply Advisory Committee

1. EXECUTIVE SUMMARY

The purpose of the Executive Summary is to briefly describe the City of Santa Cruz Water Department (City) Water Conservation Master Plan (WCMP or Plan). The evaluation process and assumptions used to develop this Plan and recommendations for future implementation are included in the full report.

The City of Santa Cruz has had a long-standing commitment to water conservation since the 1980s 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 2011, the City sponsored a survey of its residential and commercial customers called the Residential and Commercial Baseline Water Use Survey Program (Baseline Survey) to develop a picture of the current state of water-using equipment within the service area. This study revealed that indoor water use efficiency opportunities were mostly saturated. The survey findings provided a basis for estimating additional conservation potential and yielded information to help select, target, and design future water conservation initiatives.

In 2013, the City of Santa Cruz contracted with Maddaus Water Management (MWM) to develop an updated Water Conservation Master Plan. Strengthening water conservation efforts had been identified as top priority by the Santa Cruz City Council (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. The overall goal of the updated plan was to define the next generation of water conservation activities and serve as a roadmap to help the community achieve maximum, practical water use efficiency. Additional goals established during the planning process included the following:

- Capitalize on opportunities to assist with meeting 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
- 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
- Meet the City's integrated water resource management goals to reduce peak season demands

The process used to develop the plan included analyzing individual conservation measures and different sets of measures or "programs" using the Least Cost Planning Water Demand Management Decision Support System Model (DSS Model). The evaluation includes measures directed at existing accounts as well as new development measures to help ensure new residential and business customers are more water efficient. After a significant screening and evaluation process, a Recommended Program consisting of 35 individual measures was selected to evaluate the net

effect of running selective multiple measures together over time. The elements of the Recommended Program are highlighted in Table 1-1, organized by major customer sector. Note that some measures appear twice since they apply to more than one sector.

1.1 Long-Term Demand and Conservation Program Analysis Results

The development of this Plan consisted of two main parts: 1) create a demand and conservation analysis for 2015 to 2035 and 2) evaluate conservation savings potential for the years 2015 to 2035 with a variety of different measures and conservation programs.

The first step in the analysis was to review and analyze historical water use production and billing data. The analysis built on previous efforts and was updated using M.Cubed's September 2015 City of Santa Cruz Water Demand Forecast, in which M.Cubed conducted an econometric analysis of water demand and forecasts of class-level customer demands and total system production through 2035. The historical water use, selected population projections, most recent plumbing code information, and discussions with the City were used to create a demand forecast for the years 2015 to 2035, as further described in Sections 3 and 5.

Once the demand forecast was completed, the conservation measures listed in Table 1-1 were analyzed for costs and benefits. A total of 33 out of 35 unique measures were analyzed using the DSS model. Two measures (conservation pricing and additional building code requirements for new development) were not sufficiently developed to be modeled individually at the time. The conservation analysis included all the quantifiable measures selected by the City. The following important factors about the conservation measures were included in this analysis:

1. The measures recommended are listed in Table 1-1 and described in Section 7 in Table 7-1.
2. New California state-wide plumbing standards that were adopted in 2015, the Model Water Efficient Landscape Ordinance (MWELO) and the CALGreen building code (as of December 1, 2015). These can be found in Appendix A.

Table 1-1. Elements of Recommended Program

Utility Measures	Residential Measures	CII Measures	Landscape Measures
System Water Loss Reduction	Residential Leak Assistance	CII Incentives	Large Landscape Budget-Based Water Rates
Advanced Metering Infrastructure	Single Family Residential Surveys	Pre-Rinse Spray Nozzle Installation	Water Efficient Landscape Ordinance
SF, MF, COM Conservation Pricing - Water and Sewer[1]	Plumbing Fixture Giveaway/Opt	CII Surveys	Single Family Residential Turf Removal
General Public Information	Residential Ultra High Efficiency Toilet Rebates	High Efficiency Urinal Program	Multifamily Residential/CII Turf Removal
Public Information (Home Water Use Report)	High Efficiency Clothes Washer Rebates	Public Restroom Faucet Retrofit - MUN	Expand Large Landscape Survey/Water Budgets
	Gray Water Retrofit	Public Restroom Faucet Retrofit - COM	Sprinkler Nozzle Rebates
		School Retrofit	Residential Rain Barrels
	Hot Water On Demand - New Development	Hot Water On Demand - New Development	Climate Appropriate Landscaping and Rainwater Infiltration
	Toilet Retrofit at Time of Sale	Toilet Retrofit at Time of Sale	
	CII MF Common Laundry Room High Efficiency Clothes Washer[2]	CII MF Common Laundry Room High Efficiency Clothes Washer[2]	
	Single Family/Multifamily Dishwasher Rebates[2]	Rewarding Businesses for Adopting Best Practices[2]	
	Hot Water Recirculation Systems[2]	Hot Water Recirculation Systems[2]	
	Additional Building Code Requirements for New Development[2]	Additional Building Code Requirements for New Development[2]	
	Innovation Incubator Program[2]	Innovation Incubator Program[2]	

[1] This measure was still under development when the technical memorandum was approved in April 2016. A comprehensive cost of service water rate study conducted by Raftelis Financial Consultants, Inc. was completed in August 2016.
[2] These measures target both CII and residential customers.

The Plan presents the water demands and conservation savings determined by this analysis. The Plumbing Code includes the new California State Law (Assembly Bill 715), which requires installation of High Efficiency Toilets and High Efficiency Urinals as of 2014. The Plumbing Code also includes SB 407, which applies to all new construction and replacements as of 2017 for single family and 2019 for multifamily and commercial properties. The increase of projected growth in population will cause baseline water demand to increase slightly. However, overall water use projections with plumbing code and water savings from the recommended program are expected to decline and then level off by 2035, based on current technologies.

Table 1-2 presents the City's water use projections 1) without plumbing code savings; 2) with only plumbing code savings and no active conservation activity; and 3) with plumbing code savings and the Recommended Program active conservation program implementation savings. It is important to note that demand projections are normalized,

without drought or recession conditions, whereas historical demands have been affected by drought and economic influences.

Table 1-2. Normalized Water Use Projections

	2020	2025	2030	2035
Baseline Demand (MGY)	3,560	3,636	3,743	3,838
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.

The following table shows the savings in 5-year increments for the plumbing codes, Recommended Program, and the Recommended Program with plumbing code savings from a baseline of 2015 normalized water demands without drought or recession conditions.

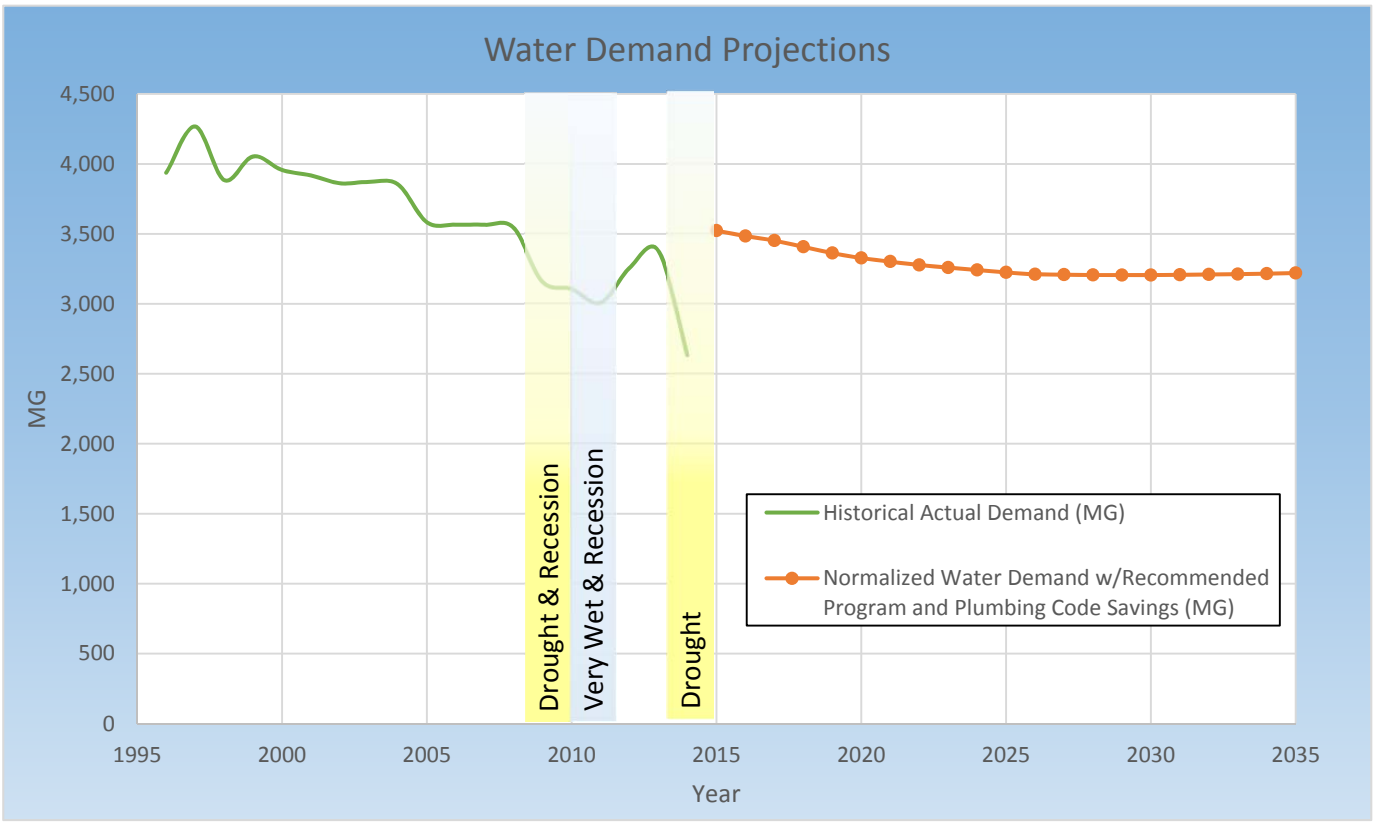
Table 1-3. Long Term Conservation Program Savings over "Baseline" Demand

Conservation Program	2020	2025	2030	2035
Plumbing Code (MGY)	96	179	269	329
Recommended Program (MGY)	137	232	269	291
Recommended Program with Plumbing Code Savings (MGY)	233	411	538	619

Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.

Figure 1-1 exhibits the same information as Table 1-2, in graphical form for the Recommended Program only. Demand projections are normalized, beginning in 2015, whereas historical demands are based on actual data, which illustrates how much demands have been affected recently by drought and economic influences. Future water demand is presented without lingering effects of drought, hence the large discontinuity between actual and forecast demand. This rebound to historical demand levels is considered a conservative assumption and repressed demands may persist for several years and beyond 2020. The projections do not reflect this delayed reaction.

Figure 1-1. Recommended Program Projected Normalized Water Demands



Notes:

1. Historical values based on actual data and projections are based on normalized future values.
2. Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.

The following table 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.

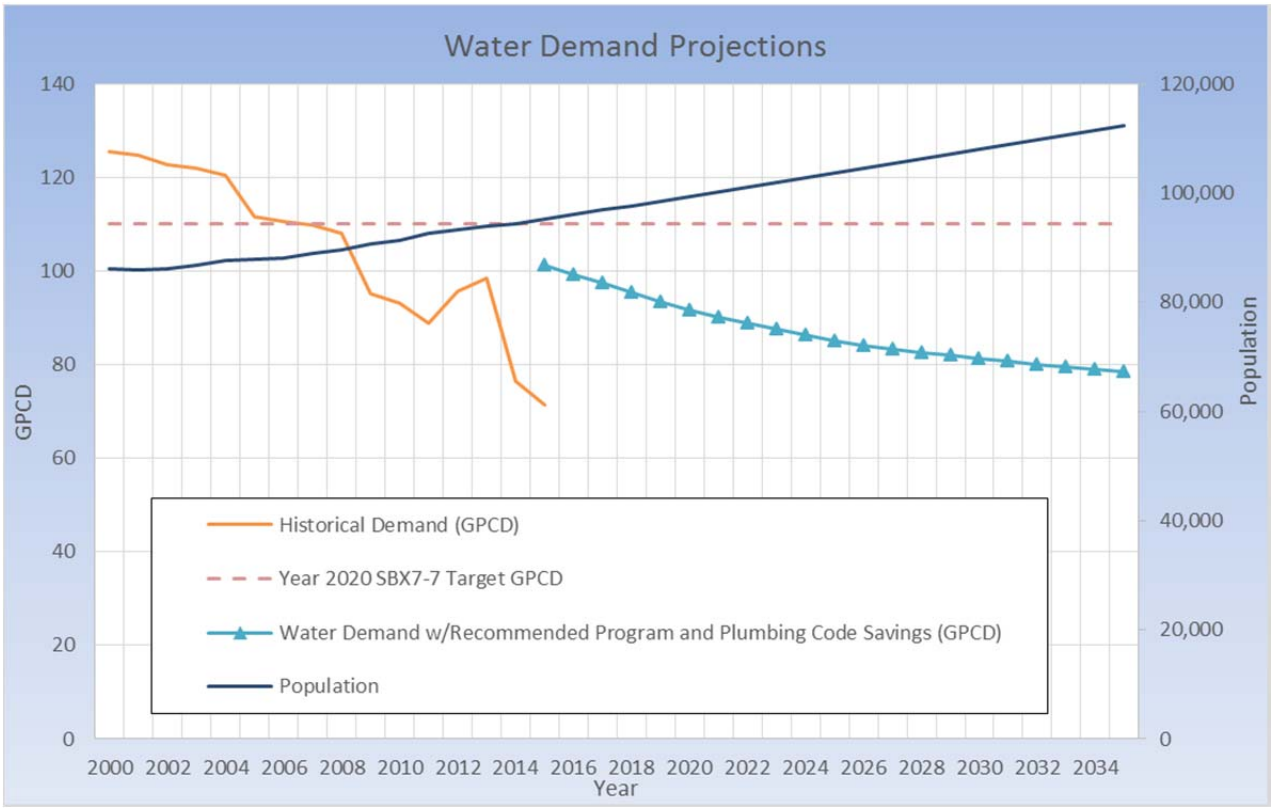
Table 1-4. Projected Population and Per Capita Water Use[1]

	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 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 of 101 GPCD. 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 1-2. Water Conservation Program Savings Normalized Projections – SB X7-7 Target



Notes:

1. Historical values based on actual data and projections are based on normalized future values.
2. Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.

The following table presents the benefit-cost analysis summary for the Recommended Program, which includes all the measures listed previously.

Table 1-5. 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	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.

1.2 Key Findings from the Water Conservation Program Analysis

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 developed by M.Cubed and used by the Water Supply Advisory Committee (WSAC), 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 M.Cubed 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. This decrease represents an almost 16% reduction is water use over 20 years.

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.

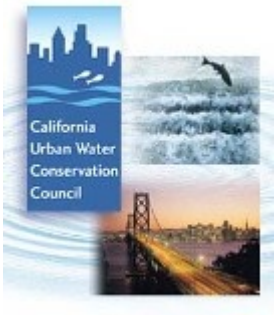
Successful implementation of the Recommended Program will require a significant increase in level of effort on the part of the City. Many new conservation measures will be employed and high participation rates are needed to achieve selected Program goals. Recommendations to assist with implementation include the following next steps:

- Budget an average of $1.1 million per year to cover the estimated cost of implementing this Program.
- Prioritize measures for implementation giving highest priority for implementation to those that contribute the most to meeting peak water saving targets in order to best optimize supply sources.
- Consider working with the largest water using customers in an attempt to reduce water use as described in Section 3.
- Develop a Measure Implementation Plan that describes exactly how each program measure will be implemented.
- Prepare an annual work plan for each plan year as soon as budget is adopted (or in concert with budget planning process).
- Update codes and ordinances, as necessary.
- Form partnerships and apply for grants, where appropriate.
- Contract services, if needed, to gain enough staff support to administer or accelerate implementation of the new program.
- Maintain the City Water Commission and Staff Conservation Working Group to guide the implementation.
- Review and use tools to track water use by customer class and overall water use reductions adjusted for the weather and other external factors.
- Set up a database to store and manage measure participation, cost, and other data to gauge successes and failures and adjust measures as needed.
- Use the tools annually to help decide on priorities for the next plan year.
- Use the DSS Model to annually update the Program, including actual measure participation, projected water savings, and expected per capita water use reductions. This will help to ensure the Program is on track to meet savings goals, including per capita water use targets.

Use the input from the City Water Commission as the forum for ongoing feedback and public input. In addition, utilize the Staff Working Group to update the annual work planning process to amend the plan, budgets, staffing, contracting, schedule, and so forth so as to stay on track.

2. INTRODUCTION

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 in order to reduce water demand system-wide by 282 million gallons per year by the year 2010. Residential and commercial customers have saved over 330 million gallons of water per year so far with the help of plumbing fixture and appliance rebate programs, technical assistance, regulations, and other strategies. The City is active in promoting water conservation statewide.

The City of Santa Cruz contracted with MWM in 2013 to develop an updated Water Conservation Master Plan in order to define the next generation of water conservation activities and serve as a roadmap to help the community achieve maximum, practical water use efficiency. The City Council, the City's Water Commission, and the City's Water Supply Alternatives Committee, in its effort aimed at delivering safe, adequate, affordable, and environmentally sustainable water, has identified strengthening water conservation efforts as a top priority.

2.1 Overview of City of Santa Cruz Water System and Need for Conservation

The City faces a projected worst year gap between peak season available supply and demand during an extended drought of about 1.2 billion gallons (WSAC, October 2015). This shortfall is due to the following factors:

- 95% of the City's water supplies are collected from surface water sources.
- The City is physically and geographically isolated from other public water systems.
- The City is currently vulnerable to water shortage in extended dry and critically dry years.
- Expected requirements for fish flow releases to protect threatened and endangered species and anticipated impacts of climate change will further reduce available water supply.
- There is a decline in available groundwater supply.

This WCMP is part of the City's integrated water management approach where the City recognizes water conservation as a responsible management strategy for meeting existing and future water needs. Some of the numerous key potential benefits include:

- Protecting natural resources;
- Stretching existing supply
- Maximizing peak season water savings; and
- Helping downsize or delay costly supply, treatment, and distribution system upgrades.

2.2 Purpose and Scope of Plan

The City of Santa Cruz's Water Conservation Master 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.

2.3 Plan Development

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. The results of this baseline study are summarized in Section 3.4. The full baseline study can be found at the following links:

http://www.cityofsantacruz.com/departments/water/conservation/more-information/water-use-baseline-survey

http://www.cityofsantacruz.com/home/showdocument?id=32326

Work on the Water Conservation Master Plan began with a kick-off meeting in January 2013 and was overseen by the City's Water Commission. 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.

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 the Water Supply Advisory Committee (WSAC). The process followed in preparing the Plan is summarized as follows:

Phase 1: January 2013-October 2014

- Analyzed water use and review City's Baseline Survey for remaining conservation potential
- Identified, screened, and prioritized measures, with significant public input via Water Commission Meetings and workshops

- Least Cost Decision Support System Model (DSS Model) was used to analyze the water savings, benefits, costs for each modeled measure that was selected during the screening process
- Formulated programs, leading to a recommended Program "C" to maximize total annual water savings based on conservation potential
- Presented outcomes to Water Commission on October 6, 2014

WSAC Review: October 2014-September 2015

- At City Council direction, staff and MWM worked with WSAC on integrated planning review. This included the WSAC review of prior Phase 1 analytical results from the DSS Model and seeking to answer additional questions with City and MWM technical assistance.
- Shifted 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.
- Prepared and adopted a new econometric-based demand forecast
- Produced recommendations for additional conservation measures to be included in the Final Water Conservation Master Plan

Phase 2: October 2015-December 2016

- Recalibrated model to updated econometric demand forecast and reset planning horizon to 2015-2035
- Incorporated new plumbing code changes based on the State's Emergency Drought Regulations, effective December 1, 2015
- Incorporated input (reviewed existing modeled measures for any adjustments and for additions of new measures) from WSAC process, with focus on peak season demand reduction, completed in workshop format on January 14, 2016 with City Staff
- Formulated the "Recommended Program" into the DSS Model and evaluated results.
- Prepared Technical Memorandum for Water Commission review and approval on April 4, 2016.
- City Council approved the TM on April 12, 2016.
- Final report prepared and posted online January 2017.

2.4 Plan Adoption

The Water Conservation Master Plan, in the Technical Memorandum form approved by City Council in April 2016, was formally adopted as a part of the City's 2015 Urban Water Management Plan on August 23, 2016.

3. ANALYSIS OF HISTORICAL WATER DEMAND

The WCMP process was comprised of 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.

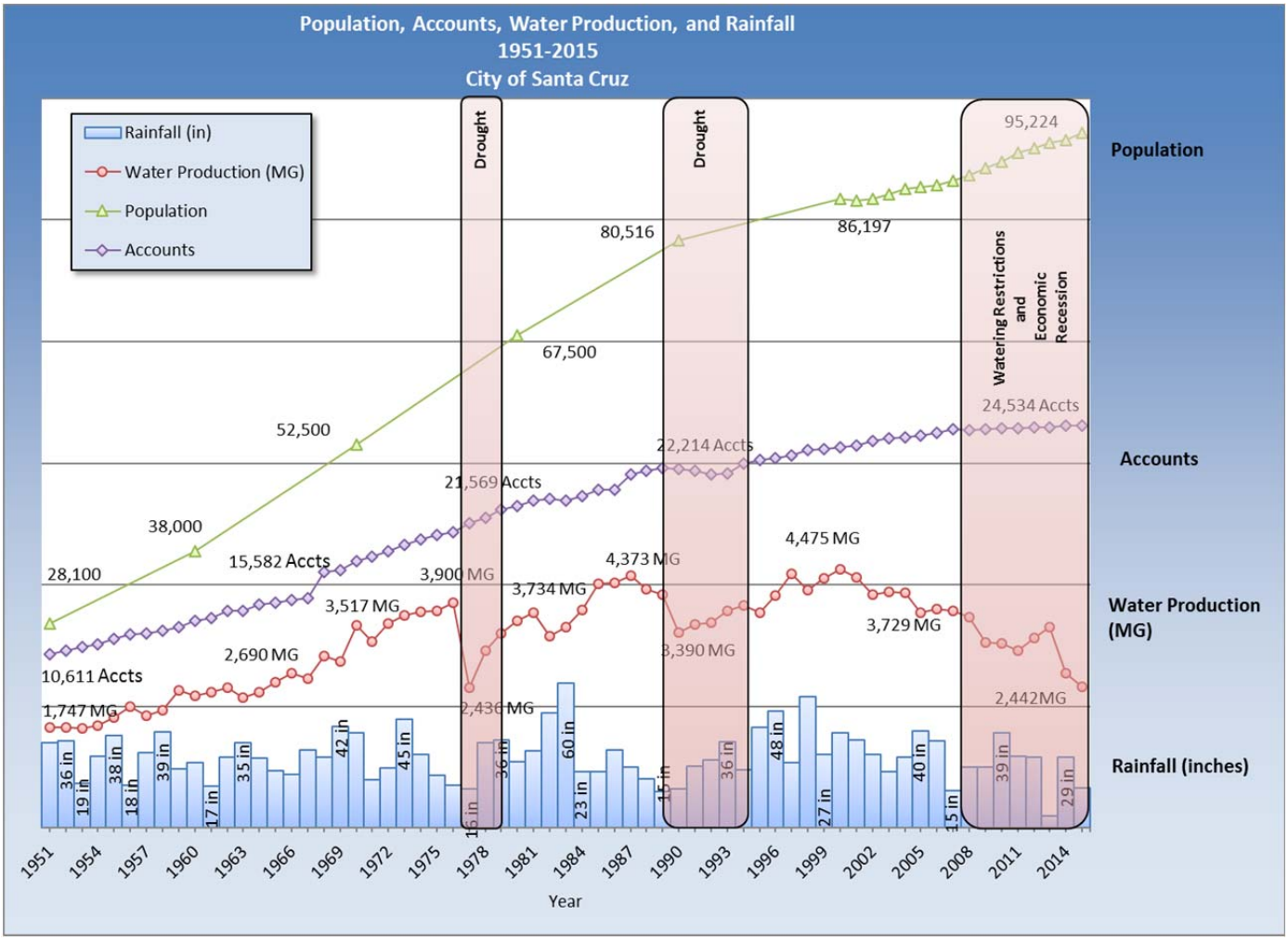
The City's water use patterns were analyzed based on water production and consumption data from City staff; water loss was examined as well. Historical monthly water use data was analyzed. Based on the City's water billing system, residential water use was broken down into single family and multifamily categories. Historical data was segregated into indoor and outdoor water use by customer type using the monthly billing data.

From the billing data, residential per capita water use values were calculated for water use inside the home and outside the home. These values were compared with other sources of municipal water use data applicable to the area. Other nonresidential categories of use were analyzed separately. Average daily commercial/industrial and public water use was expressed on a gallons-per-account or gallons-per-employee basis.

3.1 Historical Trends

As seen in Figure 3-1, the historic trend in system water use from 1950 to 2000 increased over time, consistent with account growth and population growth, 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, about one billion gallons per year less than the decade before with Stage 1 water shortage regulations and restrictions in effect. In 2014, the City instituted water rationing due to severe drought conditions. In 2015, with the same rationing scheme in place, production declined to 2,442 million gallons, a level not seen since the drought in the 1970s. Water demands are projected to remain depressed after the year 2015 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. Nonetheless, system-wide demand has recovered to near pre-drought levels after each of the three droughts of record since 1951. Given the pattern of consistent recovery, it is prudent to assume that future demands will follow suit when rainfall patterns, drought conditions, and the economy normalize.

Figure 3-1. Historical Trends for City of Santa Cruz



Source: City of Santa Cruz, 1951-2015.

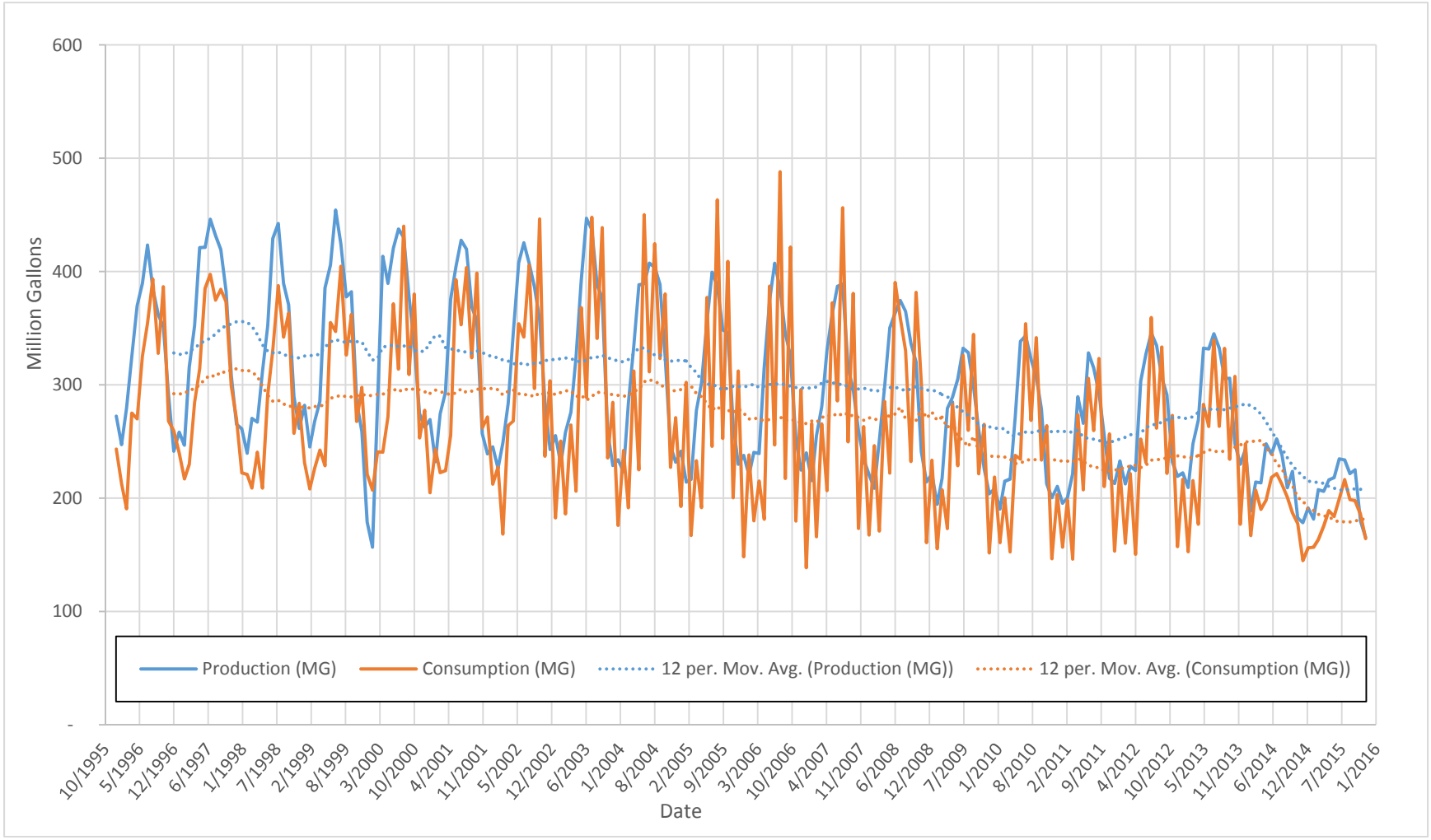
3.2 Production versus Consumption

Historical water production data for the City was analyzed on a monthly basis and shown in Figure 3-2, which illustrates the total production versus total consumption for the City. Water production data was measured at the City's water treatment plants. Water consumption data was measured at the customer meters. As can be seen from the figure, the City does not experience significant losses of water in its system between the sources and the customer.

The difference between the amount of water produced and the amount of water billed is termed the non-revenue water (NRW). The City has elected to use an estimated NRW value of 7.5% in their NRW projection estimates based on past AWWA Water System Audit Reports as presented in Section 4.4.2.

The City is currently preparing a Water Loss Control Program Report completed in 2016. The recommendations produced from this year-long project 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.

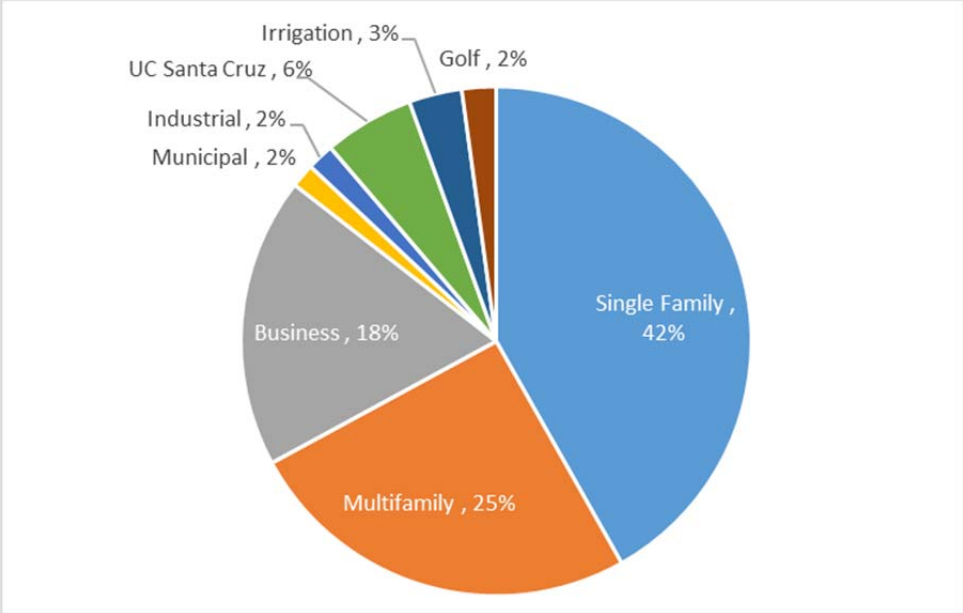
Figure 3-2. Historical Water Production and Consumption



3.3 Consumption by User Category

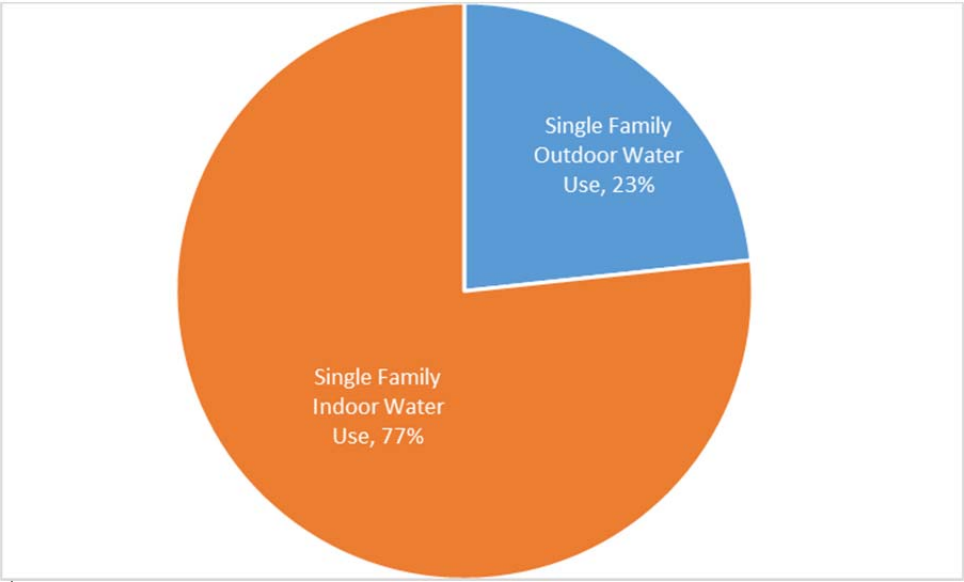
The City has several different types of water users. The current and projected user categories in the City are classified as Single Family, Multifamily, Business, Municipal, Industrial, UC Santa Cruz, Irrigation (including north coast agricultural irrigation), and Golf. The City is a mostly residential community, with some light commercial and industrial. The City is predominately a local services-based economy focused on tourism. The largest category of users of water in the City is the single family residential users who consume about 42% of the water sold. Shown in the following Figure 3-3 is the average annual consumption of the various user categories, based on year 2015 water use and account data for all customer categories.

Figure 3-3. Annual Consumption by User Category



Residential use is approximately 67% of the total annual consumption, typical of a city without significant commercial industrial uses. Since the single family residential use category formed the major portion of the City's water use (42%), it was analyzed further. Figure 3-4 shows the breakdown of single family residential use as indoor and outdoor based on the assumption that indoor use is approximately equal to the minimum use in the winter. Recent rainfall has been below normal, so an average of pre-recession and pre-drought years 2007-2008 as a baseline was selected for this profile as it was evident that there was little, if any, winter watering of landscape in these years. The goal of the analysis by customer sector, shown in the previous Figure 3-3, and the breakdown of indoor and outdoor water use, shown in the following Figure 3-4 were provided to help the water conservation planning staff to design conservation programs and marketing messages to obtain the highest water savings. As seen in Figure 3-4 below, 77% of the average single family water use is indoors.

Figure 3-4. Single Family Residential Water Use: Indoor vs. Outdoor*



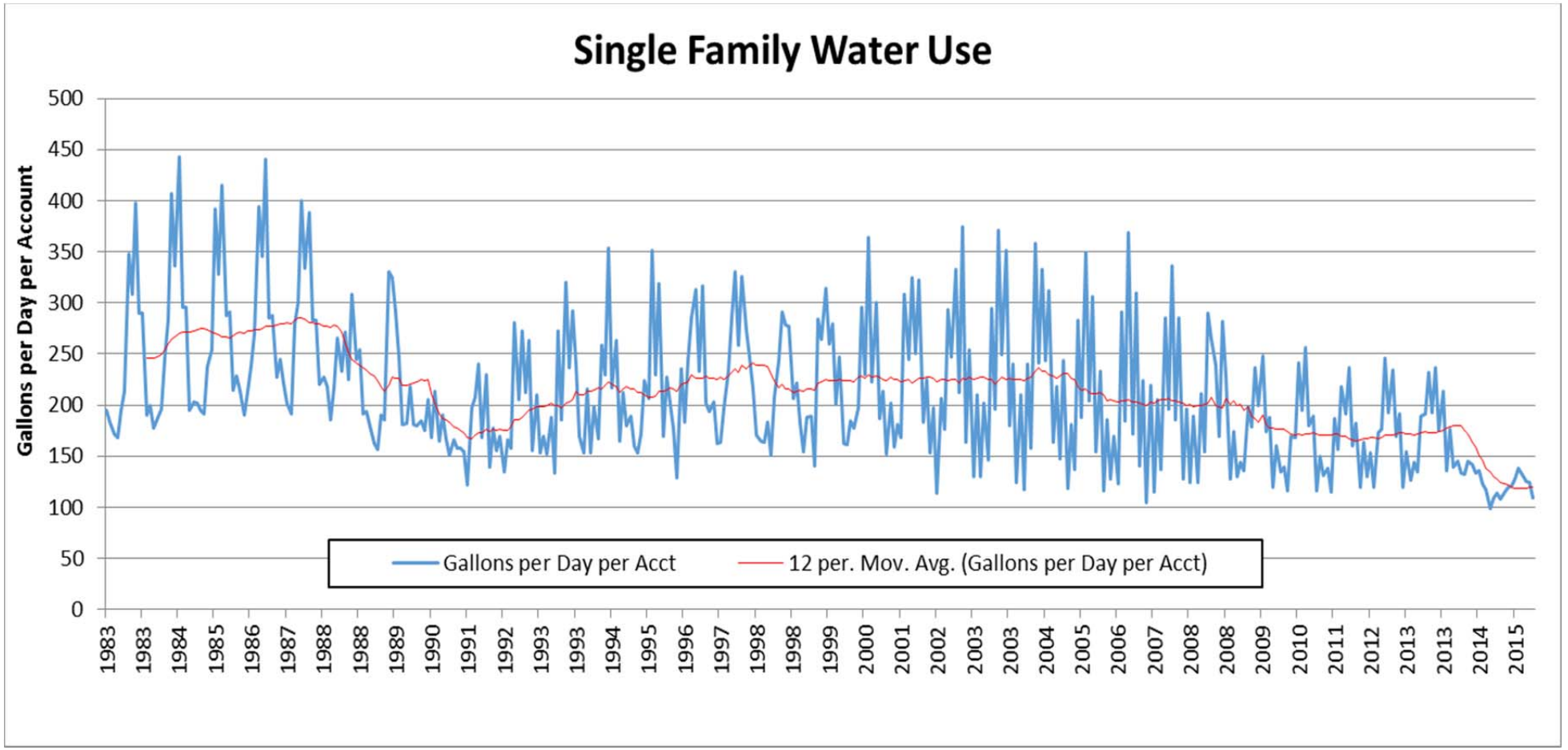
* Average 2007-2008 single family indoor and outdoor water use.

The average monthly usage per account per day for the primary water-user types of customers in the City, including Single Family, Multifamily, Business, and UC Santa Cruz are presented in the following Table 3-1 and Figures 3-5, 3-6, 3-7, and 3-8 along with more information in Appendix B.

Table 3-1. Average Monthly Usage Per Account Per Day

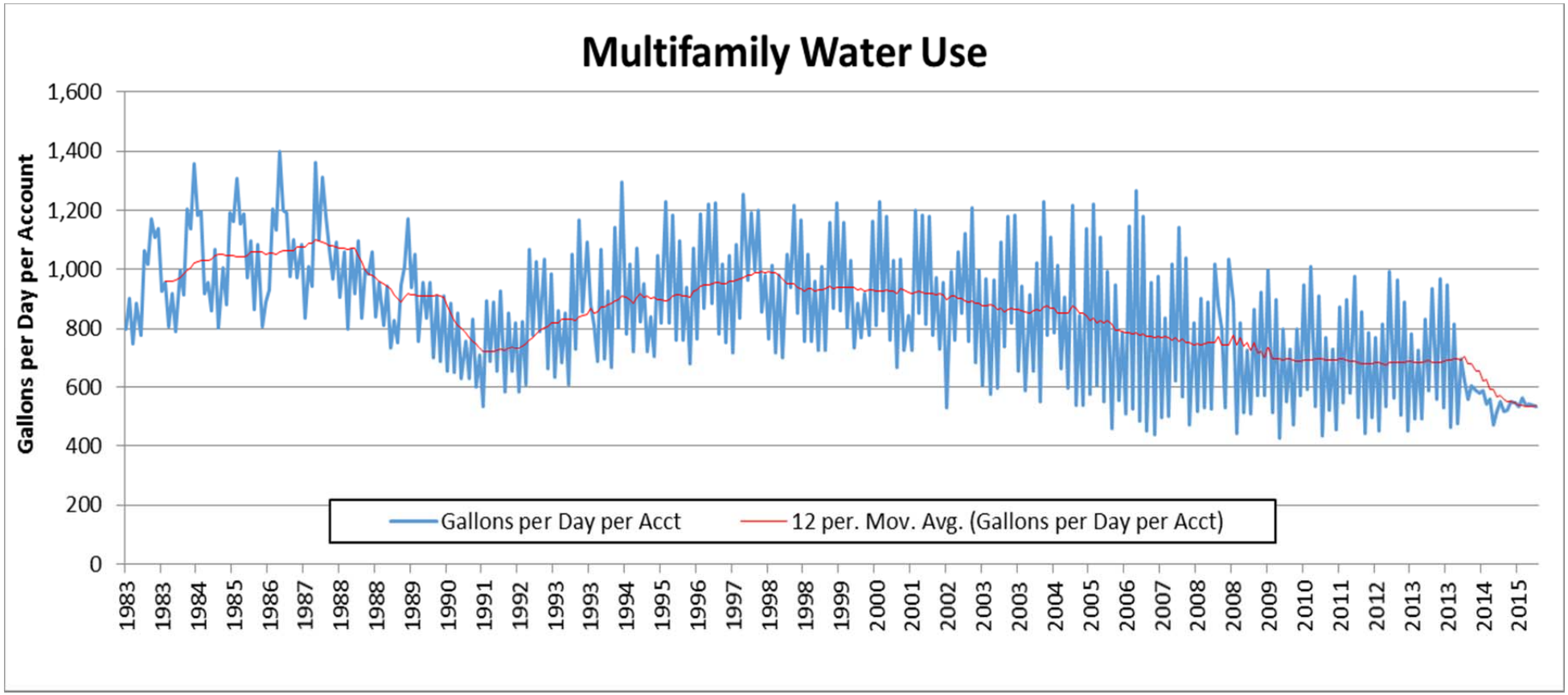
Customer Categories	Indoor Use Percentage	Outdoor Use Percentage
Single Family	77%	23%
Multifamily	88%	22%
Business	83%	17%
Municipal	32%	68%
Industrial	81%	19%
UC Santa Cruz	73%	27%
Irrigation	0%	100%
Golf	0%	100%

Figure 3-5. Single Family Consumption per Account per Day*



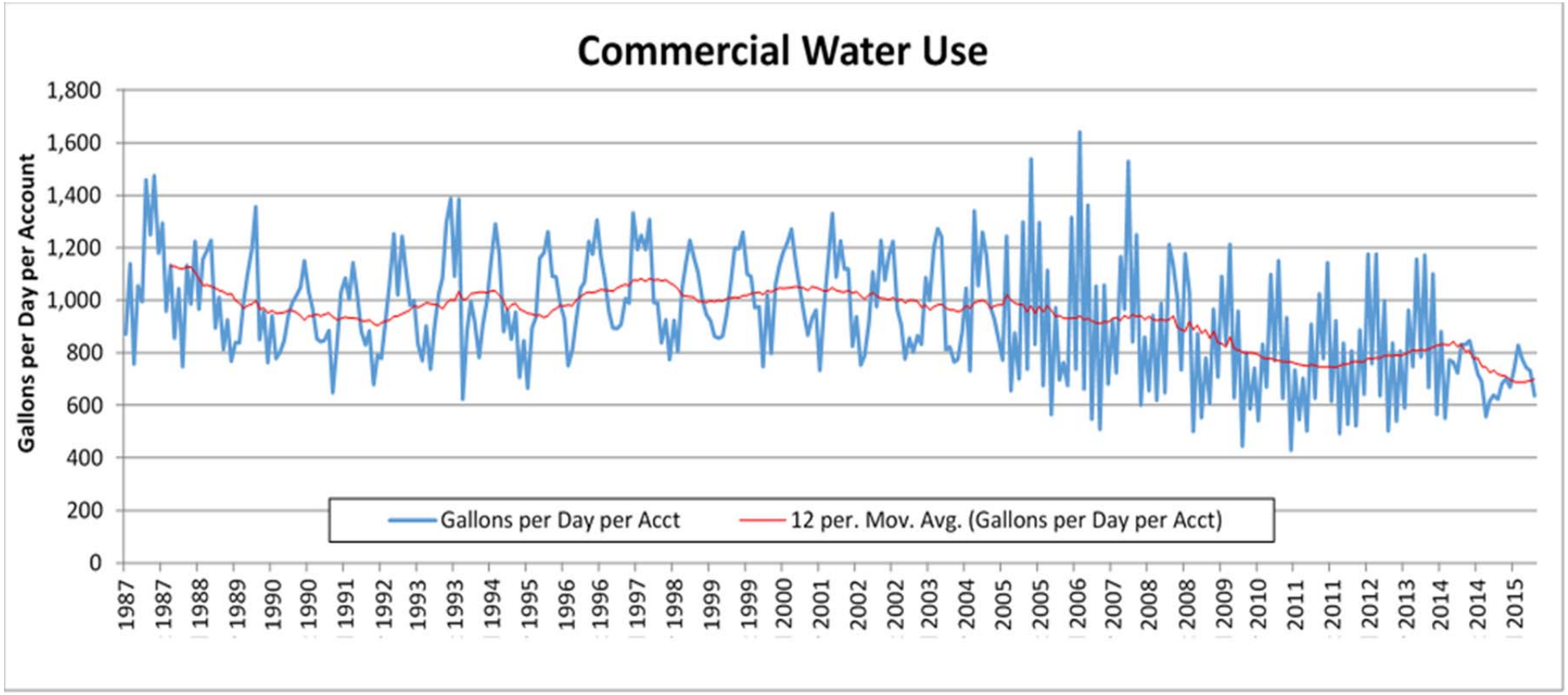
* The City experienced drought years in 1976-77, 1988-1992, and 2009-2015 and economic recession in years 2008-2012.

Figure 3-6. Multifamily Consumption per Account per Day*



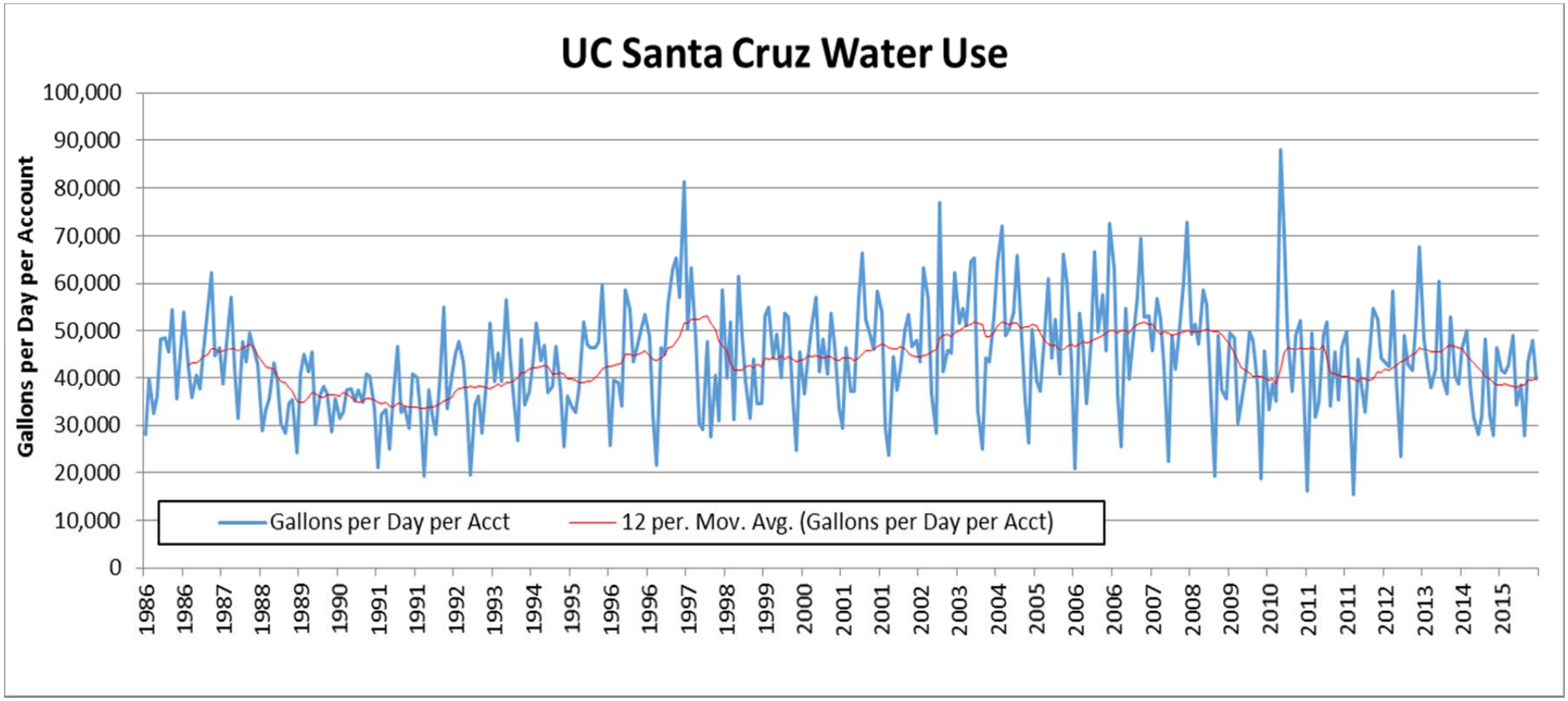
* The City experienced drought years in 1976-77, 1988-1992, and 2009-2015 and economic recession in years 2008-2012.

Figure 3-7. Commercial Consumption per Account per Day*



* The City experienced drought years in 1976-77, 1988-1992, and 2009-2015 and economic recession in years 2008-2012.

Figure 3-8. UC Santa Cruz Consumption per Account per Day*



* The City experienced drought years in 1976-77, 1988-1992, and 2009-2015 and economic recession in years 2008-2012.

Average monthly usage per account per day for the remaining lower water-using four primary types of customers in the City, Industrial, Municipal, Golf, and Irrigation is presented in Appendix B. Several observations can be made when looking at the historical record:

- The City experienced drought years in 1976-77, 1988-1992, and 2009-2015.
- The City experienced a recession in years 2008-2012.
- On January 17, 2014, Governor Edmund G. Brown, Jr. declared a drought state of emergency and directed state officials to take all necessary actions in response. Statewide mandated drought restrictions began in 2014 and are still in effect in the year 2016 at the time this Master Plan update is being written. Therefore, some of the decrease in water use is not actually a true long-term reduction in water use, but only a reflection of the drought restrictions.
- Most of the account growth over time has been in the single family category. Single family accounts have modestly grown 0.2% per year over the last five years. Commercial accounts are also growing slowly at 0.1% per year since 2010. Single family per account water use has decreased over the past five years, most likely due to a combination of the drought, economic recession, and conservation activities. Overall, the community is building out on existing parcels.
- Multifamily water use also has a downward trend, suggesting that newer accounts have been of the smaller size units or have separate irrigation meters and/or conservation programs, which are driving lower per account use.
- Commercial water use also has a gradual downward trend, suggesting shifts in types of commercial uses, smaller new accounts are being added, or commercial accounts are conserving, replacing turf, etc.
- Though the number of irrigation accounts has increased 0.8% per year over the past five years, as shown in Appendix B, irrigation account water use exhibits a significant downward trend due to the current restrictions on outdoor irrigation.

3.4 Baseline Survey Results

In 2011, the City sponsored a survey of its residential and commercial customers called the Residential and Commercial Baseline Water Use Survey Program (Baseline Survey) to develop a picture of the current state of water-using equipment within the service area. The Baseline Survey was designed to cover the City's three largest customer categories and excludes the large University of California Santa Cruz (UCSC) campus located within the service area as well as large landscape customers. Because of its non-comparability to other customers, including the UCSC campus in a random customer survey would have made little sense. Although UCSC is not a part of this study, Santa Cruz Water Department (SCWD) has a close relationship with UCSC and the campus has a water conservation plan in place that was developed specifically for the university, based on the results of a comprehensive campus-wide water audit in 2006/07[1] from which UCSC completed all identified high priority projects in the study. Large landscape customers are also excluded from this study because SCWD already has detailed information and conservation strategies in place for such customers.

[1] University of California Santa Cruz. College Water Efficiency Group, Water Conservation in Student Housing Report, 2012. Online: http://www.allianceforwaterefficiency.org/WorkArea/DownloadAsset.aspx?id=9027

The Baseline Survey was a random survey, statistically valid and designed to meet the following two goals: 1) to estimate the stock of indoor plumbing fixtures and appliances and to determine what percentage of this stock is compliant with the latest efficiency standards; and 2) to determine the prevalence, size, and characteristics of landscapes, irrigation systems, and other outdoor water using features, such as pools and spas. Additional information about the Baseline Survey can be found on the City's website at the following link: http://www.cityofsantacruz.com/home/showdocument?id=32326.

The Baseline Survey was very detailed and rigorous in order to sufficiently benchmark how much fixture replacement had been achieved in various sectors of the community. Some of the Baseline Survey findings are summarized in the following table. The percentage of indoor water using fixtures were used as a starting point (initial proportions) of these fixtures within the City in the determination of the indoor water use profile and the fixture water use plumbing code and standard potential savings. Any retrofit in the drought may shift savings earlier than planned but does not estimate any change in the overall anticipated volume of water savings.

Table 3-2. Baseline Survey Findings

Indoor Water Use Characteristics by Sector - Percentage of Water-Efficient Devices				
	Efficiency Standard	**Single Family**	**Multifamily**	**Commercial**
Toilets	≤1.6 gallons/flush	90%	89%	96%
Showerheads	≤2.5 gallons/min	92%	95%	95%
Bathroom Faucets	≤2.2 gallons/min	90%	89%	Varies
Kitchen Faucets	≤1.8 gallons/min	71%	92%	63%
Clothes Washers	Front loading type	63%	46%	52%

Source: WaterWise Consulting, Inc. (2013), Residential and Commercial Baseline Water Use Survey City of Santa Cruz Water Department.

The landscape surveys provided detailed information about outdoor water uses. Lawn, a high water use plant, was found in only about half of residential properties and just 15% of the business sites (which included schools). For single family homes, less than 1/3 of the total landscape was typically devoted to lawn. Multi-family complexes were found to have about an even mix of lawn and other landscape plants. Other than schools, most commercial properties did not have lawn. Water-efficient drip irrigation was found in 44% of single family homes, 22% of multifamily, and 25% of businesses. These averages provided an overview of typical landscapes. However, survey results showed that landscapes varied a lot between properties in size, planting palette, and irrigation equipment used. This diversity adds an extra challenge when designing outdoor conservation programs and estimating the associated water savings.

3.5 Analysis of Large Users

An analysis was conducted of the City's top-100 water users. These users may be from any customer category. The UCSC campus is the largest user, with various golf courses, businesses, and institutional customers following in terms of annual demand. The businesses include hotels, supermarkets, dialysis centers, and laundromats; the institutional customers include several elementary schools. There are also several large multifamily complexes that are top water users in the City, including many mobile home parks. In addition to their customer account numbers and property addresses, the top users are tracked by customer category and the common name of the property. On average, top-100 users use approximately 20,000 gallons per day per account.

Those users with higher use per day may indicate increased opportunities to save water. One use of this data would be to set a goal of water use reduction through targeted conservation efforts. If the City sets a goal to save 10% of water use, this goal could be achieved by working with these top-100 high water customers and attempting to reduce each account accordingly. Identifying these additional opportunities for conservation may require a more detailed analysis to determine customer-specific opportunities for water savings. The following table presents the percentage of total demand that is used by the top-100 water users.

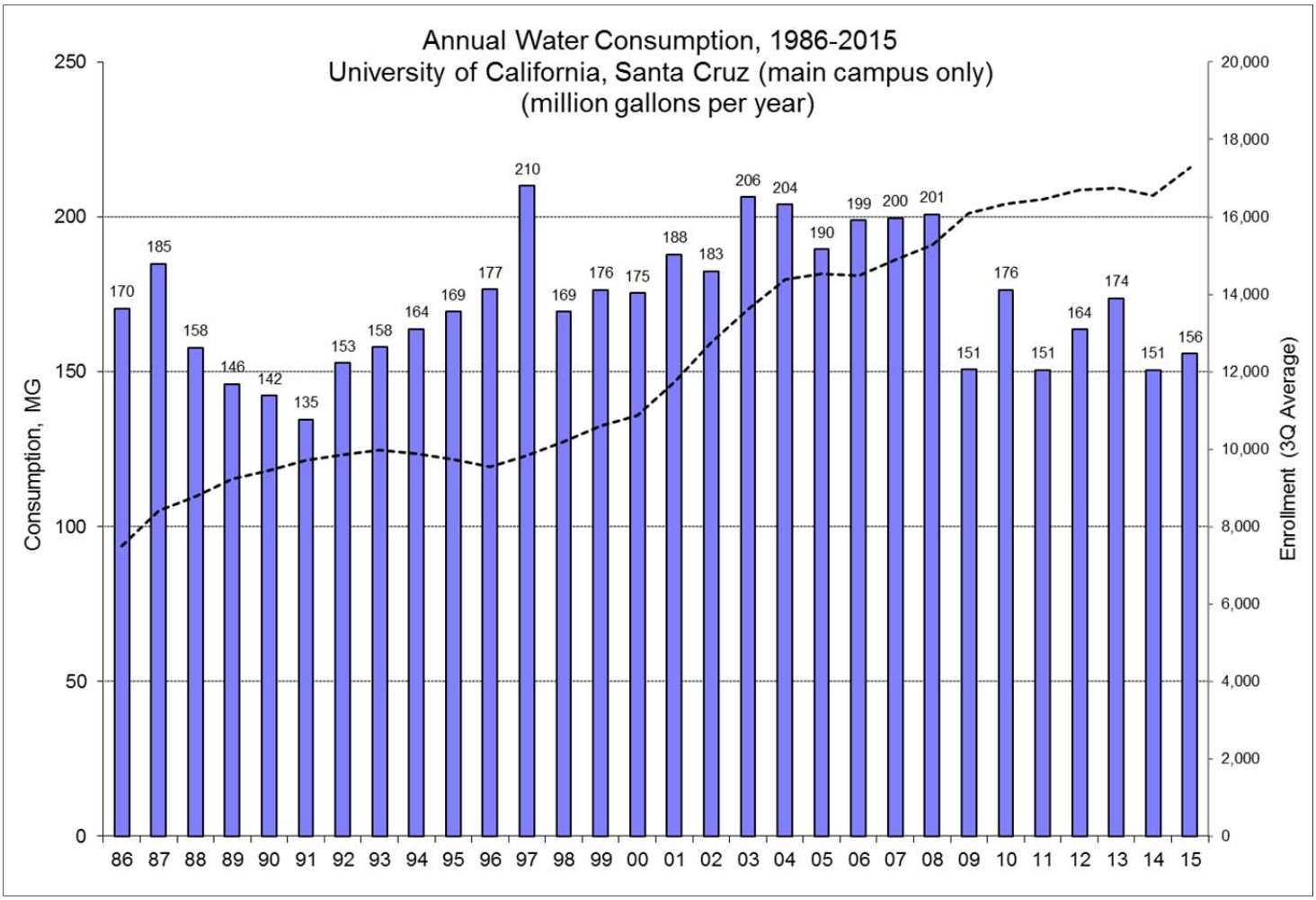
Table 3-3. Top User Demand

Top-100 Large User Demand, MGY[1]	Total CII Demand, MGY[2]	Total Demand, MGY[3]	% Top-100 Large User Use of Total CII Demand	% Top-100 Large User Use of Total Demand
743	853	2,481	87%	30%

[1] Top-100 large user demand for year 2012.
[2] Total CII demand represents year 2015 demand for business, industrial, municipal, UCSC, irrigation, and golf accounts.
[3] Total demand represents year 2015 total City water use (or production) including non-revenue water. The 2015 annual customer category consumption was approximately 2,229 MG.

The following chart presents the UCSC water use and enrollment. Note that despite a doubling in enrollment, annual water use remains relatively steady between 1986 and 2015. In fact, UCSC implemented 19 water saving projects, which reduced water use 15% from 2007 to 2011, based on the above-mentioned Water Conservation in Student Housing Report findings (UCSC, 2012).

Figure 3-9. UCSC Main Campus Annual Water Consumption and Enrollment, 1986-2015



3.5.1 Peak Demand Analysis

The composition of the peak water use was analyzed and methods were further brainstormed to reduce peak water use by all customer types and redesign measures or develop new measures to address this issue.

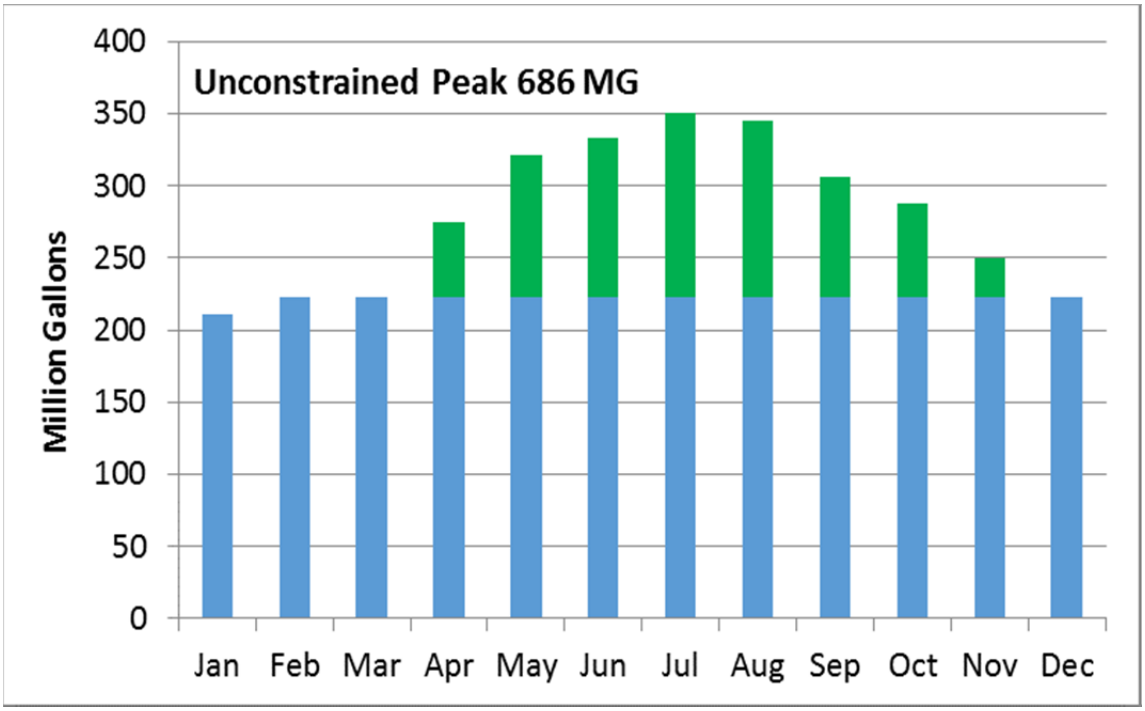
In Santa Cruz, having a pleasant coastal climate, only about 20-25% of the total water use is used for outdoor purposes. Seasonal use is also influenced by tourism, which is primarily in the summer months when visitors enjoy the City's beach lifestyle. In that context, there could be many definitions of what is peak water use, such as:

- Is it the highest water use day of the year? Is it the highest water use month of the year?
- Is it the total water use in the summer?
- Or is it the water use above a baseline of indoor use?

For purposes of this analysis, it was decided to focus on the latter, the total water used for peak use assuming that it is predominately driven by outdoor water demand, principally landscape and turf irrigation. In Santa Cruz, there is measureable outdoor use in the (eight) months of April through November. The highest use month is July, followed closely by August. Most of the nonresidential irrigation water use is separately metered making its quantification easier.

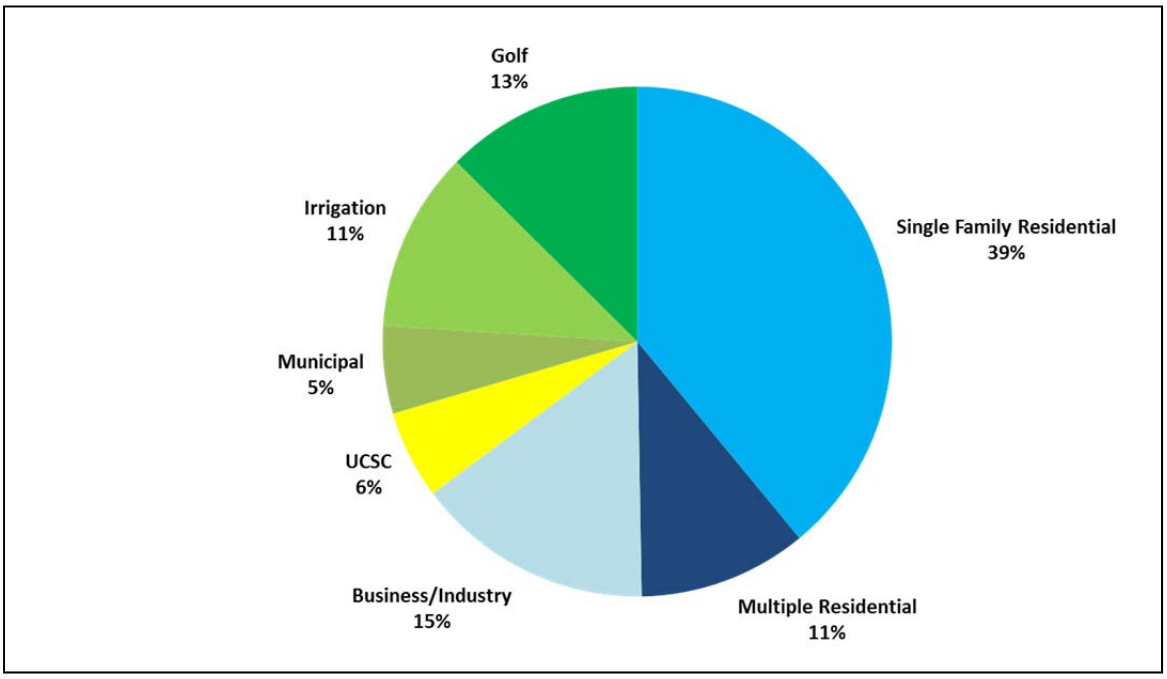
The City's interest is to maximize water savings regardless of whether it is focused on indoor or outdoor use. Due to the nature of how the City uses water, most components of the plan focus on indoor use. Nevertheless, there are some outdoor use reduction components that are useful to the intent of this current assignment of evaluating how best to reduce peak water use. The goal of the peak demand reduction analysis was to define the peak and assess what could be done to reduce it. The following figure presents the City's average monthly consumption for years 2012 and 2013. It is estimated that a total annual non-drought year, post-recession year total annual production would be approximately 3.3 billion gallons (BGY), of which peak water use represents nearly 700 MGY. As this volume is higher than occurred in 2012 or 2013, the monthly volumes shown below were adjusted upwards (about 6%) to reflect the higher annual volume. The green tips on the summer month columns represent the peak.

Figure 3-10. Monthly Consumption



The following figure presents the composition of peak season consumption by customer category for years 2012 and 2013. This is the breakdown of peak water use among the City's customer category who are contributors to peak consumption. Residential use accounts for half of the peak demand.

Figure 3-11. Composition of Peak Season Demand by Customer Category, 2012 & 2013



4. HISTORICAL AND CURRENT WATER CONSERVATION PROGRAMS

The City's past and current conservation efforts can be characterized into the following categories: utility operations programs; public information and education programs; residential; commercial, industrial, and institutional (CII); and landscape. It also includes a category for periodic water shortage management. This section presents a summary of the City's historical and current water conservation efforts.

4.1 Summary of Historical and Current Programs

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. Figure 4-1 on the following page presents the Water Conservation Program Timeline as a summary of historical water conservation program activities.

4.2 Overview of Current Program

The City of Santa Cruz has long recognized the importance of conserving water as a responsible water 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. In essence, water conservation involves making or inducing changes to many small end uses that individually have minimal effect on overall water use, but that collectively can constitute significant reductions in system demand. The City's Water Conservation section is responsible for promoting efficient water use and implementing management practices that reduce customer demand for water. Its responsibilities and major activities fall into the following four general categories:

Public Awareness and Education: to promote public awareness and education regarding the City's water resources and the importance of water conservation; 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.

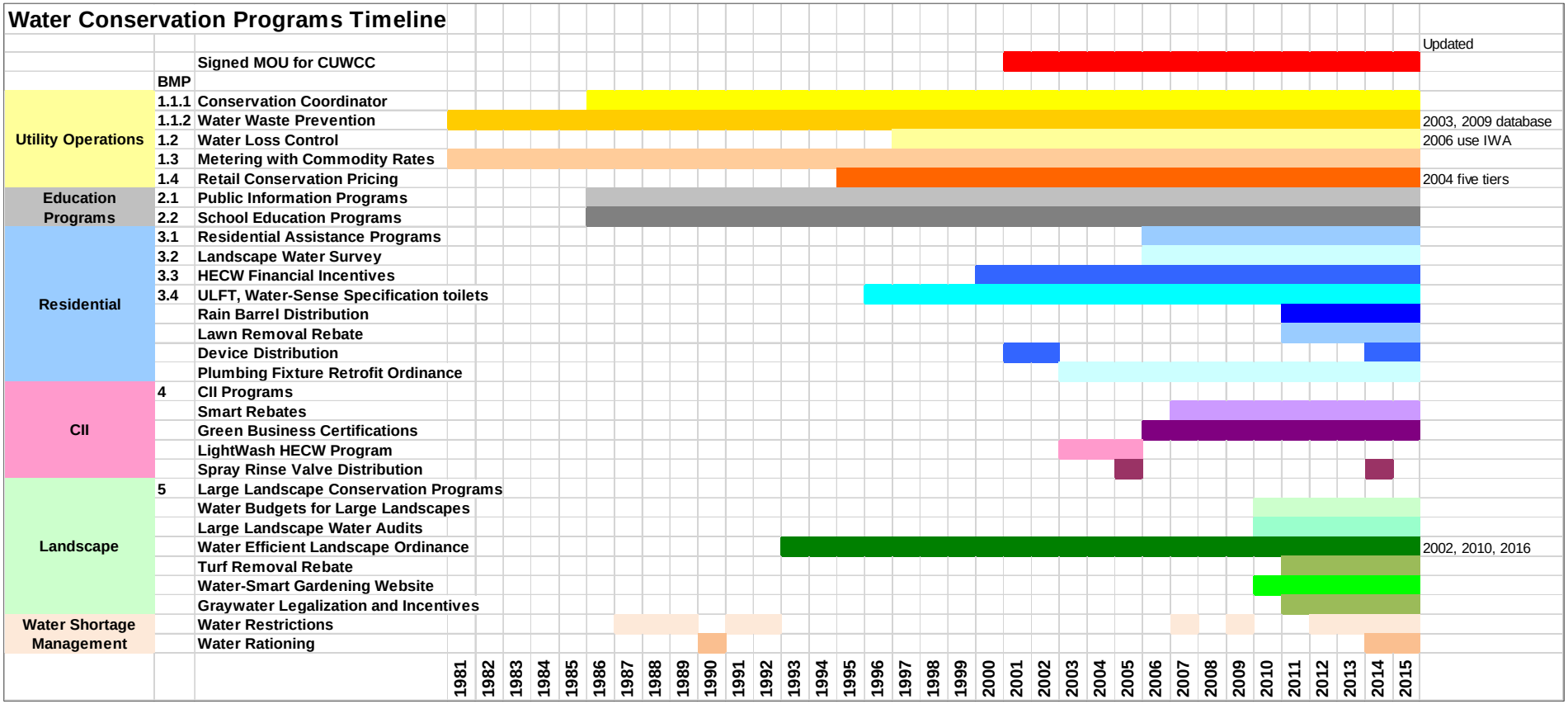
Water Demand Monitoring: to monitor water production, consumption and system water losses; to track weather and population data; to evaluate trends in per capita water use; to track demand associated with new service connections; to compare actual water demand with projected use by customer category; to develop and maintain 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; 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; to assist in Departmental and City-wide emergency planning and management activities.

Since 2000, the Water Conservation section's priorities and work plan have been guided by two principal documents: 1) MOU Regarding Urban Water Conservation in California; and 2) the Department's previous Long-Term Water Conservation Plan.

Figure 4-1. Water Conservation Program Timeline



In June 2001, the City of Santa Cruz became a signatory to the MOU and joined the 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. Subsequently, the CUWCC MOU was updated in 2008 at which time the 14 BMPs were consolidated down to 5 BMPs.

Effectively, the City's water conservation program addresses every significant end use of water in every major customer sector (residential, commercial, and landscape), with emphasis on measures that: 1) are quantifiable; 2) make a lasting reduction in average daily water use; 3) provide the greatest water savings; 4) are socially acceptable; and 5), have widespread appeal to the City's water customers. The City's water conservation program is funded by a combination of water rates, system development charges, and miscellaneous service fees. Customers also incur expenses in installing various devices and following suggested changes in water use patterns.

The City has created maps to illustrate its efforts for its water use efficiency measures. These maps can be found in Appendix D. The measures are presented in the following sections.

4.3 Recent Accomplishments

Much of the City's recent conservation activity is presented in the 2013 and 2014 CUWCC coverage reports found in Appendix E.

4.4 Utility Operations Programs

This section presents the City's water utility operations programs including the operations practices of a water conservation coordinator and water waste prevention ordinance as well as water loss control, metering, and retail conservation pricing.

4.4.1 Operations Practices

This measure encompasses two elements that the City takes to facilitate conservation program implementation and prevent water waste.

Water Conservation Coordinator

The City of Santa Cruz has employed a full-time water conservation coordinator since 1986. The current Water Conservation Coordinator is responsible for planning, organizing, and directing the operations of the Water Conservation section and for reporting on water conservation implementation.

The Water Conservation Coordinator 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 section is staffed with one Environmental Projects Analyst, and two Water Conservation Representatives who operate existing programs and assist with new program development.

Water Waste Prevention

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. 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,
- Once notified, 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 following:
    - 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
    - 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. However, during mandatory water restrictions, violating the water waste ordinance is punishable by a fine levied on the offender's utility bill ranging from $100 up to $500. 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 Water Conservation Office also encourages the community to report water waste by calling the "leak line", 831-420-LEAK, or sending an email through the City website. Customers may also submit an online form found on the City's website. Staff respond to water waste complaints in a combination of ways including site visits, in-person customer contact, phone, and/or mail correspondence is used to resolve the issue. 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.

In addition, the City has a comprehensive landscape water conservation ordinance (Santa Cruz Municipal Code 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. Information on the Water Efficient Landscape Ordinance can be found under Landscape Programs.

4.4.2 Water Loss Control

The City's Water Conservation Office has conducted an annual water audit of the City's water distribution system since 1997 using the approach described in the American Water Works Association (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. As of 2006, the City also uses 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 provide average system water losses as a percent of total water production. Of this amount, included is an estimated amount lost due to physical leakage in the distribution system and another separate portion that is not physically lost but goes uncaptured on the billing system due to sales meter inaccuracies. Results from water audits from 1997 to 2014 showed that on average the City's water loss is approximately 7.5% of total treated water production or 266 mgy. Of this amount, it is estimated that 5-6% (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 1-2% (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. In 2010, the Water Department adopted a new

Meter Testing, Repair, and Replacement Policy that accelerates large meter replacement and should help improve overall meter accuracy.

To address physical leakage, service line repairs, leak repairs, and line replacements occur on an ongoing basis, the City has a multi-year service line replacement program to eliminate all polybutylene service lines, which was a widely used material between the early 1970s and the late 1980s until it was found to be defective. To date, over 6,000 polybutylene service lines on the system have been replaced with copper lines. 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 Water 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. Starting in year 2010, the City's top irrigation customers began receiving Water Use Reports in which customers, property managers, and landscapers can see their irrigation usage, including unexpected spikes due to leaks. Because these reports are sent to vested multiple parties for each property, there is an increased opportunity and incentive to notice and repair outdoor leaks in a timely manner.

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:

- 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;
- 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
- Water loss control program design, to outline the most cost-effective strategies for reducing both real and apparent losses over time.

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.

4.4.3 Metering with Commodity Rates

All of the City's 24,534 water connections are fully metered with Automated Meter Reading (AMR) technology. Water meters are required for all new service connections. Approximately 15% of all City water meters are now connected with Advanced Metering Infrastructure (AMI) technology, allowing access to hourly meter reads. In addition, a separate, dedicated irrigation meter is required for all new and renovated multifamily 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.

Water Conservation-Oriented 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 as well as provides 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. The readiness-to-serve charge varies by meter size and location.

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 new, five-tier rate structure was adopted that applies to residential accounts with either one or two dwelling units. This new rate structure was intended to encourage more efficient use by single family residential and two-unit customers during the peak summer season, when the system relies more heavily on reservoir storage to meet daily demands. For all other customers, including multifamily (3 or more dwelling units), business, industrial, municipal, and irrigation customers, water was billed at a uniform rate up until the October 2016 rate changes.

In August 2014, the Santa Cruz City Council adopted an annual 10% 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.

The City of Santa Cruz recently developed long-range, 10-year financial plan completed in June 2016 and undertook a 5-year rate study completed in August 2016 to support the Department's ongoing operations and planned capital improvement programs. 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 was completed in Fall 2016**.** Table 4-1 shows the rate design that was implemented October 2016 in order to meet both conservation pricing and other pricing objectives.

Table 4-1. 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, as proposed in Section 7 of this plan
North Coast Agriculture	Maintain uniform rate structure

The new, recommended rate structure has changed to a structure that collects about 90% of revenues from volume charges (based on the amount of water used). The prior rate structure in 2015 collected only 65% of revenues from volume charges. Other new 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 new 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.

4.5 Public Information and School Education Programs

This section presents the City's public information and school education programs.

4.5.1 Public Information

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: media, workshops and community events, billing and customer service, and 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;
- Water supply tours; and
- Water school (offered to residential and irrigation customers who went over their allotment during rationing).

4.5.2 School Education Programs

The City offers school education activities for students ranging from upper elementary age children up to the University level. Education materials and classes are designed to meet current state education framework requirements and are available to local schools free of charge. The program gives students an opportunity to learn about the City's water supply system, watershed 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.

4.6 Residential Programs

Residential water use comprises almost two-thirds of system consumption and therefore is a main focal point of the City's water conservation efforts.

4.6.1 Residential Assistance Programs – Home Indoor and Landscape Water Surveys

The City has been conducting residential home water audits or "surveys" for customers since 2006 with a focus on high water-usage customers. This free service is designed to help residents control their utility costs and reduce water use. A conservation representative sets up the appointment for a specific date and time and spends about an hour and a half at the home. This service is geared toward households with above average water use, whose water use exceeds 14 hundred cubic feet (units) per month or more than 10,000 gallons per month.

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. The City has provided 504 home water surveys since its inception in 2006. The City anticipates that with the new rate increases, participation will increase as customers will need more support in learning how to read their meter, detect leaks, and find ways to conserve at home.

4.6.2 High Efficiency Clothes Washers

Clothes washing is one of the major end uses of water in the residential sector. It is also one with very significant water conservation potential in terms of the opportunity to reduce per capita water use on a long-term basis. Starting in 2000, the City offered a $100 rebate when a resident purchased an Energy Star® labeled high efficiency clothes washer (HECW). In July 2016, the City modified its high efficiency clothes washer rebate as mentioned in the water conservation master plan, by offering a two tiered rebate. The new rebate program offers $100 for any Energy Star® certified clothes washer, and offers an additional $100 for any current Most Efficient Energy Star® clothes washer. Energy Star® clothes washers have water factors of 4.3, whereas the Most Efficient of Energy Star® have an even lower water factor of 3.2 (lower is better). On average, Energy Star® washers use only around 15 gallons per load and about half the total gas and electric energy compared to a standard clothes washer. Since 2000, the City has rebated over 9,000 Energy Star® high efficiency clothes washers.

4.6.3 WaterSense Specification Toilets

Toilets are another area where there is potential for long-term reduction in per capita water use in the residential sector. The City's residential toilet replacement program has two components: 1) a rebate program; and 2) a plumbing fixture retrofit regulation. 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. Nearly 14,000 fixtures have been replaced under this program, saving approximately 100 million gallons of water annually.

Additionally, the DWR started a program in 2015 that provides rebates for replacing toilets in single family residences to support California's drought response. The $6 million program budget is expected to support the replacement of 60,000 toilets throughout the state. Up to $100 will be rebated for purchase and installation of one qualified HET (1.28 gallons per flush or less) per household that replaces a less efficient toilet (using more than 1.6 gallons per flush).

4.6.4 Plumbing Retrofit Ordinance – Residential

In 2003, the City adopted a plumbing fixture retrofit ordinance. 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.

As a result, the retrofit regulation applies uniformly throughout the entire water service area, regardless of jurisdiction. This ordinance implements the City's Long-Term Water Conservation Plan and fulfills the City's obligation under the MOU to carry out a toilet replacement program that is "at least as effective as requiring toilet replacement at time of resale" (CUWCC, 2014).

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 meet the low consumption standards; toilets flushing no more than 1.28 gallons per flush (1.6 gpf toilets are exempt), showerheads at 2.0 gallons per minute, and urinals flushing at 0.5 gallons per flush. 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.

Since 2003, the City has processed, inspected, and/or certified 9,523 properties through the plumbing retrofit ordinance. Because the City has had a Plumbing Fixture Retrofit (PFR) Ordinance in place since 2003, it is in compliance with the requirements of SB 407 of 2009.

4.7 Commercial, Industrial, and Institutional (CII) Programs

The City of Santa Cruz Water Department provides water to over 1,900 commercial and industrial accounts within the service area, accounting for 26% of total system water use. Commercial customers are billed for water and sewer service based on the volume of water consumed. Conserving water can lower the cost of doing business by reducing water, sewer, and energy expenses.

4.7.1 Smart Business Rebate 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 Clothes Washer (Energy Star certified): up to $400
- High-Efficiency Toilet (1.28 gpf or less): up to $200
- High-Efficiency Urinal (.125 gpf or waterless): up to $300

In the Smart Business Rebate Program, 46 businesses have participated and received a total of 97 rebates, saving an estimated 10.2 million gallons per year.

4.7.2 Green Business Certification

The Monterey Bay Area Green Business Program is a partnership of environmental agencies, utilities, and nonprofit organizations, all of which assist, recognize, and promote businesses that volunteer to operate sustainably. To be certified "green," participants must be in compliance with all regulations and meet program standards for conserving water and energy, preventing pollution, and minimizing waste. The City became a participant in the program in 2006. It is coordinated through the City 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 (i.e., low consumption fixtures and fittings), as well as a minimum number of elective requirements from several categories (e.g., cleaning, landscape irrigation). Customers are also required to meet additional measures specific to their type of business (i.e., low flow spray rinse valves for restaurants).

The Water Conservation Office has conducted 150 commercial water audits as part of the program, including a diverse list of businesses like auto repair establishments, office buildings, hotels, restaurants, hospitality services, medical facilities, retail outlets, construction companies, churches, landscape contractors, and laundromats.

4.7.3 Plumbing Fixture Retrofit Regulations – Non-Residential

The Plumbing Fixture Retrofit Ordinance's retrofit regulations also apply to commercial and industrial properties, in addition to residential properties. Any older toilets, showerheads, and urinals are required to be replaced with low consumption fixtures and fittings at the time of sale. Although commercial properties do not turn over at the same rate as residential properties, over time this ordinance has triggered the complete retrofit of some of the largest commercial properties in the water service area, including Chaminade Resort & Spa, the Dream Inn, and the University Inn and Conference Center.

4.7.4 Other CII Conservation Programs

The City has operated other commercial water conservation programs in the past which have been completed and are no longer active. Some of these activities include:

- Smart Rinse (2005): kitchen spray valve replacement in restaurants and dining service facilities, coordinated by the City and Ecology Action;
- LightWash (2003-2005): high efficiency clothes washer statewide rebate program for institutional and multifamily customers;
- Distribution of bed linen reuse, towel reuse, drinking water upon request cards to hotels and restaurants;
- CII facility water audits (2006-present); and
- Partnering with UC Santa Cruz to improve the university's water use efficiency.

4.8 Landscape Programs

This section presents the landscape water use efficiency measures available in the City.

4.8.1 Water Efficient Landscape Ordinance

The City of Santa Cruz first adopted an ordinance establishing landscape water conservation regulations for major development projects situated in the City's service area in 1993 (Santa Cruz Municipal Code Chapter 16.16). The ordinance was rewritten in 2001, and revised again in 2010 in response to AB 1881, the Water Conservation in Landscaping Act of 2006. It was adopted to promote efficient water use in landscapes and to help manage water demand when water needs are the highest. Its overall purpose 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 ordinance is currently in the process of a new update in response to April 2015 California Governor's Executive Order B-29-15.

The City's ordinance applies throughout the entire water service area as a condition of receiving water service. Landscape and irrigation plans meeting specific water conservation standards are required as part of the building plan application process for the following projects:

- New commercial, industrial, and public development projects requiring a building permit, land use approval, or new/modified water service
- Existing developments required to re-landscape as part of approval
- Developer-installed residential landscaping equal to or greater than 2,500 square feet
- New single-family and two-unit residential developments (requirements dependent upon parcel size)
- New recreation areas

The ordinance contains provisions for:

- Dedicated irrigation meters for new landscapes or expansion of existing landscapes over 5,000 square feet, except single and two-unit properties;
- Landscape water budget based on 55% (residential) and 45% (non-residential) of reference evapotranspiration;
- Turf, high water use plants and water features are 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.

Per City Code, a complete landscape plan must be submitted and found to satisfy the standards where applicable 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. Large projects that underwent the City's landscape plan review process were the Highway 1/17 interchange landscaping, live-work development at 2120 Delaware Avenue, Safeway renovation on Mission Street, and Tannery Arts complex on River Street.

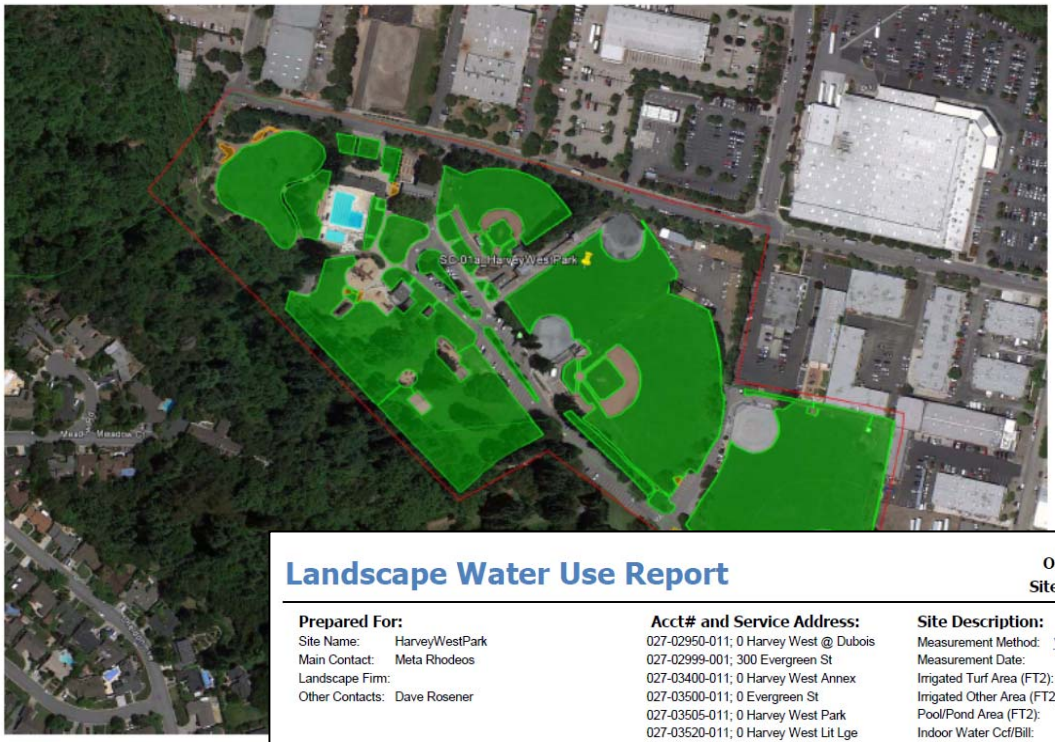
4.8.2 Large Landscape Water Budgets

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 (see Figure 4-2 below for example).

In preparation for the new rate changes in October 2016, Waterfluence mapped all irrigation sites that used above 10 CCF during 2015 and enrolled customers that used over 100 CCF into the Waterfluence program. These included city and county parks, schools, commercial properties, homeowner association golf courses, churches, and cemeteries. For customers using 10 CCF or below for 2015, the City assigned a generic budget for those accounts. Together, outdoor water use at these properties adds up to 265 million gallons per year, almost 10% of the City's total water consumption. In the future, the City anticipates that more of these mapped or noted sites will be enrolled in the Waterfluence program if water usage increases.

Figure 4-2. Landscape Irrigation Surveys and Water Budget Program Success



Landscape Water Use Report

October 2012
SiteID: SC-01a

Prepared For:
Site Name: HarveyWestPark
Main Contact: Meta Rhodeos
Landscape Firm:
Other Contacts: Dave Rosener

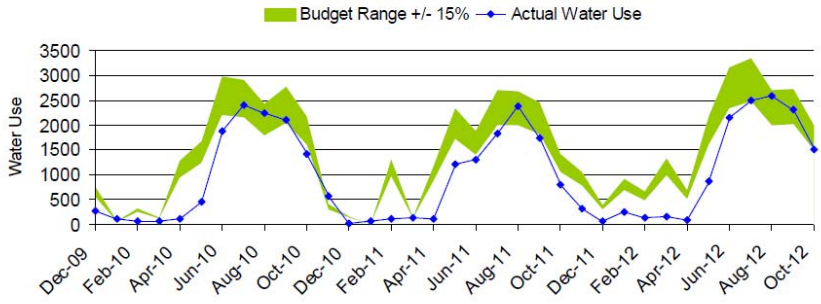
Acct# and Service Address:
027-02950-011; 0 Harvey West @ Dubois
027-02999-001; 300 Evergreen St
027-03400-011; 0 Harvey West Annex
027-03500-011; 0 Evergreen St
027-03505-011; 0 Harvey West Park
027-03520-011; 0 Harvey West Lit Lge

Site Description:
Measurement Method: View Site Map
Measurement Date: 7/10/2012
Irrigated Turf Area (FT2): 576,180
Irrigated Other Area (FT2): 2,889
Pool/Pond Area (FT2): 5,180
Indoor Water Ccf/Bill: 0

CITY OF SANTA CRUZ
HARVEY WEST PARK
809 CENTER ST RM 101
SANTA CRUZ CA 95060-3826

Site Percentile
88
100=top score

Water Use History



Savings Potential	Last Month	Last 12 Months	Last 24 Months	Last 36 Months
Over Water Ccf	0	244	614	805
Over Water %	0%	2%	3%	2%
Dollars Lost $	$0	$975	$2,458	$3,219

Read Date	Actual Water Ccf	Budget Water Ccf	Over Water Ccf	Over Water %	Weather ETo-Rain Inches
10/9/2012	1,502	1,739	0	0%	3.48
9/10/2012	2,317	2,373	0	0%	4.75
8/10/2012	2,592	2,348	244	9%	4.70
7/11/2012	2,486	2,898	0	0%	5.80
6/11/2012	2,158	2,743	0	0%	5.49
5/11/2012	865	1,881	0	0%	3.77
4/11/2012	96	591	0	0%	1.19
3/13/2012	161	1,153	0	0%	2.31
2/10/2012	135	572	0	0%	1.15
1/11/2012	253	799	0	0%	1.60
12/12/2011	74	347	0	0%	0.70
11/10/2011	324	908	0	0%	1.82

Messages

Source: Waterfluence, 2012: http://www.waterfluence.com (last accessed May 31, 2013.

4.8.3 Rain Barrel Program

In winter 2010, the City began offering a subsidized rain barrel distribution program. This program served to educate the community about water conservation for landscapes and stormwater management. In addition, the pilot allowed the City to assess consumer interest and satisfaction with rain water harvesting systems. Initially, the Water Conservation Office purchased two shipments of 65-gallon MOBY rain barrels and made them available at a reduced cost to City water customers. Water Distribution personnel delivered the barrels. Due to popularity, the rain barrel program has been modified. Currently, the Water Conservation Office offers the 50-gallon, 100% recycled plastic Ivy rain barrel at a discounted price of $50.00 that is available for pick up at distribution events located at the City corporation yard. More than 4,000 rain barrels have been sold since then saving about 0.8 mgy.

4.8.4 Turf Removal Rebate

In 2010 the Water Conservation Office began offering a rebate program to promote turf removal to encourage and expand landscape water conservation opportunities for customers and to provide an option for customers seeking to mitigate high utility bills. The rebate offer was originally $0.50 per square foot of lawn removed, up to $500 or 1,000 sq. ft. for single family and $2,500 or 5,000 sq. ft. for multifamily. Prior to the drought, customers must have met the following requirements to qualify:

- Have green lawn that is watered with an in-ground irrigation system
- Remove or cap their overhead spray system in the area to be converted
- Replace lawn with low or very low water use plants and mulch (with or without low volume drip irrigation) or install no-water-use permeable hardscape options
- Agree to pre- and post-inspections to take measurements and ensure eligibility requirements have been met
- Complete the landscape conversion within 120 days of pre-approval

These requirements were later modified due to drought conditions in 2014. In response to rationing, customers allowed their lawns to brown and were more reluctant to planting. Due to these changes, the following eligibility requirements have been modified:

- Lawns do not have to be green to receive the rebate.
- The project does not need to be completed within 180 days or by a deadline. Customers are asked to wait and plant when water conditions return to normal.

In July 2016, the rebate was increased to $1 in order to provide more incentive for customers to convert their lawns. Since 2010, the City has processed 507 lawn rebates for the removal of 496,712 square feet with an estimated water savings of 9.5 mgy.

In 2015, the DWR also implemented turf removal rebate program for single family customers who remove their turf and replace it with low water use landscapes to support California's drought response. Santa Cruz Municipal Utility customers may apply for both the City and State rebate to receive up to $2 per square foot removed. In addition, customers who did not qualify for the City rebate due to lack of pre-site inspection are also encouraged to participate in this program.

4.8.5 Graywater Workshops and Rebate

In 2011, the City amended its Sewer System Ordinance (Santa Cruz Municipal Code Chapter 16.08) to enable graywater systems to be constructed and operated in agreement with the California Plumbing Code. The amended ordinance now

allows residents to legally build a “Laundry-to-Landscape” type graywater system without a permit, and for other types of graywater systems to be developed, consistent with the Plumbing Code, with appropriate permits and oversight. In 2013, the City started offering 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. Customers also have the option of hiring a licensed greywater laundry to landscape contractor listed by Central Coast Grey Water Alliance. Applicants who reside in the City must also sign and agree to an Installation and Maintenance Agreement through Public Works to qualify for the rebate. Since 2013, the City has rebated 17 Laundry to Landscape graywater systems.

4.9 Other Water Conservation Initiatives

The City has been active in implementing other water conservation measures beyond the BMPs listed in the MOU. These include the previously presented rain barrel and gray water programs. This section presents additional water conservation initiatives conducted by the City.

The Conservation office has been providing free water-saving items to customers in the City of Santa Cruz Water Department service area since 2001. Items that may save water in the home or workplace can be picked up at the Water Conservation Office. Items include the following:

Showerheads. Low-flow, 2.0 gallon per minute showerheads with adjustable flow pattern.

Kitchen Faucet Aerators. Low-flow, 2.2 gallon per minute kitchen aerators with an easy-to-use lever to adjust the flow of water without changing the hot/cold mix. Made of chrome-plated brass.

Bathroom Faucet Aerators. Low-flow, 1.5 gallon per minute aerators made of chrome-plated brass.

Toilet Tank Leak Detection Dye Tablets. Toilets are the most common source of indoor leaks. These non-toxic dye tablets help check toilets for leaks. Drop a tablet into the toilet tank, and wait a few minutes. If blue color appears in toilet bowl, there is a leak.

Garden Hose Shut-Off Nozzles. Multiple spray patterns. Saves water by cutting off hose water that would run if left unattended.

Garden Hose Timer. Manual spring timer has settings from 15 to 120 minutes. Ideal for timing use of hose end sprinklers.

Water-Smart Gardening in Santa Cruz County CD. CD-ROM database featuring information regarding local gardens, plants, and resources to help save water in the garden.

Practical Plumbing Handbook. This booklet gives an overview of preventive maintenance and explains some of the ways residents can conserve water while keeping the home in good condition.

Shower Timer. Five-minute timer, works like an egg-timer. Helps change shower habit, encouraging shorter showers. A suction cup holds plastic timer to shower wall.

Showerhead Control Valve. Control valve used to retrofit existing showerhead to have an adjustable flow pattern.

Water Wise Gardening Literature. Several illustrated booklets on a variety of water saving garden topics.

5. PROJECTED FUTURE WATER DEMANDS WITH AND WITHOUT PLUMBING CODE

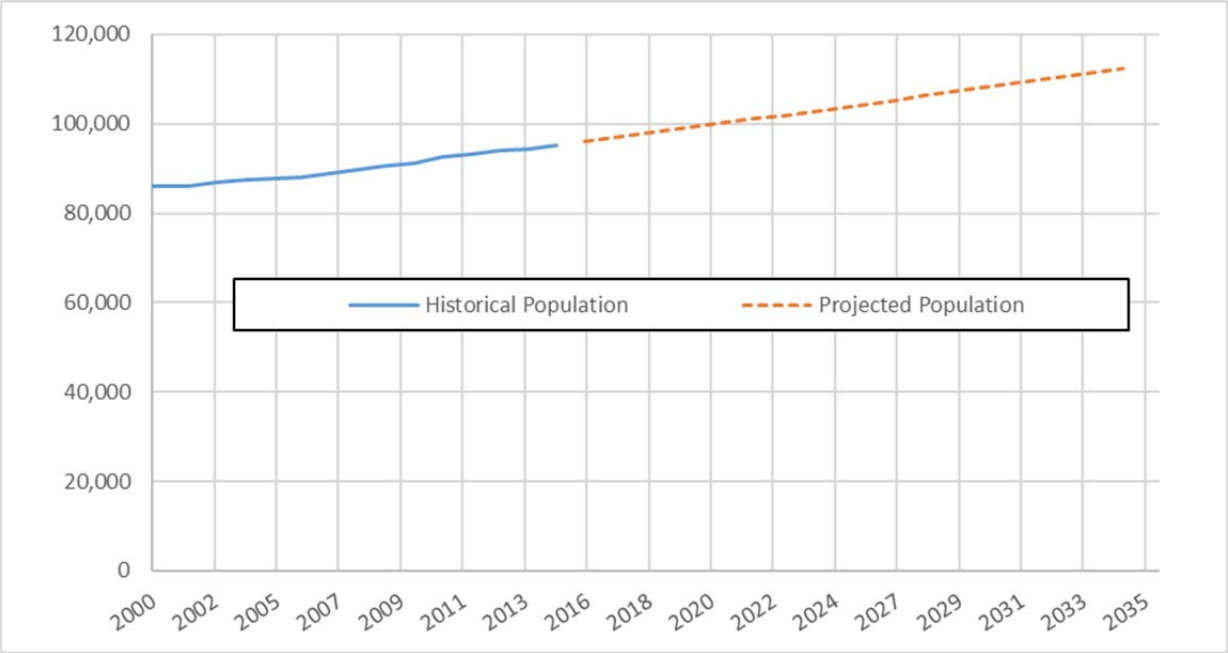
The purpose of this section is to document the demand projections developed for the Program. This section presents:

- Population and account projections;
- Demand methodology overview;
- Basis for Demand Forecast;
- Water use data analysis inputs and key assumptions for the DSS Model; and
- Water demand projections with and without the plumbing code savings through 2035 (this is the demand before incorporating planned water savings from future active conservation efforts).

5.1 Population and Water Account Projections

The main source of population projections used to generate future water demands for the Conservation Master Plan are summarized in the City of Santa Cruz Water Demand Forecast (M.Cubed, 2015). The forecast of service area population is divided into its inside-city and outside-city components. The inside-city component comes directly from the Association of Monterey Bay Area Governments (AMBAG) 2014 Regional Growth Forecast (AMBAG, 2014) and is inclusive of the UCSC population. The outside-city component is derived by Water Department staff using data from the 2014 Regional Growth Forecast. The following figure presents the City's historical and projected population. Historical population values through year 2015 are based on the Department of Finance (DOF) estimates for the City and relevant outside city jurisdictions. Specific year 2000 and 2010 population values are based on the 2010 U.S. Census and Geographic Information System (GIS) analysis. All other things being equal, higher service area population would normally translate to higher water demand over time.

Figure 5-1. Historical and Projected Population



Note: Population projections for the City of Santa Cruz are based on AMBAG projections.

The following table presents the City's projected population.

Table 5-1. Current and Projected Population

Year	Population
2010	91,291
2015	95,251
2020	99,403
2025	103,620
2030	107,989
2035	112,390

Note: Population projections for the City of Santa Cruz are based on AMBAG projections.

The following table presents the City's projected growth in accounts by customer category in five-year increments.

Table 5-2. Current and Projected Accounts by Customer Category

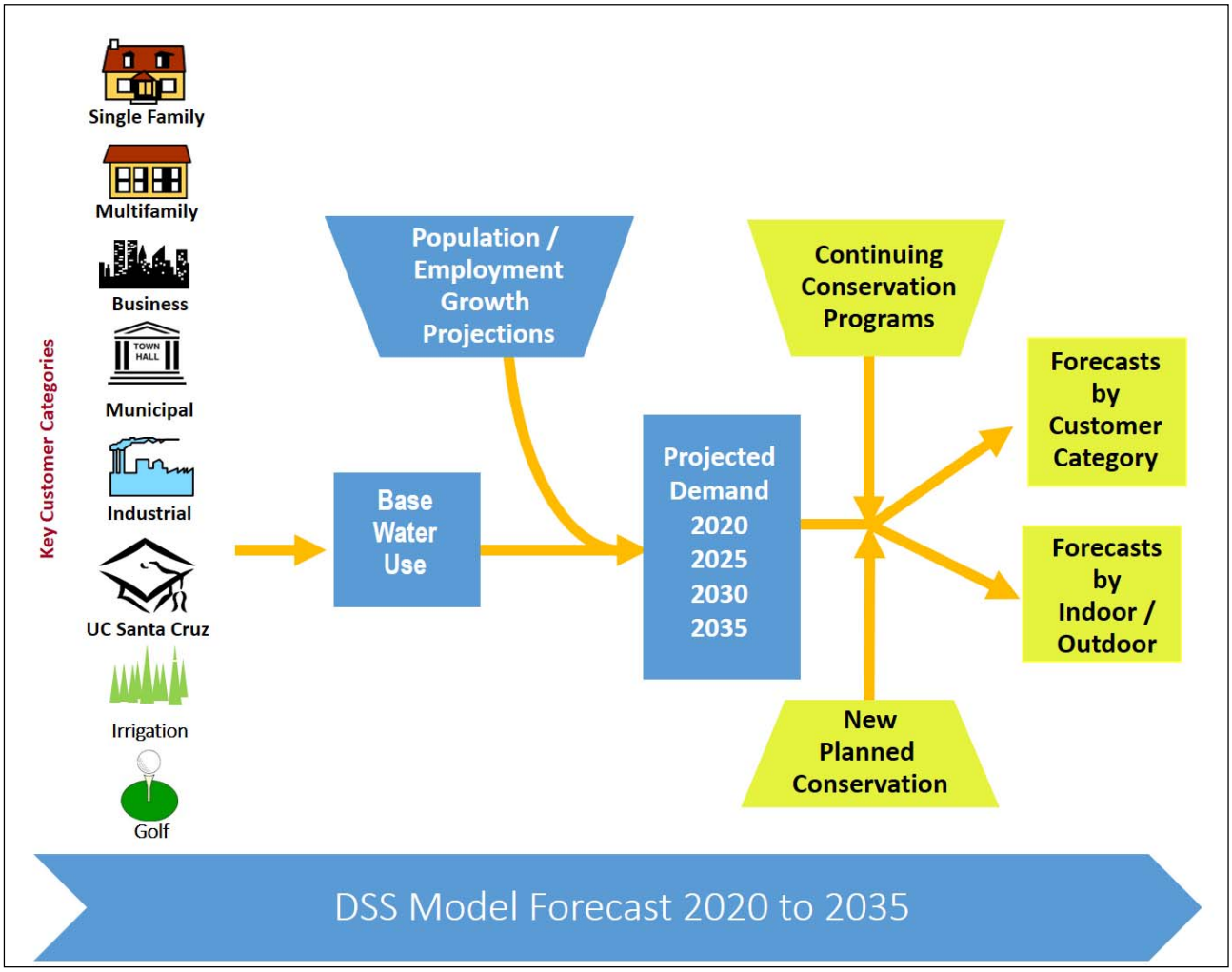
Year	Single Family	Multifamily	Business	Municipal	Industrial	UC Santa Cruz	Irrigation	Golf	Total
2015	19,029	2,745	1,897	312	40	11	460	2	24,496
2020	19,456	2,886	1,948	218	39	12	651	2	25,212
2025	19,854	2,972	1,971	218	41	14	723	2	25,795
2030	20,260	3,122	2,008	218	43	16	845	1	26,514
2035	20,636	3,238	2,055	218	43	18	951	1	27,162

5.2 Demand Methodology Overview

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.

As shown in the following figure, the first step for forecasting water demands using the DSS Model was to gather customer category billing data from the City. The next step was to check the model by comparing water use data with available demographic data to characterize water usage for each customer category (single family, multifamily, commercial, municipal, industrial, USCS, irrigation, and golf) in terms of number of users per account and per capita water use. During the model calibration process, data was further analyzed to approximate the indoor/outdoor split by customer category. The indoor/outdoor water usage was also 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 was combined with the number of water users to verify that the volume of water allocated to specific end uses in each customer category was consistent with social norms from end-use studies on water use behavior (e.g., for flushes per person per day).

Figure 5-2. DSS Model Flow Diagram



5.2.1 Water Use Data Analysis and Key Inputs to the DSS Model

The demand analysis process includes an investigation of baseline average water use per customer. This analysis includes the following elements:

- *Model Start Year* – This is the starting year for the analysis. For this project, the start year for the model is 2015. The DSS Model includes 20 years of data projecting information until the year 2035.
- *Base Year for Indoor Water Use Factors* – Based on an analysis of historical water billing data, the City selected years that are representative of current water use and used as a base year demand factor for developing future indoor water use projections. An average of 2007 and 2008 was used for all customer categories and was chosen by the City for the following reasons:
  - Note that it is recognized that the years 2009-2011 show a dip in water demand in many areas nationally due to reduction in economic activity.
  - The years selected had relatively "normal" climate conditions (i.e., not a drought or excessively wet year), so no significant weather adjustments were necessary. More recent years (2012-2015) were affected by drought conditions. The water billing or production data shown in Section 3.2 was normalized for this analysis.
  - Section 3.3 presents historical customer category water use graphs. Historical water use was provided by the City, taken from the Department of Water Resources' (DWR's) annual Public Water System Statistics

(PWSS) reports, or taken from previous modeling efforts conducted by MWM. The data was reviewed and confirmed by the City. Units shown are average gallons of water per account per day. These graphs were reviewed to better identify outlier data points and years so that a representative baseline water use value (of average account water use by category) could be determined. The effects of drought, economic recessions, and other influences on water use are typically evident in these figures.

- *Average gal/day/acct* – This is the amount of water in gallons that is used per day, per account.
- *Indoor/outdoor Water Use* – This is the amount of water per account split into the percent that is used indoors and outdoors.
- *Consumption by Customer Class* – This shows the annual amount of water used for an entire calendar year, broken down by customer class (Single Family, Multifamily, Commercial, Irrigation, etc.).
- *Non-Revenue Water (NRW)* – This is the sum of all water input to the system that is not billed (metered and unmetered), including apparent (metering accuracy) and real losses. The values were calculated by taking the difference between the amount of water produced and the amount of water sold.
- *Census Data* – Census data was used as a general reference when determining household sizes for the City.
- *Current Service Area Population* – Year 2015 City population is based on the Department of Finance City of Santa Cruz and relevant jurisdictional estimates. The population forecast of service area population comes directly from the AMBAG 2014 Regional Growth Forecast and the Water Department staff's usage of data from this forecast.

The following table presents the key inputs and assumptions used in the model. The assumptions having the most dramatic effect on future demands were the natural replacement rate of fixtures, how residential or commercial future use is projected, and the percent of estimated non-revenue water. More details on these assumptions, including screenshots of where they are incorporated into the DSS Model, can be found in Appendix C.

Table 5-3. Water Use Data Analysis and DSS Model Key Assumptions

Parameter	Model Input Value, Assumptions, and Key References		
Model Start Year	2015		
Non-Revenue Water in Start Year	7.5%		
	This value can be found in the green Non-Revenue Water section of the DSS Model.		
Population Projection Source	AMBAG 2014 Regional Growth Forecast		
Start Year Water Use Profile			
Customer Categories	**Water Use Distribution**	**Indoor Use %**	**Residential Indoor Water Use (GPCD)**
Single Family	42%	77%	57
Multifamily	25%	88%	54
Business	18%	83%	N/A
Municipal	2%	32%	N/A
Industrial	2%	81%	N/A
UC Santa Cruz	6%	73%	N/A
Irrigation	3%	0%	N/A
Golf	2%	0%	N/A
Total	100%	N/A	N/A
Residential End Uses	City of Santa Cruz Residential and Commercial Baseline Water Use Survey (2013). Key Reference: CA DWR Report "California Single Family Water Use Efficiency Study," (DeOreo, 2011 – Page 28, Figure 3: Comparison of household end-uses) and AWWA Research Foundation (AWWARF) Report "Residential End Uses of Water, Version 2 - 4309" (DeOreo, 2016). Table 2-A. Water Consumption by Water-Using Plumbing Products and Appliances - 1980-2012. PERC Phase 1 Report. Plumbing Efficiency Research Coalition. 2013. http://www.map-testing.com/content/info/menu/perc.html Model Input Values are found in the "End Uses" section of the DSS Model on the "Breakdown" worksheet.		
Non-Residential End Uses, %	City of Santa Cruz Residential and Commercial Baseline Water Use Survey (2013). Key Reference: AWWARF Report "Commercial and Institutional End Uses of Water" (Dziegielewski, 2000 – Appendix D: Details of Commercial and Industrial Assumptions, by End Use). Model Input Values are found in the "End Uses" section of the DSS Model on the "Breakdown" worksheet.		
Efficiency Residential Fixture Current Installation Rates	City of Santa Cruz Residential and Commercial Baseline Water Use Survey (2013). U.S. Census, Housing age by type of dwelling plus natural replacement plus rebate program (if any). Key Reference: California Urban Water Conservation Council Potential Best Management Practice Report "High Efficiency Plumbing Fixtures – Toilets and Urinals" (Koeller, 2005 – Page 42, Table 8 and Table 9: Residential toilet installation rates in California). Key Reference: Consortium for Efficient Energy (www.cee1.org). Model Input Values are found in the "Codes and Standards" green section of the DSS Model by customer category fixtures.		

Parameter	Model Input Value, Assumptions, and Key References
Water Savings for Fixtures, gal/capita/day	Key Reference: AWWARF Report "Residential End Uses of Water, Version 2 - 4309" (DeOreo, 2016). Key Reference: CA DWR Report "California Single Family Water Use Efficiency Study" (DeOreo, 2011 – Page 28, Figure 3: Comparison of household end-uses). WCWCD supplied data on costs and savings; professional judgment was made where no published data was available. Key Reference: California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014. Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model.
Non-Residential Fixture Efficiency Current Installation Rates	City of Santa Cruz Residential and Commercial Baseline Water Use Survey (2013). Key Reference: 2010 U.S. Census, Housing age by type of dwelling plus natural replacement plus rebate program (if any). Assume commercial establishments built at same rate as housing, plus natural replacement. California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014. Model Input Values are found in the "Codes and Standards" green section of the DSS Model by customer category fixtures.
Residential Frequency of Use Data, Toilets, Showers, Faucets, Washers, Uses/user/day	Key Reference: AWWARF Report "Residential End Uses of Water, Version 2 - 4309" (DeOreo, 2016). Summary values of the report can be found in the following presentation: http://watersmartinnovations.com/documents/pdf/2014/sessions/2014-T-1458.pdf Key Reference: California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014. Key Reference: Alliance for Water Efficiency, The Status of Legislation, Regulation, Codes & Standards on Indoor Plumbing Water Efficiency, January 2016. Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model and confirmed in each "Service Area Calibration End Use" worksheet by customer category.
Non-Residential Frequency of Use Data, Toilets, Urinals, and Faucets, Uses/user/day	Key References: Estimated based on AWWARF Report "Commercial and Institutional End Uses of Water" (Dziegielewski, 2000 – Appendix D: Details of Commercial and Industrial Assumptions, by End Use). Key Reference: California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014. Based on three studies of office buildings in which the numbers varied from 2.0 to 3.45 toilet flushes per employee per day: Darell Rogers cited in Schultz Communications (1999); Konen Plumbing Engineer (July/August 1986); and Eva Opitz cited in PMCL (1996). Fixture uses over a 5-day work week are prorated to 7 days. Non-residential 0.5 gpm faucet standards per Table 2-A. Water Consumption by Water-Using Plumbing Products and Appliances – 1980-2012. PERC Phase 1 Report. Plumbing Efficiency Research Coalition, 2013. http://www.map-testing.com/content/info/menu/perc.html Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model and confirmed in each "Service Area Calibration End Use" worksheet by customer category.
Natural Replacement Rate of Fixtures (% per year)	Residential Toilets 2% (1.28 gpf and lower), 3% (1.6 gpf toilets), 4% (3.5 gpf and higher toilets).
	Non-Residential Toilets 2% (1.6 gpf and lower), 3% (3.5 gpf and higher toilets).
	Residential Showers 4% (corresponds to 25-year life of a new fixture).

Parameter	Model Input Value, Assumptions, and Key References
	Residential Clothes Washers 10% (based on 10-year washer life). Key References: "Residential End Uses of Water" (DeOreo, 2016) and "Bern Clothes Washer Study, Final Report" (Oak Ridge National Laboratory, 1998).
	Residential Faucets 10% and Non-Residential Faucets 6.7% (every 15 years). California Energy Commission (CEC) uses an average life of 10 years for faucet accessories (aerators). A similar assumption can be made for public lavatories, though no hard data exists and since CII fixtures are typically replaced less frequently than residential, 15 years is assumed. CEC, Analysis of Standards Proposal for Residential Faucets and Faucet Accessories, a report prepared under CEC's Codes and Standards Enhancement Initiative, Docket #12-AAER-2C, August 6, 2013.
	Model Input Value is found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model.

5.3 Baseline Demand Forecast

In August 2015, M.Cubed conducted an econometric analysis of water demand and developed independent forecasts of class-level customer demands and total system production through 2035. (M.Cubed, 2015) 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 not 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 5-4 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 5-4. Comparison of M.Cubed Demand Forecast and DSS "Baseline" Forecast

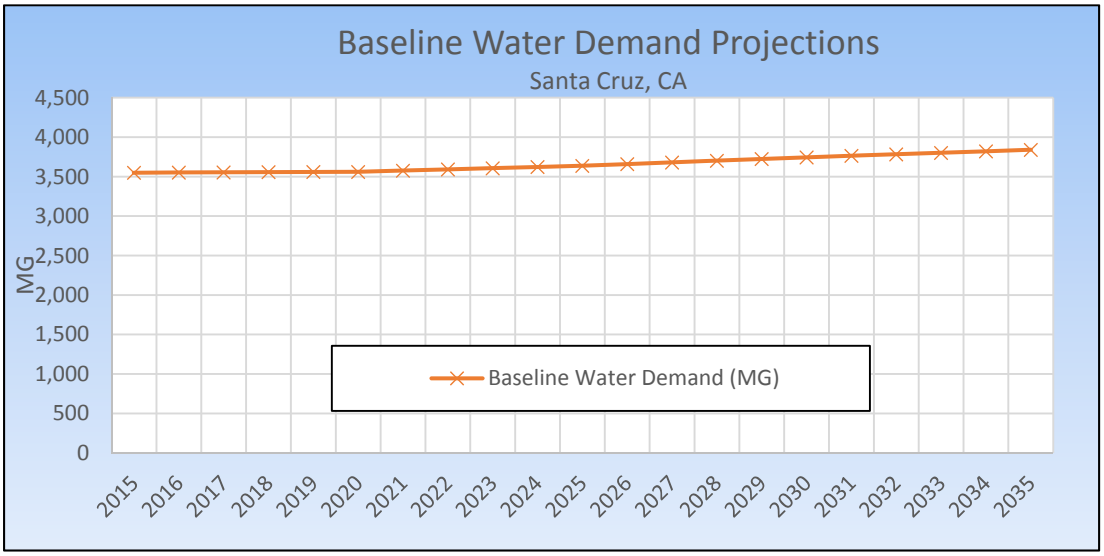
Demand (MG)	2020	2025	2030	2035
M.Cubed Final Demand Forecast, October 2015	3,385	3,351	3,388	3,442
2014 Estimate of Plumbing Code Savings (Prior DSS Model version)	65	132	197	235
M.Cubed Final Demand Forecast without Plumbing Code or Conservation Program Savings	3,560	3,626	3,724	3,811
DSS Model "Baseline" 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 5-3. 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.

Figure 5-3. Baseline Demand Forecast Without Plumbing Code Savings



Source: City of Santa Cruz. DSS Model, Section: Demand Analysis, Feb 16, 2016.

The next step involves calculating the effect of passive savings against the "baseline" demand described in the following Section 5.4. 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).

5.4 Water Demand Projections with Plumbing Code Savings

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 naturally over time 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. As explained previously, the September 2015 M.Cubed baseline forecast was closely matched before the MWM DSS Model applied plumbing code savings.

5.4.1 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 demand aggregated at the fixture level. 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 using the Baseline Survey results as a starting place and projecting future replacements. 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.

Key inputs in the model are fixture water use and life as well as the initial proportions of individual fixtures in each customer class. The following figure presents an example of the initial proportions used in existing single family accounts. Further in this section, Figure 5-4 provides the list of fixtures, average water use, and assumptions for fixture life used in this analysis.

Figure 5-4. Initial Fixture Proportions for Single Family Toilets

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%

Source: Screen shot from the DSS Model.

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 for 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 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 as of 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 as of 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 the 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 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 has been 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 to 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 assumption of permanent savings is based on when fixtures are replaced at minimum with similarly efficient equipment given fixture efficiency levels are mandated under state law. It does not take into account any reductions efficiency from aging fixtures or hypothetical higher savings from newer technology that will come on the market in the future.

This projection further assumes no active involvement by the City and that the costs of purchasing and installing replacement equipment (as well as 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 5-5 on the following page presents the list of fixtures, average fixture water use and assumed fixture life use in the DSS model.

Table 5-5. 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
<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

More information and assumptions about plumbing code and appliance standards can be found in Appendix A.

5.4.2 State Building Code for New Development – 2015 CALGreen

The 2015 CALGreen requirements effect all new development in the State of California after July 1, 2015.[2] The DSS Model includes the CALGreen requirements that effect all new development in the State of California after July 1, 2015. The DSS Model modeled water savings from the CALGreen building code by adding Multi-family and Commercial customer categories as appropriate to applicable conservation measures.

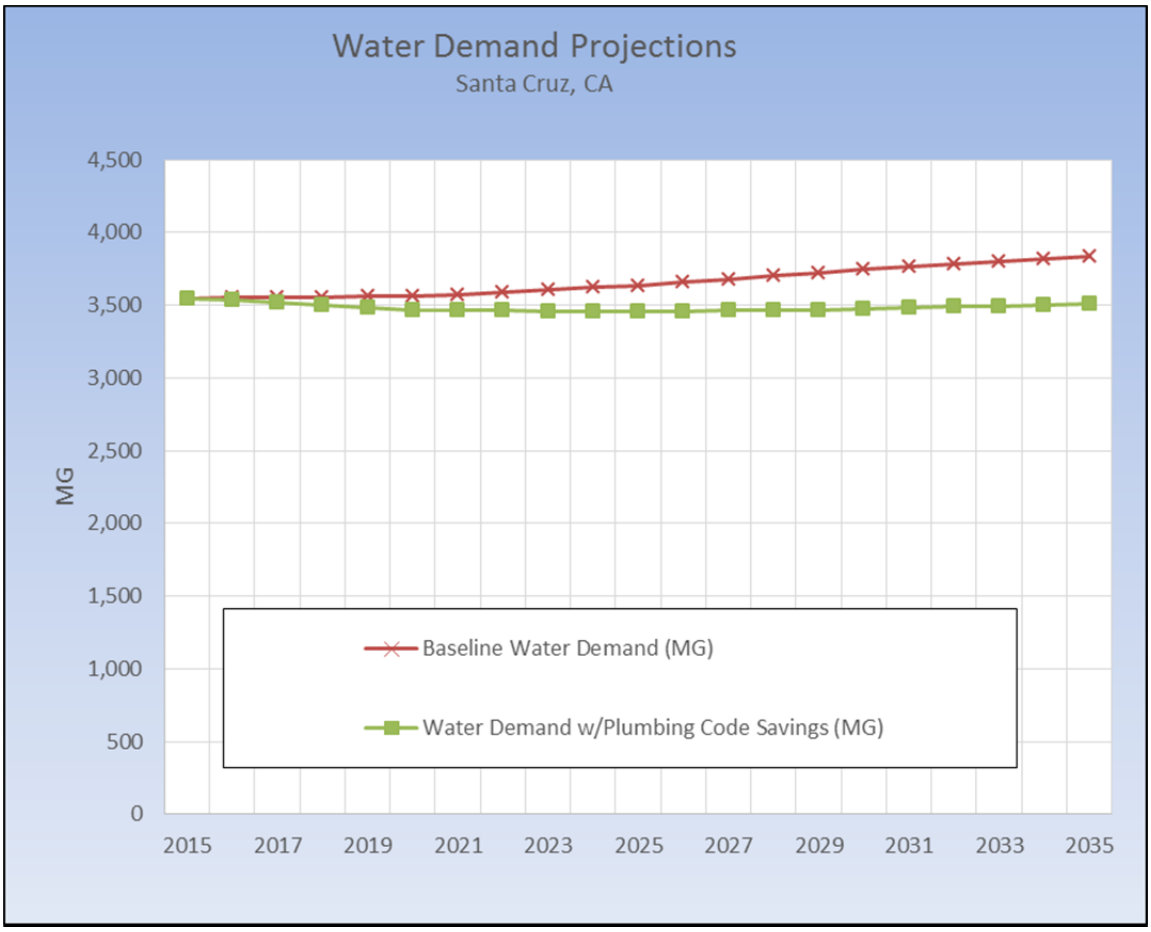
5.4.3 Baseline Demands with Passive Savings 2015-2035

The DSS Model estimates total cumulative plumbing code savings of 329 million gallons per year in 2035. As seen in Figure 5-5, water savings from fixture and appliance codes alone is expected to reduce total water demand (without plumbing code) from approximately 3.8 billion gallons per year to about 3.5 billion gallons by 2035, a reduction of about 8.6% due to plumbing code savings. As shown in Figure 5-5, overall water demand adjusted for plumbing code savings is expected to be essentially level over the 20-year planning horizon, with savings from plumbing codes effectively offsetting added demand from expected population growth and economic development within the City's service area.

Note that demand projections are normalized, without drought or recession conditions, whereas historical demands have been affected by drought and economic influences.

[2] More information on the California Building Standards Commission reference documents are available online: http://www.bsc.ca.gov/pubs/bullet.aspx

Figure 5-5. Demand Forecast With and Without Plumbing Code Savings



Source: City of Santa Cruz. DSS Model, Section: Demand Analysis, Feb 16, 2016.

Water demand projections were developed to the year 2035 using the DSS Model. Table 5-6 shows the savings in 5-year increments for the plumbing codes and the projected demands in 5-year increments with plumbing codes and appliance standards.

Table 5-6. Water Demand Forecast With and Without Plumbing Code Savings

Water Demand Forecast With and Without Plumbing Code Savings	2020	2025	2030	2035
Baseline Demand without Codes or Conservation (MGY)	3,560	3,636	3,743	3,839
Plumbing Code Savings (MGY)	96	179	269	329
Demand with Plumbing Code Savings (MGY)	3,464	3,456	3,474	3,510

Note: Values include Non-Revenue Water (NRW).

6. GOAL SETTING AND POTENTIAL NEW WATER CONSERVATION MEASURES

This section presents the City's conservation planning goals and the conservation measure screening process the City undertook to accomplish these goals.

6.1 Conservation Planning Goals and Approach

The goal of the Water Conservation Master Plan is to further enhance the existing water conservation program. To accomplish this goal, additional measures could be added to the existing program. Most of these measures are targeting new technologies to support customers to be more efficient with their water use.

Experience from many utilities has shown that there is a reasonable limit to how many measures can be feasibility implemented at one time. Programs that consist of a large number of measures are historically difficult to implement successfully; therefore, prioritization of measures is important both as an outcome of this planning effort and as the program is implemented. The approach to program implementation is viewed as a "living" process where new opportunities may be adopted as new technologies become available over time.

6.2 Potential New Conservation Measures and Measure Screening Process

As discussed at a public kickoff meeting March 4, 2013, development of the City's Water Conservation Master Plan involved a systematic process to evaluate a range of possible conservation measures and determine which measures were best suited to the City's service area. The overall goal was to create a roadmap to achieve maximum practical water use efficiency through 2035.

As part of this effort, the City cast a wide net to request that the community review existing implementation methods, including pros/cons of current efforts, and consider implementing additional conservation measures presented in this Plan.

It was envisioned that roughly 20-25 measures would be selected for further evaluation, including the existing measures that are currently being implemented and are planned to continue and new conservation measures not yet implemented. Sometimes not all programs need to be modeled to be incorporated into the plan (but can be qualitatively included in the plan instead), such as water waste prohibition or other non-quantifiable best practices like public education.

An important step in updating the water conservation program was the review and screening of new water conservation measures. This task included a review of the current water conservation measures, identification of measures that may be appropriate for the City's service area, and the screening of these measures to a short-list for detailed evaluation (benefit-cost analysis). To complete this process, a list of potential demand management measures (DMMs) for qualitative evaluation (screening) was compiled. This list, in Appendix F, includes 54 potential types of conservation measures in a variety of program implementation approaches that, when combined, total 99 individual measures ranging from those aimed at reducing real water losses to programs designed to improve customer awareness. The list also reflects the focus of specific programs based on the following categories:

- All Customers
- Residential
- Commercial, Industrial, and Institutional
- Landscape Irrigation
- System (focused on measures for the public water system rather than customers)

Additionally, the list reflects whether customer participation in a program is solely voluntary, encouraged with incentives, or mandatory through adopted rules or ordinances. This can significantly impact anticipated levels of adoption, with those that are purely voluntary likely to have the least participation, those with incentives leading to greater market penetration, and mandatory measures potentially having the highest levels of adoption. These classifications also have cost implications, with incentive programs being popular but adding expense to the utility, whereas required programs typically involve minimal cost to the utility, but may result in some costs for customers.

Appendix F lists the conservation measures considered potentially appropriate for the Santa Cruz community. The table includes devices or programs (e.g., a new high efficiency toilet that would save water if installed by the City, contractor, or customer) that can be used to achieve water conservation, the means through which the device or program will be implemented, and what distribution method, or mechanism, can be used to activate the device or program.

The list of potential measures in Appendix F was drawn from MWM's general experience and review of what the City and other water agencies with conservation programs are currently implementing. Current Program Measures implemented in the project service area as of March 2013 are indicated in the column "Current City Program" in Appendix F, mostly reflecting the City's conservation activities.

The Water Commission and community members were welcomed to add additional measures to the list presented in Appendix F. City staff and MWM reviewed these ideas as part of developing recommendations for the selection of conservation measures to be evaluated in detail. The City set up the ability to suggest ideas through its website for the project.

The screening was conducted by City staff with advice and facilitation support from MWM. Input was welcomed following the Water Commission Meeting on April 1, 2013. The public comment period, provided to stakeholders and policy makers to add new ideas to the list of potential measures, was closed after two weeks on April 15, 2013 in order to allow for the screening process to take place from April 17-24, 2013. The results of the screening process and the measures recommended for selection for the benefit-cost analysis were provided to the Water Commission at the May 6, 2013 meeting for final review and acceptance.

The screening was conducted by Water Department staff in consultation with MWM. MWM described each measure prior to the rating and answered questions about its applicability as well as potential savings and costs. MWM did not specifically recommend any one measure.

Ratings with respect to each criterion were made on a scale of 0 to 5, where 5 was the highest score. Ancillary benefits were rated on a scale of 0 to 2, where 2 was the highest score. It should be emphasized that a measure that passed the screening was not necessarily included in the recommended conservation plan, but it was analyzed.

The measures were screened using the following six criteria:

- *Water Savings Potential (Service Area Match) – emphasis on the measure's ability to reduce average daily water use within the Santa Cruz community (e.g., largely based on individual end use savings and current level of saturation)*
    - Higher savings = 5 (e.g., high end use water savings, low saturation), lower savings (e.g., low end use savings, or very saturated) = 0
- *Sustainable Water Savings – emphasis on savings lifetime/reliability*
    - Permanent = 5 (e.g., codes and technological changes ensure future reliable savings), short, temporary savings or draconian behavioral change = 0
- *Quantifiable Water Savings – emphasis on measures where water savings can be accurately predicted*

  - Highly quantifiable = 5 (substantial evidence exists to demonstrate reliable, accurate conservation savings), measure savings not quantifiable = 0

- *Widespread Community & Social Acceptance (Technology/Market Maturity) – emphasis on willingness to participate, out of pocket expenses, equity/perceived fairness, aesthetics*
  - High expected participation = 5, low expected acceptance/reject mandatory participation =0
- *Feasibility of Implementation/Secondary Impacts – emphasis on ability to achieve objectives*
  - Fully within City capacity/legally possible = 5, fatally flawed = 0 (insurmountable obstacle to implementation)
- *Ancillary Benefits – emphasis on achieving additional goals, including reduction in energy/greenhouse gases (GHG) and/or reduction in peak season use, providing valuable customer service, or other non-quantifiable benefits (behavioral change, public awareness)*
  - Multiple benefits = 2 and singular or very limited benefits = 0

Ratings were summed for all six criteria. A passing score was selected so that the number of measures with the highest scores passing the screening was 20-25 measures total.

The initial screening of all the conservation measures was a very iterative process, as was the screening and selection of the conservation measures to be included in the Recommended Program. From this iterative screening process, the Water Commission added to and approved the recommended list of measures from the technical analysis phase of the project.

More information about the City's measure screening process can be found in Appendix F.

6.3 Additional Measures to Address Peak Season Water Use

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 not only 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, thereby helping to reduce the City's peak season water use. More information about the City's peak water use can be found in section 3.5.1.

7. CONSERVATION MEASURE EVALUATION

This section presents the conservation measures evaluated in the DSS Model. The total list of measures evaluated includes the recommended measures list published in the October 2015 Water Supply Advisory Committee Final Report on Agreements and Recommendations, Table 14.

7.1 Conservation Measures Evaluated

A total of 33 individual measures were evaluated in the Santa Cruz DSS Model. 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.

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
- Estimated number of fixtures per account
- Evaluation start and end year
- Measure length, years
- Measure life, years
- Utility unit cost, $
- Customer unit cost, $
- Estimated annual administration and marketing overhead, %

The measures listed in Table 7-1 presents a basic description of each active measure and the types of customers each measure targets. Measures 29-35 listed in the table were requested additions by the WSAC in October 2015. More detailed information and assumptions for each modeled measure were developed in collaboration with City staff and are presented in Appendix C.

Water use efficiency savings due to plumbing codes, such as CALGreen (California Statewide New Development Building Code), SB 407 (Plumbing Fixture Retrofit on Resale or Remodel), and any new development ordinances, are included in the DSS Model and presented in Section 4.6.4 and Appendix A. Plumbing code measures account for 53% of the future conservation potential achieved and are independent of any program.

Table 7-1. Conservation Measure Descriptions[1]

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 (AMR) system 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 of 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.

No.	Measure Name	Type of Customer	Description
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 permitted building remodels 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 with the most efficient, upgraded fixtures when real estate is sold. A property inspection by either City staff or a licensed plumbing/general building contractor 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[4]	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 benefit-cost 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 schools 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.

No.	Measure Name	Type of Customer	Description
23	Single Family Residential Turf Removal	SF	This measure 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 for a single family residence. To increase participation, this measure would increase the rebate to $1 per square foot and a $1,000 maximum, 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 for multifamily or commercial residences. This measure would increase the rebate to $1 per square foot and a $5,000 maximum 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[2]	Climate Appropriate Landscaping and Rainwater Infiltration	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 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

No.	Measure Name	Type of Customer	Description
			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[2]	SF Conservation Pricing - Water and Sewer[3]	SF	This measure is awaiting the results of an ongoing rate study conducted by Raftelis Financial Consultants, Inc. in 2016.
30 MF[2]	MF Conservation Pricing - Water and Sewer[3]	MF	This measure is awaiting the results of an ongoing rate study conducted by Raftelis Financial Consultants, Inc. in 2016.
30 COM[2, 4]	COM Conservation Pricing - Water and Sewer	COM	This measure is awaiting the results of an ongoing rate study conducted by Raftelis Financial Consultants, Inc. in 2016.
31[2, 4]	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[2, 4]	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: 1) $300 per single family account per year; and 2) $3,000 per commercial, industrial, or institutional account (e.g., laundromats and apartments) per year.

No.	Measure Name	Type of Customer	Description
33[2, 4]	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[2, 4]	Additional Building Code Requirements for New Development	SF, MF, COM, MUN, IND	New CALGreen Building Codes already included in the DSS Model (see Section 5.4) 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[2, 4]	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 and 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 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
AMR – Automatic Meter Reading System
COM – commercial
gpf – gallons per flush
gpm – gallons per minute
HECW – high efficiency clothes washing machine
HEU – high efficiency urinal
HEW – high efficiency commercial washer
HOA – Home Owners Association
IND – industrial
IRR – irrigation
MF – multifamily
MUN – municipal
SF – single family
UHET – ultra-high efficiency toilet
WF – water factor, gallons per cubic foot
WSAC – Water Supply Alternatives Committee

[1] Source: Santa Cruz Final Technical Memorandum (City of Santa Cruz, 2016).
[2] Measures 29-35 were requested additions by the WSAC in October 2015.
[3] A comprehensive cost of service water rate study was being conducted by Raftelis Financial Consultants, Inc. when the modeling effort for this conservation plan was finalized. It was later completed in August 2016. The DSS model is set up to analyze the impacts of the new rates and rate structure on water consumption in the future if needed.
[4] These measures target both CII and residential customers.

7.2 Assumptions about Avoided Costs

The four main sources of water for the City are 1) the North Coast sources; 2) the San Lorenzo River; 3) Loch Lomond Reservoir; and 4) the Live Oak Wells. The avoided cost of water to the City is estimated to be $2,550/MG as a place holder value set to be five times the variable cost of current annual supplies. Until the City has a recommended water supply project approved with known costs, a better avoided cost is not available. For this evaluation, the avoided cost of treated water is assumed to be $2,500/MG (water production operational costs) and the avoided cost of wastewater is assumed to be $50/MG (wastewater operational costs). These values can be found in the "Avoided Costs" red section of the City's DSS Model. It is recommended in the future that this cost be updated when new cost information becomes available. It is important to note that $10,000/MG is the average total program cost threshold established by the WSAC; this value is lower than the expected unit cost of various supply augmentation projects recommended to be pursued as a result of the WSAC's work.

7.3 Comparison of Individual Measures

Table 7-2 presents each 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 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, 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 7-2, 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.

The four measures that save the most water (more than 20 million gallons per year in 2035) include:

2. Advanced Metering Infrastructure: 45.94 MGY
10. High Efficiency Clothes Washers: 36.20
1. System Water Loss Reduction: 34.87 MGY
6. Residential Leak Assistance: 22.03 MGY

Of the remaining 31 measures, five measures are each estimated to save between 10 and 20 MGY in 2035, and the remaining 26 measures all save less than 10 MGY each.

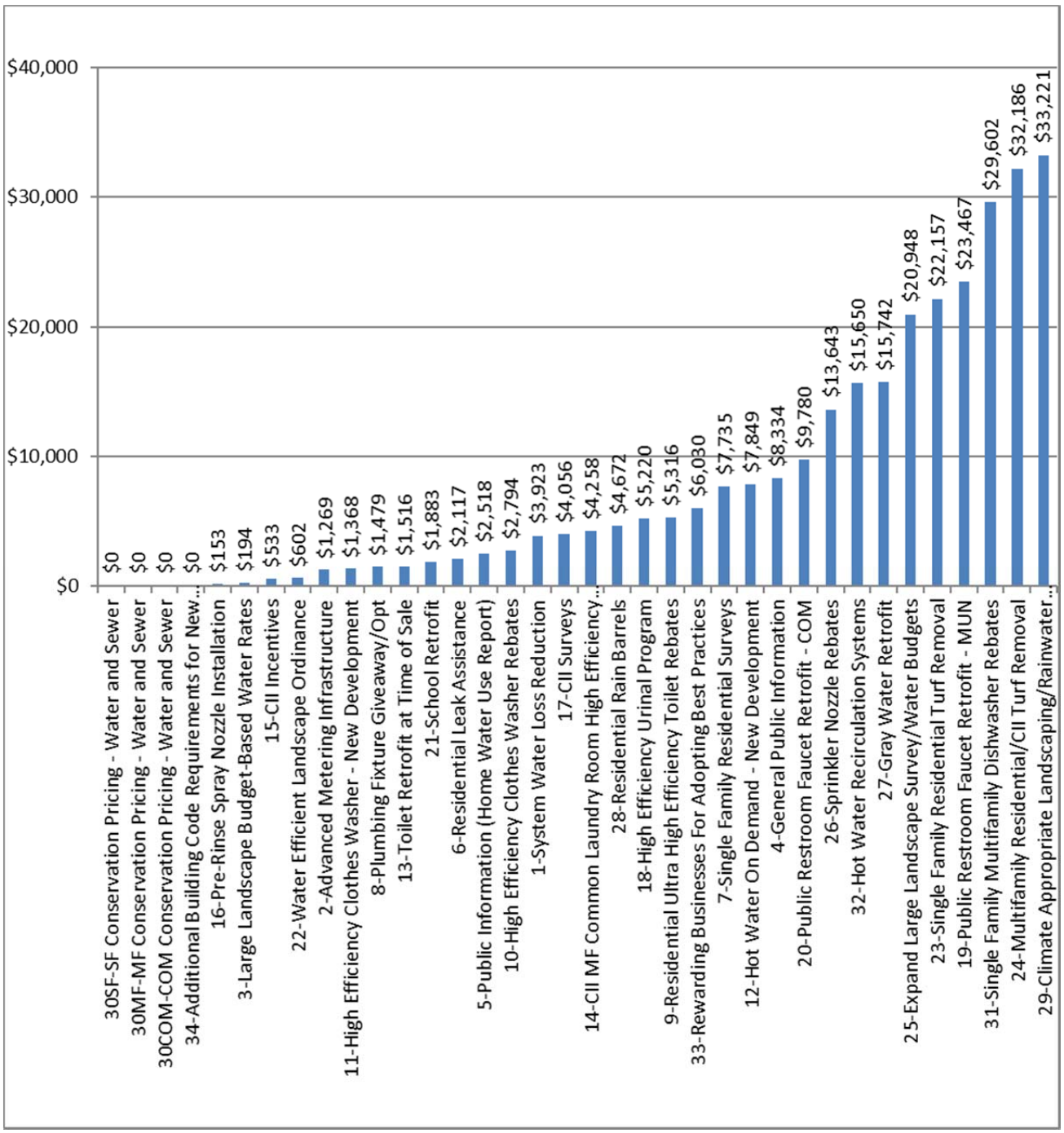
Table 7-2. Individual Measure Estimated Cost of Water Saved and 2035 Water Savings[1]

No.	Measure Name	Estimated Cost of Water Saved ($/MG)	Estimated 2035 Water Savings (MGY)
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[2]	Climate Appropriate Landscaping and Rainwater Infiltration	$33,221	8.26
30SF[2]	SF Conservation Pricing - Water and Sewer[3]	N/A	N/A
30MF[2]	MF Conservation Pricing - Water and Sewer[3]	N/A	N/A
30COM[2]	COM Conservation Pricing - Water and Sewer[3]	N/A	N/A
31[2]	Single Family Multifamily Dishwasher Rebates	$29,602	0.20
32[2]	Hot Water Recirculation Systems	$15,650	1.38
33[2]	Rewarding Businesses for Adopting Best Practices	$6,030	3.64
34[2]	Additional Building Code Requirements for New Development[4]	N/A	N/A
35[2]	Innovation Incubator Program	$121,679	1.08

[1] Source: City of Santa Cruz. DSS Model, Section: Conservation Analysis, Feb 16, 2016. This table does not contain a total in bottom row since interaction between measures has not been accounted for in table but is accounted for at the program level.
[2] Measures 29-35 were requested additions by the WSAC in October 2015.
[3] Pricing measure costs and savings not yet available. Awaiting results of ongoing rate study scheduled to be completed in 2016.
[4] New CALGreen Building codes, effective January 2016, are already modeled. This measure is awaiting support from a Working Group yet to be formed.

Figure 7-1 shows the costs of water saved for individual measures ranked from lowest to highest (excluding Measure 35 Innovation Incubator Program). The measures to be implemented in the next several years are a mix of some lower cost and some higher cost measures. It was assumed by the City's Water Supply Advisory Committee that the recommended program, even with higher cost measures included, would incur an average total program cost of no more than $10,000 per million gallons of water saved.

Figure 7-1. Conservation Measures Unit Cost of Water Saved



Notes:

1. Units are $/MG.
2. Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.

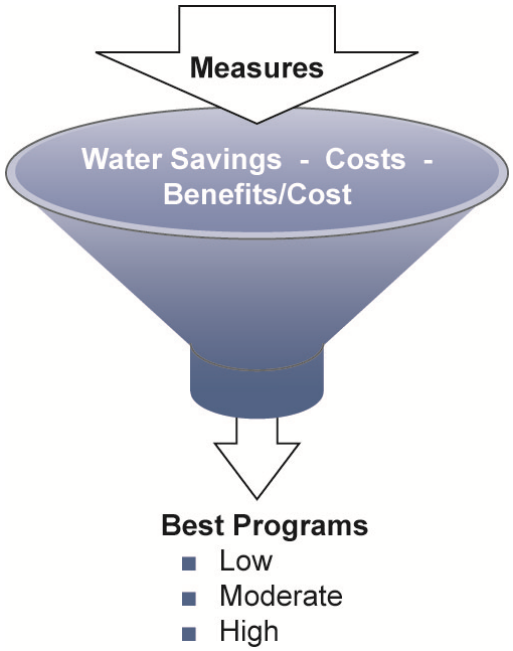
8. RECOMMENDED PROGRAM

This section of the Plan addresses the public and technical process involved to evaluate all measures available and how the final selection of measures for the Recommended Program was made. It also addresses estimated per capita water use reductions, projected total water savings, and the overall cost of water saved.

8.1 Selection of Measures for Recommended Program

During the evaluation process, as presented in Section 7 and below, the water savings and costs were estimated for the quantifiable measures using assumptions for each measure that were collaboratively developed by MWM and City staff. Benefits and costs were compared in a formal present value analysis. Conclusions were drawn about which measures produce cost-effective water savings and these were then further discussed and evaluated. This process can be considered an economic screening process (Figure 8-1). Packaging the best measures into alternative program scenarios allowed the City to consider what level of conservation was appropriate.

Figure 8-1. Overview of the Conservation Measure Evaluation Process



As part of this Program development, several measure combinations were developed and program scenarios explored in order to develop the Recommended Program that is presented below. These included several iterations with the City Staff, Water Commission and then the WSAC. The reviews included discussions on mix of measures as well as various measure design levels (e.g., more or less accounts targeted and earlier or later, longer or shorter measure lengths) such that these recommended measures were well vetted with stakeholder input.

Appendix C presents the assumptions and inputs used in the City's DSS Model to evaluate each water conservation measure, including water reduction methodology, perspectives on benefits and costs, present value parameters, and assumptions about unit costs, water savings, measure costs, and market penetration.

Benefit-cost analysis has been used by many water agencies to evaluate and select water supply alternatives, including water conservation measures best suited to local conditions. For the City's Water Department, this analysis requires a Santa Cruz-specific set of data, such as historical water consumption patterns by customer class, population projections, results of the pilot projects and Baseline Water Use Study, and prior conservation efforts. The end result is the recommended measures previously described above in Table 7-1.

The City's Recommended Program 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 (see Table 8-1): 1) general measures; 2) residential measures (indoor); 3) commercial measures (indoor); and 4) irrigation measures (outdoor).

The following table lists the Recommended Program active measures and how each falls within one of four categories.

Table 8-1. Elements of Recommended Program

Utility Measures	Residential Measures	CII Measures	Landscape Measures
System Water Loss Reduction	Residential Leak Assistance	CII Incentives	Large Landscape Budget-Based Water Rates
Advanced Metering Infrastructure	Single Family Residential Surveys	Pre-Rinse Spray Nozzle Installation	Water Efficient Landscape Ordinance
SF, MF, COM Conservation Pricing - Water and Sewer	Plumbing Fixture Giveaway/Opt	CII Surveys	Single Family Residential Turf Removal
General Public Information	Residential Ultra High Efficiency Toilet Rebates	High Efficiency Urinal Program	Multifamily Residential/CII Turf Removal
Public Information (Home Water Use Report)	High Efficiency Clothes Washer Rebates	Public Restroom Faucet Retrofit - MUN	Expand Large Landscape Survey/Water Budgets
	Gray Water Retrofit	Public Restroom Faucet Retrofit - COM	Sprinkler Nozzle Rebates
		School Retrofit	Residential Rain Barrels
	Hot Water On Demand - New Development	Hot Water On Demand - New Development	Climate Appropriate Landscaping and Rainwater Infiltration
	Toilet Retrofit at Time of Sale	Toilet Retrofit at Time of Sale	
	CII MF Common Laundry Room High Efficiency Clothes Washer*	CII MF Common Laundry Room High Efficiency Clothes Washer*	
	Single Family/Multifamily Dishwasher Rebates*	Rewarding Businesses for Adopting Best Practices*	
	Hot Water Recirculation Systems*	Hot Water Recirculation Systems*	
	Additional Building Code Requirements for New Development*	Additional Building Code Requirements for New Development*	
	Innovation Incubator Program*	Innovation Incubator Program*	

* These measures target both CII and residential customers.

8.2 Projected Total Water Savings of Program

The following Table 8-2 presents the benefit cost analysis summary for the Recommended Program, which includes all the measures evaluated as discussed in Section 7.

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 8-2 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 8-2. 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.

Table 8-3 shows the savings in 5-year increments for the plumbing codes, Recommended Program, and the Recommended Program with plumbing code savings.

Table 8-3. Long Term Conservation Program Savings over "Baseline" Demand

Conservation Program	2020	2025	2030	2035
Baseline Demand without Codes or Conservation (MGY)	3,560	3,636	3,743	3,839
Plumbing Code (MGY)	96	179	269	329
Recommended Program (MGY)	137	232	269	291
Recommended Program with Plumbing Code Savings (MGY)	233	411	538	619

Source: City of Santa Cruz. DSS Model, Feb 16, 2016.

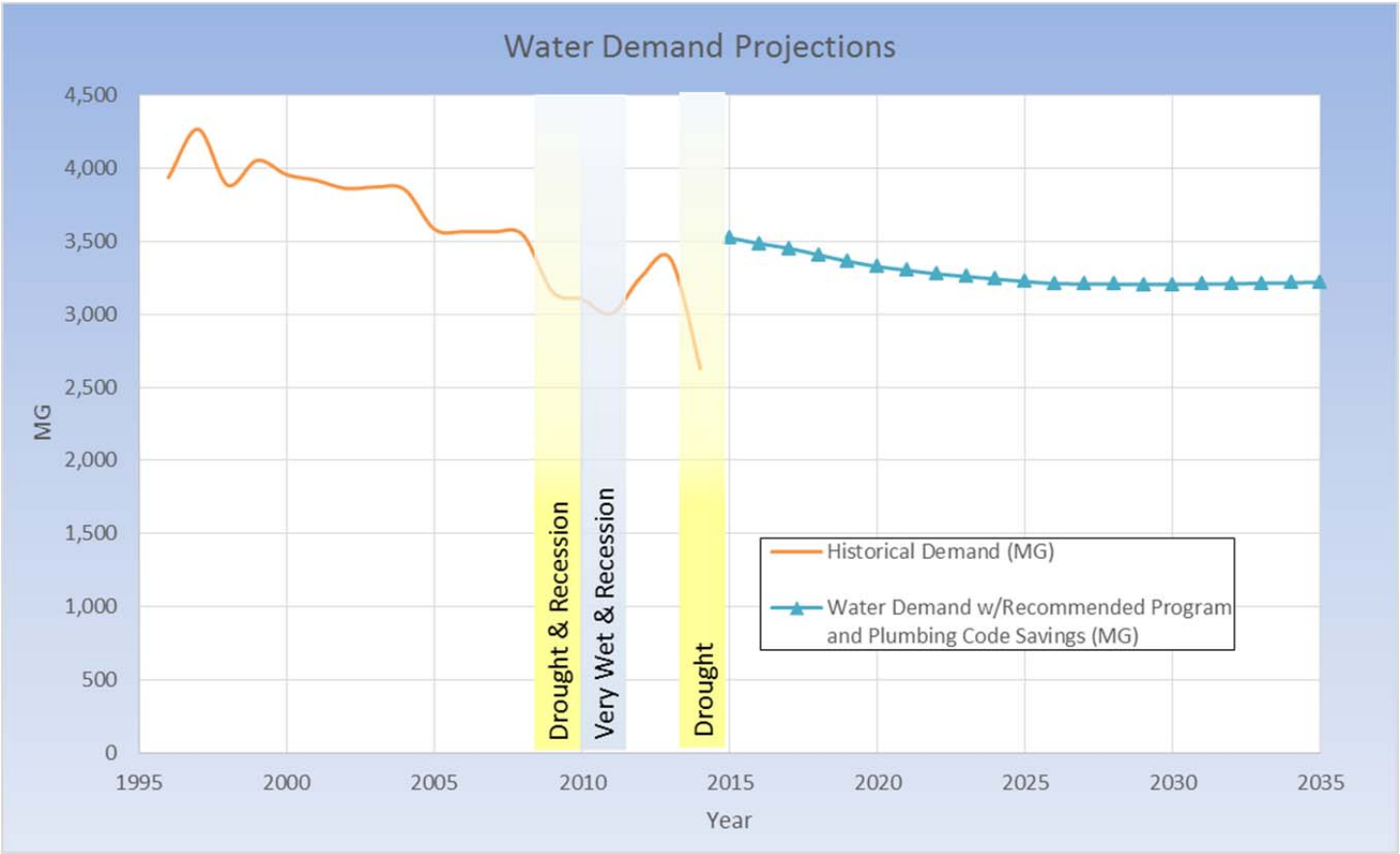
The Recommended Program is envisioned to include strong customer participation to support additional planned growth while keeping total water use relatively constant for the next 20 years. New development will be built to water efficient standards following the 2015 CALGreen Plumbing Code, 2015 CEC Code, and other local ordinances (e.g., City's landscape ordinance). Water use in new homes should be more efficient than existing homes on comparable lot sizes. Table 8-4 and Figure 8-2 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 A-1 in Appendix A of this Plan. 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. As seen in Table 8-4, total water savings from both plumbing code and the recommended program is expected to reduce total water demand from approximately 3.8 billion gallons per year to about 3.2 billion gallons per year, a reduction of over 600 million gallons or more than 16% by 2035.

Table 8-4. Normalized Water Use Projections

	2020	2025	2030	2035
"Baseline" Demand	3,560	3,636	3,743	3,839
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 8-2. Projected Water Demands with Recommended Program



Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.

The current and projected number of connections and deliveries to the City's water distribution system by sector are identified in the following table. Note that total deliveries include plumbing code savings, Recommended Program savings, and Non-Revenue Water.

Table 8-5. Accounts and Recommended Program Demands by Customer Category*

		Single Family	Multi-family	Business	Municipal	Industrial	UC Santa Cruz	Irrigation	Golf	Non-Revenue Water	Total
2020	# of accounts	19,456	2,886	1,948	218	39	12	651	2	N/A	25,212
	Deliveries MGY	1,277	772	574	46	56	196	81	58	267	3,327
2025	# of accounts	19,854	2,972	1,971	218	41	14	723	2	N/A	25,795
	Deliveries MGY	1,223	714	541	43	59	234	87	52	273	3,225
2030	# of accounts	20,260	3,122	2,008	218	43	16	845	1	N/A	26,514
	Deliveries MGY	1,191	690	525	41	60	271	100	47	281	3,205
2035	# of accounts	20,636	3,238	2,055	218	43	18	951	1	N/A	27,162
	Deliveries MGY	1,170	678	519	40	61	308	110	46	288	3,220

*Demands include plumbing code savings and Recommended Program savings.

8.3 Estimated Per Capita Water Use Reductions

The City currently and in the future is projected to exceed the two possible conservation targets that are being tracked by the City, both in terms of the State's SB X7-7 mandate and the voluntary California Urban Water Conservation Council MOU commitments. As published in the 2010 and 2015 UWMPs, 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 8-6 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. Note that demand projections are normalized, without drought or recession conditions, whereas historical demands have been affected by drought and economic influences.

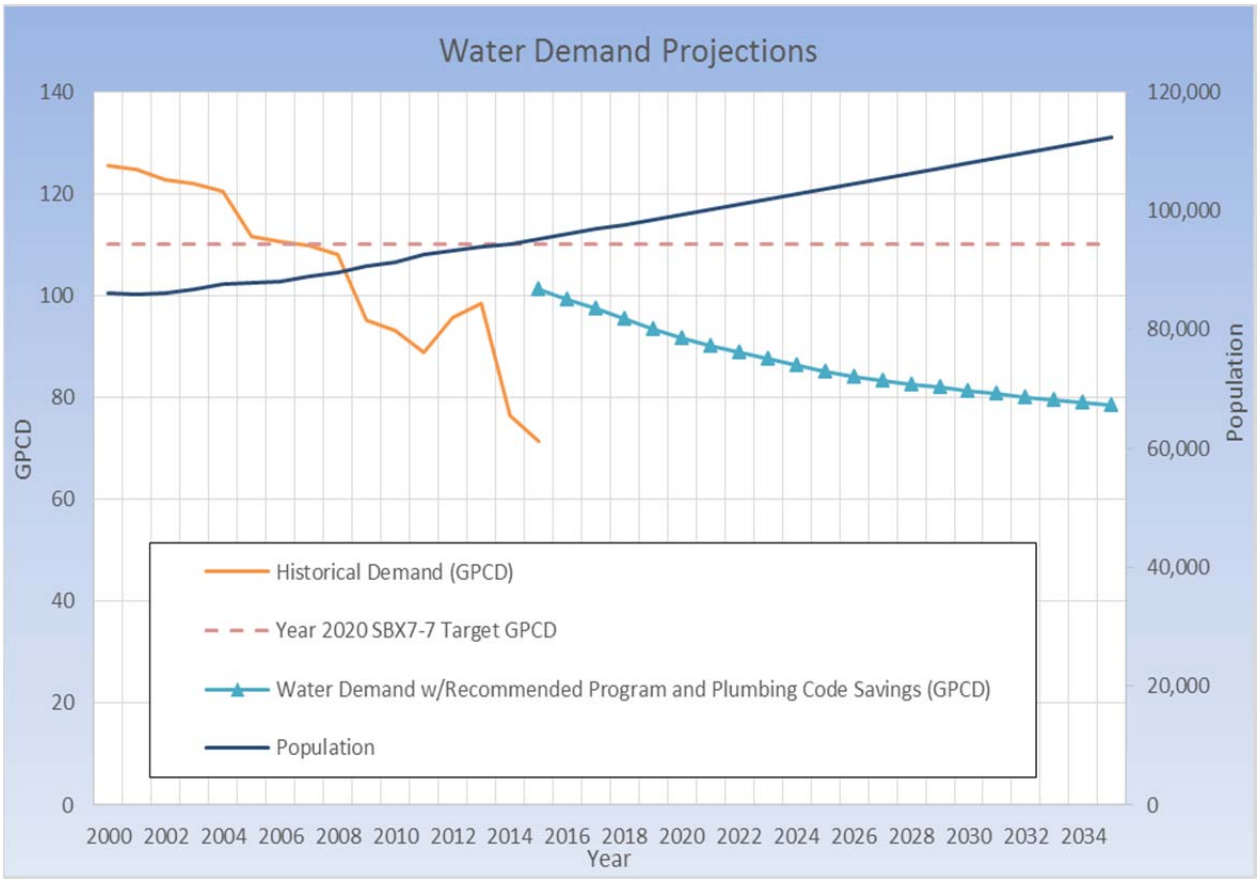
Table 8-6. Projected Population and Per Capita Water Use[1]

	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] Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.
[2] Source: WSAC Final Report, October 2015.

Figure 8-3 below 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 in Figure 8-3, 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 customer water demands.

Figure 8-3. Water Conservation Program Savings Projections – SB X7-7 Target



Notes:

1. Historical values based on actual data and projections are based on normalized future values.
2. Source: City of Santa Cruz. DSS Model, Section: Results, Feb 16, 2016.

8.4 Overall Cost of Water Saved

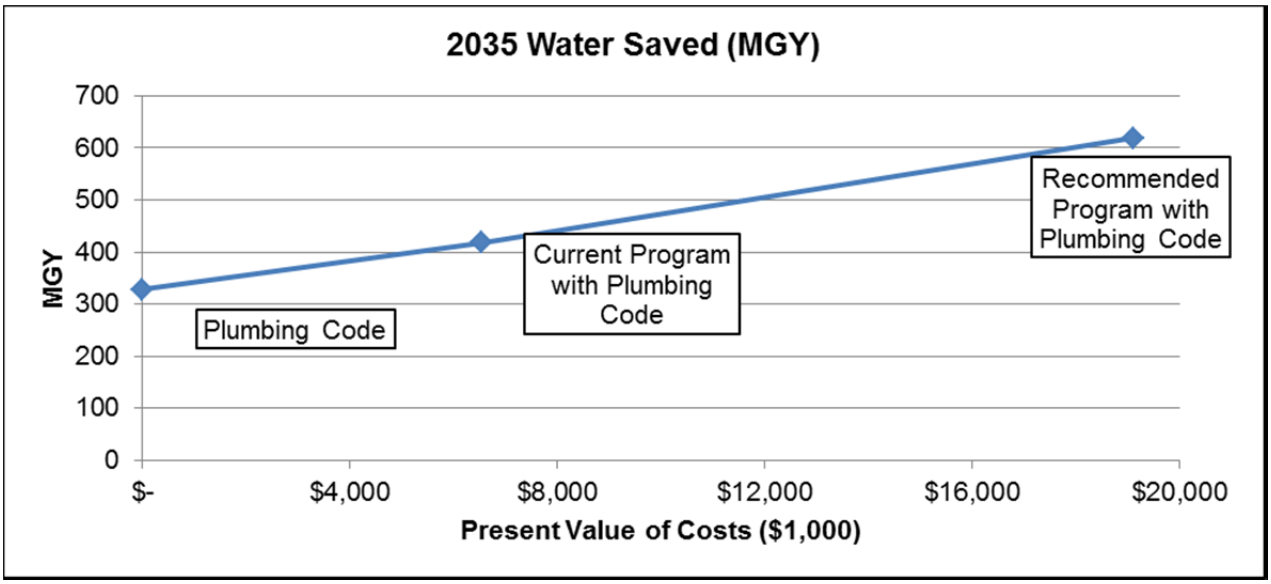
The cost of water saved per unit volume ($/MG) for the Recommended Program is $4,572/MG. This is below the Water Supply Alternatives Committee's recommended threshold for overall cost of water saved, which is $10,000/MG.

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 $10,000/MG (City of Santa Cruz, 2016), 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.

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.

The following figure shows how the costs and savings of the City's current water conservation program compare to the Recommended Program as more utility dollars are spent to achieve greater water savings.

Figure 8-4. Present Value of Utility Costs vs. Cumulative Water Saved



8.5 GHG Savings Analysis

The City has a Climate Action Plan an expressed goal to reduce greenhouse gases. For the conserved water supply, there is an estimated embedded energy intensity of 1,948 kWh/MG saved, estimated in 2015 from the Pacific Gas and Electric (PG&E) GHG Inventory and City staff. The total annual GHG savings can be estimated simply by multiplying the water savings times the energy intensity times the PG&E GHG emission factor.

The following assumptions were made in estimating the GHG emissions savings:

- Estimated water savings in 2020 are 233 MGY and in 2035 are 619 MGY (Table 8-3).
- Same energy intensity as 2015 of 1,984 kWh/gallon saved (which is considered to be a preliminary estimate of future savings provided that the City is not required to add more energy intensive treatment facilities).
- PG&E emission factor of 290 lb. CO_2/MWh estimated for 2020 as provided in their November 2015 Guidance for PG&E Customers. Note that the recent average emission factor from 2009-2013 was 457 lb. CO_2/MWh. Emission factors are estimated based on the California Public Utilities Commission calculator who regulates private energy utilities and requires tracking and reporting of GHG emissions. The CPUC calculator was developed prior to the drought with reduction in hydropower and also does not extend to 2035, such that the 2020 value was used.
- Additional GHG savings from hot water savings at the end user level and from reduced wastewater collection, treatment, and disposal energy use is not quantified in this analysis.

Based on the parameters above, the total projected annual savings due to conserved water from the 2015 water supply sources is estimated to be a total of 61 metric tons of CO_2 per year equivalent savings in 2020 and 162 metric tons of CO_2 per year equivalent savings in 2035. Cumulative greenhouse gas reduction over the 20-year planning horizon is expected to be approximately 307 metric tons of CO_2.

9. IMPLEMENTATION STRATEGY

Each year a progress update will be used to analyze the progress being made regarding meeting the Recommended Program's targeted water savings. It will be imperative to track activities and water demand to understand the level of progress being made in meeting overall goals for the program.

The Program is intended to be dynamic and changes and adjustments are expected. Monitoring progress on implementing recommended measures should be a priority. Costs, participation rates, and water use should be tracked to ensure that the Program 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.

The following sections outline the recommended schedule as well as estimated budget and staffing needs to implement the Recommended Program. It also describes recommendations for potential future activities in support of the Santa Cruz Water Conservation Master Plan, including:

- Concepts for data collection and management systems
- Considerations of emerging new technologies
- Implications for responding to water shortages
- Future DSS Model updates

9.1 Proposed Implementation Schedule

The following Figure 9-1 presents the planned Recommended Program implementation schedule. A description of each measure can be found in Table 7-1. Some measures involve modifying existing programs and are relatively simple to implement. Other measures could involve extensive planning and or additional authority to implement. At least three measures involve the City passing new ordinances or amending building codes. One measure, No. 16 (Pre-Rinse Spray Nozzle Installation), has already been completed in conjunction with drought response during 2014.

Figure 9-1. Recommended Program Planned 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							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Source: City of Santa Cruz. DSS Model.

9.2 Estimated Implementation Budget

Over the next five years (2015-2020), the average annual cost to the City to implement the Recommended Program is approximately $1,064,000 per year of additional budget and includes additional staff time, materials, rebates, giveaways, etc. The annual utility cost and administrative cost breakdown for each conservation measure can be found in the DSS Model measure screen shots in Appendix C.

This budget was developed as part of the DSS Model evaluations for level of activity by year. The opportunities for State grants or cost sharing partnership with other County utilities or other means for lowering the cost of a conservation measure would lower the budgetary needs for implementation. The City should develop a detailed annual work plan;

use the DSS Model to monitor progress on demand reductions; and update the implementation cost estimates and associated budgets on an annual basis.

Table 9-1. Five-year Implementation Budget

Measure	2015	2016	2017	2018	2019	2020
Total Utility Costs	$991,343	$995,453	$984,192	$1,228,850	$1,147,135	$1,032,241
Total Admin Costs	$199,333	$200,346	$196,967	$257,707	$236,558	$222,420
Admin % of Total Costs	20%	20%	20%	21%	21%	22%

Source: City of Santa Cruz. DSS Model, Section: Conservation Analysis, Program Scenarios, Program Details, Feb 16, 2016.

Table 9-2. Long Range Budget Forecast

	Costs		
	Utility	Customer	Total
2015	$991,343	$958,295	$1,949,637
2016	$995,453	$963,305	$1,958,757
2017	$984,192	$968,314	$1,952,506
2018	$1,228,850	$1,329,686	$2,558,536
2019	$1,147,135	$1,295,705	$2,442,840
2020	$1,032,241	$1,307,901	$2,340,142
2021	$1,512,745	$2,864,331	$4,377,076
2022	$1,518,574	$2,871,599	$4,390,173
2023	$1,418,219	$2,593,586	$4,011,805
2024	$1,384,731	$2,580,369	$3,965,100
2025	$1,363,955	$2,562,136	$3,926,090
2026	$1,383,788	$3,247,801	$4,631,588
2027	$993,319	$2,955,101	$3,948,420
2028	$998,287	$2,961,365	$3,959,652
2029	$1,003,255	$2,967,629	$3,970,884
2030	$1,008,223	$2,973,893	$3,982,116
2031	$888,237	$2,770,177	$3,658,414
2032	$892,379	$2,776,042	$3,668,422
2033	$896,522	$2,781,907	$3,678,430
2034	$900,665	$2,787,772	$3,688,438
2035	$904,808	$2,793,638	$3,698,445

Source: City of Santa Cruz. DSS Model, Section: Conservation Analysis, Program Scenarios, Recommended Programs, Feb 16, 2016.

9.2.1 Overall Program Staffing Needs

The overall vision for conservation spans across the City's Water Department with multiple sections supporting planning and implementation tasks. A summary of each section's roles and responsibilities are as follows:

- Water Department: responsible for leading the efforts for both the internal and external conservation programs with a Conservation Section supported by four staff positions currently. It is estimated that the Water

Department may need to add up to two more full-time equivalent personnel to implement the additional workload represented by the recommended plan.

- Operations (Production and Distribution sections): responsible for implementation of the water loss control program as part of the water loss control program initiative.
- Customer Service section: responsible for responding to direct customer questions related to water conservation or for referring the questions to the appropriate staff, as well as meter shop operations.
- Communications staff: responsible for outreach and awareness campaigns to educate the public related to the need to use water wisely and the quality of the City's water in order to help sustain Santa Cruz's quality of life.
- In addition, implementation of the plan will require coordination and assistance of other City Departments, including IT, Finance, Planning and Community Development (building inspectors), Public Works, and Parks and Recreation.

The governing body for the Water Department is the Santa Cruz City Council. A seven-member Water Commission advises the City Council on policy matters involving the operations and management of the water system, including water conservation initiatives and activities.

Water conservation activities are also coordinated with neighboring water districts and other jurisdictions served by the City of Santa Cruz. These include the County of Santa Cruz, City of Capitola, Soquel Creek Water District, Scotts Valley Water District, San Lorenzo Valley Water District, and the City of Watsonville. The Regional Water Management Foundation and Resource Conservation District of Santa Cruz County also assist with coordination, outreach, integrated regional planning, and grant administration.

9.3 Conservation Data Collection and Management System

Tracking conservation data can and should be well organized. As conservation is a vital part of the water supply portfolio for City to meet projected future demands, estimating and analyzing water savings due to water demand reductions is necessarily based on reviewing customer usage data and conservation program activities. The City is embarking on a significant expansion of its existing efforts. As a result, taking an ad-hoc approach to data management where different employees maintain various program data inevitably leads to information having compatibility or quality issues over time as attempts at creating program activity summaries and water savings estimates are compiled. Different conservation measures have different options for tracking data. A summary of primary data tracking and management needs by program area are presented in Table 9-3.

Conservation database systems can be designed to integrate within a customer information system (e.g., billing system) and/or a work order system or be created as a stand-alone database (or utilize all three systems) to implement the conservation program (e.g., issue requests for surveys or water waste call follow-up sent to staff) and track data (e.g., post survey reports or water waste enforcement actions). Most systems track by address and not customer account number, given that these can open and close and legacy data can be lost. These information systems used to manage conservation program actions and data are custom to each utility, given the individual conservation measures and implementation strategies are unique to each agency and their existing data management system. Most important is a plan for data collection and due diligence on implementation of data tracking according to the Program. Without adequate data collection, analysis of past water savings and future planning adjustments for the conservation program become very challenging and end up being based mainly on assumptions or inferences of savings achieved or possible.

Table 9-3. Overview of Data Tracking and Management Needs

Program Area	Primary Data Tracking and Management Needs
Program Database Tracking	• Budget tracking (especially rebate and incentive programs for funds remaining). • Overall program water savings (e.g., calculator of quantifiable savings by activity or create a monitoring version of DSS Model using "actual" versus "planned activities"). • Workload planning (e.g., survey requests and technician assigned, through the customized work order system). • Contracts and agreements. • Overall programs and measures status. • Demand Use Study data - flow meter logging or connection to an existing database. • Saturation estimates of hardware or the measure (toilets, faucets, etc.) similar to the stats from the Baseline Water Use Survey and with updates every 3-5 years on a formal survey. • Retail audit information from periodic checks with local hardware stores.
Water Loss Control Program	• Use both Geographic Information System (GIS) and Customer Information System (CIS). • Manage data for annual AWWA system water audit software. • Analyze data for capital planning purposes (e.g., repeat main breaks earmarked for replacement versus repair). • Data from various leak detection products, data, etc. • Main break and leak information - dates, time, location, size of main, etc. This can be linked to existing database. Annually create a summary of program statistics. • Pipeline failure analysis - also can be linked to the existing database. Annually create a summary of program statistics. • Cathodic protection (CP) information - CP testing data. • Photo library of the main breaks - can be tied to mapping but it may be more organized through a data search and or location/demographic search.
Public Awareness and Education	• Customer Information System to manage customer contacts (e.g., attending classes, etc.). • Inventory of current outreach materials. • Educational classes for schools and to target groups such as school teachers, landscapers, etc.
Water Waste Violations	• CIS linked to GIS to manage customer water waste violations and repeat violation history and past fines.
All Rebate and Incentive Programs	• CIS linked to GIS to manage customer participating in any rebate or incentive program (e.g., allows for quick checking on exceeding number of eligible rebates, fraud protection, financial tracking on budget expended, etc.).

Program Area	Primary Data Tracking and Management Needs
Residential Surveys	• CIS linked to GIS to manage customer data (e.g., usage history queries, survey reports, notes customer needs [like medical for when drought comes to allow for variances], etc.).
Commercial Surveys	• CIS linked to GIS to manage customer data (e.g., usage history queries, survey reports, notes customer unique uses and needs [any issues for when drought comes to allow for variances], etc.).
Landscape Surveys and Water Budgets	• CIS linked to GIS to manage customer data (e.g., usage history queries, landscape survey reports, water budget tracking related to actual usage compared to budget, site photos, etc.).

Data tracking will be customized to each measure. At a minimum, the City staff will need the data for the DSS Model updates if it is desired to use the model to estimate achieved water savings. Ideally, City staff would also include enough data to support an annual report and/or publish summary accomplishments on the City's website.

Related to supporting future DSS Model updates, as described in Section 9.3, the City will need to collect data regarding measure implementation in separate worksheets (i.e., one worksheet per measure). Important parameters to track on the individual measure worksheets include the following for measures that involve rebates:

- All parameters requested in the rebate application
- City cost
- Pre-retrofit consumption
- Post-retrofit consumption
- Estimated savings

Related to incentive program information, it is recommended that the City develop rebate application forms that require the customer to complete the following fields in order to receive their rebate:

- Measure name
- Customer name
- Customer address
- Customer phone number
- Customer City water account number
- Customer PG&E account number (only applicable if cost-sharing measure with PG&E)
- Assessor parcel number (if needed to cross reference with other utility program for cost sharing)
- Water use of fixture being replaced, including the year that the fixture was manufactured (particularly for the HET retrofit)
- Original type of plumbing or appliance data – means to determine water usage (e.g., date purchased [plumbing fixtures] or manufacturer and model number)
- Behavior use information, as appropriate (e.g., number of loads of clothes per washer per week)

- New equipment date purchased
- New equipment date installed
- Purchase price
- Brand
- Model number
- Store name
- Any customer satisfaction related questions (e.g., toilet double flushing experienced before with old fixture and then with new fixture)
- Year property built
- Square footage
- Property type (include check-boxes with all customer types eligible to receive a rebate for particular measure)

Additionally, it should be required that the City require that the following are submitted with rebate applications:

- Proof of purchase
- Signed application for rebate (to be developed and provided by City)

The City should take the same approach to collecting data on other measures (e.g., surveys) to track progress. The following parameters should be tracked on individual measure worksheets for surveys:

- Measure name
- Customer name
- Customer address
- Customer phone number
- Customer City account number
- Customer PG&E account number (only applicable if cost-sharing measure with PG&E)
- Water use of fixture being replaced, including the year that the fixture was manufactured (particularly for the HET retrofit)
- Survey date
- Total acres of turf surveyed (if landscape survey)
- Inventory of water using appliances (and appropriate usage information if seeking to estimate before water savings)
- Documentation of any upgraded equipment on site (already occurred, planned or potential future) – especially important if a rebate or other incentive for upgrade is to be offered
- Information related to cooling tower or other larger water using equipment on site (dependent on building type and occupant usage)

9.4 Track and Update for New Codes and Emerging Technologies

More challenging is tracking the changes in the consumer marketplace for the vast array of water-using appliances and plumbing fixtures in both the residential and commercial sectors. Some means for tracking the latest in national standards and building codes as well as technologies and emerging trends in customer preferences include the following resources:

- Having staff member(s) assigned to voluntarily participate on the AWWA Water Conservation Division's committees with attendance at the Annual Conference Committee Meetings and conference calls, in particular the Water Efficiency Programs and Technology Committee.
- Monitor the Alliance for Water Efficiency (AWE) for updates on changes in National Standards and Codes and opportunities to comment on future changes to codes and regulations at the national level.
- As a WaterSense Partner, the City should continue to track the U.S. EPA WaterSense new technologies and post updated equipment lists of newly labeled products and services. Frequently, AWE or CUWCC have performance testing results posted on their websites that provide very useful information to consumers. Performance information may also be available through Consumer Reports or Consortium for Energy Efficiency (http://www.cee1.org).
- Attend the WaterSmart Innovations Conference for exposure to the vendors participating in the exhibition and also to attend technical sessions on emerging trends in water conservation programs.
- Leverage the State and County process for adopting new building codes and regulations, especially building codes to help implement proactive changes in future development in Santa Cruz. Many new codes first appear in appendices that can be easily excluded.
- Maintain and use a network of ten to twenty key contacts at progressive utilities to inquire about new technologies (e.g., through known contacts or new contacts made at WaterSmart Innovations or AWWA conferences).
- Host events with other partner utilities and applicable stakeholders on related water loss control programs or conservation measures.
- Conduct surveys every three years with other utilities nationally to gain insight on programs and testing of products.

Staying on or ahead of the curve with tracking new technologies would lead to water savings without City investment for later upgrades through incentive programs. One caution is adopting new technologies that have yet to have adequate research or product testing. These emerging products may be worthy of pilot programs and potentially attractive for grant funding projects through agencies like the U.S. EPA or U.S. Bureau of Reclamation (USBR).

9.5 Implications for Responding to Water Shortages

Given the investment and response by the Community both with the most recent 2013-2015 drought and through implementation of this conservation program in the coming years, the City will need to revise its Water Shortage Contingency Plan. This is needed in order to modify its expectations in meeting future reductions during low water supply conditions as it's assumed that the City has been and will continue to be subject to "demand hardening." This term refers to the concept that certain upgrades or changes can only have realized savings once (e.g., replacing an older toilet with a new high efficiency 1.28 gpf toilet).

In an attempt to achieve equity, it is recommended that the City's policies and Water Shortage Contingency Plan be expanded to include additional definition for other customer user classes. It is also recommended that priority for fire, health, and sanitation protection be placed above other discretionary uses. In other states, such as California, the Water Code Section 350 sets priority for order of demand to be served in times of drought, including fire protection, health and sanitation, with more discretionary uses following later. The California Water Code in Section 10632(a) specifies requirements for any water supplier serving more than 3,000 acre feet or 3,000 connections to plan for up to a 50% reduction in demand in times of drought. Section 10632(b) sets the criteria for planning for minimum water supply conditions based on the driest three-year sequence on record. These sections of the Water Code are required to be addressed every five years in a Water Shortage Contingency Plan, which is to be filed with the California Department of Water Resources.

Given the goal to reduce peak water savings and preserve surface water storage supplies, more concentrated efforts aimed at lowering irrigation and non-potable demands in times of drought should be explored for potential inclusion in the City's Water Shortage Contingency Plan.

9.6 Suggestions for Future DSS Model Updates

With the level of investment in both capital projects that may be deferred due to this program and also investments in the program itself, City staff should be ready with an answer to the question: "How much water has been saved and at what cost?" In addition, due to the need for ongoing water conservation efforts to attain and maintain more water savings, the City will need to track program water savings, programs costs, and benefits (i.e., cost savings).

The DSS Model is only for the quantifiable measures that have estimates for water savings. There are two types of updates envisioned for the DSS Model: 1) regular monitoring of costs and water savings; and 2) model recalibration with updated base year data and model inputs and assumptions. The following describes each type of update in more detail:

- Annual or more frequent model monitoring updates: The conservation measure worksheets can each be used to track actual activities and compared to the planned activities defined as part of the model development for this program plan. This update is recommended to happen as part of developing an annual work plan and budget. At minimum, it should happen on the order of every 3-5 years.
- Recalibration of the model: The DSS Model has a base year set in 2015. Depending on water demand and account growth rates, it is advisable to update the base year on a 5-year basis, which can be a few percent change in the number of total accounts served by the City. This update requires reviewing historical demand trends, future population and demand forecasts, fixture models calibration, new or updated conservation measures, and cost and water savings assumptions. The next model recalibration update is likely due around 2020 after the next U.S. Census is completed and when development of the next Urban Water Management Plan is underway.

Specific triggers for updates may include:

- Significant cost in the water pumped (more than 10-20% energy or chemical cost increase or decrease would modify the "savings worksheet" and change the benefit cost ratios)
- Significant change in population or accounts by one of the billing categories (more than 5% shift)
- Revision to the end use (e.g., study of end uses that modify the breakdown of the water system balance on the Demand Scenarios Worksheet)
- Significant changes to water system balance (e.g., more than 10% change in water losses or other parameter on the Demands Section of the Model)

- New codes or regulations that affect natural replacement rates of fixtures (need to modify to fixture models)
- Alternatives for staffing versus outsource contracting or other change to cost of implementation of a conservation measure (change to conservation measure worksheet only)
- New technologies for conservation measure being considered (change or addition of new conservation measure worksheet)
- Any other change in conservation measures (e.g., updates to the measure worksheets can be changed or modified at any time without altering the water system balance worksheets or affecting fixture model calibration)

A separate deliverable of the DSS Model and accompanying model source data documentation are also being provided to the City under a license from Maddaus Water Management, Inc.

10. CONCLUSIONS

The City staff and community teamed with MWM and developed this comprehensive water conservation program over the course of 2 phases and 3 years. The Program is in full alignment with and supports the City's recommended plan outlined in the WSAC Report. Overall, this Conservation Plan strives to balance the three interdependent goals of cost effective demand reduction, affordability, and organizational stability or capability. This section provides a summary of the planning effort, overall benefits and key findings from this Plan's development.

10.1 Summary of Planning Efforts

Throughout this planning effort, MWM teamed with City staff to achieve the goals of providing conservation program planning services that included the following components:

- Development and implementation support of pilot projects, Baseline Water Use Study, economic analysis tools, and metrics to define the planning assumptions appropriate to the Santa Cruz community
- A measure screening and evaluation process to select the specific water conservation measures for City's water conservation program
- An outline for the schedule and budget to implement the selected conservation measures
- A blueprint for an organizational staffing structure to support the wide variety water demand-side management projects and programs to implement the measures

Santa Cruz and MWM with this Plan have now documented the Water Conservation Program that clearly defines the following:

- City needs and objectives with a recommended, phased implementation strategy for meeting the objectives including scope, budget, and schedule for each of conservation measures selected
- An organizational structure for the City's water conservation program
- A process for ongoing use of the DSS Model as a decision-making tool using benefit-cost analysis, or business case evaluations, for the current planned and potential future new conservation measures

10.2 Key Benefits from the Water Conservation Program

This Program, when successfully implemented, will deliver a host of benefits. These benefits are listed in this section.

10.2.1 Resource Sustainability

Maximize available freshwater sources: The Santa Cruz community has finite limits on fresh surface and groundwater supplies to meet supply reliability needs and a growing population. The more efficient the existing demands become with the Program being implemented, the more resilient the existing water supplies will become.

Enhance stream ecosystems: Local streams and waterways are unique ecosystems and are home to sensitive listed species such as steelhead and Coho salmon. Decreasing the amount of water diverted for municipal purpose through water conservation allows for increased habitat value and healthier ecosystems.

10.2.2 Economic Sustainability

Allow for accelerated investment in rehabilitation and replacement programs under the Capital Improvement Plan: The costs for all utility services are projected to increase; however, the costs will be lower than otherwise with conservation due to lower demands and less wear and tear on infrastructure. The City would also be better able to afford increasing fiscal demands to rehabilitate and replace aging infrastructure by avoiding adding costlier supplies to meet future demands or savings from debt service to the extent projects can be delayed. Any reductions in lower demand are offset by lower fiscal requirements from the cost-effective conservation program that has been selected for implementation.

Utilize the least costly sources of supply: Conservation is often the cheapest source of water when offsetting the cost of future supplies that may be more than $10,000/MG. The unit cost of the recommend conservation program is about half the estimated cost of new supply in terms of $/MG produced.

Supply Augmentation Strategy: The water conservation program is estimated to assist in meeting future demands of more than 700 MG per year through 2035.

10.2.3 Social Sustainability

Support the City Council's sustainability initiatives: The national trend to minimize reliance on imported oil and use all resources more efficiently has been evolving and accelerating in recent years. City has unique resources and natural biodiversity that leads the community to flourish economically through tourism and other industry and is wholly dependent on local residents and visitors respecting the need to live sustainably.

Strengthen the socioeconomic conditions of Santa Cruz's residents: By maintaining more reasonable costs for water, energy, and sewer utility bills, local residents and businesses can better afford to reinvest in their community and have more dispensable income to support the local economy.

10.3 Key Findings from the Water Conservation Program

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. This decrease represents an almost 16% reduction is water use over 20 years.
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.

10.4 Recommended Next Steps

Successful implementation of the Program will require a significant increase in efforts on the part of the City. Many new conservation measures will be employed and high participation rates are needed to achieve Program goals. At current staffing and budget levels, the City would have difficultly implementing such an aggressive conservation program. Additional resources are needed. Recommendations to assist with implementation include the following next steps:

- Budget an additional $1.1 million per year to cover the added cost of implementing this plan
- Prioritize measures for implementation with those that contribute the most to meeting water saving targets being given highest priority for implementation
- Consider working with the largest water using customers to try to reduce water use as described in Section 3.5
- Develop a Measure Implementation Plan that describes exactly how the plan measures will be designed and implemented

- Develop an annual work plan for each plan year as soon as budget is adopted (or in concert with budget planning process)
- Update codes and ordinances, as necessary
- Form partnerships and apply for grants, where appropriate
- Contract to gain enough staff support to help administer or accelerate the new program measures, if needed
- Develop analytical tools to track water use by customer class and overall water use reductions adjusted for the weather and external factors
- Set up a database to store and manage measure participation, cost, and other data to gauge successes and failures
- Use the tools annually to help decide on priorities for the next plan year
- Use the DSS Model to annually update the Program, including actual measure participation, projected water savings, and expected per capita water use reductions, to ensure Program is on track to meet 2020 targets

To stay focused and on schedule, use input from the City's Water Commission and annual work planning process as the forum to amend the plan, budgets, staffing, contracting, schedule, and so forth to stay on track.

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APPENDIX A – DEMAND & PASSIVE SAVINGS METHODOLOGY

Plumbing codes and appliance standards for toilets, urinals, faucets, clothes washers, and showerheads will continue to reduce indoor residential and non-residential water demands in the future. This reduction in demand is accounted for in Maddaus Water Management (MWM) Decision Support System (DSS) Model. Background on the DSS Model, as well as details on the method of determining plumbing code savings is presented in the following sections.

A.1 DSS Model Overview

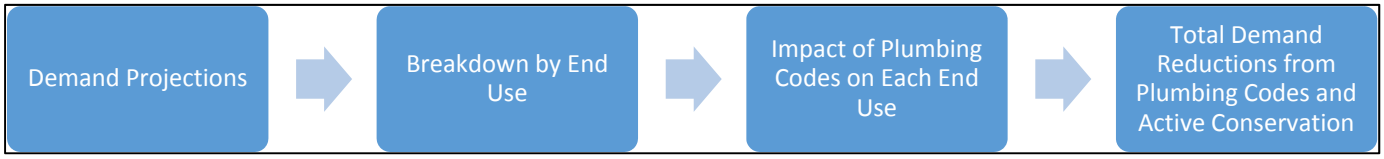
The DSS Model prepares long-range, detailed demand projections. The purpose of the extra detail is to enable a more accurate assessment of the impact of water efficiency programs on demand. A rigorous modeling approach is especially important if the project will be subject to regulatory or environmental 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 are obtained from the water agency being modeled. The demand data are 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 are 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 are 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., for 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 figure below illustrates the process 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 250 service areas representing 20 million people including extensive efforts nationally in California, Colorado, Hawaii, Idaho, Utah, Georgia, Florida, North Carolina, Tennessee, Oregon, Texas, Ohio, and internationally in Australia, New Zealand and Canada. The California Urban Water Conservation Council (CUWCC) did a peer review and has endorsed the model since 2006. The model is offered to all of their members for use to estimate water demand, plumbing code and conservaiton program savings. For more information please see the CUWCC Website: https://www.cuwcc.org/Resources/Planning-Tools-and-Models?folderId=776&view=gridview&pageSize=10



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, or deleted by the user. This yields two demand forecasts: 1) with plumbing codes, and 2) without plumbing codes.

Plumbing code measures are independent of any conservation program; they are based on customers following applicable current local, state and federal laws, building codes, and ordinances.

A.2 Plumbing Codes and Legislation

The DSS Model incorporates the following items as a "code" meaning that the savings are assumed to occur and are therefore "passive" savings.

- National Plumbing Code
- CALGreen
- AB 715
- AB 407
- CA Code of Regulations Title 20 Sections 1601-1608 2015 Appliance Efficiency Rulemaking New Standards

National Plumbing Code

The Federal Energy Policy Act of 1992, as amended in 2005, mandates that only fixtures meeting the following standards can be installed in new buildings:

- Toilet – 1.6 gal/flush maximum
- Urinals – 1.0 gal/flush maximum
- Showerhead – 2.5 gal/min at 80 psi
- Residential faucets – 2.2 gal/min at 60 psi
- Public restroom faucets – 0.5 gal/min at 60 psi
- Dishwashing pre-rinse spray valves – 1.6 gal/min at 60 psi

Replacement of fixtures in existing buildings is also governed by the Federal Energy Policy Act, which mandates that only devices with the specified level of efficiency (as shown above) can be sold as of 2006. The net result of the plumbing code is that new buildings will have more efficient fixtures and old inefficient fixtures will slowly be replaced with new, more efficient models. The national plumbing code is an important piece of legislation and must be carefully taken into consideration when analyzing the overall water efficiency of a service area.

In addition to the plumbing code, the U.S. Department of Energy regulates appliances, such as residential clothes washers, further reducing indoor water demands. Regulations to make these appliances more energy efficient have driven manufactures to dramatically reduce the amount of water these machines use. Generally, front loading washing machines use 30-50% less water than conventional models (which are still available). In a typical analysis, the DSS Model forecasts a gradual transition to high efficiency clothes washers (using 12 gallons or less) so that by the year 2025 that will be the only type of machines available for purchase. In addition to the industry becoming more efficient, rebate programs for washers have been successful in encouraging customers to buy more water efficient models. Given that machines last about 10 years, eventually all machines on the market will be the more water efficient models. Energy Star® washing machines have a water factor (WF) of 6.0 or less - the equivalent of using 3.1 cubic feet (or 23.2 gallons) of water per load. The maximum water factor for residential clothes washers under current federal standards is 9.5. The water factor equals the number of gallons used per cycle per cubic foot of capacity. Prior to year 2000, the water factor for a typical new residential clothes washer was about 12. In March 2015, the federal standard reduced the maximum water factor for top- and front-loading machines to 8.4 and 4.7, respectively. In 2018, the maximum water factor for top-loading machines will be further reduced to 6.5. For commercial washers, the maximum water factors were reduced

in 2010 to 8.5 and 5.5 for top- and front-loading machines, respectively. Beginning in 2015, the maximum water factor for Energy Star® certified washers was 3.7 for front-loading and 4.3 for top-loading machines. In 2011, the Environmental Protection Agency (EPA) estimated that Energy Star® washers comprised more that 60% of the residential market and 30% of the commercial market (Energy Star®, 2011). A new Energy Star® compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s.

State Building Code – 2015 CALGreen

The 2015 CALGreen requirements effect all new development in the State of California after July 1, 2015.[3] The DSS Model includes the CALGreen requirements that effect all new development in the State of California after July 1, 2015. The DSS Model modeled water savings from the CALGreen building code by adding Multi-family and Commercial customer categories as appropriate to applicable conservation measures.

State Plumbing Code – AB 715

Plumbing codes for toilets, urinals, showerheads, and faucets were initially adopted by California in 1991, mandating the sale and use of ultra-low flush 1.6 gallon per flush (gpf) toilets (ULFTs), 1 gpf urinals, and low-flow showerheads and faucets. California Code of Regulations Title 20 California State Law (AB 715) required High Efficiency Toilets and High Efficiency Urinals be exclusively sold in the state by 2014. Effective January 1, 2014, Assembly Bill (AB) 715 (enacted in 2007) required that toilets and urinals sold and installed in California cannot have flush ratings exceeding 1.28 and 0.5 gallons per flush, respectively.

California State Law – SB 407

SB 407 addresses plumbing fixture retrofits on resale or remodel. The DSS Model carefully takes into account the overlap with SB 407, the plumbing code (natural replacement), CALGreen, AB 715 and rebate programs (such as toilet rebates). SB 407 (enacted in 2009) requires that properties built prior to 1994 be fully retrofitted with water conserving fixtures by the year 2017 for single-family residential houses and 2019 for multifamily and commercial properties. SB 407 program length is variable and continues until all the older high flush toilets have been replaced the service area. The number of accounts with high flow fixtures is tracked to make sure that the situation of replacing more high flow fixtures than actually exist does not occur. SB 837 (enacted in 2011) requires that sellers of real property disclose on their Real Estate Transfer Disclosure Statement whether their property complies with these requirements. Additionally, SB 407 conditions issuance of building permits for major improvements and renovations upon retrofit of non-compliant plumbing fixtures. Each of these laws is intended to accelerate the replacement of older, low efficiency plumbing fixtures, and ensure that only high-efficiency fixtures are installed in new residential and commercial buildings.

2015 CALGreen and 2015 CA Code of Regulations Title 20 Appliance Efficiency Regulations

Fixture characteristics in the DSS Model are 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. The CEC 2015 appliance efficiency standards applies to the following new appliances, if they are sold in California: showerheads, lavatory faucets, kitchen faucets, metering faucets, replacement aerators, wash fountains, tub spout diverters, public lavatory faucets, commercial pre-rinse spray valves, urinals, and toilets. The DSS Model accounts for plumbing code savings due to these standards effects on showerheads, faucets and aerators, urinals, and toilets.

[3] More information on the California Building Standards Commission reference documents are available online: http://www.bsc.ca.gov/pubs/bullet.aspx

- Showerheads: July 2016: 2.0 gpm; July 2018: 1.8 gpm
- Wall Mounted Urinals: 2016: 0.125 (pint) gpf
- Lavatory Faucets and Aerator: July 2016: 1.2 gpm at 60 psi
- Kitchen Faucets and Aerator: July 2016: 1.8 gpm with optional temporary flow of 2.2 gpm at 60 psi
- Public Lavatory Faucets: July 2016: 0.5 gpm at 60 psi

In summary, 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.

Standards for **residential clothes washers** fall under the regulations of the U.S. Department of Energy. 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.

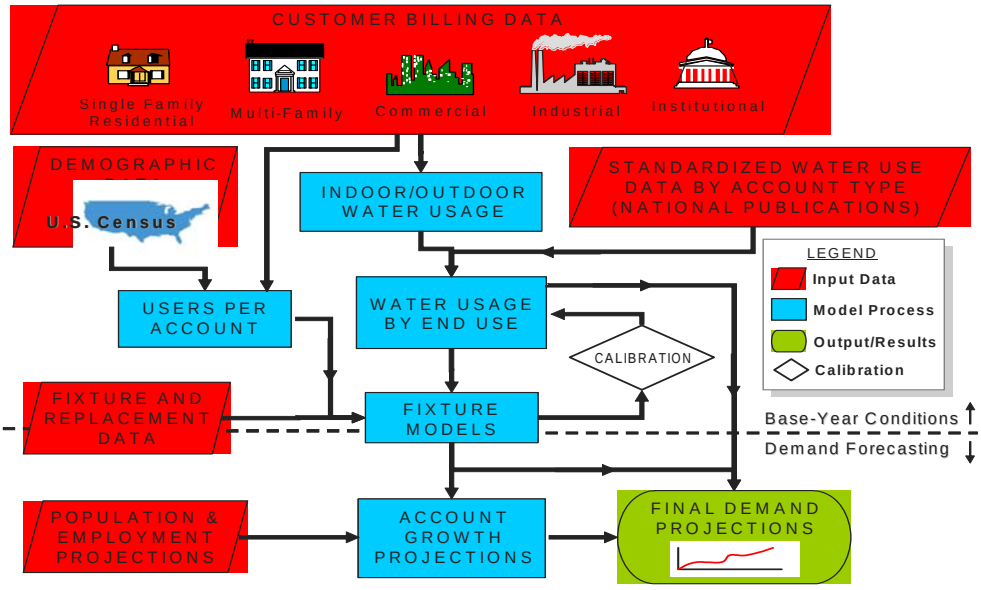
Showerhead flow rates are newly regulated under the 2015 California Code of Regulations Title 20 Appliance Efficiency Regulations adopted by the CEC, which requires the exclusive sale in California of 2.0 gpm showerheads at 80 psi as of July 1, 2016 and 1.8 gpm showerheads at 80 psi as of July 1, 2018. 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 July 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. The demand projections including plumbing code savings further assumes no active involvement by the water utility, 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).

The following figure conceptually describes how plumbing codes are incorporated into the flow of information in the DSS Model.

Figure A-1. DSS Model Overview Used to Make Potable Water Demand Projections



DSS Model Fixture Replacement

The DSS Model is capable of modeling multiple types of fixtures, including fixtures with slightly different design standards. For example, currently toilets can be purchased that flush at a rate of 0.8 gallons per flush (gpf), 1.0 gallon per flush or 1.28 gallons per flush. The 1.6 gpf and higher gallons per flush toilets still exist but can no longer be purchased in California. Therefore, they cannot be used for replacement or new installation of a toilet. So, the DSS Model utilizes a fixture replacement table to decide what type of fixture should be installed when a fixture is replaced or a new fixture is installed. The replacement of the fixtures is listed as a percentage, as shown in the following figure. A value of 100% would indicate that all the toilets sold would be of one particular flush volume. A value of 75% means that three out of every four toilets installed would be of that particular flush volume type. The DSS Model contains a pair of replacement tables for each fixture type and customer category combination (i.e., Residential Single Family toilets, Residential Multifamily toilets, Commercial toilets, Residential clothes washing machines, Commercial washing machines, etc.).

In the following example, the DSS Model includes the effects of the Federal Policy Act and AB 715 on each toilet fixture type. This DSS Model feature determines the “saturation” of 1.6 gpf toilets as the Federal Policy Act was in effect from 1992-2014 for 1.6 gpf toilet replacements.

Figure A-2. Toilet Replacement Percentages by Type of Toilet

Replacement Fixture Market Shares					
Year	1.28 gpf HET Residential	1.6 gpf ULFT Residential	High Use Toilet Residential	<1.0 gpf Toilet Residential	Total
2012	75%	25%	0%	0%	100%
2015	100%	0%	0%	0%	100%
2020	90%	0%	0%	10%	100%
2030	65%	0%	0%	35%	100%
2040	50%	0%	0%	50%	100%
New Fixture Market Shares					
Year	1.28 gpf HET Residential	1.6 gpf ULFT Residential	High Use Toilet Residential	<1.0 gpf Toilet Residential	Total
2012	100%	0%	0%	0%	100%
2015	100%	0%	0%	0%	100%
2020	90%	0%	0%	10%	100%
2030	65%	0%	0%	35%	100%
2040	50%	0%	0%	50%	100%

A.3 Basis for the Demand Forecast

In the City of Santa Cruz Water Demand Forecast, M.Cubed conducted an econometric analysis of water demand and forecasts of class-level customer demands and total system production through 2035. (M.Cubed, 2015) 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, water rates, and other factors expected to impact the future demand for water. MWM's DSS Model incorporates 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 City's DSS Model starts with a "baseline" demand forecast, which is not 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.

The following table 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 A-1. Comparison of M.Cubed Demand Forecast and DSS "Baseline" Forecast

Demand (MG)	2020	2025	2030	2035
M.Cubed Final Demand Forecast, September 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%

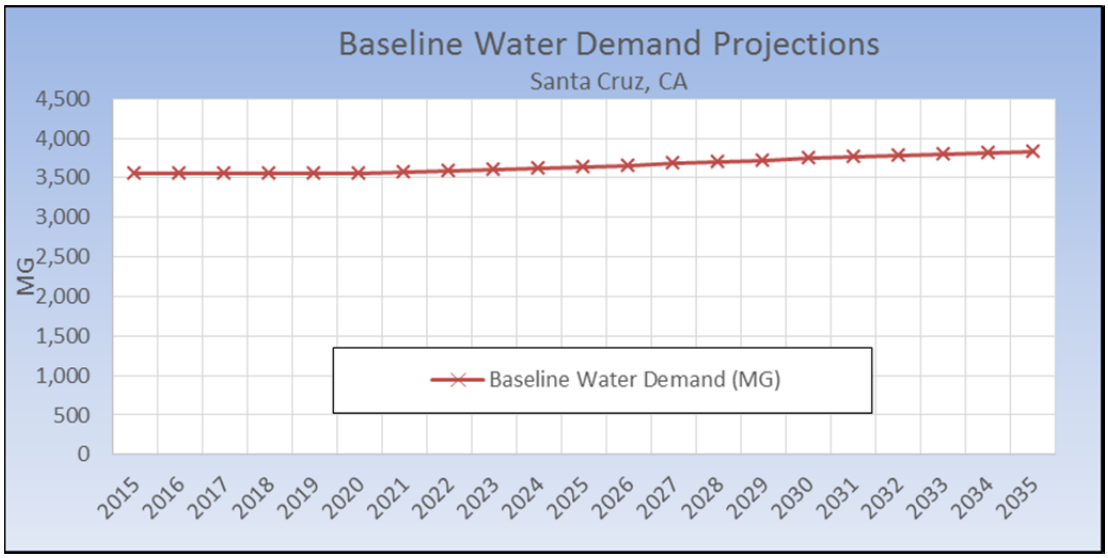
Note: Plumbing code and program savings (M.Cubed, 2015, Attachment 8) were originally based on results from the 2014 DSS Model work by Maddaus Water Management; they were updated with the most recent DSS Model results from February 2016.

As can be seen in the previous 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. As referenced in the 2015 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 previous 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 A-3. Baseline Demand Forecast Without Plumbing Code Savings



Source: City of Santa Cruz. DSS Model, Section: Demand Analysis, Feb 16, 2016.

A.4 Water Reduction Methodology

Each conservation measure targets a particular water use such as indoor single family water use. Targeted water uses are categorized by water user group and by end use. Targeted water user groups include single family residential, multifamily residential, commercial, industrial, and institutional (CII), etc. Measures may apply to more than one water user group. Targeted end uses include indoor and outdoor use. The targeted water use is important to identify because the water savings are generated from reductions in water use for the targeted end use. For example, a residential retrofit conservation measure targets single family and multifamily residential indoor use, and in some cases specifically shower use. When considering the water savings potential generated by a residential retrofit one considers the water saved by installing low-flow showerheads in single family and multifamily homes.

The market penetration goal for a measure is the extent to which the product or service related to the conservation measure occupies the potential market. In essence, the market penetration goal identifies how many fixtures, rebates, surveys, etc. the wholesale customer would have to offer or conduct over a period of time to reach its water savings goal for that conservation measure. This is often expressed in terms of the number of fixtures, rebates, surveys, etc. offered or conducted per year.

The potential for errors in market penetration goal estimates for each measure can be significant because they are based on previous experience, chosen implementation methods, projected utility effort, and funds allocated to implement the measure. The potential error can be corrected through re-evaluation of the measure as the implementation of the measure progresses. For example, if the market penetration required to achieve specific water savings turns out to be more or less than predicted, adjustments to the implementation efforts can be made. Larger rebates or additional promotions are often used to increase the market penetration. The process is iterative to reflect actual conditions and helps to ensure that market penetration and needed savings are achieved regardless of future variances between estimates and actual conditions.

In contrast, market penetration for mandatory ordinances can be more predictable with the greatest potential for error occurring in implementing the ordinance change. For example, requiring dedicated irrigation meters for new accounts through an ordinance can assure an almost 100% market penetration for affected properties.

Water utilities are constantly looking at when a measure reaches saturation. Baseline surveys are the best approach to having the most accurate information on market saturation. This was taken into account when analyzing individual conservation measures where best estimates were made. MWM was not provided with any baseline surveys for this analysis, but discussions were held with the City staff regarding what their best estimates were for saturation for their service area.

A.5 Perspectives on Benefits and Costs

The determination of the economic feasibility of water conservation programs involves comparing the costs of the programs to the benefits provided. This analysis was performed using the DSS Model developed by MWM. The DSS Model has received the endorsement of the California Urban Water Conservation Council, and calculates cost effectiveness of conservation measure savings at the end-use level; for example, the model determines the amount of water a toilet rebate program saves in daily toilet use for each single family account.

A.6 Present Value Parameters

Present value analysis using constant FY 2015 dollars and a real discount rate of 2.25% is used to discount costs and benefits to the base year; this is based on a nominal interest rate of 4.5% and an assumed inflation rate of 2.2%. From this analysis, benefit-cost ratios of each measure are computed. When measures are put together in programs, the model is set up to avoid double counting savings from multiple measures that act on the same end use of water. For example, multiple measures in a program may target toilet replacements. The model includes assumptions to apportion water savings between the multiple measures.

Economic analysis can be performed from several different perspectives, based on which party is affected. For planning water use efficiency programs for utilities, the perspectives most commonly used for benefit-cost analyses are the "utility" perspective and the "community" perspective. The Utility Benefit-Cost Analysis is based on the benefits and costs to the water provider. The Community Benefit-Cost Analysis includes the utility benefit and costs together with account owner/customer benefits and costs. These include customer energy and other capital or operating cost benefits plus costs of implementing the measure, beyond what the utility pays.

The utility perspective offers two advantages. First, it considers only the program costs that will be directly borne by the utility. This enables the utility to fairly compare potential investments for saving versus supplying increased quantities of water. Second, revenue shifts are treated as transfer payments, which means program participants will have lower water bills and non-participants will have slightly higher water bills so that the utility's revenue needs continue to be met. Therefore, the analysis is not complicated with uncertainties associated with long-term rate projections and retail rate design assumptions. It should be noted that there is a significant difference between the utility's savings from the avoided cost of procurement and delivery of water and the reduction in retail revenue that results from reduced water sales due to water use efficiency. This budget impact occurs slowly, and can be accounted for in water rate planning. Because it is the water provider's role in developing a water use efficiency plan that is vital in this study, the utility perspective was primarily used to evaluate elements of this report.

The community perspective is defined to include the utility and the customer costs and benefits. Costs incurred by customers striving to save water while participating in water use efficiency programs are considered, as well as the benefits received in terms of reduced energy bills (from water heating costs) and wastewater savings, among others. Water bill savings are not a customer benefit in the aggregate for reasons described above. Other factors external to the utility, such as environmental effects, are often difficult to quantify or are not necessarily under the control of the utility. They are therefore frequently excluded from economic analyses, including this one.

The time value of money is explicitly considered. Typically, the costs to save water occur early in the planning period whereas the benefits usually extend to the end of the planning period. A long planning period of 20-30 years is typically used because costs and benefits that occur beyond 2050 years have very little influence on the total present value of the costs and benefits. The value of all future costs and benefits is discounted to the first year in the DSS Model (the base year, which in this case is 2015), at the real interest rate of 2.25%. The DSS Model calculates this real interest rate, adjusting the current nominal interest rate (assumed to be approximately 4.5%) by the assumed rate of inflation (2.2%). The formula to calculate the real interest rate is: (nominal interest rate – assumed rate of inflation)/ (1 + assumed rate of inflation). Cash flows discounted in this manner are herein referred to as "Present Value" sums.

A.7 Measure Assumptions Including Unit Costs, Water Savings, and Market Penetrations

Measure assumptions including unit costs, water savings and market penetrations were made for each measure.

- Targeted Water User Group End Use – Water user group (e.g., single family residential) and end use (e.g., indoor or outdoor water use).
- Utility Unit Cost – Cost of rebates, incentives, and contractors hired to implement measures. The assumed dollar values for the measure unit costs were closely reviewed by staff and are found to be adequate for each individual measure. The values in the majority of cases are in the range of what is currently offered by other water utilities in the region.
- Retail Customer Unit Cost – Cost for implementing measures that is paid by retail customers (i.e., the remainder of a measure's cost that is not covered by a utility rebate or incentive).
- Utility Administration and Marketing Cost – The cost to the utility for administering the measure, including consultant contract administration, marketing, and participant tracking. The mark-up is sufficient (in total) to cover conservation staff time and general expenses and overhead.

The unit costs vary according to the type of customer account and implementation method being addressed. For example, a measure might cost a different amount for a residential single family account than a residential multifamily

account, and for a rebate versus an ordinance requirement or a direct installation implementation method. Typically water utilities have found there are increased costs associated with achieving higher market saturation, such as more surveys per year. The DSS Model calculates the annual costs based on the number of participants each year. The general formula for calculating annual utility costs is:

- Annual Utility Cost = Annual market penetration rate x total accounts in category x unit cost per account x (1+administration and marketing markup percentage)
- Annual Customer Cost = Annual number of participants x unit customer cost
- Annual Community Cost = Annual utility cost + annual customer cost

A.8 Assumptions about Measure Costs

Costs were determined for each of the measures based on industry knowledge, past experience and data provided by the City. Costs may include incentive costs, usually determined on a per-participant basis; fixed costs, such as marketing; variable costs, such as the costs to staff the measures and to obtain and maintain equipment; and a one-time set-up cost. The set-up cost is for measure design by staff or consultants, any required pilot testing, and preparation of materials that will be used in marketing the measure. The model was run for 25 years, (each year between 2015 and 2035) to encompass the 10-year conservation planning period of 2015 to 2025. The model provides long range forecasted savings, with a focus on conservation measure implementation period of 10 years. Costs were spread over the time period depending on the length of the implementation period for the measure and estimated voluntary customer participation levels.

Lost revenue due to reduced water sales is not included as a cost because the conservation measures evaluated herein generally take effect over a span of time that is sufficient to enable timely rate adjustments, if necessary, to meet fixed cost obligations.

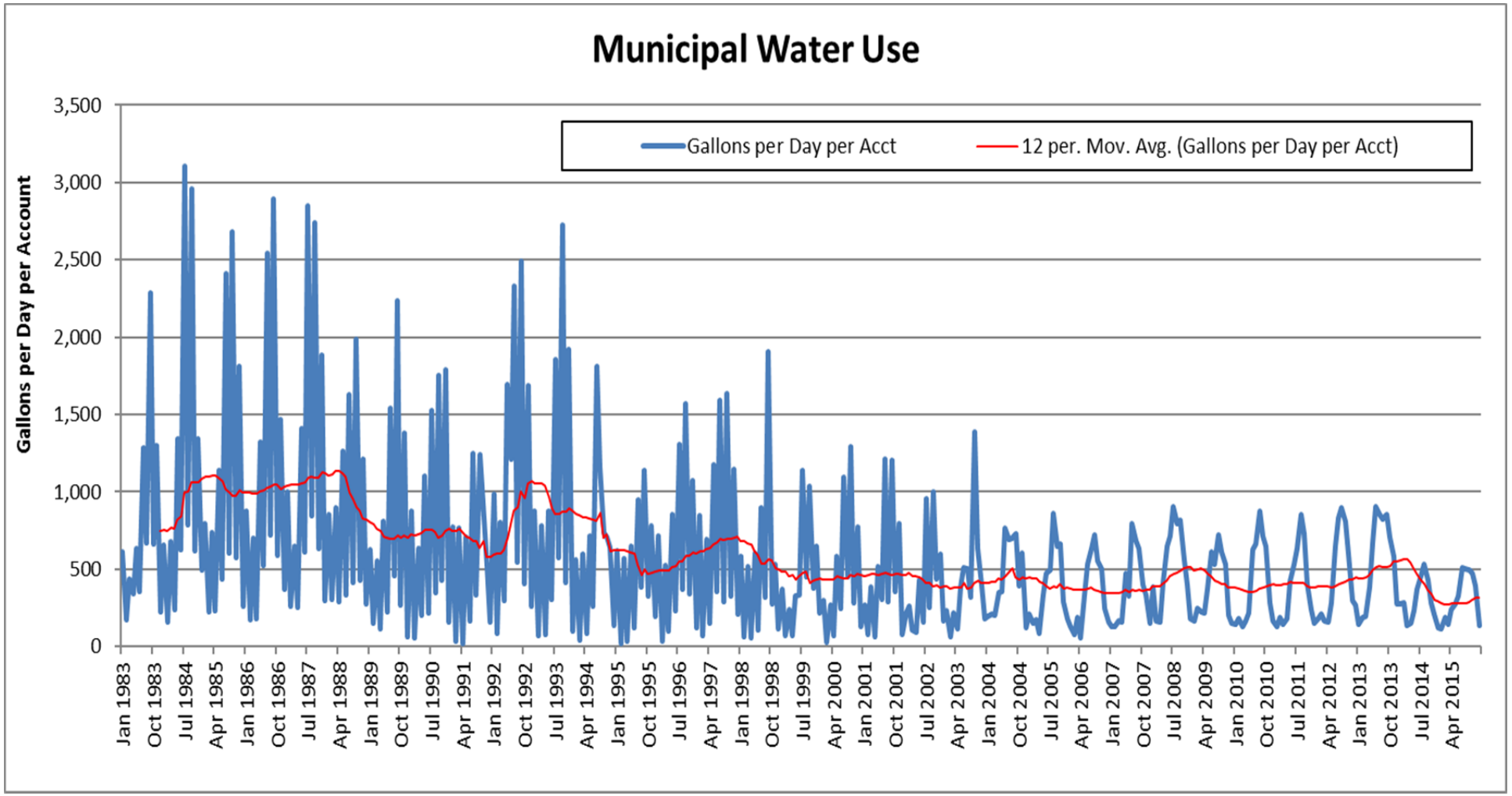
A.9 Assumptions about Measure Savings

Data necessary to forecast water savings of measures include specific data on water use, demographics, market penetration, and unit water savings. Savings normally develop at a measured and predetermined pace, reaching full maturity after full market penetration is achieved. This may occur three to seven years after the start of implementation, depending upon the implementation schedule. For every conservation activity or replacement with more efficient devices, there is a useful life. The useful life is called the “Measure Life” and is defined to be how long conservation measure stays in place and continues to save water. It is assumed that measures implemented because of codes, standards or ordinances, like toilets for example, would be “permanent” and not revert to an old inefficient level of water use if the device needed to be replaced. However, some measures that are more behavioral based like residential surveys are assumed to need to be repeated on an ongoing basis to retain the water savings (e.g., homeowners move away and new homeowners may have less efficient water using practices around the home). Surveys typically have a measure life on the order of five years.

APPENDIX B – HISTORICAL MONTHLY WATER USE PER ACCOUNT TYPE

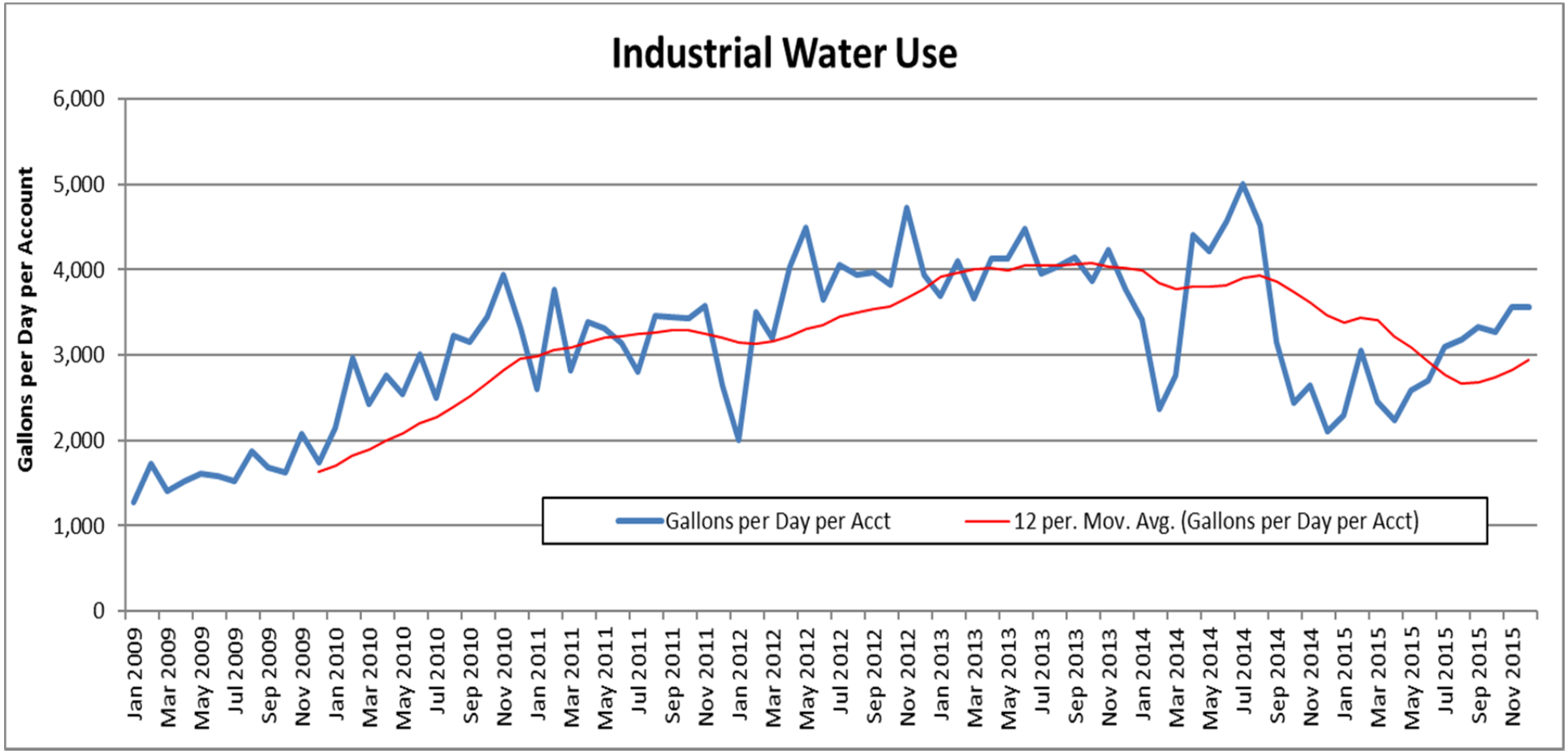
The average monthly usage per account per day for the four primary types of customers in the City are presented in the following figures.

Figure B-1. Municipal Consumption per Account per Day*



* The City experienced drought years in 1976-77, 1988-1992, and 2009-2015 and economic recession in years 2008-2012.

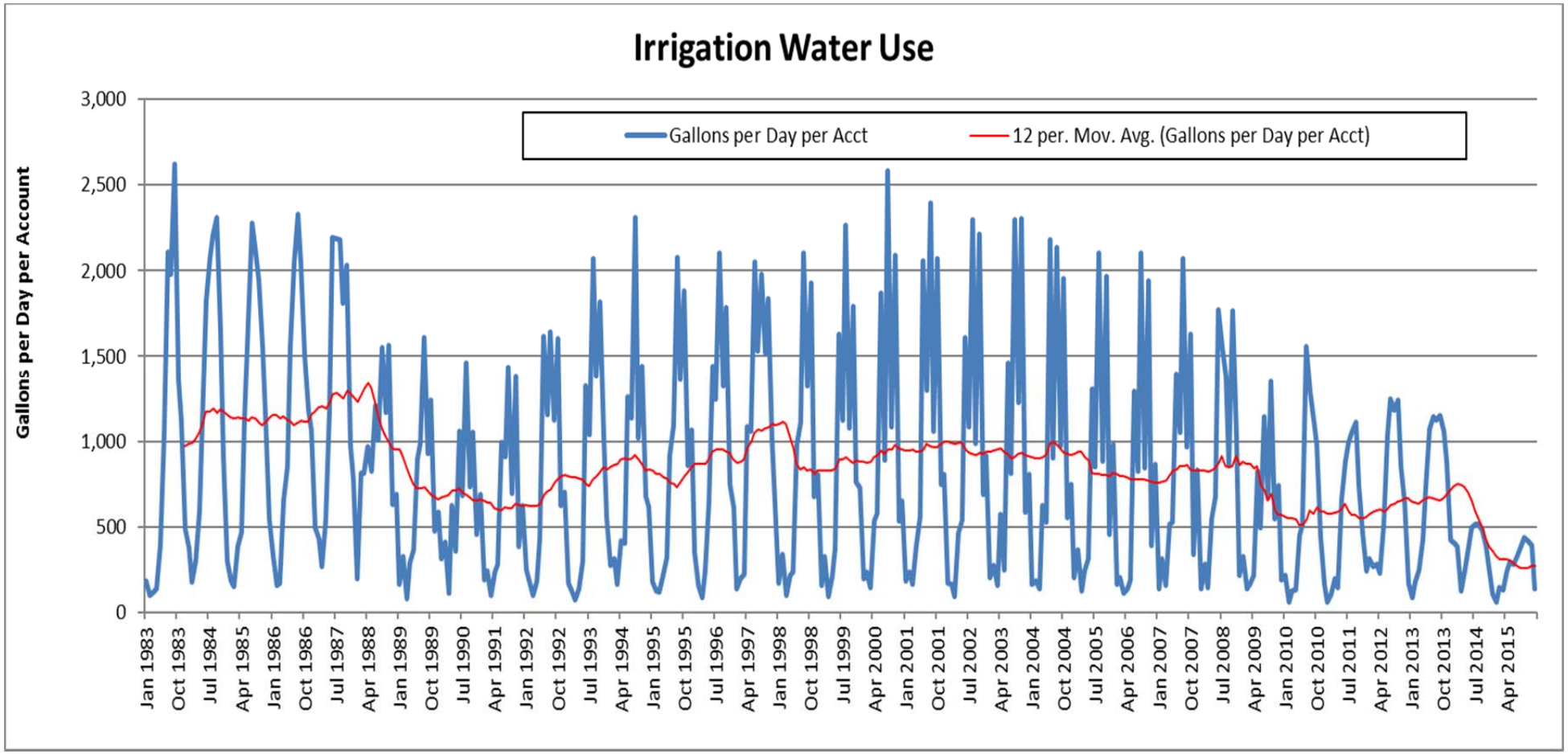
Figure B-2. Industrial Consumption per Account per Day



Notes:

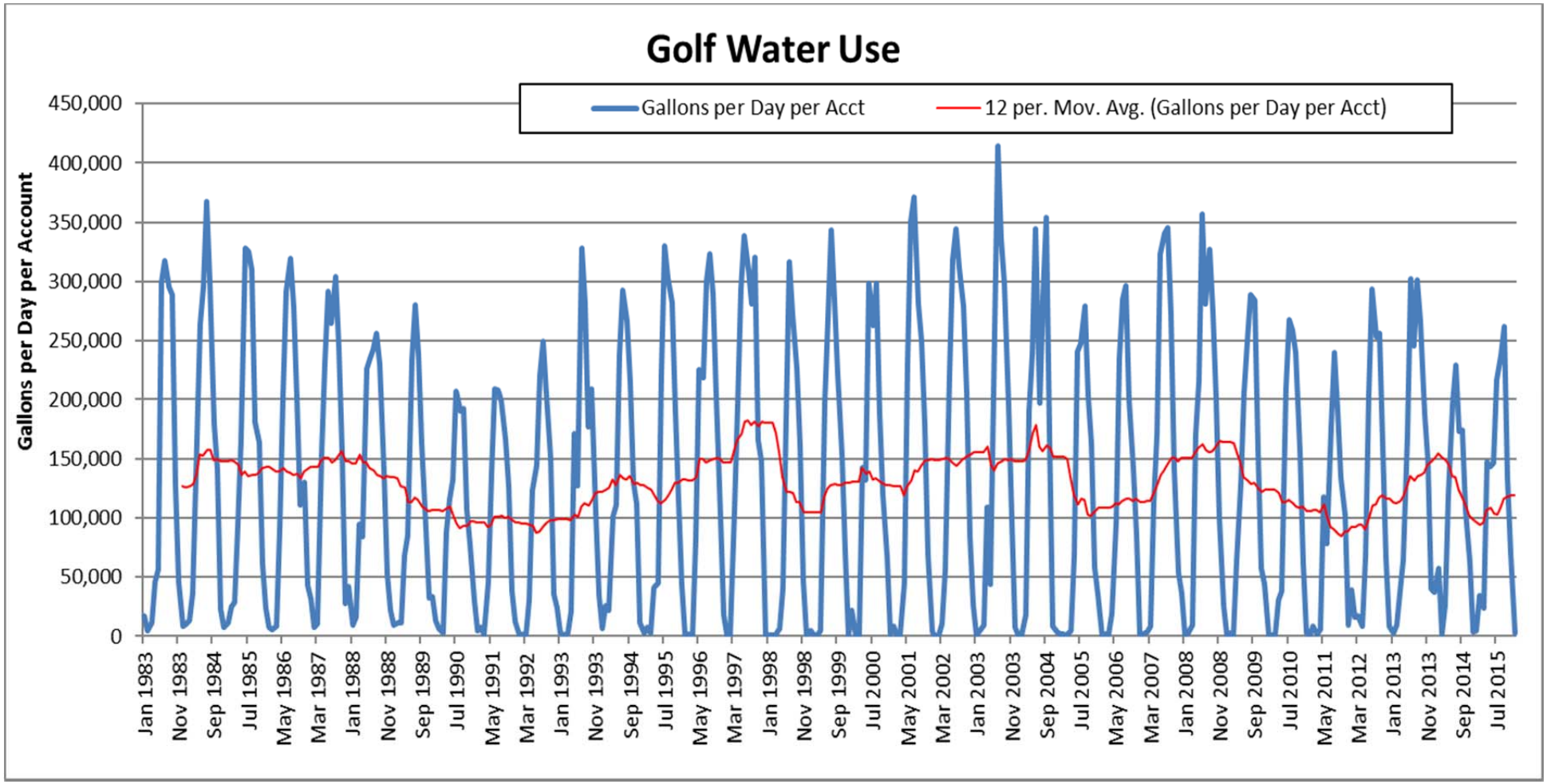
1. Industrial water use was not tracked as a separate customer category until 2009.
2. The City experienced drought years in 1976-77, 1988-1992, and 2009-2015 and economic recession in years 2008-2012.

Figure B-3. Irrigation Consumption per Account per Day*



* The City experienced drought years in 1976-77, 1988-1992, and 2009-2015 and economic recession in years 2008-2012.

Figure B-4. Golf Consumption per Account per Day*



* The City experienced drought years in 1976-77, 1988-1992, and 2009-2015 and economic recession in years 2008-2012.

APPENDIX C – DSS MODELING ASSUMPTIONS FOR CONSERVATION MEASURES

System Water Loss Reduction

Overview	
Name	System Water Loss Reduction
Abbr	1
Category	Default
Measure Type	Water Loss Measure

Time Period	
First Year	2015

Backlog Costs	
Total Backlog Work Costs	$1,000,000
Years to Complete Backlog	5

Maintenance Costs	
Annual Maintenance Costs	$120,000

Target	
Total GPCD Reduction	0.9

Description

City of Santa Cruz's water losses are relatively low. This measure would seek to maintain low non-revenue water rates through controlling both apparent and real water losses. This would be annually tracked through the American Water Works Association (AWWA) Water Balance Water System Audit. The City's Distribution Department implements this measure.

Results	
Average Water Savings (mgd)	
	0.080377
Lifetime Savings - Present Value ($)	
Utility	$1,210,408
Community	$1,210,408
Lifetime Costs - Present Value ($)	
Utility	$2,418,332
Community	$2,418,332
Benefit to Cost Ratio	
Utility	0.50
Community	0.50
Cost of Savings per Unit Volume ($/mg)	
Utility	$3,923

Comments

The savings is over the life of the program which is tied to the agency current Non Revenue Water (NRW) percentage which can be found in the GREEN "Non Revenue Water" portion of the DSS Model. "Annual Maintenance Costs" inputs allow for budget estimates for complete program. Additional water savings of "Non-Revenue Water" real water losses may be available when technically feasible. Rule of thumb is minimum system water losses below approximately 6% (as defined as the difference between production and consumption or alternatively as a percent of System Input Volume using AWWA Water System Audit definitions). For NRW below 6% (which can be found in the GREEN "Non Revenue Water" portion of the DSS Model), input "0%" for new real water savings and "$0" in the Backlog Cost section. For NRW above 6%, a GPCD savings input volume can be computed (an estimate of annual savings volume divided by total population). For example a 4.0 GPCD is equivalent to a 2% reduction for the system with a 150 GPCD water use. Additional Water Loss Control Program budget to achieve these water savings is inputted into the "Backlog Cost" section along with the duration of the years to accomplish the estimated reduction. In other words, $250,000 over 5 years would add $50,000 per year to assist with meeting NRW reduction goals.

Costs	
	Utility
2015	$200,000
2016	$200,000
2017	$200,000
2018	$200,000
2019	$200,000
2020	$120,000
2021	$120,000
2022	$120,000
2023	$120,000
2024	$120,000
2025	$120,000
2026	$120,000
2027	$120,000
2028	$120,000
2029	$120,000
2030	$120,000
2031	$120,000
2032	$120,000
2033	$120,000
2034	$120,000
2035	$120,000

Targets	
	Projected NRW Percent
2015	7.3%
2016	7.2%
2017	7.0%
2018	6.8%
2019	6.6%
2020	6.6%
2021	6.6%
2022	6.6%
2023	6.6%
2024	6.6%
2025	6.6%
2026	6.6%
2027	6.6%
2028	6.5%
2029	6.5%
2030	6.5%
2031	6.5%
2032	6.5%
2033	6.5%
2034	6.5%
2035	6.5%

Water Savings	
	Total Savings
2015	0.016188
2016	0.032660
2017	0.049417
2018	0.066457
2019	0.083782
2020	0.084493
2021	0.085209
2022	0.085926
2023	0.086643
2024	0.087360
2025	0.088077
2026	0.088820
2027	0.089562
2028	0.090305
2029	0.091048
2030	0.091791
2031	0.092539
2032	0.093287
2033	0.094035
2034	0.094783
2035	0.095532

Advanced Metering Infrastructure

Overview	
Name	Advanced Metering Infrastructure
Abbr	2
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2035
Measure Length	15

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
SF	$40.00	$500.00	1
MF	$40.00	$500.00	1
COM	$40.00	$1,500.00	1

Administration Costs	
Markup Percentage	40%

Description

Install or retrofit system with AMI meters and associated network capable of providing continuous consumption data to Utility offices. Improved identification of system and customer leaks is major conservation benefit. Some of costs of these systems are offset by operational efficiencies and reduced staffing, as regular meter reading and those for opening and closing accounts are accomplished without need for physical or drive-by meter reading. Also enables enhanced billing options and ability to monitor unauthorized usage (such as use/tampering with closed accounts or irrigation if time of day or days per week are regulated). Customer service is improved as staff can quickly access continuous usage records to address customer inquiries. Optional features include online customer access to their usage, which has been shown to improve accountability and reduce water use. Assume seven year change-out would be a reasonable objective based on City's past experience with AMR installation program.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☑	☑	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐	☐	☐					
Urinals			☐					
Lavatory Faucets	☐	☐	☐					
Showers	☐	☐	☐					
Dishwashers	☐	☐	☐					
Clothes Washers	☐	☐	☐					
Process			☐					
Kitchen Spray Rinse			☐					
Internal Leakage	☑	☑	☑					
Baths	☐	☐						
Other	☐	☐	☐					
Irrigation	☐	☐	☐					
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐	☐					
Indoor								
Outdoor								
Cooling			☐					
tory/Kitchen Faucets	☐	☐	☐					

Comments

Basis for the starting value cost estimate is $540 per AMI unit where assumes (a) partial % cost share for the "utility" of estimated AMI (automatic meter infrastructure) retrofit cost of $40 with other water utility departments such as operations; and (b) model input for customer unit cost of $500 to cover the reminder of the total unit cost (assumed paid by rate revenue). Cost estimate includes leak repair for those customer-side leaks found and fixed. Cost estimate does not include service leak repair (assume included in Water Loss Control program).

Results	
Average Water Savings (mgd)	
0.048889	
Lifetime Savings - Present Value ($)	
Utility	$683,028
Community	$683,028
Lifetime Costs - Present Value ($)	
Utility	$475,949
Community	$5,400,600
Benefit to Cost Ratio	
Utility	1.44
Community	0.13
Cost of Savings per Unit Volume ($/mg)	
Utility	$1,269

End Use Savings Per Replacement	% Savings per Account
SF Internal Leakage	50.0%
MF Internal Leakage	50.0%
COM Internal Leakage	50.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	3.000%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$40,977	$424,451	$465,428
2022	$41,148	$426,113	$467,260
2023	$41,318	$427,774	$469,092
2024	$41,489	$429,436	$470,924
2025	$41,659	$431,098	$472,757
2026	$41,859	$433,101	$474,960
2027	$42,058	$435,104	$477,163
2028	$42,258	$437,108	$479,366
2029	$42,457	$439,111	$481,568
2030	$42,657	$441,115	$483,771
2031	$42,838	$443,013	$485,851
2032	$43,019	$444,911	$487,930
2033	$43,200	$446,809	$490,009
2034	$43,381	$448,708	$492,088
2035	$43,562	$450,606	$494,167

Targets — View: Accounts

	SF	MF	COM	Total
2015	0	0	0	0
2016	0	0	0	0
2017	0	0	0	0
2018	0	0	0	0
2019	0	0	0	0
2020	0	0	0	0
2021	586	87	59	732
2022	588	88	59	735
2023	591	88	59	738
2024	593	89	59	741
2025	596	89	59	744
2026	598	90	59	747
2027	600	91	60	751
2028	603	92	60	755
2029	605	93	60	758
2030	608	94	60	762
2031	610	94	61	765
2032	612	95	61	768
2033	615	96	61	771
2034	617	96	61	775
2035	619	97	62	778

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000000
2019	0.000000
2020	0.000000
2021	0.009004
2022	0.017903
2023	0.026695
2024	0.035380
2025	0.043958
2026	0.052397
2027	0.060755
2028	0.069042
2029	0.077267
2030	0.085434
2031	0.093598
2032	0.101719
2033	0.109803
2034	0.117853
2035	0.125872

Large Landscape Budget-Based

Overview	
Name	Large Landscape Budget-Based W
Abbr	3
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2018
Last Year	2020
Measure Length	3

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
IRR	$50.00	$200.00	1

Administration Costs	
Markup Percentage	50%

Description

Develop individualized monthly water budgets for all or a selected category of customers. Water budgets are linked to a rate schedule where rates per unit of water increase when a customer goes above their budget, or decreases if they are below their budget. Budgets typically are based on such factors as the size of the irrigated area and often vary seasonally to reflect weather during the billing period. These rates have been shown to be effective in reducing landscape irrigation demand (AWWARF Reports). This measure would require rate study and capable billing software. Over time lower budgets to climate appropriate irrigation levels.

Customer Classes

SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
☐	☐	☐	☐	☐	☐	☑	☐

End Uses

	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets								
Urinals								
Lavatory Faucets								
Showers								
Dishwashers								
Clothes Washers								
Process								
Kitchen Spray Rinse								
Internal Leakage								
Baths								
Other								
Irrigation							☑	
Pools								
Wash Down								
Car Washing								
External Leakage							☑	
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets								

Comments

Basis of water savings: Overwatering is about 30 MGY for all participants or about 12%. Education has dropped the use about 15 MGY and price and other measures should do the rest of 15 MGY or about 6% of this end use category.

Results

Average Water Savings (mgd)	
0.030986	
Lifetime Savings - Present Value ($)	
Utility	$460,424
Community	$460,424
Lifetime Costs - Present Value ($)	
Utility	$46,122
Community	$169,115
Benefit to Cost Ratio	
Utility	9.98
Community	2.72
Cost of Savings per Unit Volume ($/mg)	
Utility	$194

End Use Savings Per Replacement	% Savings per Account
IRR Irrigation	12.0%
IRR External Leakage	0.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	36.000%
Only Effects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$16,046	$42,790	$58,837
2019	$16,814	$44,838	$61,652
2020	$17,582	$46,885	$64,467
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets

View: Accounts

	IRR	Total
2015	0	0
2016	0	0
2017	0	0
2018	214	214
2019	224	224
2020	234	234
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.013868
2019	0.027587
2020	0.041137
2021	0.040711
2022	0.040289
2023	0.039872
2024	0.039459
2025	0.039051
2026	0.038642
2027	0.038238
2028	0.037838
2029	0.037442
2030	0.037050
2031	0.036663
2032	0.036279
2033	0.035900
2034	0.035524
2035	0.035153

General Public Information

Overview	
Name	General Public Information
Abbr	4
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2035
Measure Length	21

Measure Life	
Permanent	☐
Years	2
Repeat	☐

Fixture Costs	Utility	Customer	Fix/Acct
SF	$4.00	$2.00	1

Administration Costs	
Markup Percentage	50%

Description

Comprehensive education and public awareness campaign that would evolve over the years and seek to drive participation in other conservation programs. This measure includes support for the Landscape Water Budget & Water Use Reports and additional overall customer service and administrative support not specific to any particular conservation measure across the Water Department.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☐	☐	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☑							
Urinals								
Lavatory Faucets	☑							
Showers	☑							
Dishwashers	☑							
Clothes Washers	☑							
Process								
Kitchen Spray Rinse								
Internal Leakage	☑							
Baths	☑							
Other	☑							
Irrigation	☑							
Pools	☑							
Wash Down	☑							
Car Washing	☑							
External Leakage	☑							
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets	☐							

Comments

Cost assumes SF category but impacts all customer classes. Basis of water savings: Assume baseline of 0.5% per year average single family home use. Utility costs are based on staffing support and education materials cost. Have website now.

Results	
Average Water Savings (mgd)	
	0.015759
Lifetime Savings - Present Value ($)	
Utility	$247,012
Community	$247,012
Lifetime Costs - Present Value ($)	
Utility	$1,007,398
Community	$1,343,197
Benefit to Cost Ratio	
Utility	0.25
Community	0.18
Cost of Savings per Unit Volume ($/mg)	
Utility	$8,334

End Use Savings Per Replacement	% Savings per Account
SF Toilets	0.5%
SF Lavatory Faucets	0.5%
SF Showers	0.5%
SF Dishwashers	0.5%
SF Clothes Washers	0.5%
SF Internal Leakage	0.5%
SF Baths	0.5%
SF Other	0.5%
SF Irrigation	0.5%
SF Pools	0.5%
SF Wash Down	0.5%
SF Car Washing	0.5%
SF External Leakage	0.5%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	50.000%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$57,290	$19,097	$76,387
2016	$57,506	$19,169	$76,674
2017	$57,721	$19,240	$76,962
2018	$57,937	$19,312	$77,249
2019	$58,153	$19,384	$77,537
2020	$58,368	$19,456	$77,824
2021	$58,607	$19,536	$78,143
2022	$58,846	$19,615	$78,461
2023	$59,085	$19,695	$78,779
2024	$59,323	$19,774	$79,098
2025	$59,562	$19,854	$79,416
2026	$59,806	$19,935	$79,741
2027	$60,050	$20,017	$80,066
2028	$60,293	$20,098	$80,391
2029	$60,537	$20,179	$80,716
2030	$60,781	$20,260	$81,041
2031	$61,006	$20,335	$81,341
2032	$61,231	$20,410	$81,642
2033	$61,457	$20,486	$81,942
2034	$61,682	$20,561	$82,243
2035	$61,907	$20,636	$82,543

Targets — View: Accounts

	SF	Total
2015	9,548	9,548
2016	9,584	9,584
2017	9,620	9,620
2018	9,656	9,656
2019	9,692	9,692
2020	9,728	9,728
2021	9,768	9,768
2022	9,808	9,808
2023	9,847	9,847
2024	9,887	9,887
2025	9,927	9,927
2026	9,968	9,968
2027	10,008	10,008
2028	10,049	10,049
2029	10,089	10,089
2030	10,130	10,130
2031	10,168	10,168
2032	10,205	10,205
2033	10,243	10,243
2034	10,280	10,280
2035	10,318	10,318

Water Savings (mgd)

	Total Savings (mgd)
2015	0.008488
2016	0.016847
2017	0.016736
2018	0.016623
2019	0.016507
2020	0.016389
2021	0.016329
2022	0.016271
2023	0.016211
2024	0.016148
2025	0.016084
2026	0.016020
2027	0.015964
2028	0.015914
2029	0.015869
2030	0.015830
2031	0.015797
2032	0.015766
2033	0.015738
2034	0.015714
2035	0.015694

Public Information (Home Water

Overview	
Name	Public Information (Home Water
Abbr	5
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2018
Last Year	2035
Measure Length	18

Measure Life	
Permanent	☐
Years	5
Repeat	☐

Fixture Costs	Utility	Customer	Fix/Acct
SF	$31.01	$0.00	1

Administration Costs	
Markup Percentage	35%

Description

Detailed Water Billing Reports for Customers with neighborhood use comparisons and suggestions on customer specific conservation actions. Use or pattern after WaterSmart software's program. Special emphasis and contact for high water users. Design to obtain 5% water savings overall.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☐	☐	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☑							
Urinals								
Lavatory Faucets	☑							
Showers	☑							
Dishwashers	☑							
Clothes Washers	☑							
Process								
Kitchen Spray Rinse								
Internal Leakage	☑							
Baths	☑							
Other	☑							
Irrigation	☑							
Pools	☑							
Wash Down	☑							
Car Washing	☑							
External Leakage	☑							
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets	☐							

Comments

Water savings basis: WaterSmart states about 5% savings, City has lower per capita use which will result in less savings, however resulted to account 5% savings. Assume that targeting to the higher 20% of customer users would be sent a report and 4% will act on the billing report (20% over the 5 years respond). Utility costs are based on WaterSmart Software Program cost. Unit cost is assuming $6.20 per account responding and need to multiply by 5 to get to the 20% of accounts that receive a billing report.

Results	
Average Water Savings (mgd)	
0.024235	
Lifetime Savings - Present Value ($)	
Utility	$360,158
Community	$902,012
Lifetime Costs - Present Value ($)	
Utility	$468,123
Community	$468,123
Benefit to Cost Ratio	
Utility	0.77
Community	1.93
Cost of Savings per Unit Volume ($/mg)	
Utility	$2,518

End Use Savings Per Replacement	% Savings per Account
SF Toilets	5.0%
SF Lavatory Faucets	5.0%
SF Showers	5.0%
SF Dishwashers	5.0%
SF Clothes Washers	5.0%
SF Internal Leakage	5.0%
SF Baths	5.0%
SF Other	5.0%
SF Irrigation	5.0%
SF Pools	5.0%
SF Wash Down	5.0%
SF Car Washing	5.0%
SF External Leakage	5.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	4.000%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$32,339	$0	$32,339
2019	$32,460	$0	$32,460
2020	$32,580	$0	$32,580
2021	$32,713	$0	$32,713
2022	$32,847	$0	$32,847
2023	$32,980	$0	$32,980
2024	$33,113	$0	$33,113
2025	$33,246	$0	$33,246
2026	$33,382	$0	$33,382
2027	$33,518	$0	$33,518
2028	$33,654	$0	$33,654
2029	$33,791	$0	$33,791
2030	$33,927	$0	$33,927
2031	$34,052	$0	$34,052
2032	$34,178	$0	$34,178
2033	$34,304	$0	$34,304
2034	$34,430	$0	$34,430
2035	$34,555	$0	$34,555

Targets — View: Accounts

	SF	Total
2015	0	0
2016	0	0
2017	0	0
2018	772	772
2019	775	775
2020	778	778
2021	781	781
2022	785	785
2023	788	788
2024	791	791
2025	794	794
2026	797	797
2027	801	801
2028	804	804
2029	807	807
2030	810	810
2031	813	813
2032	816	816
2033	819	819
2034	822	822
2035	825	825

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.006662
2019	0.013206
2020	0.019630
2021	0.026028
2022	0.032351
2023	0.032227
2024	0.032101
2025	0.031975
2026	0.031847
2027	0.031734
2028	0.031634
2029	0.031547
2030	0.031470
2031	0.031407
2032	0.031351
2033	0.031301
2034	0.031256
2035	0.031216

Residential Leak Assistance

Overview	
Name	Residential Leak Assistance
Abbr	6
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2018
Last Year	2035
Measure Length	18

Measure Life	
Permanent	☐
Years	5
Repeat	☐

Fixture Costs	Utility	Customer	Fix/Acct
SF	$300.00	$0.00	1
MF	$500.00	$0.00	1

Administration Costs	
Markup Percentage	45%

Description

Customer leaks can go uncorrected at properties where owners are least able to pay costs of repair. These programs may require that customer leaks be repaired, but either subsidize part of the repair and/or pay the cost with revolving funds that are paid back with water bills over time. May also include an option to replace inefficient plumbing fixtures at low-income residences.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☑	☐	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐	☐						
Urinals								
Lavatory Faucets	☐	☐						
Showers	☐	☐						
Dishwashers	☐	☐						
Clothes Washers	☐	☐						
Process								
Kitchen Spray Rinse								
Internal Leakage	☑	☑						
Baths	☐	☐						
Other	☐	☐						
Irrigation	☐	☐						
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐						
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets	☐	☐						

Results	
Average Water Savings (mgd)	
	0.046894
Lifetime Savings - Present Value ($)	
Utility	$700,539
Community	$700,539
Lifetime Costs - Present Value ($)	
Utility	$761,305
Community	$761,305
Benefit to Cost Ratio	
Utility	0.92
Community	0.92
Cost of Savings per Unit Volume ($/mg)	
Utility	$2,117

End Use Savings Per Replacement	% Savings per Account
SF Internal Leakage	595.0%
MF Internal Leakage	549.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.500%
Only Effects New Accts	☐

Comments

Savings is difference between unrepaired and repaired leaks. Assumes SF accounts that have more than 100 gpd/acct leakage (MF>300 gpd/acct leakage) or more are eligible to participate (the savings percentage is estimate of 595% for SF and 549% for MF) is accounting for the fact that the "average internal leakage" of less than 10% (5.7 gpd) in the "average" home). Assuming that City pays 100% of costs for low income, utility costs are based on city checking with local plumbing contractors. Assuming that low income customers pay 0% and some cost share (like City bill credit on high bills) in the future may be considered for customers not in the PG&E Customer Care Program. For SF accts, up to $300 for leak repair or fixture replacement ($500 for MF accts.). Small faucet or toilet repair, irrigation expert to help with leak repair, or customer side service line leak. GreenPlumbers on retainer from a menu to do an upgrade. Assume $100-200 will be multi-family type repairs per dwelling unit, not per account. Cost will be multiplied by 5 for per account cost (average number of units per account), so $500 per MF acct.

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$52,233	$0	$52,233
2019	$52,505	$0	$52,505
2020	$52,777	$0	$52,777
2021	$53,013	$0	$53,013
2022	$53,248	$0	$53,248
2023	$53,484	$0	$53,484
2024	$53,719	$0	$53,719
2025	$53,955	$0	$53,955
2026	$54,241	$0	$54,241
2027	$54,527	$0	$54,527
2028	$54,813	$0	$54,813
2029	$55,099	$0	$55,099
2030	$55,385	$0	$55,385
2031	$55,632	$0	$55,632
2032	$55,879	$0	$55,879
2033	$56,127	$0	$56,127
2034	$56,374	$0	$56,374
2035	$56,621	$0	$56,621

Targets — View: Accounts

	SF	MF	Total
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	97	14	111
2019	97	14	111
2020	97	14	112
2021	98	15	112
2022	98	15	113
2023	98	15	113
2024	99	15	114
2025	99	15	114
2026	100	15	115
2027	100	15	115
2028	100	15	116
2029	101	15	116
2030	101	16	117
2031	102	16	117
2032	102	16	118
2033	102	16	118
2034	103	16	119
2035	103	16	119

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.012965
2019	0.025658
2020	0.038078
2021	0.050471
2022	0.062699
2023	0.062475
2024	0.062224
2025	0.061947
2026	0.061614
2027	0.061333
2028	0.061101
2029	0.060913
2030	0.060767
2031	0.060674
2032	0.060587
2033	0.060505
2034	0.060425
2035	0.060348

Single Family Residential Surveys

Overview	
Name	Single Family Residential Surveys
Abbr	7
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2035
Measure Length	21

Measure Life	
Permanent	☐
Years	5
Repeat	☐

Fixture Costs	Utility	Customer	Fix/Acct
SF	$100.00	$50.00	1

Administration Costs	
Markup Percentage	25%

Description

Outdoor water surveys for existing single family residential customers. Assume survey is triggered for leak forgiveness application (average in 2015 was 700 account applications). Target those with high water use and provide a customized report to owner. May include give-away of efficient shower heads, aerators, toilet devices. Would include a basic outdoor survey (look for leaks, irrigation problems & schedule, plant information, etc.). Personalized outreach to high water users with periodic follow up to maintain savings as long as possible.

Customer Classes

SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
☑	☐	☐	☐	☐	☐	☐	☐

End Uses

	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐							
Urinals								
Lavatory Faucets	☐							
Showers	☐							
Dishwashers	☐							
Clothes Washers	☐							
Process								
Kitchen Spray Rinse								
Internal Leakage	☑							
Baths	☐							
Other	☐							
Irrigation	☑							
Pools	☑							
Wash Down	☑							
Car Washing	☑							
External Leakage	☑							
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets	☐							

Comments

Target % considers pushing for more than 100 accounts per year. Utility cost based mainly on internal labor cost (2 hours of labor per survey) and some additional labor for short report. Customer costs based on customer cost to implement recommendations. Water savings based on results from Baseline Study to support conservation potential and CUWCC Cost and Savings Study, 2006.

Results	
Average Water Savings (mgd)	
0.007075	
Lifetime Savings - Present Value ($)	
Utility	$108,353
Community	$108,353
Lifetime Costs - Present Value ($)	
Utility	$419,749
Community	$587,649
Benefit to Cost Ratio	
Utility	0.26
Community	0.18
Cost of Savings per Unit Volume ($/mg)	
Utility	$7,735

End Use Savings Per Replacement	% Savings per Account
SF Internal Leakage	25.0%
SF Irrigation	10.0%
SF Pools	10.0%
SF Wash Down	10.0%
SF Car Washing	10.0%
SF External Leakage	25.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.000%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$23,871	$9,548	$33,419
2016	$23,961	$9,584	$33,545
2017	$24,051	$9,620	$33,671
2018	$24,140	$9,656	$33,797
2019	$24,230	$9,692	$33,922
2020	$24,320	$9,728	$34,048
2021	$24,420	$9,768	$34,187
2022	$24,519	$9,808	$34,327
2023	$24,619	$9,847	$34,466
2024	$24,718	$9,887	$34,605
2025	$24,818	$9,927	$34,745
2026	$24,919	$9,968	$34,887
2027	$25,021	$10,008	$35,029
2028	$25,122	$10,049	$35,171
2029	$25,224	$10,089	$35,313
2030	$25,325	$10,130	$35,455
2031	$25,419	$10,168	$35,587
2032	$25,513	$10,205	$35,718
2033	$25,607	$10,243	$35,850
2034	$25,701	$10,280	$35,981
2035	$25,795	$10,318	$36,113

Targets — View: Accounts

	SF	Total
2015	191	191
2016	192	192
2017	192	192
2018	193	193
2019	194	194
2020	195	195
2021	195	195
2022	196	196
2023	197	197
2024	198	198
2025	199	199
2026	199	199
2027	200	200
2028	201	201
2029	202	202
2030	203	203
2031	203	203
2032	204	204
2033	205	205
2034	206	206
2035	206	206

Water Savings (mgd)

	Total Savings (mgd)
2015	0.001659
2016	0.003293
2017	0.004897
2018	0.006473
2019	0.008020
2020	0.007963
2021	0.007933
2022	0.007903
2023	0.007873
2024	0.007842
2025	0.007811
2026	0.007780
2027	0.007753
2028	0.007728
2029	0.007707
2030	0.007688
2031	0.007673
2032	0.007659
2033	0.007647
2034	0.007636
2035	0.007626

Plumbing Fixture Giveaway/Opt

Overview	
Name	Plumbing Fixture Giveaway/Opt
Abbr	8
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2017
Measure Length	3

Measure Life	
Permanent	☐
Years	25
Repeat	☐

Fixture Costs	Utility	Customer	Fix/Acct
SF	$12.00	$0.00	2
MF	$12.00	$0.00	6

Administration Costs	
Markup Percentage	35%

Description

City would buy showerheads and faucet aerators in bulk and give them away at Utility office or community events. Need to coordinate this program with the School Education measure on retrofit kit giveaways to the same customer categories.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☑	☐	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐	☐						
Urinals								
Lavatory Faucets	☑	☑						
Showers	☑	☑						
Dishwashers	☐	☐						
Clothes Washers	☐	☐						
Process								
Kitchen Spray Rinse								
Internal Leakage	☐	☐						
Baths	☐	☐						
Other	☐	☐						
Irrigation	☐	☐						
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐						
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets	☐	☐						

Comments

Assumes 2 kits per SF account and 6 kits per MF account. Utility Costs provided by BAWSCA for 1.8 gpm showerhead / 1.5 gpm aerator kit. Customer cost is to repair leaks or other minor costs. Current customer participation based on WCDB Residential retrofit kits measure record (2004-2013). Assume kits save 27.6% (reduced to be conservative).

Results	
Average Water Savings (mgd)	
	0.005751
Lifetime Savings - Present Value ($)	
Utility	$90,465
Community	$310,044
Lifetime Costs - Present Value ($)	
Utility	$65,222
Community	$65,222
Benefit to Cost Ratio	
Utility	1.39
Community	4.75
Cost of Savings per Unit Volume ($/mg)	
Utility	$1,479

End Use Savings Per Replacement	% Savings per Account
SF Lavatory Faucets	6.9%
SF Showers	6.9%
MF Lavatory Faucets	6.9%
MF Showers	6.9%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	2.500%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$22,093	$0	$22,093
2016	$22,228	$0	$22,228
2017	$22,364	$0	$22,364
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets — View: Accounts

	SF	MF	Total
2015	477	68	546
2016	479	69	548
2017	481	70	551
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	0	0	0
2022	0	0	0
2023	0	0	0
2024	0	0	0
2025	0	0	0
2026	0	0	0
2027	0	0	0
2028	0	0	0
2029	0	0	0
2030	0	0	0
2031	0	0	0
2032	0	0	0
2033	0	0	0
2034	0	0	0
2035	0	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.002245
2016	0.004446
2017	0.006600
2018	0.006507
2019	0.006414
2020	0.006322
2021	0.006266
2022	0.006210
2023	0.006154
2024	0.006097
2025	0.006040
2026	0.005976
2027	0.005915
2028	0.005858
2029	0.005804
2030	0.005753
2031	0.005710
2032	0.005668
2033	0.005629
2034	0.005592
2035	0.005556

Residential Ultra High Efficiency

Overview	
Name	Residential Ultra High Efficiency T
Abbr	9
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2020
Measure Length	6

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
SF	$150.00	$150.00	2
MF	$150.00	$150.00	4

Administration Costs	
Markup Percentage	35%

Description

Provide a rebate or voucher for the installation of an ultra high efficiency toilet (UHET). Toilets flushing less than 1.0 gpf and phase out inclusion of 1.28 gpf (dual flush) technology. Rebate amounts would reflect the incremental purchase cost and have been at least $150 for UHET. Phase out HETs over time to sunset by 2020.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☑	☐	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☑	☑						
Urinals								
Lavatory Faucets	☐	☐						
Showers	☐	☐						
Dishwashers	☐	☐						
Clothes Washers	☐	☐						
Process								
Kitchen Spray Rinse								
Internal Leakage	☐	☐						
Baths	☐	☐						
Other	☐	☐						
Irrigation	☐	☐						
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐						
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets	☐	☐						

Comments

Water savings calculated from fixture models based on flush volume HET vs. 1.6 gpf. Baseline study reports that 90% of toilets are 1.6 gpf. There are not many UHET models right now, but more are entering the market annually.
Consider: implementing a Retrofit on Resale.
Consider: Graduated rebate levels. Use averages in the model. Phase out $50 on HET and focus on $150 on UHET. Tie the HET Time of Sale connected to the 2019 sunset of that ordinance with the sunset of the HET rebate.

Results	
Average Water Savings (mgd)	
	0.007561
Lifetime Savings - Present Value ($)	
Utility	$116,911
Community	$116,911
Lifetime Costs - Present Value ($)	
Utility	$308,293
Community	$536,658
Benefit to Cost Ratio	
Utility	0.38
Community	0.22
Cost of Savings per Unit Volume ($/mg)	
Utility	$5,316

End Use Savings Per Replacement	% Savings per Account
SF Toilets	37.5%
MF Toilets	37.5%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.500%
Only Effects New Accts	☐

Costs

View: Utility Details

	Fixture Costs	Admin Costs	Util Total
2015	$39,688	$13,891	$53,578
2016	$39,902	$13,966	$53,868
2017	$40,116	$14,041	$54,157
2018	$40,331	$14,116	$54,446
2019	$40,545	$14,191	$54,735
2020	$40,759	$14,266	$55,025
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets

View: Fixtures

	SF	MF	Total
2015	210	55	265
2016	211	55	266
2017	212	56	267
2018	212	56	269
2019	213	57	270
2020	214	58	272
2021	0	0	0
2022	0	0	0
2023	0	0	0
2024	0	0	0
2025	0	0	0
2026	0	0	0
2027	0	0	0
2028	0	0	0
2029	0	0	0
2030	0	0	0
2031	0	0	0
2032	0	0	0
2033	0	0	0
2034	0	0	0
2035	0	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.001592
2016	0.003154
2017	0.004682
2018	0.006176
2019	0.007637
2020	0.009065
2021	0.008984
2022	0.008904
2023	0.008823
2024	0.008741
2025	0.008660
2026	0.008567
2027	0.008479
2028	0.008397
2029	0.008320
2030	0.008247
2031	0.008184
2032	0.008125
2033	0.008069
2034	0.008015
2035	0.007964

High Efficiency Clothes Washer

Overview	
Name	High Efficiency Clothes Washer Re
Abbr	10
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2026
Measure Length	12

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
SF	$200.00	$400.00	1
MF	$200.00	$400.00	1

Administration Costs	
Markup Percentage	40%

Description

Provide a rebate for efficient washing machines to single family homes and in-unit condo/apartment complexes that do NOT have common laundry rooms. It is assumed that the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star) and only offer the best available technology. This program would be similar to the City's current program. Rebate would be modified to increase incentive for the most efficient washers. Consider alternative delivery/financing mechanisms.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☑	☐	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐	☐						
Urinals								
Lavatory Faucets	☐	☐						
Showers	☐	☐						
Dishwashers	☐	☐						
Clothes Washers	☑	☑						
Process								
Kitchen Spray Rinse								
Internal Leakage	☐	☐						
Baths	☐	☐						
Other	☐	☐						
Irrigation	☐	☐						
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐						
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets	☐	☐						

Comments

Water savings is based on difference between a 34 gallon per load machine compared to a 12 gallon per load CEE Tier 3 machine. Assumes PG&E program is ongoing. Water savings is calculated from fixture models based on washer volume. Allows participants to replace medium efficiency machines with high-efficiency ones. Customer pays incremental purchase and installation costs after rebate amount. Utility cost is based on the City's current rebate value doubled to increase participation.

Results	
Average Water Savings (mgd)	
0.077760	
Lifetime Savings - Present Value ($)	
Utility	$1,168,045
Community	$4,058,236
Lifetime Costs - Present Value ($)	
Utility	$1,666,452
Community	$4,047,097
Benefit to Cost Ratio	
Utility	0.70
Community	1.00
Cost of Savings per Unit Volume ($/mg)	
Utility	$2,794

End Use Savings Per Replacement	% Savings per Account
SF Clothes Washers	53.3%
MF Clothes Washers	53.3%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	2.500%
Only Effects New Accts	☐

Costs

View: Utility Details

	Fixture Costs	Admin Costs	Util Total
2015	$109,114	$43,645	$152,759
2016	$109,633	$43,853	$153,486
2017	$110,151	$44,061	$154,212
2018	$110,670	$44,268	$154,938
2019	$111,189	$44,476	$155,665
2020	$111,708	$44,683	$156,391
2021	$112,192	$44,877	$157,069
2022	$112,676	$45,070	$157,747
2023	$113,160	$45,264	$158,424
2024	$113,644	$45,458	$159,102
2025	$114,128	$45,651	$159,780
2026	$114,685	$45,874	$160,559
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets

View: Fixtures

	SF	MF	Total
2015	477	68	546
2016	479	69	548
2017	481	70	551
2018	483	71	553
2019	485	71	556
2020	486	72	559
2021	488	73	561
2022	490	73	563
2023	492	73	566
2024	494	74	568
2025	496	74	571
2026	498	75	573
2027	0	0	0
2028	0	0	0
2029	0	0	0
2030	0	0	0
2031	0	0	0
2032	0	0	0
2033	0	0	0
2034	0	0	0
2035	0	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.009766
2016	0.019343
2017	0.028708
2018	0.037867
2019	0.046817
2020	0.055560
2021	0.064449
2022	0.073211
2023	0.081845
2024	0.090347
2025	0.098717
2026	0.106819
2027	0.105710
2028	0.104668
2029	0.103686
2030	0.102758
2031	0.101967
2032	0.101217
2033	0.100504
2034	0.099825
2035	0.099177

High Efficiency Clothes Washer - New

Overview	
Name	High Efficiency Clothes Washer - N
Abbr	11
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2035
Measure Length	15

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
SF	$50.00	$600.00	1
MF	$50.00	$600.00	1
COM	$50.00	$1,200.00	10

Administration Costs	
Markup Percentage	40%

Description

Require developers to install an efficient clothes washer (meeting certain water efficiency standards, such as gallons/load). Building Department would be requested to ensure that an efficient washer was installed before new home or building occupancy. Verify that the Utility can enforce conditions of water service that may include efficiency standards for washing machines. Pattern after the North Marin Water District Program.

Customer Classes

SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
☑	☑	☑	☐	☐	☐	☐	☐

End Uses

	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐	☐	☐					
Urinals			☐					
Lavatory Faucets	☐	☐	☐					
Showers	☐	☐	☐					
Dishwashers	☐	☐	☐					
Clothes Washers	☑	☑	☑					
Process			☐					
Kitchen Spray Rinse			☐					
Internal Leakage	☐	☐	☐					
Baths	☐	☐						
Other	☐	☐	☐					
Irrigation	☐	☐	☐					
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐	☐					
Indoor								
Outdoor								
Cooling			☐					
tory/Kitchen Faucets	☐	☐	☐					

Comments

Water savings is based on difference between a 34 gallon per load machine compared to a 12 gallon per load CEE Tier 3 machine. Water savings based on new machines selected and paid for by developer (bearing the customer costs). Utility costs based on cost of inspection - City estimates the administrative costs of having a HECW code requirement as part of construction projects would be about $10,000 per year. This is based on 75-100 projects that would need plan review, customer contacts to explain requirements, inspections at the end of all projects, and all necessary interactions with Planning Department through the computer or by other means.

Results

Average Water Savings (mgd)	
0.012936	
Lifetime Savings - Present Value ($)	
Utility	$179,990
Community	$657,587
Lifetime Costs - Present Value ($)	
Utility	$135,761
Community	$1,771,938
Benefit to Cost Ratio	
Utility	1.33
Community	0.37
Cost of Savings per Unit Volume ($/mg)	
Utility	$1,368

End Use Savings Per Replacement

	% Savings per Account
SF Clothes Washers	53.3%
MF Clothes Washers	53.3%
COM Clothes Washers	53.3%

Targets

Target Method	Percentage
% of Accts Targeted / yr	100.000%
Only Effects New Accts	☑

Costs

View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$10,035	$113,944	$123,979
2022	$10,035	$113,944	$123,979
2023	$10,035	$113,944	$123,979
2024	$10,035	$113,944	$123,979
2025	$10,035	$113,944	$123,979
2026	$12,972	$155,540	$168,511
2027	$12,972	$155,540	$168,511
2028	$12,972	$155,540	$168,511
2029	$12,972	$155,540	$168,511
2030	$12,972	$155,540	$168,511
2031	$13,475	$172,034	$185,509
2032	$13,475	$172,034	$185,509
2033	$13,475	$172,034	$185,509
2034	$13,475	$172,034	$185,509
2035	$13,475	$172,034	$185,509

Targets

View: Accounts

	SF	MF	COM	Total
2015	0	0	0	0
2016	0	0	0	0
2017	0	0	0	0
2018	0	0	0	0
2019	0	0	0	0
2020	0	0	0	0
2021	80	17	5	101
2022	80	17	5	101
2023	80	17	5	101
2024	80	17	5	101
2025	80	17	5	101
2026	81	30	7	119
2027	81	30	7	119
2028	81	30	7	119
2029	81	30	7	119
2030	81	30	7	119
2031	75	23	9	108
2032	75	23	9	108
2033	75	23	9	108
2034	75	23	9	108
2035	75	23	9	108

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000000
2019	0.000000
2020	0.000000
2021	0.002097
2022	0.004156
2023	0.006178
2024	0.008162
2025	0.010109
2026	0.012870
2027	0.015576
2028	0.018230
2029	0.020838
2030	0.023402
2031	0.025638
2032	0.027848
2033	0.030033
2034	0.032195
2035	0.034334

Hot Water On Demand - New Development

Overview	
Name	Hot Water On Demand - New Dev
Abbr	12
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2035
Measure Length	15

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
SF	$25.00	$600.00	3
MF	$25.00	$2,767.72	14
COM	$25.00	$2,940.19	15

Administration Costs	
Markup Percentage	50%

Description

Work with developers and permitted remodels (of certain size or type) to equip new homes or buildings with efficient hot water on-demand systems such as structured plumbing 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.

Customer Classes

SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
☑	☑	☑	☐	☐	☐	☐	☐

End Uses

	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐	☐	☐					
Urinals			☐					
Lavatory Faucets	☑	☑	☑					
Showers	☑	☑	☑					
Dishwashers	☐	☐	☐					
Clothes Washers	☐	☐	☐					
Process			☐					
Kitchen Spray Rinse			☐					
Internal Leakage	☐	☐	☐					
Baths	☐	☐						
Other	☐	☐	☐					
Irrigation	☐	☐	☐					
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐	☐					
Indoor								
Outdoor								
Cooling			☐					
tory/Kitchen Faucets	☐	☐	☐					

Results

Average Water Savings (mgd)	
0.004647	
Lifetime Savings - Present Value ($)	
Utility	$64,691
Community	$223,009
Lifetime Costs - Present Value ($)	
Utility	$279,776
Community	$15,345,798
Benefit to Cost Ratio	
Utility	0.23
Community	0.01
Cost of Savings per Unit Volume ($/mg)	
Utility	$7,849

End Use Savings Per Replacement

	% Savings per Account
SF Lavatory Faucets	11.6%
MF Lavatory Faucets	11.6%
COM Lavatory Faucets	11.6%
SF Showers	11.6%
MF Showers	11.6%
COM Showers	11.6%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	100.000%
Only Effects New Accts	☑

Comments

Customer costs funded by developer and based on installation costs. Utility cost based on inspection cost. Target about 60 new SF homes per year for a total of 840 new homes inside the city by year 2030. Also an additional 2510 multi-family dwelling units by 2030. The number of fixtures per account is based on the number of bath and kitchen units. For MF accounts it's based on the ratio of dwelling units to accounts and assumes one bath unit and kitchen.

Water savings based on Jim Lutz paper and information from Gary Klein and David Grieshop. See spreadsheet titled "Hot Water On Demand Water Savings Estimate_2013", includes 1750 sq. ft. house, saves 1571 gallons per year or 4.3 gpd/acct and a total of 99.5 gpd per SF home, equates to ~4.3% savings per home. Based on a review of Single Family Home use for City of Santa Cruz customers at 30.6 gpd for faucet and 37.5 gpd for showers per household results in an equivalent savings of 12% on shower and faucet end use. Overall an estimated 7.45 gpd savings or 12% by MWM.

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$20,454	$1,003,809	$1,024,263
2022	$20,454	$1,003,809	$1,024,263
2023	$20,454	$1,003,809	$1,024,263
2024	$20,454	$1,003,809	$1,024,263
2025	$20,454	$1,003,809	$1,024,263
2026	$28,861	$1,620,580	$1,649,441
2027	$28,861	$1,620,580	$1,649,441
2028	$28,861	$1,620,580	$1,649,441
2029	$28,861	$1,620,580	$1,649,441
2030	$28,861	$1,620,580	$1,649,441
2031	$25,673	$1,430,279	$1,455,952
2032	$25,673	$1,430,279	$1,455,952
2033	$25,673	$1,430,279	$1,455,952
2034	$25,673	$1,430,279	$1,455,952
2035	$25,673	$1,430,279	$1,455,952

Targets — View: Accounts

	SF	MF	COM	Total
2015	0	0	0	0
2016	0	0	0	0
2017	0	0	0	0
2018	0	0	0	0
2019	0	0	0	0
2020	0	0	0	0
2021	80	17	5	101
2022	80	17	5	101
2023	80	17	5	101
2024	80	17	5	101
2025	80	17	5	101
2026	81	30	7	119
2027	81	30	7	119
2028	81	30	7	119
2029	81	30	7	119
2030	81	30	7	119
2031	75	23	9	108
2032	75	23	9	108
2033	75	23	9	108
2034	75	23	9	108
2035	75	23	9	108

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000000
2019	0.000000
2020	0.000000
2021	0.000764
2022	0.001513
2023	0.002249
2024	0.002972
2025	0.003680
2026	0.004665
2027	0.005630
2028	0.006577
2029	0.007506
2030	0.008420
2031	0.009199
2032	0.009969
2033	0.010730
2034	0.011482
2035	0.012227

Toilet Retrofit at Time of Sale

Overview	
Name	Toilet Retrofit at Time of Sale
Abbr	13
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2019
Measure Length	5

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
SF	$37.50	$80.25	2
MF	$37.50	$75.00	4
COM	$125.00	$500.00	10

Administration Costs	
Markup Percentage	50%

Description

Work with the real estate industry to require a certificate of compliance be submitted to the Utility that verifies that a plumber has inspected the property and efficient fixtures were either already there or were installed at time of sale (TOS).

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☑	☑	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☑	☑	☑					
Urinals			☐					
Lavatory Faucets	☐	☐	☐					
Showers	☐	☐	☐					
Dishwashers	☐	☐	☐					
Clothes Washers	☐	☐	☐					
Process			☐					
Kitchen Spray Rinse			☐					
Internal Leakage	☐	☐	☐					
Baths	☐	☐						
Other	☐	☐	☐					
Irrigation	☐	☐	☐					
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐	☐					
Indoor								
Outdoor								
Cooling			☐					
tory/Kitchen Faucets	☐	☐	☐					

Comments

Water savings assumes City's ordinance will sunset when Statewide Retrofit on Resale SB 407 goes active 2017 for residential and 2019 for commercial properties. Savings based on replacing a 3.5 gpf with a 1.28 gpf HET. Utility cost based on inspection costs. Customer costs based on purchase and installation costs. Long term housing turnover is about 2.7% per year. Commercial property turns over less frequently than residential. Fewer than 1 fixture per property is now being replaced under this ordinance. Will upgrade standard to become HET.

Results	
Average Water Savings (mgd)	
0.023134	
Lifetime Savings - Present Value ($)	
Utility	$359,499
Community	$359,499
Lifetime Costs - Present Value ($)	
Utility	$268,930
Community	$832,001
Benefit to Cost Ratio	
Utility	1.34
Community	0.43
Cost of Savings per Unit Volume ($/mg)	
Utility	$1,516

End Use Savings Per Replacement	% Savings per Account
SF Toilets	63.0%
MF Toilets	63.0%
COM Toilets	63.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.850%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$55,676	$116,610	$172,286
2016	$55,947	$117,158	$173,105
2017	$56,218	$117,706	$173,924
2018	$56,490	$118,254	$174,744
2019	$56,761	$118,802	$175,563
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets — View: Accounts

	SF	MF	COM	Total
2015	162	23	16	202
2016	163	23	16	203
2017	164	24	16	204
2018	164	24	16	205
2019	165	24	16	206
2020	0	0	0	0
2021	0	0	0	0
2022	0	0	0	0
2023	0	0	0	0
2024	0	0	0	0
2025	0	0	0	0
2026	0	0	0	0
2027	0	0	0	0
2028	0	0	0	0
2029	0	0	0	0
2030	0	0	0	0
2031	0	0	0	0
2032	0	0	0	0
2033	0	0	0	0
2034	0	0	0	0
2035	0	0	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.005652
2016	0.011199
2017	0.016633
2018	0.021955
2019	0.027166
2020	0.026803
2021	0.026583
2022	0.026363
2023	0.026143
2024	0.025924
2025	0.025704
2026	0.025458
2027	0.025226
2028	0.025007
2029	0.024799
2030	0.024603
2031	0.024432
2032	0.024269
2033	0.024114
2034	0.023965
2035	0.023823

CII MF Common Laundry Room

Overview	
Name	CII MF Common Laundry Room Hi
Abbr	14
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2024
Measure Length	10

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
MF	$400.00	$500.00	2
COM	$400.00	$500.00	4

Administration Costs	
Markup Percentage	35%

Description

Provide a $400 rebate for the installation of a high efficiency commercial washer (HEW) in CII and MF common area laundry. Rebate amounts would reflect the incremental purchase cost. Program will be shorter lived as it is intended to be a market transformation measure and eventually would be stopped as efficient units reach saturation. Currently, eligible for City's program, this is planned as an expanded measure.

Customer Classes

SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
☐	☑	☑	☐	☐	☐	☐	☐

End Uses

	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets		☐	☐					
Urinals			☐					
Lavatory Faucets		☐	☐					
Showers		☐	☐					
Dishwashers		☐	☐					
Clothes Washers		☑	☑					
Process			☐					
Kitchen Spray Rinse			☐					
Internal Leakage		☐	☐					
Baths		☐						
Other		☐	☐					
Irrigation		☐	☐					
Pools		☐						
Wash Down		☐						
Car Washing		☐						
External Leakage		☐	☐					
Indoor								
Outdoor								
Cooling			☐					
tory/Kitchen Faucets		☐	☐					

Comments

Water savings is based on difference between a 34 gallon per load machine compared to a 12 gallon per load CEE Tier 3 machine. Utility costs assume high-efficiency machine that's more expensive than a SF residential one. Customer costs based on installation costs. Engineering estimate of average savings, assume water factor is 25% less for replacement. Want on-site laundries for CII (hotels), spas, UCSC laundry, see page 49 of baseline survey. Start by considering a combination of a mandate and City funded clothes washer program for common laundry rooms that would accelerate retirement of old inefficient equipment for the next 5-10 years when codes will transform market.

Results

Average Water Savings (mgd)	
	0.007058
Lifetime Savings - Present Value ($)	
Utility	$106,946
Community	$427,131
Lifetime Costs - Present Value ($)	
Utility	$230,548
Community	$444,018
Benefit to Cost Ratio	
Utility	0.46
Community	0.96
Cost of Savings per Unit Volume ($/mg)	
Utility	$4,258

End Use Savings Per Replacement

	% Savings per Account
MF Clothes Washers	53.3%
COM Clothes Washers	53.3%

Targets

Target Method	Percentage
% of Accts Targeted / yr	0.350%
Only Effects New Accts	☐

Costs

View: Utility Details

	Fixture Costs	Admin Costs	Util Total
2015	$18,306	$6,407	$24,713
2016	$18,442	$6,455	$24,897
2017	$18,579	$6,503	$25,082
2018	$18,716	$6,550	$25,266
2019	$18,852	$6,598	$25,451
2020	$18,989	$6,646	$25,635
2021	$19,063	$6,672	$25,735
2022	$19,138	$6,698	$25,836
2023	$19,212	$6,724	$25,936
2024	$19,286	$6,750	$26,036
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets

View: Fixtures

	MF	COM	Total
2015	19	27	46
2016	19	27	46
2017	20	27	46
2018	20	27	47
2019	20	27	47
2020	20	27	47
2021	20	27	48
2022	20	27	48
2023	21	27	48
2024	21	28	48
2025	0	0	0
2026	0	0	0
2027	0	0	0
2028	0	0	0
2029	0	0	0
2030	0	0	0
2031	0	0	0
2032	0	0	0
2033	0	0	0
2034	0	0	0
2035	0	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000999
2016	0.001978
2017	0.002933
2018	0.003868
2019	0.004781
2020	0.005674
2021	0.006586
2022	0.007487
2023	0.008375
2024	0.009251
2025	0.009170
2026	0.009070
2027	0.008977
2028	0.008888
2029	0.008804
2030	0.008724
2031	0.008656
2032	0.008592
2033	0.008530
2034	0.008470
2035	0.008413

CII Incentives

Overview	
Name	CII Incentives
Abbr	15
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2026
Measure Length	6

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
MF	$500.00	$1,500.00	1
COM	$500.00	$1,500.00	2

Administration Costs	
Markup Percentage	50%

Description

After the free water use survey has been completed at site, the Utility will analyze the recommendations on the findings report that is provided and determine if site qualifies for a financial incentive. Financial incentives will be provided after analyzing the cost-benefit ratio of each proposed project. Incentives are tailored to each individual site as each site has varying water savings potentials. Incentives will be granted at the sole discretion of the Utility while funding lasts.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☐	☑	☑	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets		☑	☑					
Urinals			☐					
Lavatory Faucets		☑	☑					
Showers		☑	☑					
Dishwashers		☑	☑					
Clothes Washers		☑	☑					
Process			☐					
Kitchen Spray Rinse			☐					
Internal Leakage		☑	☑					
Baths		☐						
Other		☐	☐					
Irrigation		☑	☑					
Pools		☐						
Wash Down		☐						
Car Washing		☐						
External Leakage		☑	☑					
Indoor								
Outdoor								
Cooling			☐					
tory/Kitchen Faucets		☑	☑					

Comments

Water savings based on engineering estimate of average savings for MF CII Facilities receiving an incentive. Assume targeting larger accounts with use above 5,000 gpd or the top 3% (about 200 accounts). Utility costs set-up similar to SNWA and EBMUD. Large accounts have moved down in use - efficiency has happened. Utility costs based on paying for $200 to help replace CII toilet. Currently, running about $22 per 1000 gals per year. Basis for cost sharing. Assume utility cost may triple as more expensive rebates are requested. Customer costs based on labor installation costs. This is a designer rebate or grant program that depends on viable projects documented in survey.

Results	
Average Water Savings (mgd)	
	0.031363
Lifetime Savings - Present Value ($)	
Utility	$449,234
Community	$1,482,337
Lifetime Costs - Present Value ($)	
Utility	$128,134
Community	$384,401
Benefit to Cost Ratio	
Utility	3.51
Community	3.86
Cost of Savings per Unit Volume ($/mg)	
Utility	$533

End Use Savings Per Replacement	% Savings per Account
MF Toilets	55.6%
COM Toilets	71.4%
MF Lavatory Faucets	55.6%
COM Lavatory Faucets	71.4%
MF Showers	55.6%
COM Showers	71.4%
MF Dishwashers	55.6%
COM Dishwashers	71.4%
MF Clothes Washers	55.6%
COM Clothes Washers	71.4%
MF Internal Leakage	55.6%
COM Internal Leakage	71.4%
MF Irrigation	55.6%
COM Irrigation	71.4%
MF External Leakage	55.6%
COM External Leakage	71.4%
Non-Lavatory/Kitchen Fa	55.6%
Non-Lavatory/Kitchen Fa	71.4%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.500%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$25,531	$51,062	$76,593
2022	$25,631	$51,261	$76,892
2023	$25,730	$51,460	$77,190
2024	$25,830	$51,659	$77,489
2025	$25,929	$51,858	$77,787
2026	$26,098	$52,195	$78,293
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets — View: Accounts

	MF	COM	Total
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	15	10	24
2022	15	10	24
2023	15	10	24
2024	15	10	25
2025	15	10	25
2026	15	10	25
2027	0	0	0
2028	0	0	0
2029	0	0	0
2030	0	0	0
2031	0	0	0
2032	0	0	0
2033	0	0	0
2034	0	0	0
2035	0	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000000
2019	0.000000
2020	0.000000
2021	0.009326
2022	0.018534
2023	0.027627
2024	0.036605
2025	0.045468
2026	0.054144
2027	0.053614
2028	0.053111
2029	0.052634
2030	0.052179
2031	0.051791
2032	0.051420
2033	0.051064
2034	0.050722
2035	0.050393

Pre-Rinse Spray Nozzle Installation

Overview	
Name	Pre-Rinse Spray Nozzle Installatio
Abbr	16
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2016
Measure Length	2

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
COM	$100.00	$0.00	1

Administration Costs	
Markup Percentage	40%

Description

Provide free 1.3 gpm (or lower) spray nozzles and possibly free installation for the rinse and clean operation in restaurants and other commercial kitchens. Thousands have been replaced in California going door to door, very cost-effective because saves hot water. Project completed in 2014.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☐	☐	☑	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets			☐					
Urinals			☐					
Lavatory Faucets			☐					
Showers			☐					
Dishwashers			☐					
Clothes Washers			☐					
Process			☐					
Kitchen Spray Rinse			☑					
Internal Leakage			☐					
Baths								
Other			☐					
Irrigation			☐					
Pools								
Wash Down								
Car Washing								
External Leakage			☐					
Indoor								
Outdoor								
Cooling			☐					
tory/Kitchen Faucets			☐					

Comments

Water savings based on back calculation from the City's baseline survey; use 1.3 gpm Fisher. Scaled up end-use savings to allow for more savings on the average account. Only 2 year program. Using 7.2 scaling factor for the "average" CII customer does not have high enough demand for this end use, which therefore is estimated at 360% for this end use for restaurant customers only. Utility costs are based on $50 for valve, $50 for installation including door to distribution. Plan on about 200 sites with up to 300 valves in the service area. Renew every ten years.

Results	
Average Water Savings (mgd)	
0.025722	
Lifetime Savings - Present Value ($)	
Utility	$405,820
Community	$3,820,600
Lifetime Costs - Present Value ($)	
Utility	$30,202
Community	$30,202
Benefit to Cost Ratio	
Utility	13.44
Community	126.50
Cost of Savings per Unit Volume ($/mg)	
Utility	$153

End Use Savings Per Replacement	% Savings per Account
COM Kitchen Spray Rins	360.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	5.710%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$15,236	$0	$15,236
2016	$15,303	$0	$15,303
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets — View: Accounts

	COM	Total
2015	109	109
2016	109	109
2017	0	0
2018	0	0
2019	0	0
2020	0	0
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.014123
2016	0.028031
2017	0.027754
2018	0.027485
2019	0.027224
2020	0.026969
2021	0.026818
2022	0.026673
2023	0.026531
2024	0.026395
2025	0.026262
2026	0.026130
2027	0.026002
2028	0.025877
2029	0.025756
2030	0.025638
2031	0.025522
2032	0.025408
2033	0.025298
2034	0.025190
2035	0.025084

CII Surveys

Overview	
Name	CII Surveys
Abbr	17
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2026
Measure Length	6

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
MF	$4,000.00	$500.00	1
COM	$4,000.00	$500.00	2

Administration Costs	
Markup Percentage	50%

Description

Offer top water customers from each category a professional water survey that would evaluate ways for the business 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. Emphasis will be on supporting the top 25 users for each customer category.

Customer Classes

	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☐	☑	☑	☐	☐	☐	☐	☐

End Uses

	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets		☑	☑					
Urinals			☐					
Lavatory Faucets		☑	☑					
Showers		☑	☑					
Dishwashers		☑	☑					
Clothes Washers		☑	☑					
Process			☐					
Kitchen Spray Rinse			☐					
Internal Leakage		☑	☑					
Baths		☐						
Other		☐	☐					
Irrigation		☑	☑					
Pools		☐						
Wash Down		☐						
Car Washing		☐						
External Leakage		☑	☑					
Indoor								
Outdoor								
Cooling			☐					
tory/Kitchen Faucets		☑	☑					

Comments

Water savings based on CUWCC Cost and Savings Study (2005) report of potential savings ranging from 11 to 29%, assuming all projects are implemented. Assume 30% potential and 35% compliance, CUWCC Cost and Savings Study, 2005, page 2-66-68. Assume 10% due to survey only, rest of savings comes from participation in an incentive program. Assume shared savings between survey and incentives for overall 20% per facility. Targeting large accounts. Utility costs based on CUWCC Cost and Savings Study (2005) report of cost range from $600 to $8,000. Customer costs based on installation costs. Large CII users are already receiving landscape water use reports and surveys.

Results

Average Water Savings (mgd)	
	0.032952
Lifetime Savings - Present Value ($)	
Utility	$472,192
Community	$1,475,766
Lifetime Costs - Present Value ($)	
Utility	$1,025,069
Community	$1,110,492
Benefit to Cost Ratio	
Utility	0.46
Community	1.33
Cost of Savings per Unit Volume ($/mg)	
Utility	$4,056

End Use Savings Per Replacement

	% Savings per Account
MF Toilets	71.4%
COM Toilets	55.6%
MF Lavatory Faucets	71.4%
COM Lavatory Faucets	55.6%
MF Showers	71.4%
COM Showers	55.6%
MF Dishwashers	71.4%
COM Dishwashers	55.6%
MF Clothes Washers	71.4%
COM Clothes Washers	55.6%
MF Internal Leakage	71.4%
COM Internal Leakage	55.6%
MF Irrigation	71.4%
COM Irrigation	55.6%
MF External Leakage	71.4%
COM External Leakage	55.6%
Non-Lavatory/Kitchen Fa	71.4%
Non-Lavatory/Kitchen Fa	55.6%

Targets

Target Method	Percentage
% of Accts Targeted / yr	0.500%
Only Effects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$204,249	$17,021	$221,270
2022	$205,045	$17,087	$222,132
2023	$205,841	$17,153	$222,994
2024	$206,636	$17,220	$223,856
2025	$207,432	$17,286	$224,718
2026	$208,780	$17,398	$226,179
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets

View: Accounts

	MF	COM	Total
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	15	10	24
2022	15	10	24
2023	15	10	24
2024	15	10	25
2025	15	10	25
2026	15	10	25
2027	0	0	0
2028	0	0	0
2029	0	0	0
2030	0	0	0
2031	0	0	0
2032	0	0	0
2033	0	0	0
2034	0	0	0
2035	0	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000000
2019	0.000000
2020	0.000000
2021	0.009853
2022	0.019574
2023	0.029163
2024	0.038619
2025	0.047944
2026	0.057043
2027	0.056422
2028	0.055836
2029	0.055280
2030	0.054753
2031	0.054310
2032	0.053887
2033	0.053483
2034	0.053095
2035	0.052723

High Efficiency Urinal Program

Overview	
Name	High Efficiency Urinal Program
Abbr	18
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2018
Measure Length	4

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
COM	$300.00	$200.00	2
MUN	$300.00	$200.00	2
IND	$300.00	$200.00	2

Administration Costs	
Markup Percentage	35%

Description

Provide a rebate or voucher for the installation of high efficiency urinals (HEU). Recent CEC requirements denote flushing as low as 0.125 gpf (1 pint).

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☐	☐	☑	☑	☑	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets			☐	☐	☐			
Urinals			☑	☑	☑			
Lavatory Faucets			☐	☐	☐			
Showers			☐	☐	☐			
Dishwashers			☐	☐	☐			
Clothes Washers			☐	☐	☐			
Process			☐		☐			
Kitchen Spray Rinse			☐	☐				
Internal Leakage			☐	☐	☐			
Baths								
Other			☐	☐	☐			
Irrigation			☐	☐	☐			
Pools								
Wash Down								
Car Washing								
External Leakage			☐	☐	☐			
Indoor								
Outdoor								
Cooling			☐	☐	☐			
tory/Kitchen Faucets			☐	☐	☐			

Comments

Water savings assumes 50% of urinal replacements use 1 gpf and up, and 50% are 0.5 and .25 gpf urinals being replaced with 0.125 gpf pint urinals. Baseline Survey found lower saturation in restaurants and office buildings. Schools were 100% high efficiency. Utility costs based on fixture cost. Customer costs based on installation costs. Comprehensive City, school, and other government buildings urinal replacement with 0.125 gpf or less. City could potentially fund 100% of costs.

Results	
Average Water Savings (mgd)	
0.008515	
Lifetime Savings - Present Value ($)	
Utility	$132,704
Community	$132,704
Lifetime Costs - Present Value ($)	
Utility	$340,958
Community	$509,333
Benefit to Cost Ratio	
Utility	0.39
Community	0.26
Cost of Savings per Unit Volume ($/mg)	
Utility	$5,220

End Use Savings Per Replacement	% Savings per Account
COM Urinals	80.0%
MUN Urinals	80.0%
IND Urinals	80.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	5.000%
Only Effects New Accts	☐

Costs

View: Utility Details

	Fixture Costs	Admin Costs	Util Total
2015	$64,887	$22,710	$87,597
2016	$65,143	$22,800	$87,943
2017	$65,399	$22,890	$88,288
2018	$65,655	$22,979	$88,634
2019	$0	$0	$0
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets

View: Fixtures

	COM	MUN	IND	Total
2015	191	22	4	216
2016	191	22	4	217
2017	192	22	4	218
2018	193	22	4	219
2019	0	0	0	0
2020	0	0	0	0
2021	0	0	0	0
2022	0	0	0	0
2023	0	0	0	0
2024	0	0	0	0
2025	0	0	0	0
2026	0	0	0	0
2027	0	0	0	0
2028	0	0	0	0
2029	0	0	0	0
2030	0	0	0	0
2031	0	0	0	0
2032	0	0	0	0
2033	0	0	0	0
2034	0	0	0	0
2035	0	0	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.002435
2016	0.004837
2017	0.007206
2018	0.009544
2019	0.009463
2020	0.009385
2021	0.009339
2022	0.009295
2023	0.009253
2024	0.009212
2025	0.009171
2026	0.009132
2027	0.009093
2028	0.009055
2029	0.009018
2030	0.008983
2031	0.008947
2032	0.008913
2033	0.008879
2034	0.008846
2035	0.008814

Public Restroom Faucet Retrofit

Overview	
Name	Public Restroom Faucet Retrofit -
Abbr	19
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2023
Measure Length	3

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
MUN	$300.00	$200.00	4

Administration Costs	
Markup Percentage	35%

Description

Direct install of high efficiency (0.5 gpm) sensor faucet fixtures in all or selected high-use institutional buildings.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☐	☐	☐	☑	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets				☐				
Urinals				☐				
Lavatory Faucets				☑				
Showers				☐				
Dishwashers				☐				
Clothes Washers				☐				
Process								
Kitchen Spray Rinse				☐				
Internal Leakage				☐				
Baths								
Other				☐				
Irrigation				☐				
Pools								
Wash Down								
Car Washing								
External Leakage				☐				
Indoor								
Outdoor								
Cooling				☐				
tory/Kitchen Faucets				☐				

Comments

Water savings based on reduction in flow rate from existing 2 gpm to 0.5 gpm or 75% reduction. Page 51 of Baseline Study. 2.2-1.5 gpm is basis. Measured by WaterWise. Customer costs based on installation costs. Utility costs based on a rebate for full fixture costs. No official limit on total number per site, but assume up to 6 per site. Schools and public beach restrooms.

Results	
Average Water Savings (mgd)	
0.000554	
Lifetime Savings - Present Value ($)	
Utility	$8,077
Community	$16,588
Lifetime Costs - Present Value ($)	
Utility	$99,747
Community	$149,005
Benefit to Cost Ratio	
Utility	0.08
Community	0.11
Cost of Savings per Unit Volume ($/mg)	
Utility	$23,467

End Use Savings Per Replacement	% Savings per Account
MUN Lavatory Faucets	75.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	11.000%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$38,848	$19,184	$58,032
2022	$38,848	$19,184	$58,032
2023	$38,848	$19,184	$58,032
2024	$0	$0	$0
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets — View: Accounts

	MUN	Total
2015	0	0
2016	0	0
2017	0	0
2018	0	0
2019	0	0
2020	0	0
2021	24	24
2022	24	24
2023	24	24
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000000
2019	0.000000
2020	0.000000
2021	0.000287
2022	0.000571
2023	0.000852
2024	0.000848
2025	0.000844
2026	0.000841
2027	0.000837
2028	0.000833
2029	0.000829
2030	0.000825
2031	0.000822
2032	0.000818
2033	0.000814
2034	0.000810
2035	0.000807

Public Restroom Faucet Retrofit

Overview	
Name	Public Restroom Faucet Retrofit -
Abbr	20
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2030
Measure Length	10

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
COM	$300.00	$100.00	4

Administration Costs	
Markup Percentage	35%

Description

Rebate Program for installation of high efficiency (0.5 gpm) sensor faucet fixtures in all or selected high-use commercial buildings.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☐	☐	☑	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets			☐					
Urinals			☐					
Lavatory Faucets			☑					
Showers			☐					
Dishwashers			☐					
Clothes Washers			☐					
Process			☐					
Kitchen Spray Rinse			☐					
Internal Leakage			☐					
Baths								
Other			☐					
Irrigation			☐					
Pools								
Wash Down								
Car Washing								
External Leakage			☐					
Indoor								
Outdoor								
Cooling			☐					
tory/Kitchen Faucets			☐					

Comments

Water savings based on reduction in flow rate from existing 2 gpm to 0.5 gpm or 75% reduction. Page 51 of Baseline Study. 2.2-1.5 gpm is basis. Measured by WaterWise. Customer costs based on installation costs. Utility costs based on a rebate for full fixture costs. No official limit on total number per site, but assume up to 6 per site. Large restaurants, spas, etc.

Results	
Average Water Savings (mgd)	
0.011851	
Lifetime Savings - Present Value ($)	
Utility	$167,271
Community	$386,622
Lifetime Costs - Present Value ($)	
Utility	$889,040
Community	$1,108,555
Benefit to Cost Ratio	
Utility	0.19
Community	0.35
Cost of Savings per Unit Volume ($/mg)	
Utility	$9,780

End Use Savings Per Replacement	% Savings per Account
COM Lavatory Faucets	75.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	3.500%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$110,722	$27,339	$138,061
2022	$110,986	$27,404	$138,390
2023	$111,250	$27,469	$138,719
2024	$111,514	$27,534	$139,048
2025	$111,778	$27,599	$139,377
2026	$112,197	$27,703	$139,900
2027	$112,616	$27,806	$140,423
2028	$113,035	$27,910	$140,945
2029	$113,455	$28,013	$141,468
2030	$113,874	$28,117	$141,991
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets — View: Accounts

	COM	Total
2015	0	0
2016	0	0
2017	0	0
2018	0	0
2019	0	0
2020	0	0
2021	68	68
2022	69	69
2023	69	69
2024	69	69
2025	69	69
2026	69	69
2027	70	70
2028	70	70
2029	70	70
2030	70	70
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000000
2019	0.000000
2020	0.000000
2021	0.002451
2022	0.004881
2023	0.007291
2024	0.009683
2025	0.012057
2026	0.014416
2027	0.016762
2028	0.019096
2029	0.021419
2030	0.023731
2031	0.023623
2032	0.023518
2033	0.023415
2034	0.023315
2035	0.023218

School Retrofit

Overview	
Name	School Retrofit
Abbr	21
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2030
Measure Length	10

Measure Life	
Permanent	☐
Years	27
Repeat	☐

Fixture Costs	Utility	Customer	Fix/Acct
MUN	$2,500.00	$2,500.00	1

Administration Costs	
Markup Percentage	35%

Description

School retrofit program wherein school receives a grant to replace fixtures and upgrade irrigation systems. Expand current City Program, pattern after EBMUD and MWD programs. Promote to schools for cash flow upfront. Review Generation Water program.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☐	☐	☐	☑	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets				☑				
Urinals				☑				
Lavatory Faucets				☑				
Showers				☑				
Dishwashers				☐				
Clothes Washers				☐				
Process								
Kitchen Spray Rinse				☐				
Internal Leakage				☑				
Baths								
Other				☐				
Irrigation				☑				
Pools								
Wash Down								
Car Washing								
External Leakage				☑				
Indoor								
Outdoor								
Cooling				☐				
tory/Kitchen Faucets				☐				

Comments

Water savings based on doing two schools per year and assuming a reduction in use of 25% below a current use of 3,000 gpd. Costs assume $5,000 split 50:50 between customer and City. Might have to couple with survey of school sites first, and a landscape survey.

Results	
Average Water Savings (mgd)	
0.004042	
Lifetime Savings - Present Value ($)	
Utility	$56,200
Community	$56,200
Lifetime Costs - Present Value ($)	
Utility	$58,362
Community	$101,593
Benefit to Cost Ratio	
Utility	0.96
Community	0.55
Cost of Savings per Unit Volume ($/mg)	
Utility	$1,883

End Use Savings Per Replacement	% Savings per Account
MUN Toilets	88.2%
MUN Urinals	88.2%
MUN Lavatory Faucets	88.2%
MUN Showers	88.2%
MUN Internal Leakage	88.2%
MUN Irrigation	88.2%
MUN External Leakage	88.2%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.000%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$7,358	$5,450	$12,808
2022	$7,358	$5,450	$12,808
2023	$7,358	$5,450	$12,808
2024	$7,358	$5,450	$12,808
2025	$7,358	$5,450	$12,808
2026	$7,358	$5,450	$12,808
2027	$7,358	$5,450	$12,808
2028	$7,358	$5,450	$12,808
2029	$7,358	$5,450	$12,808
2030	$7,358	$5,450	$12,808
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets — View: Accounts

	MUN	Total
2015	0	0
2016	0	0
2017	0	0
2018	0	0
2019	0	0
2020	0	0
2021	2	2
2022	2	2
2023	2	2
2024	2	2
2025	2	2
2026	2	2
2027	2	2
2028	2	2
2029	2	2
2030	2	2
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000000
2019	0.000000
2020	0.000000
2021	0.000841
2022	0.001675
2023	0.002502
2024	0.003321
2025	0.004132
2026	0.004936
2027	0.005732
2028	0.006521
2029	0.007303
2030	0.008077
2031	0.008041
2032	0.008004
2033	0.007967
2034	0.007931
2035	0.007895

Water Efficient Landscape Ordinance

Overview

Name	Water Efficient Landscape Ordinance
Abbr	22
Category	Default
Measure Type	Standard Measure

Time Period

First Year	2015
Last Year	2035
Measure Length	21

Measure Life

Permanent	☐
Years	27
Repeat	☐

Fixture Costs

	Utility	Customer	Fix/Acct
SF	$0.00	$0.00	0
MF	$50.00	$1,000.00	1
COM	$100.00	$2,500.00	1
MUN	$100.00	$2,500.00	1
IND	$100.00	$2,500.00	1

Administration Costs

Markup Percentage	35%

Description

Include less irrigation demand for new accounts due to more efficient landscape designs because of City Code (implementation of Statewide Model Landscape Ordinance). Update City Code to keep pace with new state regulations and technology for irrigation controllers and irrigation equipment. Updated MWELO based on changes Dec 1, 2015. City changes are pending as of January 31, 2016.

Customer Classes

SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
☑	☑	☑	☑	☑	☐	☐	☐

End Uses

	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐	☐	☐	☐	☐			
Urinals			☐	☐	☐			
Lavatory Faucets	☐	☐	☐	☐	☐			
Showers	☐	☐	☐	☐	☐			
Dishwashers	☐	☐	☐	☐	☐			
Clothes Washers	☐	☐	☐	☐	☐			
Process			☐		☐			
Kitchen Spray Rinse			☐	☐				
Internal Leakage	☐	☐	☐	☐	☐			
Baths	☐	☐						
Other	☐	☐	☐	☐	☐			
Irrigation	☑	☑	☑	☑	☑			
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐	☐	☐	☐			
Indoor								
Outdoor								
Cooling			☐	☐	☐			
tory/Kitchen Faucets	☐	☐	☐	☐	☐			

Comments

Water savings based on native landscaping (Xeriscape) over efficiently irrigated turf grass per City Code Chapter 16.16.
http://www.cityofsantacruz.com
Utility costs based on application and inspection. Customer costs based on Xeriscape replacing turf. Based on ordinance limit of 2,500 square feet. Assumed increased by 10% savings and added in single family homes to new Ordiance.

Results

Average Water Savings (mgd)	
0.010291	
Lifetime Savings - Present Value ($)	
Utility	$149,120
Community	$149,120
Lifetime Costs - Present Value ($)	
Utility	$47,531
Community	$816,763
Benefit to Cost Ratio	
Utility	3.14
Community	0.18
Cost of Savings per Unit Volume ($/mg)	
Utility	$602

End Use Savings Per Replacement

	% Savings per Account
MF Irrigation	35.0%
COM Irrigation	35.0%
MUN Irrigation	35.0%
IND Irrigation	35.0%
SF Irrigation	0.0%

Targets

Target Method	Percentage
% of Accts Targeted / yr	100.000%
Only Effects New Accts	☑

Costs

View: Summary

	Utility	Customer	Total
2015	$3,306	$53,245	$56,551
2016	$3,306	$53,245	$56,551
2017	$3,306	$53,245	$56,551
2018	$3,306	$53,245	$56,551
2019	$3,306	$53,245	$56,551
2020	$3,306	$53,245	$56,551
2021	$1,841	$29,782	$31,623
2022	$1,841	$29,782	$31,623
2023	$1,841	$29,782	$31,623
2024	$1,841	$29,782	$31,623
2025	$1,841	$29,782	$31,623
2026	$3,067	$49,253	$52,320
2027	$3,067	$49,253	$52,320
2028	$3,067	$49,253	$52,320
2029	$3,067	$49,253	$52,320
2030	$3,067	$49,253	$52,320
2031	$2,853	$47,046	$49,899
2032	$2,853	$47,046	$49,899
2033	$2,853	$47,046	$49,899
2034	$2,853	$47,046	$49,899
2035	$2,853	$47,046	$49,899

Targets

View: Accounts

	SF	MF	COM	MUN	IND	Total
2015	72	32	8	0	0	112
2016	72	32	8	0	0	112
2017	72	32	8	0	0	112
2018	72	32	8	0	0	112
2019	72	32	8	0	0	112
2020	72	32	8	0	0	112
2021	80	17	5	0	0	102
2022	80	17	5	0	0	102
2023	80	17	5	0	0	102
2024	80	17	5	0	0	102
2025	80	17	5	0	0	102
2026	81	30	7	0	0	119
2027	81	30	7	0	0	119
2028	81	30	7	0	0	119
2029	81	30	7	0	0	119
2030	81	30	7	0	0	119
2031	75	23	9	0	0	108
2032	75	23	9	0	0	108
2033	75	23	9	0	0	108
2034	75	23	9	0	0	108
2035	75	23	9	0	0	108

Water Savings (mgd)

	Total Savings (mgd)
2015	0.001258
2016	0.002477
2017	0.003655
2018	0.004795
2019	0.005897
2020	0.006962
2021	0.007582
2022	0.008191
2023	0.008789
2024	0.009376
2025	0.009952
2026	0.010882
2027	0.011797
2028	0.012696
2029	0.013582
2030	0.014454
2031	0.015230
2032	0.015998
2033	0.016759
2034	0.017513
2035	0.018260

Single Family Residential Turf Removal

Overview	
Name	Single Family Residential Turf Rem
Abbr	23
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2035
Measure Length	21

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
SF	$1,000.00	$2,000.00	1

Administration Costs	
Markup Percentage	25%

Description

Provide a per-square-foot incentive to remove turf and replace with low-water-use plants or permeable hardscape. Pattern after the City's current program. Rebate is currently $0.50 per square foot removed and capped at $500 for single family residence. Increase rebate to $1 per square foot or more and raise maximum to $1,000 or more to increase participation.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☐	☐	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐							
Urinals								
Lavatory Faucets	☐							
Showers	☐							
Dishwashers	☐							
Clothes Washers	☐							
Process								
Kitchen Spray Rinse								
Internal Leakage	☐							
Baths	☐							
Other	☐							
Irrigation	☑							
Pools	☐							
Wash Down	☐							
Car Washing	☐							
External Leakage	☐							
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets	☐							

Comments

Estimated water savings are 19 gallons per square foot. CUWCC Cost and Savings Study (2005) reports up to 39% savings in summer. Assume 50% of landscaping removed and replaced with low water use that uses 50% less water so overall irrigation savings may be on the order of 35% (documented up to maximum of 38%). Note some system efficiency/residual overwatering may still occur. Costs assume $3/per square foot. Net cost to customer is $2/square foot for 1,000 square feet.

Results	
Average Water Savings (mgd)	
0.006175	
Lifetime Savings - Present Value ($)	
Utility	$88,847
Community	$88,847
Lifetime Costs - Present Value ($)	
Utility	$1,049,373
Community	$2,728,369
Benefit to Cost Ratio	
Utility	0.08
Community	0.03
Cost of Savings per Unit Volume ($/mg)	
Utility	$22,157

End Use Savings Per Replacement	% Savings per Account
SF Irrigation	35.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.250%
Only Effects New Accts	☐

Costs

View: Utility Details

	Fixture Costs	Admin Costs	Util Total
2015	$47,742	$11,935	$59,677
2016	$47,921	$11,980	$59,902
2017	$48,101	$12,025	$60,126
2018	$48,281	$12,070	$60,351
2019	$48,460	$12,115	$60,576
2020	$48,640	$12,160	$60,800
2021	$48,839	$12,210	$61,049
2022	$49,038	$12,260	$61,298
2023	$49,237	$12,309	$61,546
2024	$49,436	$12,359	$61,795
2025	$49,635	$12,409	$62,044
2026	$49,838	$12,460	$62,298
2027	$50,041	$12,510	$62,552
2028	$50,244	$12,561	$62,805
2029	$50,447	$12,612	$63,059
2030	$50,651	$12,663	$63,313
2031	$50,838	$12,710	$63,548
2032	$51,026	$12,757	$63,783
2033	$51,214	$12,803	$64,017
2034	$51,402	$12,850	$64,252
2035	$51,589	$12,897	$64,487

Targets

View: Accounts

	SF	Total
2015	48	48
2016	48	48
2017	48	48
2018	48	48
2019	48	48
2020	49	49
2021	49	49
2022	49	49
2023	49	49
2024	49	49
2025	50	50
2026	50	50
2027	50	50
2028	50	50
2029	50	50
2030	51	51
2031	51	51
2032	51	51
2033	51	51
2034	51	51
2035	52	52

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000612
2016	0.001214
2017	0.001806
2018	0.002387
2019	0.002957
2020	0.003517
2021	0.004080
2022	0.004636
2023	0.005185
2024	0.005728
2025	0.006263
2026	0.006791
2027	0.007316
2028	0.007838
2029	0.008357
2030	0.008875
2031	0.009392
2032	0.009908
2033	0.010423
2034	0.010936
2035	0.011449

Multifamily Residential/CII Turf Removal

Overview	
Name	Multifamily Residential/CII Turf Removal
Abbr	24
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2035
Measure Length	21

Measure Life	
Permanent	☑

Fixture Costs

	Utility	Customer	Fix/Acct
MF	$2,000.00	$8,000.00	1
COM	$5,000.00	$10,000.00	1
MUN	$5,000.00	$10,000.00	1
IRR	$5,000.00	$10,000.00	1

Administration Costs	
Markup Percentage	25%

Description

Provide a per-square-foot incentive to remove turf and replace with low-water-use plants or hardscape. Pattern after the City's current program. Rebate is currently $0.50 per square foot removed and capped at $2,500 for multi-family or commercial residences. Increase rebate to $1 per square foot or more and raise maximum amount to $5,000 or more to increase participation.

Customer Classes

SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
☐	☑	☑	☑	☐	☐	☑	☐

End Uses

	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets		☐	☐	☐				
Urinals			☐	☐				
Lavatory Faucets		☐	☐	☐				
Showers		☐	☐	☐				
Dishwashers		☐	☐	☐				
Clothes Washers		☐	☐	☐				
Process			☐					
Kitchen Spray Rinse			☐	☐				
Internal Leakage		☐	☐	☐				
Baths		☐						
Other		☐	☐	☐				
Irrigation		☑	☑	☑			☑	
Pools		☐						
Wash Down		☐						
Car Washing		☐						
External Leakage		☐	☐	☐			☐	
Indoor								
Outdoor								
Cooling			☐	☐				
tory/Kitchen Faucets		☐	☐	☐				

Comments

Estimated water savings are 19 gallons per square foot from high water use plants (turf grass) at Plant Factor (PF) 0.8 compared to low water use plants at PF of 0.4. Evapotranspiration (ETo) for Santa Cruz is relatively low at 36 inches per year. Assume 50% square footage is replaced. Costs assume $3/per square foot. Net cost to customer is $2/square foot for 1,000 square feet.

Results

Average Water Savings (mgd)	
0.003519	
Lifetime Savings - Present Value ($)	
Utility	$50,616
Community	$50,616
Lifetime Costs - Present Value ($)	
Utility	$868,786
Community	$2,661,845
Benefit to Cost Ratio	
Utility	0.06
Community	0.02
Cost of Savings per Unit Volume ($/mg)	
Utility	$32,186

End Use Savings Per Replacement

	% Savings per Account
MF Irrigation	35.0%
COM Irrigation	35.0%
MUN Irrigation	5.0%
IRR Irrigation	5.0%

Targets

Target Method	Percentage
% of Accts Targeted / yr	0.200%
Only Effects New Accts	☐

Costs

View: Utility Details

	Fixture Costs	Admin Costs	Util Total
2015	$37,233	$9,308	$46,541
2016	$37,729	$9,432	$47,162
2017	$38,226	$9,556	$47,782
2018	$38,722	$9,681	$48,403
2019	$39,219	$9,805	$49,023
2020	$39,715	$9,929	$49,644
2021	$39,975	$9,994	$49,968
2022	$40,234	$10,059	$50,293
2023	$40,494	$10,123	$50,617
2024	$40,753	$10,188	$50,941
2025	$41,012	$10,253	$51,266
2026	$41,451	$10,363	$51,814
2027	$41,890	$10,472	$52,362
2028	$42,328	$10,582	$52,910
2029	$42,767	$10,692	$53,459
2030	$43,205	$10,801	$54,007
2031	$43,604	$10,901	$54,506
2032	$44,003	$11,001	$55,004
2033	$44,402	$11,101	$55,503
2034	$44,801	$11,200	$56,002
2035	$45,200	$11,300	$56,501

Targets

View: Accounts

	MF	COM	MUN	IRR	Total
2015	5	4	0	1	11
2016	6	4	0	1	11
2017	6	4	0	1	11
2018	6	4	0	1	11
2019	6	4	0	1	11
2020	6	4	0	1	11
2021	6	4	0	1	11
2022	6	4	0	1	12
2023	6	4	0	1	12
2024	6	4	0	1	12
2025	6	4	0	1	12
2026	6	4	0	1	12
2027	6	4	0	2	12
2028	6	4	0	2	12
2029	6	4	0	2	12
2030	6	4	0	2	12
2031	6	4	0	2	12
2032	6	4	0	2	13
2033	6	4	0	2	13
2034	6	4	0	2	13
2035	6	4	0	2	13

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000347
2016	0.000689
2017	0.001023
2018	0.001350
2019	0.001672
2020	0.001986
2021	0.002309
2022	0.002629
2023	0.002945
2024	0.003258
2025	0.003568
2026	0.003869
2027	0.004170
2028	0.004469
2029	0.004766
2030	0.005063
2031	0.005362
2032	0.005661
2033	0.005958
2034	0.006255
2035	0.006551

Expand Large Landscape Survey/Water

Overview	
Name	Expand Large Landscape Survey/V
Abbr	25
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2018
Last Year	2035
Measure Length	18

Measure Life	
Permanent	☐
Years	10
Repeat	☐

Fixture Costs	Utility	Customer	Fix/Acct
IRR	$1,500.00	$1,500.00	1

Administration Costs	
Markup Percentage	45%

Description

Outdoor water audits offered for existing large landscape customers. Normally those with high water use are targeted and provided a customized report on how to save water. All large multifamily residential, CII, and public irrigators of large landscapes would be eligible for free landscape water audits upon request. Tied to the Water Budget Program.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☐	☐	☐	☐	☐	☐	☑	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets								
Urinals								
Lavatory Faucets								
Showers								
Dishwashers								
Clothes Washers								
Process								
Kitchen Spray Rinse								
Internal Leakage								
Baths								
Other								
Irrigation							☑	
Pools								
Wash Down								
Car Washing								
External Leakage							☐	
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets								

Comments

1 acre and above get offered survey and water budget due to ordinance. Option to do it on their own. Water savings based on relatively cool climate and not much turf irrigation. See notes on water budget based billing. Utility costs based on $1400 per audit per contract. Customer costs assume customer makes some changes to system to try and meet budget. 10-15 audits per year on 250 participating accounts.

Results	
Average Water Savings (mgd)	0.003167
Lifetime Savings - Present Value ($)	
Utility	$45,029
Community	$45,029
Lifetime Costs - Present Value ($)	
Utility	$508,859
Community	$859,797
Benefit to Cost Ratio	
Utility	0.09
Community	0.05
Cost of Savings per Unit Volume ($/mg)	
Utility	$20,948

End Use Savings Per Replacement	% Savings per Account
IRR Irrigation	6.6%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	2.200%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$28,438	$19,612	$48,050
2019	$29,798	$20,551	$50,349
2020	$31,159	$21,489	$52,648
2021	$31,848	$21,964	$53,813
2022	$32,538	$22,440	$54,977
2023	$33,227	$22,915	$56,142
2024	$33,916	$23,390	$57,306
2025	$34,605	$23,866	$58,471
2026	$35,773	$24,671	$60,444
2027	$36,941	$25,477	$62,418
2028	$38,109	$26,282	$64,391
2029	$39,277	$27,087	$66,364
2030	$40,445	$27,893	$68,337
2031	$41,459	$28,593	$70,052
2032	$42,474	$29,292	$71,766
2033	$43,489	$29,992	$73,481
2034	$44,503	$30,692	$75,195
2035	$45,518	$31,392	$76,910

Targets — View: Accounts

	IRR	Total
2015	0	0
2016	0	0
2017	0	0
2018	13	13
2019	14	14
2020	14	14
2021	15	15
2022	15	15
2023	15	15
2024	16	16
2025	16	16
2026	16	16
2027	17	17
2028	18	18
2029	18	18
2030	19	19
2031	19	19
2032	20	20
2033	20	20
2034	20	20
2035	21	21

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000466
2019	0.000927
2020	0.001383
2021	0.001856
2022	0.002329
2023	0.002803
2024	0.003278
2025	0.003752
2026	0.004232
2027	0.004719
2028	0.004807
2029	0.004890
2030	0.004969
2031	0.005049
2032	0.005132
2033	0.005217
2034	0.005304
2035	0.005392

Sprinkler Nozzle Rebates

Overview	
Name	Sprinkler Nozzle Rebates
Abbr	26
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2018
Last Year	2035
Measure Length	18

Measure Life	
Permanent	☐
Years	20
Repeat	☐

Fixture Costs	Utility	Customer	Fix/Acct
SF	$6.00	$4.00	25
MF	$6.00	$4.00	50
COM	$6.00	$4.00	100

Administration Costs	
Markup Percentage	25%

Description

Provide rebates to replace standard spray sprinkler nozzles with rotating nozzles that have lower application rates. Nozzles cost about $6 each. Consider online application processing through options like www.freesprinklernozzles.com.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☑	☑	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐	☐	☐					
Urinals			☐					
Lavatory Faucets	☐	☐	☐					
Showers	☐	☐	☐					
Dishwashers	☐	☐	☐					
Clothes Washers	☐	☐	☐					
Process			☐					
Kitchen Spray Rinse			☐					
Internal Leakage	☐	☐	☐					
Baths	☐	☐						
Other	☐	☐	☐					
Irrigation	☑	☑	☑					
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐	☐					
Indoor								
Outdoor								
Cooling			☐					
tory/Kitchen Faucets	☐	☐	☐					

Comments

Water savings assume improvement in distribution uniformity saves 10% of irrigation. Reference CUWCC Potential Best Management Practice Report on Rotating Nozzles. Utility costs assume cost is $6/nozzle with rebate amount of $2 per nozzle with the following nozzles distributed: SF = 25; MF = 50; COM = 100. Customer pays the remainder of the device cost plus installation. No nozzle minimum.

Results	
Average Water Savings (mgd)	0.004259
Lifetime Savings - Present Value ($)	
Utility	$59,780
Community	$59,780
Lifetime Costs - Present Value ($)	
Utility	$445,715
Community	$683,430
Benefit to Cost Ratio	
Utility	0.13
Community	0.09
Cost of Savings per Unit Volume ($/mg)	
Utility	$13,643

End Use Savings Per Replacement	% Savings per Account
SF Irrigation	10.0%
MF Irrigation	10.0%
COM Irrigation	10.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.500%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$30,638	$16,340	$46,978
2019	$30,797	$16,425	$47,222
2020	$30,956	$16,510	$47,466
2021	$31,080	$16,576	$47,656
2022	$31,205	$16,642	$47,847
2023	$31,329	$16,709	$48,038
2024	$31,453	$16,775	$48,228
2025	$31,578	$16,841	$48,419
2026	$31,738	$16,927	$48,665
2027	$31,898	$17,013	$48,911
2028	$32,059	$17,098	$49,157
2029	$32,219	$17,184	$49,403
2030	$32,380	$17,269	$49,649
2031	$32,529	$17,349	$49,878
2032	$32,678	$17,428	$50,106
2033	$32,827	$17,508	$50,335
2034	$32,977	$17,587	$50,564
2035	$33,126	$17,667	$50,793

Targets — View: Accounts

	SF	MF	COM	Total
2015	0	0	0	0
2016	0	0	0	0
2017	0	0	0	0
2018	97	14	10	120
2019	97	14	10	121
2020	97	14	10	121
2021	98	15	10	122
2022	98	15	10	122
2023	98	15	10	123
2024	99	15	10	123
2025	99	15	10	124
2026	100	15	10	125
2027	100	15	10	125
2028	100	15	10	126
2029	101	15	10	126
2030	101	16	10	127
2031	102	16	10	127
2032	102	16	10	128
2033	102	16	10	129
2034	103	16	10	129
2035	103	16	10	130

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000560
2019	0.001110
2020	0.001649
2021	0.002187
2022	0.002719
2023	0.003244
2024	0.003762
2025	0.004274
2026	0.004777
2027	0.005277
2028	0.005772
2029	0.006265
2030	0.006755
2031	0.007245
2032	0.007733
2033	0.008220
2034	0.008705
2035	0.009188

Gray Water Retrofit

Overview	
Name	Gray Water Retrofit
Abbr	27
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2035
Measure Length	21

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
SF	$175.00	$300.00	1

Administration Costs	
Markup Percentage	45%

Description

Provide a workshop to support a Gray Water Challenge similar to 2013 event that was modeled after Sonoma County program. Offer rebate to assist covering certain percentage of the cost to single family homeowners per year to install gray water systems. Package from local hardware stores containing the primary components would be supported by City rebate.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☐	☐	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐							
Urinals								
Lavatory Faucets	☐							
Showers	☐							
Dishwashers	☐							
Clothes Washers	☐							
Process								
Kitchen Spray Rinse								
Internal Leakage	☐							
Baths	☐							
Other	☐							
Irrigation	☑							
Pools	☐							
Wash Down	☐							
Car Washing	☐							
External Leakage	☐							
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets	☐							

Comments

Water savings assume single fixture type system used to replace a portion of garden watering on new or existing homes. System costs ~$450 and City pays ~ 1/3. Customer pays for installation. In the summer washing machine use of ~25 gpd would cover about 25% or summer use (2x annual average). Based on continuation of our 2013 Gray Water Challenge.

Results	
Average Water Savings (mgd)	
	0.000353
Lifetime Savings - Present Value ($)	
Utility	$5,077
Community	$5,077
Lifetime Costs - Present Value ($)	
Utility	$42,605
Community	$92,974
Benefit to Cost Ratio	
Utility	0.12
Community	0.05
Cost of Savings per Unit Volume ($/mg)	
Utility	$15,742

End Use Savings Per Replacement	% Savings per Account
SF Irrigation	10.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.050%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$2,423	$2,865	$5,287
2016	$2,432	$2,875	$5,307
2017	$2,441	$2,886	$5,327
2018	$2,450	$2,897	$5,347
2019	$2,459	$2,908	$5,367
2020	$2,468	$2,918	$5,387
2021	$2,479	$2,930	$5,409
2022	$2,489	$2,942	$5,431
2023	$2,499	$2,954	$5,453
2024	$2,509	$2,966	$5,475
2025	$2,519	$2,978	$5,497
2026	$2,529	$2,990	$5,520
2027	$2,540	$3,002	$5,542
2028	$2,550	$3,015	$5,565
2029	$2,560	$3,027	$5,587
2030	$2,571	$3,039	$5,610
2031	$2,580	$3,050	$5,630
2032	$2,590	$3,062	$5,651
2033	$2,599	$3,073	$5,672
2034	$2,609	$3,084	$5,693
2035	$2,618	$3,095	$5,714

Targets — View: Accounts

	SF	Total
2015	10	10
2016	10	10
2017	10	10
2018	10	10
2019	10	10
2020	10	10
2021	10	10
2022	10	10
2023	10	10
2024	10	10
2025	10	10
2026	10	10
2027	10	10
2028	10	10
2029	10	10
2030	10	10
2031	10	10
2032	10	10
2033	10	10
2034	10	10
2035	10	10

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000035
2016	0.000069
2017	0.000103
2018	0.000136
2019	0.000169
2020	0.000201
2021	0.000233
2022	0.000265
2023	0.000296
2024	0.000327
2025	0.000358
2026	0.000388
2027	0.000418
2028	0.000448
2029	0.000478
2030	0.000507
2031	0.000537
2032	0.000566
2033	0.000596
2034	0.000625
2035	0.000654

Residential Rain Barrels

Overview	
Name	Residential Rain Barrels
Abbr	28
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2035
Measure Length	21

Measure Life	
Permanent	☐
Years	20
Repeat	☐

Fixture Costs	Utility	Customer	Fix/Acct
SF	$30.00	$50.00	1

Administration Costs	
Markup Percentage	25%

Description

Provide incentive for installation of rain barrels. This could involve rebates or bulk purchase and giveaways of barrels, plus workshops on proper installation and use of captured rain water for landscape irrigation. Pattern after Honolulu Board of Water Supply program.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☐	☐	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐							
Urinals								
Lavatory Faucets	☐							
Showers	☐							
Dishwashers	☐							
Clothes Washers	☐							
Process								
Kitchen Spray Rinse								
Internal Leakage	☐							
Baths	☐							
Other	☐							
Irrigation	☑							
Pools	☐							
Wash Down	☐							
Car Washing	☐							
External Leakage	☐							
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets	☐							

Results	
Average Water Savings (mgd)	0.005271
Lifetime Savings - Present Value ($)	
Utility	$75,892
Community	$75,892
Lifetime Costs - Present Value ($)	
Utility	$188,887
Community	$440,737
Benefit to Cost Ratio	
Utility	0.40
Community	0.17
Cost of Savings per Unit Volume ($/mg)	
Utility	$4,672

End Use Savings Per Replacement	% Savings per Account
SF Irrigation	5.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.500%
Only Effects New Accts	☐

Comments

Water savings assumes 4 effective fills per year for 20 years. 20 year useful life. 1.5% actual water savings from barrel and 3.5% from behavioral change. City pays for the difference plus shipping. Customer has to install.
If the rain barrel model were available for purchase locally, the City would probably stop selling them and offer a rebate instead due to storage and delivery challenges. We could also add a rebate anyway so people have more choice in models and sizes. Assume a 50 percent subsidy. Currently sell subsidized rain barrels to customers. May want to expand types. Probill Hardware now carries the bushman line. Education and promotion program. 3-4 effective fills. Discount starts at $100 per barrel.

Costs — View: Summary

	Utility	Customer	Total
2015	$10,742	$14,323	$25,064
2016	$10,782	$14,376	$25,159
2017	$10,823	$14,430	$25,253
2018	$10,863	$14,484	$25,347
2019	$10,904	$14,538	$25,442
2020	$10,944	$14,592	$25,536
2021	$10,989	$14,652	$25,641
2022	$11,034	$14,711	$25,745
2023	$11,078	$14,771	$25,849
2024	$11,123	$14,831	$25,954
2025	$11,168	$14,891	$26,058
2026	$11,214	$14,951	$26,165
2027	$11,259	$15,012	$26,272
2028	$11,305	$15,073	$26,378
2029	$11,351	$15,134	$26,485
2030	$11,396	$15,195	$26,592
2031	$11,439	$15,251	$26,690
2032	$11,481	$15,308	$26,789
2033	$11,523	$15,364	$26,887
2034	$11,565	$15,420	$26,986
2035	$11,608	$15,477	$27,084

Targets — View: Accounts

	SF	Total
2015	286	286
2016	288	288
2017	289	289
2018	290	290
2019	291	291
2020	292	292
2021	293	293
2022	294	294
2023	295	295
2024	297	297
2025	298	298
2026	299	299
2027	300	300
2028	301	301
2029	303	303
2030	304	304
2031	305	305
2032	306	306
2033	307	307
2034	308	308
2035	310	310

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000524
2016	0.001041
2017	0.001548
2018	0.002046
2019	0.002535
2020	0.003014
2021	0.003497
2022	0.003974
2023	0.004445
2024	0.004909
2025	0.005368
2026	0.005821
2027	0.006271
2028	0.006718
2029	0.007164
2030	0.007607
2031	0.008051
2032	0.008493
2033	0.008934
2034	0.009374
2035	0.009364

Climate Appropriate Landscaping

Overview	
Name	Climate Appropriate Landscaping and Rainw
Abbr	29
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2035
Measure Length	21

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
SF	$1,000.00	$1,500.00	1
MF	$2,000.00	$2,500.00	1
COM	$5,000.00	$10,000.00	1
MUN	$5,000.00	$10,000.00	1

Administration Costs	
Markup Percentage	25%

Description

Provide incentives for installation of climate appropriate landscaping and rainwater infiltration. This measure will provide rebates for HOAs, businesses, and institutions that increase their outdoor water use efficiency 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 prior to beginning their project or purchasing materials for which they would like to receive rebates. Single family homes, multifamily and business properties with qualifying irrigated landscape (i.e., irrigated turf or functional swimming pool) can receive rebates for replacing high water use landscape, such as irrigated turf grass, with a minimum of 50% plant coverage consisting of low water using plants from the Approved Plant List.

Recommendations from July 17, 2015 WSAC Agenda Item 6A "Summary of WSAC Work on Demand Management Options and Options for Integrating Demand Management into potential Water Supply Advisory Committee Recommendations and Agreement":

- Increase turf conversion rebate
- Require conversion of spray to drip for shrub irrigation
- Discourage runoff through rainwater infiltration features
- Support local initiatives for climate-appropriate landscaping
- Target landscaping narrower than 10 ft - no spray irrigation and/or next to hardscapes

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☑	☑	☑	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐	☐	☐	☐				
Urinals			☐	☐				
Lavatory Faucets	☐	☐	☐	☐				
Showers	☐	☐	☐	☐				
Dishwashers	☐	☐	☐	☐				
Clothes Washers	☐	☐	☐	☐				
Process			☐					
Kitchen Spray Rinse			☐	☐				
Internal Leakage	☐	☐	☐	☐				
Baths	☐	☐						
Other	☐	☐	☐	☐				
Irrigation	☑	☑	☑	☑				
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐	☐	☐				
Indoor								
Outdoor								
Cooling			☐	☐				
tory/Kitchen Faucets	☐	☐	☐	☐				

Results	
Average Water Savings (mgd)	
0.012210	
Lifetime Savings - Present Value ($)	
Utility	$175,704
Community	$175,704
Lifetime Costs - Present Value ($)	
Utility	$3,111,311
Community	$7,115,560
Benefit to Cost Ratio	
Utility	0.06
Community	0.02
Cost of Savings per Unit Volume ($/mg)	
Utility	$33,221

End Use Savings Per Replacement	% Savings per Account
SF Irrigation	25.0%
MF Irrigation	25.0%
COM Irrigation	25.0%
MUN Irrigation	25.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.400%
Only Effects New Accts	☐

Comments

Drought tolerant plants require little dry season irrigation. Native plants require no irrigation or fertilizer, and provide habitat for native insects and birds. Rainwater infiltration features such as swales or rain gardens capture water runoff from roofs and paved surfaces. Enhanced infiltration increases soil porosity, which provides moisture to trees and landscape plants during dry periods, reducing stress on trees during droughts. In some areas, rainwater that infiltrates the landscape recharges aquifers, adding to our water supply. For example, Kennedy/Jenks estimates that water infiltration modifications could add 300-500 acre feet per year to the aquifer beneath Scotts Valley. In areas with less permeable clay soils, rainwater infiltration slows runoff into local creeks, reducing stormwater erosion and increasing creek flows during dry months, enhancing biodiversity. Paving can be done with permeable materials and/or in conjunction with infiltration swales. Examine the implementation of these systems at schools as part of the Drought Response Outreach for Schools State program.

References:

Irrigation:
http://cuwcc.org/Portals/0/Document%20Library/Resources/Publications/Potential%20BMP%20Reports/2014%20Drip%20Irrigation%20PBMP.pdf
http://www.rainbird.com/documents/drip/LandscapedripConversionGuide.pdf

Infiltration: See Infiltration documents in the Infiltration folder on our Google Drive.

Water Transfers Santa Cruz County:
http://scceh.com/Home/Programs/WaterResources/IntegratedRegionalWaterManagement.aspx

Drought Response Outreach for Schools: http://ca.gov/drought/news/story-97.html

Costs

View: Summary

	Utility	Customer	Total
2015	$175,841	$226,796	$402,637
2016	$176,730	$227,884	$404,615
2017	$177,620	$228,972	$406,592
2018	$178,510	$230,060	$408,570
2019	$179,399	$231,148	$410,547
2020	$180,289	$232,236	$412,525
2021	$180,975	$233,072	$414,048
2022	$181,662	$233,908	$415,570
2023	$182,348	$234,744	$417,092
2024	$183,035	$235,580	$418,615
2025	$183,721	$236,416	$420,137
2026	$184,614	$237,501	$422,114
2027	$185,506	$238,585	$424,092
2028	$186,399	$239,670	$426,069
2029	$187,291	$240,755	$428,046
2030	$188,184	$241,839	$430,023
2031	$189,027	$242,898	$431,925
2032	$189,869	$243,958	$433,827
2033	$190,712	$245,017	$435,729
2034	$191,555	$246,076	$437,632
2035	$192,398	$247,136	$439,534

Targets

View: Accounts

	SF	MF	COM	MUN	Total
2015	76	11	8	1	96
2016	77	11	8	1	96
2017	77	11	8	1	97
2018	77	11	8	1	97
2019	78	11	8	1	98
2020	78	12	8	1	98
2021	78	12	8	1	98
2022	78	12	8	1	99
2023	79	12	8	1	99
2024	79	12	8	1	100
2025	79	12	8	1	100
2026	80	12	8	1	101
2027	80	12	8	1	101
2028	80	12	8	1	101
2029	81	12	8	1	102
2030	81	12	8	1	102
2031	81	13	8	1	103
2032	82	13	8	1	103
2033	82	13	8	1	104
2034	82	13	8	1	104
2035	83	13	8	1	105

Water Savings (mgd)

	Total Savings (mgd)
2015	0.001214
2016	0.002408
2017	0.003577
2018	0.004725
2019	0.005849
2020	0.006951
2021	0.008067
2022	0.009170
2023	0.010259
2024	0.011335
2025	0.012397
2026	0.013439
2027	0.014474
2028	0.015503
2029	0.016527
2030	0.017545
2031	0.018566
2032	0.019584
2033	0.020598
2034	0.021609
2035	0.022617

Single Family Multifamily Dishwasher

Overview	
Name	Single Family Multifamily Dishwas
Abbr	31
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2018
Last Year	2022
Measure Length	5

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
SF	$50.00	$350.00	1
MF	$50.00	$350.00	6

Administration Costs	
Markup Percentage	25%

Description

Provide incentives for installation of water efficient dishwashers (Residential WF of 6.25 or less). Assume Department of Energy continues to regulate dishwashers to require state of the art technolgy, using less water over time.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☑	☐	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐	☐						
Urinals								
Lavatory Faucets	☐	☐						
Showers	☐	☐						
Dishwashers	☑	☑						
Clothes Washers	☐	☐						
Process								
Kitchen Spray Rinse								
Internal Leakage	☐	☐						
Baths	☐	☐						
Other	☐	☐						
Irrigation	☐	☐						
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐						
Indoor								
Outdoor								
Cooling								
tory/Kitchen Faucets	☐	☐						

Results	
Average Water Savings (mgd)	0.000452
Lifetime Savings - Present Value ($)	
Utility	$6,772
Community	$42,119
Lifetime Costs - Present Value ($)	
Utility	$102,692
Community	$677,766
Benefit to Cost Ratio	
Utility	0.07
Community	0.06
Cost of Savings per Unit Volume ($/mg)	
Utility	$29,602

End Use Savings Per Replacement	% Savings per Account
SF Dishwashers	15.0%
MF Dishwashers	15.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.000%
Only Effects New Accts	☐

Comments

Recommendations from July 17, 2015 WSAC Agenda Item 6A "Summary of WSAC Work on Demand Management Options and Options for Integrating Demand Management into potential Water Supply Advisory Committee Recommendations and Agreement": Dishwashers have seen similar technological advances as clothes washers with some machines now offering 2.5 GPL. The old standard of 10-15 GPL has been updated to 5.5 GPL for an Energy Star certified product.
https://www.energystar.gov/products/certified-products/detail/dishwashers
Units cost between $500-$1000. Customer costs include installation.

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$22,652	$126,849	$149,501
2019	$22,816	$127,771	$150,587
2020	$22,981	$128,693	$151,673
2021	$23,095	$129,333	$152,428
2022	$23,209	$129,973	$153,182
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets — View: Accounts

	SF	MF	Total
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	193	28	221
2019	194	29	222
2020	195	29	223
2021	195	29	224
2022	196	29	225
2023	0	0	0
2024	0	0	0
2025	0	0	0
2026	0	0	0
2027	0	0	0
2028	0	0	0
2029	0	0	0
2030	0	0	0
2031	0	0	0
2032	0	0	0
2033	0	0	0
2034	0	0	0
2035	0	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000129
2019	0.000255
2020	0.000378
2021	0.000501
2022	0.000623
2023	0.000617
2024	0.000612
2025	0.000606
2026	0.000600
2027	0.000594
2028	0.000589
2029	0.000583
2030	0.000578
2031	0.000574
2032	0.000570
2033	0.000567
2034	0.000563
2035	0.000559

Hot Water Recirculation Systems

Overview	
Name	Hot Water Recirculation Systems
Abbr	32
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2018
Last Year	2022
Measure Length	5

Measure Life	
Permanent	☐
Years	25
Repeat	☐

Fixture Costs	Utility	Customer	Fix/Acct
SF	$300.00	$700.00	1
MF	$300.00	$700.00	5
COM	$300.00	$700.00	5

Administration Costs	
Markup Percentage	25%

Description

Provide 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 are 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
b) $3,000 per commercial, industrial or institutional account, such as laundromats and apartments, per year
• Some installations may be selected for a random inspection. At reasonable times and with reasonable notice, you agree to allow the City of Santa Cruz to inspect the system at the installation address for up to one year after purchase.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☑	☑	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐	☐	☐					
Urinals			☐					
Lavatory Faucets	☑	☑	☑					
Showers	☑	☑	☑					
Dishwashers	☐	☐	☐					
Clothes Washers	☐	☐	☐					
Process			☐					
Kitchen Spray Rinse			☐					
Internal Leakage	☐	☐	☐					
Baths	☐	☐						
Other	☐	☐	☐					
Irrigation	☐	☐	☐					
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐	☐					
Indoor								
Outdoor								
Cooling			☐					
tory/Kitchen Faucets	☐	☐	☐					

Comments

Recommendations from July 17, 2015 WSAC Agenda Item 6A "Summary of WSAC Work on Demand Management Options and Options for Integrating Demand Management into potential Water Supply Advisory Committee Recommendations and Agreement": Hot Water Demand Recirculation Systems are a tool that helps address the water loss we all Experience while waiting for hot water-for showers, hand washing and dishwashing. The simpler sytems are installed into existing plumbing and act by returning the cooled water back through the cold water line at the push of a button-even from the warmth of your bed. For a shower the wait can waste 2 gallons or more of water.
http://www.osti.gov/scitech/biblio/885864

Results	
Average Water Savings (mgd)	
0.003045	
Lifetime Savings - Present Value ($)	
Utility	$45,599
Community	$161,188
Lifetime Costs - Present Value ($)	
Utility	$365,578
Community	$1,047,989
Benefit to Cost Ratio	
Utility	0.12
Community	0.15
Cost of Savings per Unit Volume ($/mg)	
Utility	$15,650

End Use Savings Per Replacement	% Savings per Account
SF Lavatory Faucets	11.6%
MF Lavatory Faucets	11.6%
COM Lavatory Faucets	11.6%
SF Showers	11.6%
MF Showers	11.6%
COM Showers	11.6%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.500%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$80,770	$150,770	$231,539
2019	$81,283	$151,728	$233,010
2020	$81,796	$152,685	$234,481
2021	$82,150	$153,347	$235,497
2022	$82,504	$154,008	$236,512
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets — View: Accounts

	SF	MF	COM	Total
2015	0	0	0	0
2016	0	0	0	0
2017	0	0	0	0
2018	97	14	10	120
2019	97	14	10	121
2020	97	14	10	121
2021	98	15	10	122
2022	98	15	10	122
2023	0	0	0	0
2024	0	0	0	0
2025	0	0	0	0
2026	0	0	0	0
2027	0	0	0	0
2028	0	0	0	0
2029	0	0	0	0
2030	0	0	0	0
2031	0	0	0	0
2032	0	0	0	0
2033	0	0	0	0
2034	0	0	0	0
2035	0	0	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000865
2019	0.001712
2020	0.002541
2021	0.003369
2022	0.004186
2023	0.004151
2024	0.004115
2025	0.004079
2026	0.004039
2027	0.004001
2028	0.003965
2029	0.003931
2030	0.003899
2031	0.003871
2032	0.003845
2033	0.003819
2034	0.003795
2035	0.003772

Rewarding Businesses For Adopting

Overview	
Name	Rewarding Businesses For Adoptin
Abbr	33
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2020
Last Year	2035
Measure Length	16

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
COM	$500.00	$5,000.00	1

Administration Costs	
Markup Percentage	25%

Description

Recommendations from July 17, 2015 WSAC Agenda Item 6A "Summary of WSAC Work on Demand Management Options and Options for Integrating Demand Management into potential Water Supply Advisory Committee Recommendations and Agreement": Offer commercial customers who employ best practices increased supply reliability and lower price. For a business, the imposition of rationing during severe drought years hits the bottom line. This proposal suggests that the City's Water Shortage Contingency Plan be modified so that businesses who adopt best practices such as efficient plumbing fixtures, hotel laundry recycling, and climate-appropriate landscaping, would incur a lower level of curtailment in a severe drought. For example, in a Stage 4 drought, with a system-wide goal of 35% curtailment, the current plan is to ration businesses to 87% of their normal year water use. Under our recommendation, businesses adopting best practices would be expected to cut back to 95% of normal use. These businesses could also be rewarded with a lower rate for their water use. Target is to reach 20% of the accounts (400).

As with residential clothes washers, the City could facilitate the financing of landscape retrofits, hotel laundry recycling, compressed air pre-wash stations, etc.

References:

http://www.aquarecycle.com/WastewaterRecycle_8-13-14.pdf

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☐	☐	☑	☐	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets			☑					
Urinals			☑					
Lavatory Faucets			☑					
Showers			☑					
Dishwashers			☑					
Clothes Washers			☑					
Process			☑					
Kitchen Spray Rinse			☑					
Internal Leakage			☑					
Baths								
Other			☐					
Irrigation			☑					
Pools								
Wash Down								
Car Washing								
External Leakage			☑					
Indoor								
Outdoor								
Cooling			☑					
tory/Kitchen Faucets			☑					

Comments

Rewarding Businesses for Adopting Best Practices. Two ideas were set forth here by the working group. One involves granting relief to businesses that adopt best practices in future periods of water curtailment. This concept has already been instituted in the City's Water Shortage Contingency Plan and associated water shortage regulations and restrictions, beginning in Stage 4, through the granting of an exception. The Municipal Code allows for the Director to provide an exception under the following circumstances: 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.

The second idea involves the City facilitating/financing various promoting water efficiency improvements, such as hotel laundry recycling, as a way to reduce peak water use by reducing indoor usage in visitor serving facilities. This idea is consistent with both the Commercial Incentives measure proposed in the Conservation Plan, as well as with past programs the City has offered its commercial customers (LightWash and Smart Rebates programs) in the past.

Results	
Average Water Savings (mgd)	
0.004095	
Lifetime Savings - Present Value ($)	
Utility	$57,463
Community	$208,065
Lifetime Costs - Present Value ($)	
Utility	$189,426
Community	$1,704,833
Benefit to Cost Ratio	
Utility	0.30
Community	0.12
Cost of Savings per Unit Volume ($/mg)	
Utility	$6,030

End Use Savings Per Replacement	% Savings per Account
COM Toilets	5.0%
COM Urinals	5.0%
COM Lavatory Faucets	3.0%
COM Showers	3.0%
COM Dishwashers	3.0%
COM Clothes Washers	3.0%
COM Process	3.0%
COM Kitchen Spray Rins	5.0%
COM Internal Leakage	3.0%
COM Irrigation	3.0%
COM External Leakage	3.0%
COM Cooling	3.0%
Non-Lavatory/Kitchen Fa	3.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.250%
Only Effects New Accts	☐

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$15,220	$121,757	$136,977
2021	$15,256	$122,048	$137,304
2022	$15,292	$122,339	$137,632
2023	$15,329	$122,630	$137,959
2024	$15,365	$122,921	$138,286
2025	$15,401	$123,212	$138,613
2026	$15,459	$123,674	$139,133
2027	$15,517	$124,136	$139,653
2028	$15,575	$124,598	$140,173
2029	$15,633	$125,060	$140,693
2030	$15,690	$125,522	$141,212
2031	$15,764	$126,111	$141,875
2032	$15,837	$126,700	$142,537
2033	$15,911	$127,289	$143,200
2034	$15,985	$127,878	$143,862
2035	$16,058	$128,466	$144,525

Targets — View: Accounts

	COM	Total
2015	0	0
2016	0	0
2017	0	0
2018	0	0
2019	0	0
2020	24	24
2021	24	24
2022	24	24
2023	25	25
2024	25	25
2025	25	25
2026	25	25
2027	25	25
2028	25	25
2029	25	25
2030	25	25
2031	25	25
2032	25	25
2033	25	25
2034	26	26
2035	26	26

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000000
2019	0.000000
2020	0.000655
2021	0.001305
2022	0.001949
2023	0.002588
2024	0.003222
2025	0.003851
2026	0.004477
2027	0.005099
2028	0.005718
2029	0.006334
2030	0.006947
2031	0.007558
2032	0.008167
2033	0.008774
2034	0.009379
2035	0.009983

Additional Building Code Requirements

Overview	
Name	Additional Building Code Requirements for New Develc
Abbr	34
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2018
Last Year	2035
Measure Length	18

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
SF	$100.00	$500.00	1
MF	$100.00	$1,000.00	1
COM	$200.00	$5,000.00	1
MUN	$200.00	$5,000.00	1
IND	$200.00	$5,000.00	1

Administration Costs	
Markup Percentage	25%

Description

NEW CALGREEN INCLUDED, FUTURE CALGREEN UPDATES 2017, 2021.
Recommendations from July 17, 2015 WSAC Agenda Item 6A "Summary of WSAC Work on Demand Management Options and Options for Integrating Demand Management into potential Water Supply Advisory Committee Recommendations and Agreement":
Convene a working group of planners, builders, conservation groups, and Water Dept personnel to evaluate possible additions to current codes and fee structures that would encourage water conservation. Some examples include:
a. Requiring high efficiency washers in new development
b. Require hot water on demand/structured plumbing in new development
Currently there is a spurt of innovation in water efficiency. A working group could evaluate innovative measures for cost effectiveness and recommend them for inclusion in local code. Some possible measures:
a) Require .25 gal/flush urinals in new development.
b) Require efficient dishwashers in new development.
c) Require plumbing for gray water in new development.
d) Ordinance requiring fixture replacement in existing buildings (e.g. toilets).
e) Require efficient dish wash sprayers in restaurants.
f) Require replacement of all toilets using more than 1.6 gallons per flush in existing buildings.
g) Require low-flush urinals in existing buildings.
h) Require highest efficiency toilets & faucets in new construction & retrofit upon sale.
i) Require weather-based controllers in new landscapes.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☑	☑	☑	☑	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☑	☑	☑	☑	☑			
Urinals			☑	☑	☑			
Lavatory Faucets	☑	☑	☑	☑	☑			
Showers	☑	☑	☑	☑	☐			
Dishwashers	☑	☑	☑	☑	☐			
Clothes Washers	☑	☑	☑	☐	☐			
Process			☐	☐				
Kitchen Spray Rinse			☑	☐				
Internal Leakage	☐	☐	☐	☐	☐			
Baths	☐	☐						
Other	☐	☐	☐	☐	☐			
Irrigation	☑	☑	☑	☑	☑			
Pools	☑	☑						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☐	☐	☐	☐	☐			
Indoor								
Outdoor								
Cooling			☐	☐	☐			
tory/Kitchen Faucets	☐	☐	☐	☐	☐			

Comments

Results	
Average Water Savings (mgd)	0.000000
Lifetime Savings - Present Value ($)	
Utility	$0
Community	$0
Lifetime Costs - Present Value ($)	
Utility	$0
Community	$0
Benefit to Cost Ratio	
Utility	0.00
Community	0.00
Cost of Savings per Unit Volume ($/mg)	
Utility	$0

End Use Savings Per Replacement	% Savings per Account
SF Toilets	10.0%
MF Toilets	10.0%
COM Toilets	10.0%
MUN Toilets	10.0%
IND Toilets	10.0%
COM Urinals	10.0%
MUN Urinals	10.0%
IND Urinals	10.0%
SF Lavatory Faucets	10.0%
MF Lavatory Faucets	10.0%
COM Lavatory Faucets	10.0%
MUN Lavatory Faucets	10.0%
IND Lavatory Faucets	10.0%
SF Showers	10.0%
MF Showers	10.0%
COM Showers	10.0%
MUN Showers	10.0%
SF Dishwashers	10.0%
MF Dishwashers	10.0%
COM Dishwashers	10.0%
MUN Dishwashers	10.0%
SF Clothes Washers	10.0%
MF Clothes Washers	10.0%
COM Clothes Washers	10.0%
OM Kitchen Spray Rins	10.0%
SF Irrigation	10.0%
MF Irrigation	10.0%
COM Irrigation	10.0%
MUN Irrigation	10.0%
IND Irrigation	10.0%
SF Pools	10.0%
MF Pools	10.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.000%
Only Effects New Accts	☑

Costs — View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
2026	$0	$0	$0
2027	$0	$0	$0
2028	$0	$0	$0
2029	$0	$0	$0
2030	$0	$0	$0
2031	$0	$0	$0
2032	$0	$0	$0
2033	$0	$0	$0
2034	$0	$0	$0
2035	$0	$0	$0

Targets — View: Accounts

	SF	MF	COM	MUN	IND	Total
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
2021	0	0	0	0	0	0
2022	0	0	0	0	0	0
2023	0	0	0	0	0	0
2024	0	0	0	0	0	0
2025	0	0	0	0	0	0
2026	0	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	0	0	0
2029	0	0	0	0	0	0
2030	0	0	0	0	0	0
2031	0	0	0	0	0	0
2032	0	0	0	0	0	0
2033	0	0	0	0	0	0
2034	0	0	0	0	0	0
2035	0	0	0	0	0	0

Water Savings (mgd)

	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000000
2019	0.000000
2020	0.000000
2021	0.000000
2022	0.000000
2023	0.000000
2024	0.000000
2025	0.000000
2026	0.000000
2027	0.000000
2028	0.000000
2029	0.000000
2030	0.000000
2031	0.000000
2032	0.000000
2033	0.000000
2034	0.000000
2035	0.000000

Overview	
Name	Innovation Incubator Program
Abbr	35
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2035
Measure Length	15

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
SF	$300.00	$0.00	1
MF	$300.00	$0.00	1
COM	$300.00	$0.00	1
MUN	$300.00	$0.00	1

Administration Costs	
Markup Percentage	25%

Description

Recommendations from July 17, 2015 WSAC Agenda Item 6A "Summary of WSAC Work on Demand Management Options and Options for Integrating Demand Management into potential Water Supply Advisory Committee Recommendations and Agreement":
Establish an Innovation Incubator Program. Santa Cruz can continue its leadership in water stewardship by creating a program that: supports innovations in:
• Supports innovative new technologies, customer financing programs, and customer outreach programs
• Supports pilot projects to facilitate popular adoption of: rainwater for toilets & washers composting toilets in institutional buildings onsite recycling of graywater rainwater irrigated lawns promotion of native plant landscapes onsite recycling of graywater
Modest grants would be offered to local businesses and/or collaboration with state and national organizations like California Urban Water Conservation Council, California Water Foundation, California Urban 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.

Customer Classes	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
	☑	☑	☑	☑	☐	☐	☐	☐

End Uses	SF	MF	COM	MUN	IND	UCSC	IRR	GOLF
Toilets	☐	☐	☐	☐				
Urinals			☐	☐				
Lavatory Faucets	☐	☐	☐	☐				
Showers	☐	☐	☐	☐				
Dishwashers	☐	☐	☐	☐				
Clothes Washers	☐	☐	☐	☐				
Process			☑					
Kitchen Spray Rinse			☐	☐				
Internal Leakage	☑	☑	☑	☑				
Baths	☐	☐						
Other	☐	☐	☐	☐				
Irrigation	☑	☑	☑	☑				
Pools	☐	☐						
Wash Down	☐	☐						
Car Washing	☐	☐						
External Leakage	☑	☑	☑	☑				
Indoor								
Outdoor								
Cooling			☑	☑				
tory/Kitchen Faucets	☐	☐	☐	☐				

Comments

The Innovation Incubator Program identifies and supports entrepreneurs in their development and distribution of innovative learning technologies related to water use efficiency. The program will provide mentorship for products and companies in their efforts to improve water use efficiency and education through the use of software, digital content and related technologies. The Innovation Incubator Program finalists will be selected from an applicant pool based on key selection criteria, including:
•Ability to positively impact end users of the product
•Ability to succeed in the water use efficiency tech market
•Level of originality and innovation

The Innovation Incubator Program is a 12-month program of activities, master classes and coaching sessions, mentoring support, and business-to-business meetings that will facilitate and accelerate the market entry of technologies addressing water management challenges.
The Program will aim to ensure more efficient and effective practices across the water industry and across water-using sectors.

Innovators taking part in the Innovation Incubator Program will have access to a range of benefits that will support them with the successful market entry of their technology.

Results	
Average Water Savings (mgd)	
0.001148	
Lifetime Savings - Present Value ($)	
Utility	$15,845
Community	$43,706
Lifetime Costs - Present Value ($)	
Utility	$1,071,611
Community	$1,071,611
Benefit to Cost Ratio	
Utility	0.01
Community	0.04
Cost of Savings per Unit Volume ($/mg)	
Utility	$121,679

End Use Savings Per Replacement	% Savings per Account
COM Process	1.0%
SF Internal Leakage	1.0%
MF Internal Leakage	1.0%
COM Internal Leakage	1.0%
MUN Internal Leakage	1.0%
SF Irrigation	1.0%
MF Irrigation	1.0%
COM Irrigation	1.0%
MUN Irrigation	1.0%
SF External Leakage	1.0%
MF External Leakage	1.0%
COM External Leakage	1.0%
MUN External Leakage	1.0%
COM Cooling	1.0%
MUN Cooling	1.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.000%
Only Effects New Accts	☐

Costs

View: Summary

	Utility	Customer	Total
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$92,284	$0	$92,284
2022	$92,665	$0	$92,665
2023	$93,045	$0	$93,045
2024	$93,426	$0	$93,426
2025	$93,806	$0	$93,806
2026	$94,252	$0	$94,252
2027	$94,697	$0	$94,697
2028	$95,143	$0	$95,143
2029	$95,588	$0	$95,588
2030	$96,034	$0	$96,034
2031	$96,437	$0	$96,437
2032	$96,841	$0	$96,841
2033	$97,245	$0	$97,245
2034	$97,649	$0	$97,649
2035	$98,053	$0	$98,053

Targets

View: Accounts

	SF	MF	COM	MUN	Total
2015	0	0	0	0	0
2016	0	0	0	0	0
2017	0	0	0	0	0
2018	0	0	0	0	0
2019	0	0	0	0	0
2020	0	0	0	0	0
2021	195	29	20	2	246
2022	196	29	20	2	247
2023	197	29	20	2	248
2024	198	30	20	2	249
2025	199	30	20	2	250
2026	199	30	20	2	251
2027	200	30	20	2	253
2028	201	31	20	2	254
2029	202	31	20	2	255
2030	203	31	20	2	256
2031	203	31	20	2	257
2032	204	32	20	2	258
2033	205	32	20	2	259
2034	206	32	20	2	260
2035	206	32	21	2	261

Water Savings (mgd)

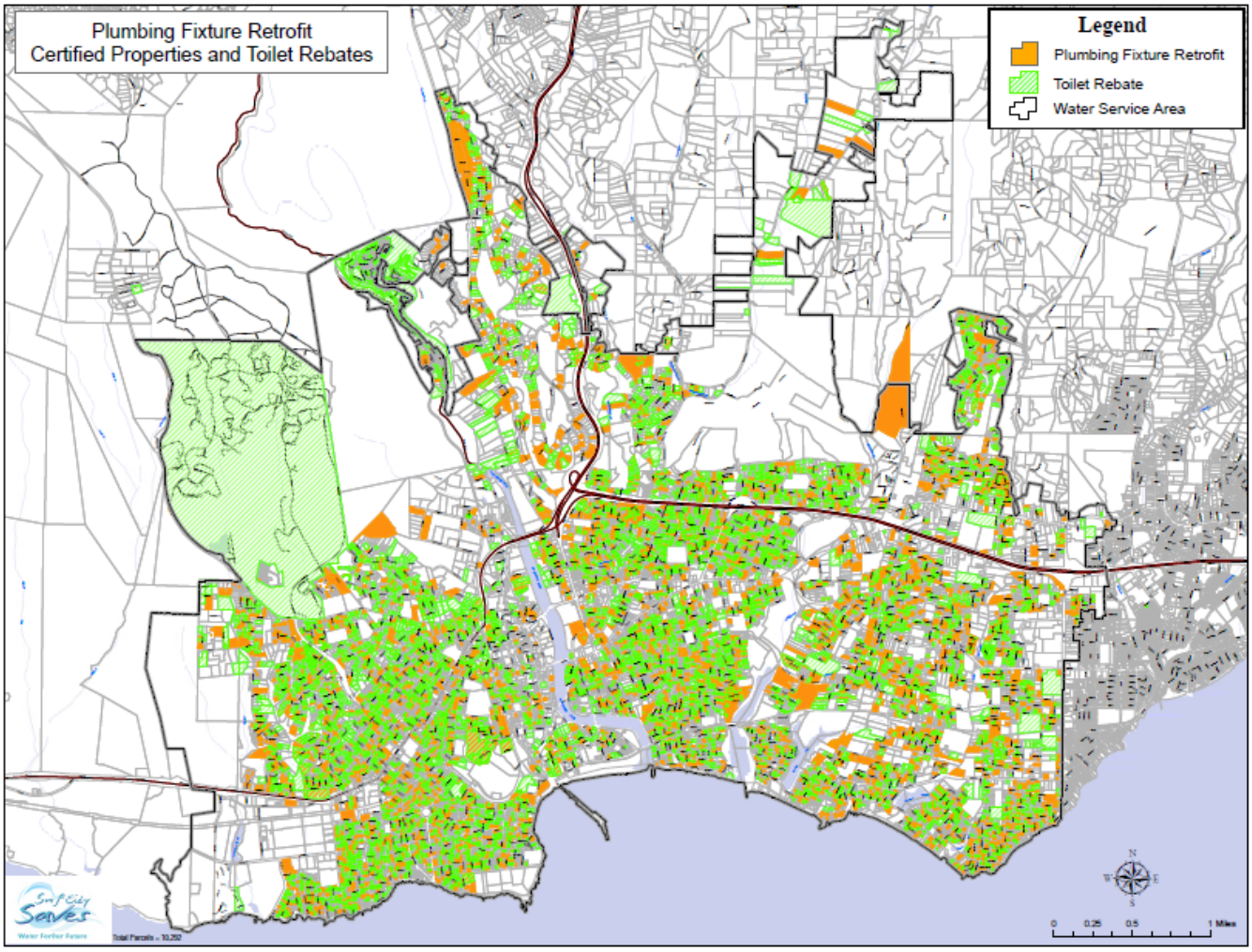
	Total Savings (mgd)
2015	0.000000
2016	0.000000
2017	0.000000
2018	0.000000
2019	0.000000
2020	0.000000
2021	0.000211
2022	0.000419
2023	0.000625
2024	0.000829
2025	0.001030
2026	0.001229
2027	0.001426
2028	0.001621
2029	0.001815
2030	0.002007
2031	0.002199
2032	0.002390
2033	0.002581
2034	0.002770
2035	0.002959

APPENDIX D – WATER USE EFFICIENCY MEASURE IMPLEMENTATION MAPS

The City has created maps to illustrate their efforts for their water use efficiency measure.

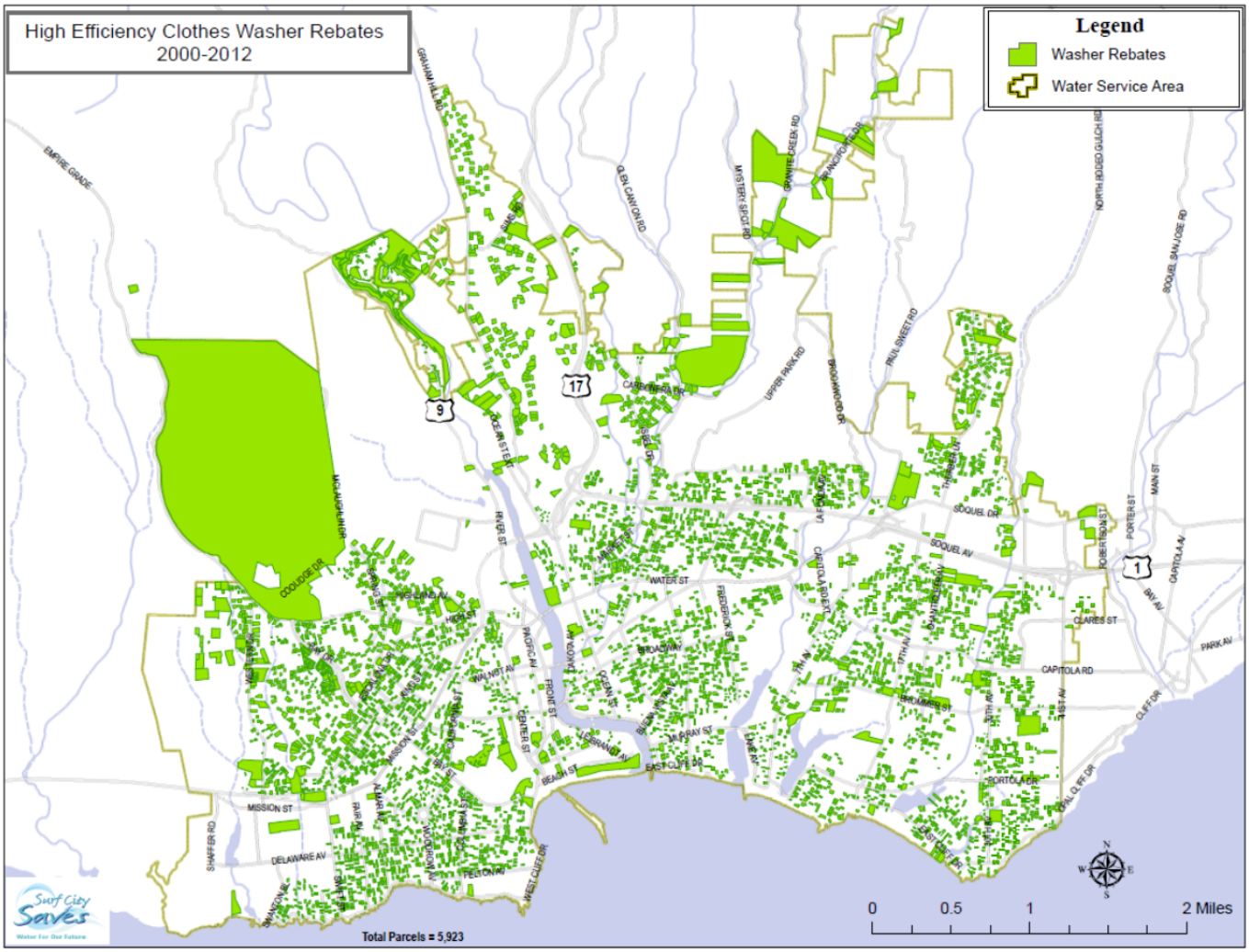
The following figure indicates the City's properties that have participated in a toilet rebate program or have been certified as complying with plumbing fixture retrofit regulations.

Figure D-1. Plumbing Fixture Retrofit Certified Properties and Toilet Rebates



The following figure presents an example of one map for all the properties that participated in their high efficiency clothes washer rebate incentive programs between 2000 and 2012. This map was created using Geographical Information System (GIS) mapping software and the database of customers that participated in the program.

Figure D-2. Map of Incentives for High Efficiency Clothes Washers (Domestic and Commercial)



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.

NOT ON TRACK

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

CUWCC BMP Retail Coverage Report 2013

Foundational Best Management 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

ON TRACK

Implementation (Water Rate Structure)

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:

NOT ON TRACK

Agency Provide Sewer Service: Yes

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

APPENDIX F – POTENTIAL WATER CONSERVATION MEASURES SCREENING PROCESS AND RESULTS

At its April 1, 2013 meeting, the City's Water Commission reviewed 1) the comprehensive list of existing and possible new water conservation measures prepared by MWM, and 2) the criteria proposed to rank and screen the measures down to a more manageable number for further modeling and analysis. In doing so, the Commission requested staff make more effort to solicit public ideas and input in the planning process.

In response to this request, City staff prepared and published display ads in the Santa Cruz Sentinel on both April 5, 2013 and April 12, 2013. A total of 63 suggestions were submitted by 22 individuals by the April 15, 2013 cutoff date. These community ideas for future water conservation programs are summarized in Figure F-1.

City staff and the consultant reviewed these 63 suggestions April 18, 2013. Many were considered to be sufficiently covered in the existing measure description, thus no change was needed. For others, conservation measure descriptions were modified, or a new line was added with the suggested measure incorporated. Finally, there were a handful of comments that either didn't fit into any particular demand management category or dealt with the subject of alternative water supplies, which is beyond the scope of this project.

On April 24, 2013 water conservation staff and the consultant performed the measure screening process. To make the ratings more understandable, consistent, and transparent, staff developed various qualitative/quantitative definitions for each of the numbers associated with the following six criteria:

1. Water Savings Potential (Service Area Match)
2. Sustainable Water Savings – emphasis on savings lifetime/reliability
3. Quantifiable Water Savings
4. Widespread Community & Social Acceptance (Technology/Market Maturity)
5. Feasibility of Implementation/Secondary Impacts – emphasis on ability to achieve objectives
6. Additional Service Area Benefits (GHG, Stormwater)

In some cases, ratings were obvious and straightforward. In others, it triggered deliberation and discussion involving different viewpoints, resulting in a score that fairly represented the consensus of the group.

The outcome of this process is shown in Table F-1. Essentially, the rating process resulted in the following four categories:

Group 1: The 23 top-rated measures that are recommended to be modeled for further analysis. Some of these measures have multiple components and therefore consist of more than one line-item.

Group 2: Measures that are considered important elements of a comprehensive water conservation program that were passed but will not be modeled. These include:

- Public education
- Water waste prohibition
- Landscape water conservation in new development
- Research

Group 3: The lower rated measures that are not recommended for modeling.

Group 4: Measures that were individually left unrated but potentially will be included in the design the measure included as part of the following measures to be modeled:

- Water loss control program
- Future public education initiatives
- Independent water rate study

The Water Commission was encouraged to review and comment on the screening outcome and consider including another 4-5 items from Group 3 to be modeled for further analysis. The project budget provided for a total of 30 measures to be analyzed in detail for costs and benefits. Though additional measures were not planned to be added after the modeling phase had started, many measures were modified, cut and/or added.

The following figure presents a compiled list of the community's ideas for future conservation programs.

Figure F-1. Community Ideas for Future Water Conservation Programs

Program Type	Suggestion	Already Included in the Potential Measures List?
Water Loss	Collect annual flushing water into tanks and use as reclaimed water.	Item 3C
Water Loss	Include an estimate of future water lost to leakage when considering a program for replacing distribution system pipes.	Item 3B
Adv. Meter Infrastruct.	Allow customers to monitor their own water consumption via the computer.	Item 5A
Water Rates	Charge more for water usage.	Items 6A-B
Water Rates	Develop a formula for tying the price of water to population.	
Water Rates	Drastically reduce the 'Ready to Serve' charge while increasing the per unit water charge in a revenue neutral manner.	
Water Rates	Eliminate the 'Ready to Serve' charge, increase the per unit water charge in a revenue neutral manner, and charge a nominal fee when usage does not register as a billable water unit.	
Water Rates	Develop a separate billing category for individually metered apartments and multi-family residences.	
Water Rates	Charge more for water used to irrigate golf courses.	Item 6C
Water Rates	Increase the rates between tiers.	Item 6A
Water Rates	Study and implement a new and improved tiered rate structure that significantly encourages water conservation.	Items 6A-C
Indoor Plumb. Fixtures	Install pressure regulators on properties with high pressure.	Item 9D
Indoor Plumb. Fixtures	Require businesses to install 1.28gpf toilets and waterless urinals.	Items 15B, 18
Indoor Plumb. Fixtures	Promote composting toilets.	Item 48A
Indoor Plumb. Fixtures	Make installation showerheads with shutoffs, ulfts, and waterless urinals mandatory in all hotels and motels.	Items 12A, 13, 15A, 17, 18
Indoor Plumb. Fixtures	Require waterless urinals as part of the building code.	
Hot Water on Demand	Promote hot water recirculation pumps.	
Hot Water on Demand	Study water savings for hot water on demand pumps and potentially fund program using developer funded offsets.	Items 20A-B
Clothes Washers	Buy everyone a High Efficiency Clothes Washer.	
Clothes Washers	Offer an immediate "no interest" loan for every household in the service area to purchase a high efficiency clothes washer.	
Irrigation/ Washers	Increase incentives to save water e.g. lawn removal, water catchment, and water/energy efficient clothes washers.	Items 21A-B, 26-31, 35A-35B
Irrigation	Give rebates to customers who plant drought-resistant and native plants.	Item 26
Irrigation	Ban sprinkler systems.	
Irrigation	Increase the turf replacement rebate from $0.50/sq ft to $1.00/sq ft with an upper limit of $1,000.	27A
Irrigation	Develop water conservation programs for agricultural customers focusing on irrigation practices.	
Irrigation	New home and business construction should include drought resistant landscaping and permeable paving.	Item 32
Irrigation	Provide funding for drought tolerant landscaping	Items 26, 27A-B
Rainwater Catchment	Establish large rain water collection tanks.	
Rainwater Catchment	Every new home must be built with a catchment system to collect rainwater. Every existing home must install one too.	Item 35B
Rainwater Catchment	Install rainwater catchment systems and use water for flushing toilets.	
Rainwater/Graywater	Revise local building code to facilitate use of rainwater and graywater, e.g. rainwater to toilet.	Items 36B, D
Graywater	Offer incentives for graywater installation.	Items 36A,C, D
Graywater	Plumb for reuseable grey water to be available outdoors or for toilets.	Items 36A-D
Graywater	Require golf courses use to use graywater.	
Graywater	Every new and existing home should catch and use graywater to water the yard.	Items 36A-C
Public Education	Publish a weekly report of the service area's water consumption.	
Public Education	Develop a public awareness campaign focusing on total water consumption.	Item 47D
Public Education	Publish water consumption data by neighborhood and by large users.	Item 47D

The following table presents the City's measure screening results.

Table F-1. Measure Screening Results

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
Group 1 - Top Rated Measures Planned to be Modeled															
1A	Clothes Washers	Residential Washer Rebate	SF, MF Indoor	Provide a rebate for efficient washing machines to single family homes and apartment complexes that have common laundry rooms. It is assumed that the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star) and only offer the best available technology. This program would be similar the City's current program. Current rebate $100. Rebate could be modified to increase incentive for the most efficient washers *up to full replacement cost*.	5	3.5	5	5	5	2	25.5	Yes	Yes	19) Buy everyone a High Efficiency Clothes Washer. 20) Offer an immediate "no interest" loan for every household in the service area to purchase a high efficiency clothes washer.	

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
1B	Clothes Washers	High Efficiency Washer Rebate	CII Indoor	Provide a $400 rebate for the installation of a high efficiency commercial washer (HEW). Rebate amounts would reflect the incremental purchase cost. Program will be shorter lived as it is intended to be a market transformation measure and eventually would be stopped as efficient units reach saturation.	4	3.5	5	5	5	2	24.5	Yes	Yes	Buy everyone a High Efficiency Clothes Washer.	Uses per machine is higher than residential, less accounts
2	Clothes Washers	Require High Efficiency Clothes Washers in New Developme nt	New SF Indoor	Require developers to install an efficient clothes washer (meeting certain water efficiency standards, such as gallons/load), Building Department would be requested to ensure that an efficient washer was installed before new home or building occupancy. Verify that the Utility can enforce conditions of water service that may include efficiency	4	3.5	5	5	3	2	22.5	Yes	No		Requires changing local codes

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
				standards for washing machines. Pattern after the North Marin Water District Program.											
3	Water Loss	Water Loss Control Program	System	City of Santa Cruz's water losses are relatively low. This measure would seek to maintain low non-revenue water rates through controlling both apparent and real water losses. This would be annual tracked through the AWWA Water Balance Water System Audit.	4	4	5	5	3	1	22	Yes	No		
4	Indoor Plumbing Fixtures	Ultra High Efficiency Toilet (UHET) Rebates	SF MF	Provide a rebate or voucher for the installation of an ultra high efficiency toilet (UHET). (Toilets flushing 1.0 gpf or less and include dual flush technology. Rebate amounts would reflect the incremental purchase cost and have been at least $150.	4	5	4	3	5	0	21	Yes	No		Modify UHET Program <1.0 gpf toilets

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
5	Hot Water on Demand	Provide a Rebate for Hot Water on Demand Pump Systems	SF Indoor	Provide a rebate to equip homes 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 reduce hot water waiting times by having an on-demand pump on a recirculation line. Can be installed on kitchen sink or master bath, wherever hot water waiting times are more than 1/2 minute. Requires an electrical outlet under the sink, which is not common on older home bathrooms but is on kitchen sinks.	4	2	3	5	5	2	21	Yes	No	17) Promote hot water recircu-lation pumps.	

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
6	Irrigation	Outdoor Water Audit	Large Irrigation Customers - Outdoor Only	Outdoor water audits offered for existing large landscape customers. Normally those with high water use are targeted and provided a customized report on how to save water. All large multi-family residential, CII, and public irrigators of large landscapes would be eligible for free landscape water audits upon request. Tied to the Water Budget Program.	4	1	4	5	5	2	21	Yes	No		Measureable on Waterfluence
7A	Irrigation	Landscape Conversion or Turf Removal	SF	Provide a per square foot incentive for to remove turf and replace with low water use plants or permeable hardscape. Pattern after the City's current program. Rebate is currently $0.50 per square foot removed, and capped at an upper limit of $500 for single family residence. *Consider higher rebate amount.*	4	2.5	4	5	4	1	20.5	Yes	Yes	Increase incentives to save water e.g. lawn removal, water catchment, and water/ energy efficient clothes washers.	

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
7B	Irrigation	Landscape Conversion or Turf Removal	MF CII	Provide a per square foot incentive for to remove turf and replace with low water use plants or hardscape. Pattern after the City's current program. Rebate is currently $0.50 per square foot removed, and capped at an upper limit of $2,500 for multi-family or commercial residence.	3	3	4	5	4	1	20	Yes	Yes		
8A	Advanced Meter Infrastruct ure (AMI)	Targeted AMI to Irrigation or Large User Accounts	ALL	Require that larger or irrigation customers install such AMI meters as described above and possibly purchase means of viewing daily consumption by landscape/property managers, or business either through the Internet (if available) or separate device. The AMI system would, on demand, indicate to the customer and Utility where and how their water is used,	2	4	4	4	4	2	20	Yes	Yes		

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
				facilitating water use reduction and prompt leak identification. This would require Utility to install an AMI system.											
8B	Advanced Meter Infrastruct ure (AMI)	Install AMI System-wide	ALL	Retrofit system with AMI meters and associated network capable of providing continuous consumption data to Utility offices. Improved identification of system and customer leaks is major conservation benefit. Some of costs of these systems are offset by operational efficiencies and reduced staffing, as regular meter reading and those for opening and closing accounts are accomplished without need for physical or drive-by meter reading. Also enables enhanced billing options and ability to monitor	4	4	3	4	2	2	19	Yes	Yes	Allow customers to monitor their own water consump-tion via the computer.	

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
				unauthorized usage (such as use/tampering with closed accounts or irrigation if time of day or days per week are regulated). Customer service is improved as staff can quickly access continuous usage records to address customer inquiries. Optional features include online customer access to their usage, which has been shown to improve accountability and reduce water use. A ten-year change-out would be a reasonable objective.											
9	Indoor Plumbing Fixtures	Real Customer Water Loss Reduction - Leak Repair and Plumbing Emergency Assistance	SFR, MFR	Customer leaks can go uncorrected at properties where owners are least able to pay costs of repair. These programs may require that customer leaks be repaired, but either subsidize part of the repair and/or pay the cost with revolving	4	2	4	5	4	1	20	Yes	No		Social justice benefits to low income households

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
				funds that are paid back with water bills over time. May also include an option to replace inefficient plumbing fixtures at low-income residences.											
10A	Indoor Plumbing Fixtures	High Efficiency Faucet Aerator/ Shower-head Giveaway	SF MF	Utility would buy showerheads and faucet aerators in bulk and give them away at Utility office or community events.	2	3	4	4	5	2	20	Yes	Yes		Giveaway, don't know if installed
10B	Indoor Plumbing Fixtures	High Efficiency Faucet Aerator/ Shower-head Giveaway	CII	Utility would buy showerheads and faucet aerators in bulk and give them away at Utility office or community events.	1	3	4	4	5	2	19	Yes	Yes		Hotel opportunities ?
11	Indoor Plumbing Fixtures	Toilet Retrofit at Time of Sale	ALL	Work with real estate industry to require a certificate of compliance be submitted to Utility that verifies a plumber has inspected property and efficient fixtures were either already there or were installed at time of sale.	2	5	4	4	5	0	20	Yes	No		Saturated and 1.6 gpf would get an exemption

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
12	Irrigation	Outdoor Water Surveys	SF MF	Outdoor water surveys offered for existing customers. Normally those with high water use are targeted and provided a customized report on how to save water. Can be combined with indoor surveys or focused on certain customer classes. All single family and multi-family residential would be eligible for free landscape water surveys upon request.	4	1	3	5	5	2	20	Yes	No		Customer service, water quality runoff benefits
13A	CII Equip-ment	Customized Top Users Incentive Program	CII Indoor/ Outdoor	After the free water use survey has been completed at site, the Utility will analyze the recommendations on the findings report that is provided and determine if site qualifies for a financial incentive. Financial incentives will be provided after analyzing the cost benefit ratio of each proposed project. Incentives are tailored	3	4	4	4	4	1	20	Yes	No		

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
				to each individual site as each site has varying water savings potentials. Incentives will be granted at the sole discretion of the Utility while funding lasts.											
13B	CII Equip-ment	Promote Restaurant Spray Nozzles	CII Indoor	Provide free 1.3 gpm (or lower) spray nozzles and possibly free installation for the rinse and clean operation in restaurants and other commercial kitchens. Thousands have been replaced in California going door to door, very cost-effective because saves hot water.	4	4	5	4	4	2	23	Yes	No		

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
14	CII Equip-ment	CII Surveys and Top Water Users Program (Top customers from each customer category)	CII Indoor/ Outdoor	Top water customers from each category would be offered a professional water survey that would evaluate ways for the business to save water and money. The surveys would be for large accounts (such as, accounts that use more than 5,000 gallons of water per day) such as hotels, restaurants, stores and schools. Emphasis will be on supporting the top 25 users for each customer category.	3	2	3	3	4	1	16	Yes	No		

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)					
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No	Community Suggestions	WD Comments
15	Water Rates	Water Budget Based Billing	Dedicated Meters – Outdoor Use is primary focus	Develop individualized monthly water budgets for all or a selected category of customers. Water budgets are linked to a rate schedule where rates per unit of water increase when a customer goes above their budget, or decreases if they are below their budget. Budgets typically are based on such factors as the size of the irrigated area and often vary seasonally to reflect weather during the billing period. These rates have been shown to be effective in reducing landscape irrigation demand (AWWARF Reports). Could combine this measure with Measures 6A -6C. This measure would require rate study and capable billing software.	2	4	4	4	4	1	19	Yes	No		

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
16	Indoor Plumbing Fixtures	Single Family Water Surveys	SF Indoor	Indoor water surveys for existing single family residential customers. Target those with high water use and provide a customized report to owner. May include give-away of efficient shower heads, aerators, toilet devices. Usually combined with outdoor surveys (See Irrigation Measures).	3	1	3	5	5	2	19	Yes	No		Important customer service benefits
17	Indoor Plumbing Fixtures	Pressure Reduction	ALL	Provide incentive to install pressure regulating valve on existing properties with pressure exceeding 80 psi.	2	5	3	5	3	1	19	Yes		11) Install pressure regulators on properties with high pressure.	
18	Indoor Plumbing Fixtures	High Efficiency Urinal Rebates	CII	Provide a rebate or voucher for the installation of a high efficiency urinals. WaterSense standard is .5 gpf or less, though models flushing as low as 0.125 gpf (1 pint) are available and function well, so could be specified. Rebate	3	4	4	5	3	0	19	Yes	No		Unsure about capability to retrofit existing CII Buildings

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
				amounts would reflect the incremental purchase cost and have been about $300.											
19	Indoor Plumbing Fixtures	Install High Efficiency Toilets, Shower-heads, and Faucet Aerators in Residential Buildings	SF, MF	Utility would subsidize installation cost of a new HET purchased by the utility. Licensed plumbers, pre-qualified by the Utility would solicit customers directly. Customers would get a new HET installed at a discounted price. *Example: the Niagara City Smart Program*	4	4	4	2	4	1	19	Yes	No		
20	Indoor Plumbing Fixtures	Install sensor-activated faucets	CII Indoor	Consider direct install program, rebates or grants for installation of high efficiency sensor faucet fixtures in all or selected high-use commercial or institutional buildings.	2	3	2	5	5	2	19	Yes	No		

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)					
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No	Community Suggestions	WD Comments
21	Hot Water on Demand	Require Hot Water on Demand/ Structured Plumbing in New Develop-ments	SF Indoor	Work with developers to equip new homes or buildings with efficient hot water on demand systems such as structured plumbing 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.	2	2	3	5	5	2	19	Yes	No		
22	CII Equip-ment	School Building Retrofit	CII Indoor/ Outdoor	School retrofit program wherein school receives a grant to replace fixtures and upgrade irrigation systems. Expand current City Program, pattern after EBMUD program.	2	4	4	5	4	0	19	Yes	No		

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
23A	Irrigation	Financial Incentives for Irrigation and Landscape Upgrades	ALL	For SF, MF, CII, and IRR customers with landscape, provide a Smart Landscape Rebate Program with rebates for substantive landscape retrofits or installation of water efficient upgrades; Rebates contribute towards the purchase and installation of water-wise plants, compost, mulch and selected types of irrigation equipment upgrades. Rebate for residential accounts and up to 50% more for commercial customers.	4	2.5	3	5	3	1	18.5	Yes	Yes		
23B	Irrigation	Rotating Sprinkler Nozzle Rebates	ALL Outdoor	Provide rebates to replace standard spray sprinkler nozzles with rotating nozzles that have lower application rates. Nozzles cost about $6 and rebates have been on the order of $4 with a minimum purchase of about 20 nozzles.	4	3	5	5	4	1	22	Yes	Yes		

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
24	Irrigation	Shade Tree Program	ALL	Provide incentives and information to promote shade tree planting as a water conservation measure. Potential for Water-Energy Partnership.	2	5	2	5	5	1	20	Yes	Yes		
25	Rainwater Catchmen t	Provide Rain Barrel Incentive	SFR Outdoor	Provide incentive for installation of rain barrels. This could involve rebates or bulk purchase and giveaways of barrels plus workshops on proper installation and use of captured rain water for landscape irrigation. Pattern after Honolulu Board of Water Supply program.	2	3	2	5	4	1	17	Yes	Yes	Every new home must be built with a catchment system to collect rainwater. Every existing home must install one too.	Current Program
26	Irrigation	Weather-Based Irrigation Controller Rebates	ALL	Provide a per station rebate (typically $25 per station) up to a 50% cost-share for the purchase of a weather based irrigation controller. These controllers have on-site weather sensors or rely on a signal from a central weather station that modifies irrigation times at least	3	2	3	2	3	1	14	No			Retrofitted existing homes only

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
				weekly. Requires local irrigation contractors who are competent with these products, so may require sponsoring a training program in association with this measure.											
27	Irrigation	Require Rain Sensors	Outdoor ALL or Selected	Require installation of rain sensor shut-off devices when installing new irrigation systems.	1	2	2	3	4	1	13	No			
28	Rainwater Catch-ment	Provide Incentive for Large Rainwater Catchment Systems	MFR CII IRR Outdoor	Provide incentive for installation of large rainwater catchment systems. This could involve rebates, grants and other cost share methods. Might require simultaneous installation of water efficient landscaping to assure that amount of water collected is capable of lasting into peak irrigation season.	1	3	2	3	3	1	13	No			
29	Gray water	Gray water Retrofit SF	SF Outdoor	Provide a rebate to assist a certain percentage of single family homeowners per year to install gray water systems.	3	2	1	3	3	0	12	No		Offer incentives for graywater installation.	

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
30	Indoor Plumbing Fixtures	High Efficiency Toilet (HET) Rebates	CII	Provide a rebate or voucher for the installation of a high efficiency toilet (HET). (Toilets flushing 1.28 gpf or less and include dual flush technology. Rebate amounts would reflect the incremental purchase cost and have been at least $200.	3	5	4	3	3	0	18	No	Consider Including		CII difficult to motivate the change
31	Indoor Plumbing Fixtures	Plumber Initiated High Efficiency Toilet and/ or Urinal Retrofit Program	CII	Utility would subsidize installation cost of a new HET/ urinals purchased by the utility. Licensed plumbers, pre-qualified by the Utility would solicit customers directly. Customers would get a new HET installed at a discounted price. Pattern after Sonoma County program.	3	5	4	3	3	0	18	No	Consider Including		Mixed response from CII Customers, Practical obstacles of direct install type program

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
Group 2 - Measures Intended for Plan, not to be Modeled															
	Public Education	ALL	ALL	Comprehensive education and public awareness campaign that would evolve over the years and seek to drive participation in other conservation programs.							0	Yes	Yes		
	Other	Prohibit Once through Cooling, Non-Recycling Fountains, Water Wasting Fixtures and Practices	CII	Prohibit certain obvious wastes of water in new and existing facilities, such as those listed. Consider requiring retrofits of existing situations, allowing reasonable time for compliance.							0	Yes	Yes		Not ranked. Included.
	Other Outdoor	Prohibit Water Waste and Practices	All Outdoor	Adopt or modify ordinance that prohibits the waste of water defined as gutter flooding and failure to repair leaks in a timely manner.	4	1	1	5	5	1	17	No			Required, stormwater benefits

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
City Code	Irrigation	Water Conserving Landscape and Irrigation Codes	ALL	Develop and enforce Water Efficient Landscape Design Standards. Standards specify that development projects subject to design review be landscaped according to climate appropriate principals, with appropriate turf ratios, plant selection, efficient irrigation systems and smart irrigation controllers. There are many examples that have demonstrated significant water savings. The ordinance could require certification of landscape professionals.	1	4	3	4	4	1	17	Yes	Yes	New home and business construc-tion should include drought resistant landscaping and permeable paving.	Current Code

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
City Code	Irrigation	Require Weather Adjusting Smart Irrigation Controllers and/or Rain Sensors in New Develop-ment	ALL	Require developers for all properties of greater than four residential units and all commercial development to install the weather based irrigation controllers. Some utilities offer rebates for rain sensors. For example, see Cal Green building code that requires this on all new buildings with an irrigation system. Like line 28, may require landscaper training.	1	2	2	3	4	1	13	No			Current Ordinance for City
City Code	Irrigation	Require Irrigation Designers/ Installers be Certified – possibly by Irrigation Association or CA Landscape Contractors Association	CII Outdoor	Require design/ installation of irrigation systems by trained/certified contractors. Certification might be through the CLCA, Irrigation Association (IA) and/or specialized training provided by utility. Model after Cary North Carolina's program.	1	4	2	4	4	1	16	Yes	Yes		Current Code

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
	Other	Research	ALL	*Support the potential Best Management Practices, including hot water recirculation pumps, and other emerging technologies or approaches to conservation. End Use analysis, savings evaluations, continued monitor Baseline Study and AWWA studies and CUWCC support.*							0			18) Study water savings for hot water on demand pumps and potentially fund program using developer funded offsets.	Not ranked. Include in plan
Group 3 - Measures Not Selected for Plan or to be Modeled															
	Indoor Plumbing Fixtures	Multi-Family Water Surveys	MF Indoor	Indoor water surveys for existing multifamily residential customers (2 units or more). Target those with high water use and provided a customized report to owner. Usually combined with outdoor surveys (see Irrigation Measures) and sometimes with single family surveys.	2	3	2	5	5	1	18	No	Consider Including		Economy of scale – many customers when property manager, and facility maintenance.

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)					
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No	Community Suggestions	WD Comments
	Indoor Plumbing Fixtures	High Efficiency Toilet (HET) Rebates	CII	Provide a rebate or voucher for the installation of a high efficiency toilet (HET). Toilets flushing 1.28 gpf or less and include dual flush technology. Rebate amounts would reflect the incremental purchase cost and have been at least $200.	3	5	4	3	3	0	18	No	Consider Including		CII difficult to motivate the change
	Indoor Plumbing Fixtures	Plumber Initiated High Efficiency Toilet and/ or Urinal Retrofit Program	CII	Utility would subsidize installation cost of a new HET/urinals purchased by the utility. Licensed plumbers, pre-qualified by the Utility would solicit customers directly. Customers would get a new HET installed at a discounted price. Pattern after Sonoma County program.	3	5	4	3	3	0	18	No	Consider Including		Mixed response from CII Customers, Practical obstacles of direct install type program
	Indoor Plumbing Fixtures	Install High Efficiency Fixtures in Governmen t Buildings	CII Indoor	Provide rebates or grants to install high efficiency faucets, toilets, urinals and showerheads in local and state government facilities.	2	5	4	4	3	0	18	No	Consider Including		Consider county jail, use Otay WD example (William Granger)

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
	Indoor Plumbing Fixtures	Install High Efficiency Toilets, Urinals, and Showerheads in Commercial Buildings	CII Indoor	Consider direct install program-type for installation of high efficiency fixtures in all or selected commercial or institutional buildings. Replacements would include high efficiency toilets, showerhead, and waterless or high efficiency urinals.	3	5	4	3	3	0	18	No	Consider Including	Require businesses to install 1.28gpf toilets and waterless urinals.	Same as 13A – could be more turn-key with City Smart Program. Schools?
	Dish-washers	Efficient Dishwasher Rebates	SF Indoor	Provide a rebate to encourage homeowner to purchase an efficient dishwasher (meeting certain water efficiency standards, such as a limit on the gallons/load) when replacing an existing dishwasher.	2	3	2	5	5	1	18	No	Consider Including		Baseline study shows relatively modern machines in service area
	Irrigation	Artificial Turf Sports Fields	IRR Outdoor	Provide a rebate (up to $10,000) as a cost share for customer wishing to install artificial grass on sports fields, parks, or golf courses.	2	3	4	3	5	1	18	No	Consider Including		

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)					
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No	Community Suggestions	WD Comments
	Sub-metering	MF Submeter Incentive	Existing MF Indoor	Provide a rebate (per unit) to assist MF building owners installing submeters on each existing individual apartment or condominium unit.	3	4	4	4	1	1	17	No			
	Indoor Plumbing Fixtures	Install High Efficiency Fixtures in Low Income Housing	SFR/MFR	Direct install type toilet replacement program in in low income housing operated a government agency/ housing authority.	1	5	4	4	3	0	17	No			
	CII Equip-ment	CII Rebates to Replace Inefficient Equipment	Existing Customers CII	Expand on the City's program to provide rebates for a standard list of water efficient equipment. Included: x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, and add conductivity controller on cooling towers. Pattern after San Diego County Water Authority or Seattle Water Department programs.	2	3	3	4	4	1	17	No			

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)					
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No	Community Suggestions	WD Comments
	CII Equip-ment	Hotels/Mot els Retrofit w/Financial Assistance	CII Indoor	Following a free water audit offer motels a rebate for equipment identified that would save water. Or provide a rebate schedule for certain efficient equipment such as air-cooled ice machines that motels could apply for without an audit. Pattern after San Antonio, Texas program.	2	3	3	4	4	1	17	No			
	Sub-metering	Mobile Home Park Sub-metering	MF Indoor	Require or provide a partial cost rebate to meter all remaining mobile home parks that are currently master metered but not separately metered, pattern after Santa Clara Valley Water District program.	1	4	4	4	3	0	16	No			Most already accomplished this.
	Sub-metering	Require Multifamily Sub-metering for New Developme nts	New MF Indoor	Require the submetering of individual units in new multi-family, condos, townhouses, and mobile-home parks.	1	4	4	4	2	1	16	No			Require Code Change

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
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	Indoor Plumbing Fixtures	Require Fixture Replacement by a Deadline	ALL	Utility would pass an ordinance that requires certain targeted sectors of businesses to bring fixtures up to efficient standard by a fixed date at their own expense.	2	4	5	2	2	1	16	No			Look to sectors
	Irrigation	Landscape irrigation restricted to designated days and times	ALL Outdoor	Specify specific irrigation schedules, including which days and times watering is allowed. Would help with load balancing system demands with planning for water areas can water on what days. Consider water waste enforcement approach. For an example see the Southern Nevada Water Authority program. http://www.snwa.com/consv/restrictions_landscape.html	4	2	4	3	2	1	16	No			Requires local codes

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
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	Indoor Plumbing Fixtures	Require <0.25 gal/flush urinals in new develop-ment	CII (New Develop-ment)	Require that new building be fitted with 0.25 gpf (or one pint) *or less* urinals rather than the current standard of 0.5 gal/flush models.	1	4	4	4	2	0	15	No		Require businesses to install 1.28gpf toilets and waterless urinals. 16) Require waterless urinals as part of the building code.	
	Dishwash ers	Require Efficient Dish-washers in New Develop-ment	SF Indoor	Require developers to install an efficient dishwasher (meeting certain water efficiency standards, such as gallons/load).	1	3	2	5	3	1	15	No			Requires changing local codes
	CII Equip-ment	Water Savings Performanc e Program	CII Indoor	Water Districts such as the East Bay Municipal Utility District and Metropolitan Water District of Southern California provide about $0.50 per 748 gallons (1 billing unit) saved to sites within the City's service area. Incentive is based on the potential for savings over 5 years.	2	3	3	2	4	1	15	No			Switch to non-potable supply?

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
				Eligible project costs include labor, hardware and up to 1 year of water management fees.											
	Other	Low Impact New and Remodeled Developme nt	ALL	City would require developers of new/remodeled sites to follow Low Impact Development concepts/standards/Be st Management Practices for stormwater and water conservation benefits. Encourage or require use of bio-retention facilities, rain water cisterns, graywater plumbing, etc.	1	4	1	4	4	1	15	No			Public Works Dept.

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
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	Advanced Meter Infrastruct ure (AMI)	Install AMI New Develop-ment Only	ALL	Require that new customers install such AMI meters as described above and possibly purchase means of viewing daily consumption inside their home/business either through the Internet (if available) or separate device. The AMI system would, on demand, indicate to the customer and Utility where and how their water is used, facilitating water use reduction and prompt leak identification. This would require Utility to install an AMI system.	1	4	3	4	0	2	14	No			
	Sub-metering	MF Submeter Incentive	New MF Indoor	Provide a rebate (per unit) to assist MF building owners installing submeters on each new individual apartment unit.	1	4	4	4	0	1	14	No			Already required unless space is not available.

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
	Indoor Plumbing Fixtures	High Efficiency Toilet and/ or Urinal Bulk Purchase Program	ALL	Utility would buy HETs or urinals in bulk and give them away or sell them at a discounted price for customers who want to replace a 3.5 gallon/flush toilet or >1 gal/flush urinal.	3	4	4	2	1	0	14	No			
	Irrigation	Weather-Based Irrigation Controller Rebates	ALL	Provide a per station rebate (typically $25 per station) up to a 50% cost-share for the purchase of a weather based irrigation controller. These controllers have on-site weather sensors or rely on a signal from a central weather station that modifies irrigation times at least weekly. Requires local irrigation contractors who are competent with these products, so may require sponsoring a training program in association with this measure.	3	2	3	2	3	1	14	No			

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
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	Irrigation	Rebate or Free Rain Sensors	Outdoor ALL or Selected	Provide a rebate or free rain sensor shut-off device for existing irrigation controllers. These cancel scheduled sprinkling when sufficient rain has been received. This measure is most effective in areas with intermittent rain in peak watering seasons.	2	2	2	4	3	1	14	No			
	Rainwater Catch-ment	Require Rain Barrel	SFR Outdoor	*All new homes would need a rainwater catchment*	1	3	2	4	3	1	14	No		Every new home must be built with a catchment system to collect rainwater. Every existing home must install one too.	Explain - plumbed for non-potable (or potable use) use for irrigation. Code change required
	CII Equip-ment	Require Plan Review for new CII	CII Indoor / Outdoor	Require plan reviews for water use efficiency for all new business customers.	1	3	2	4	4	0	14	No			

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	CII Equip-ment	Focused Water Audits for Hotels/ Motels	CII Indoor/ Outdoor	Proved free water audits to hotels and motels. Standardize on the types of services offered to reduce costs. Included would be bathrooms, kitchens, ice machines, laundry, landscaping, and irrigation systems and schedules.	1	1	3	4	4	1	14	No			
	CII Equip-ment	Hotels/Mot els Retrofit	CII Indoor	*Require schedule for certain efficient plumbing fixtures be replaced by a deadline.*	2	3	4	2	2	1	14	No		Make installation showerhea ds with shutoffs, ULFT's, and waterless urinals mandatory in all hotels and motels.	
	Irrigation	Require Weather Adjusting Smart Irrigation Controllers and/or Rain Sensors in New Develop-ment	ALL	Require developers for all properties of greater than four residential units and all commercial development to install the weather based irrigation controllers. Some utilities offer rebates for rain sensors. For example,	1	2	2	3	4	1	13	No			

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				see Cal Green building code that requires this on all new buildings with an irrigation system. Like line 28, may require landscaper training.											
	Irrigation	Require Rain Sensors	Outdoor ALL or Selected	Require installation of rain sensor shut-off devices when installing new irrigation systems.	1	2	2	3	4	1	13	No			
	Rainwater Catch-ment	Provide Incentive for Large Rainwater Catchment Systems	MFR CII IRR Outdoor	Provide incentive for installation of large rainwater catchment systems. This could involve rebates, grants and other cost share methods. Might require simultaneous installation of water efficient landscaping to assure that amount of water collected is capable of lasting into the peak irrigation season.	1	3	2	3	3	1	13	No			
	Gray water	Gray water Retrofit SF	SF Outdoor	Provide a rebate to assist a certain percentage of single family homeowners per year to install gray water systems.	3	2	1	3	3	0	12	No		Offer incentives for graywater installation.	

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	Other Outdoor	Require or Rebate Swimming Pool Covers	ALL Outdoor	Provide a rebate through pool equipment supply stores for purchase of a swimming pool cover.	1	2	1	3	4	0	11	No			
	Other	Regulations	ALL	*Ban Sprinkler Systems*	5	0	3	1	0	1	10	No			
	Indoor Plumbing Fixtures	Garbage Disposal	SF Indoor	Encourage 1% of single family homeowners per year to remove garbage disposals. Could provide a rebate.	2	2	1	1	3	0	9	No			
	Rainwater Catchmen t	Promote Rain Barrel	SFR Outdoor/In door	*Promote with an incentive rainwater catchment for toilet flushing.*	1	3	2	2	1	0	9	No		Install rainwater catchment systems and use water for flushing toilets.	
	Gray water	Require Plumbing for Gray Water in New SF Develop-ment	SF Outdoor	Require builders of single family homes to provide plumbing for and/or install a gray water system in new homes.	1	2	1	3	2	0	9	No		Revise local building code to facilitate use of rainwater and graywater, e.g. rainwater to toilet. Plumb for	Requires Code Change and enforcement

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														reusable grey water to be available outdoors or for toilets.	
	Gray Water	SF Toilet Reuse	SFR, MFR	*Recycle lavatory sink water for toilet flushing, such as Aqus System*	1	2	1	3	2	0	9	No		Every new and existing home should catch and use graywater to water the yard.	
	Indoor Plumbing Fixtures	Compost-ing Toilet Promotions	Residential	*Promote composting toilets.*	3	2	2	1	0	0	8	No		14) Promote composting toilets.	Change of law
	Gray water	Rebate for Gray Water Systems in New CII Develop-ment	CII Outdoor	Provide a rebate for gray water systems in new CII development, in accordance with existing codes. *Consider graywater for golf courses.*	0	2	1	3	2	0	8	No		Require golf courses use to use graywater.	Domestic use in hotels only

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	Other	Agricultural	ALL	*Develop water conservation programs for agricultural customers focusing on irrigation practices.*	1	2	1	3	0	1	8	No			Most north coast agriculture customers do not use City water. Water Department operational benefits on raw water transmission line.
	CII Equip-ment	Rebates for Submeters on Cooling Towers	CII Indoor	Offer a rebate to buildings that install submeters to measure the make-up and bleed-off water of the facility cooling towers. Provide educational brochures and a phone contact of a knowledgeable person to provide conservation information.	See WD comment						0	No			Only applies to one site. Not ranked

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	CII Equipmen t	Rebates for Conduc-tivity Controllers on Cooling Towers	CII Indoor	Offer a rebate ($900-$1,200 dependent on type) to buildings that install conductivity controllers to reduce bleed-off water of the facility cooling towers. Provide educational brochures and a phone contact of a knowledgeable person to provide conservation information.	See WD comment						0	No			UC completed this. One more site eligible.
	CII Equipmen t	Cooling Tower Regulations	CII Indoor	Prohibit discharge of cooling tower blow down unless the TDS of the water is at least a certain level (that would ensure 5-10 cycles of concentration). Pattern regulations after the State of Arizona.	See WD comment						0	No			Not applicable
	CII Equipmen t	Dry Vacuum Pump	CII Indoor	Provide a rebate to assist CII with installation of dry vacuum pumps. (Possibly combine into Measure #40B CII Inefficient Equipment)	See WD comment						0	No			Not ranked. Few sites.

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	Other	Encourage "Life Cycle Analysis" Mentality of Sustain-ability and Reliability	ALL	Encourage customers to "save water" instead of "sell water". This is a suggested fundamental business model change that would focus on infrastructure delay or prevention by focusing on lowering production. Key would be to get customers to believe in this idea and message as well as management and directors. This is a paradigm shift to the importance of the entire "life cycle" cost of water including review and inclusion of the energy and Green House Gas components associated with each and every gallon of water use.	See WD comment						0				Education program. Cultural philosophy of efficient water use. Add more into energy education of water use, for example.
Group 4 - Unrated Measures May Be Included in Group 1 Measures Design when Modeled															

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Included in above Water Loss Measure	Water Loss	Conduct Annual System Water Use Audit	System	Maintain a thorough annual accounting of water production, sales by customer class and quantity of water produced but not sold (non-revenue water). In conjunction with system accounting, include audits that identify and quantify known legitimate uses of non-revenue water in order to determine remaining unaccounted for water losses. Goal would be to lower Infrastructure Leakage Index (ILI) and non-revenue water every year by a pre-determined amount based on cost-effectiveness. These programs typically pay for themselves based on savings in operational costs (and saved rate revenue can be directed more to system repairs/replacement and other costs).							0	No			

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	Water Loss	Apparent Loss Reduction - Billing System	System	Continuously analyze billing data for system errors and under-registering meters. Identify and quickly notify customers of apparent leaks.							0	No			
	Water Loss	Apparent Loss Reduction - Meter Testing	System	Address meter testing and repair/ replacement to insure more accurate meter reads and revenue collection. Actions could include meter calibration and accelerated meter replacement.							0	No			
	Water Loss	Real Water Loss Reduction - Leak Repair	System	Measure covers efforts to find and repair leaks in the distribution system to reduce real water loss. More aggressive actions could include installation of data loggers and proactive leak detection. Leak repairs would be handled by existing crews at no extra cost. Specific goals and methods to be developed by Utility.							0	No			

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				May include accelerated main and service line replacement.											
	Water Loss	Real Water Loss Reduction	System	Capture water from water main flushing and hydrant flow testing for reuse										Collect annual flushing water into tanks and use as reclaimed water.	
	Water Loss	Real Water Loss Reduction – Reduce Backgroun d Losses with Main Replace-ment	System	Enhanced real loss reduction may include more ambitious main replacement and active leak detection.							0	No		Include an estimate of future water lost to leakage when considering a program for replacing distribution system pipes.	

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	Water Loss – Pressure Regula-tion	Distribution System Pressure Regulation	System	Install additional pressure regulators in portions of distribution system to maintain pressure within limits so accounts do not receive excessive pressure. There is a high correlation between high water usage and high pressure, due to higher leakage, atomization of sprinklers and ease of using excessive water.							0	No			

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To be included in Public Educa-tion Measure above	Public Education	Conservati on Print Media	ALL	Use a range of printed materials to raise awareness of conservation measures available to customers, including incentive programs offered by Utility. This can include newsletters, bill stuffers, brochures (self-developed or purchased), working with local newspapers, signage at retailers, signs on public buses. Regional participation and development can help assure consistent message. Such programs would continue indefinitely. *"Develop the public awareness campaign to focus on total water consumption." "Display water conservation banners." "Educate customers on water conservation measures." "Change culture of water use through advertising and publicity."*							0	Yes			

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	Public Education	Electronic Conserva-tion Options/ Web Site/ Social Media	ALL	Provide variety of conservation information on city or utility web site, distribution of "videos." Also consider social media options such as cell phone apps, Facebook, interactive kiosk with view screen, etc. *Publish a weekly report of the service area's water use. Educate customers on water conservation measures.*							0				
	Public Education	Speakers Bureau/ Event Participa-tion	ALL	Conduct presentations at various venues, from radio and TV to service organizations and focused groups. Have booths at relevant community events. Participate in parades, etc. *"Disseminate education materials, and give talks and tours promoting drought tolerant landscaping."*							0				

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	Public Education	Media Campaign: such as the "Use Only What You Need" or "Beat the Peak"	ALL	*Suggest a general "Use Only What You Need" message like Denver Water's program or a "Beat the Peak" message media campaign like Cary, North Carolina or Tucson Arizona: aahttp://cms3.tucsonaz.gov/water/beatthepeak. Also considered a program with focused action like: "Take Control of your Controller" Campaign for a focused social media based campaign as a media campaign. Consider determining appropriate usage and media campaign message with marketing study/focus groups. Develop the public awareness campaign to focus on total water consumption.*							*0*				

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	Public Education	Billing Report Educational Tool	ALL	*Example: Water Smart Software with online and print billing consumptions to customers.* Public Comment: *"Publish water consumption data by neighborhood and by large users." "Use WaterSmart Software or similar program to help customers understand and reduce their water demand."*							0	Yes - stand alone			
	Public Education	*Ambassa-dor Program*	*SFR, MFR*	*Have water ambassadors within neighborhoods to promote awareness. Could be staff by volunteers or student interns. Pattern after Town of Cary, North Carolina or Regional Water Authority in Sacramento, CA. "Have a water patrol of students inform neighborhoods about water conservation and promote water wise landscapes."*								Yes			

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	Public Education	Recogni-tion Programs for Water Savings by Residences & Apartments Program	SFR Outdoor	Sponsor an annual awards program for residences and multi-family properties that significantly reduce water use. They would receive a plaque/ recognition. This could include innovative customers that install compost toilets, gray-water, bio-swales and rainwater cisterns in an effort to maximize practical home water use efficiency. *"Praise people with xeriscapes. Make them public heroes for others to emulate."*							0				
	Public Education	Recogni-tion Programs for Water Savings by Businesses	CII Indoor/ Outdoor	Sponsor an annual awards program for businesses that significantly reduce water use. They would receive a plaque/recognition.							0				

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	Public Education: Irrigation Focus	Outdoor Residential Focused Public Awareness Informa-tion Program	SF Outdoor Only	Programs could continue efforts including poster contests, speakers to community groups, conservation hotline, website, video loan, radio and television time, demonstration gardens and printed educational material such as bill inserts, etc. Could also consider increasing current Utility efforts possibly adding social media such as cell phone apps, Facebook, interactive kiosk with view screen, etc. Program would continue indefinitely. *"Promote the removal of front lawns as they are more ornamental in general than a back lawn."*							0	Yes			

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	Public Education: Irrigation Focus	Efficient Outdoor Use Education and Training Programs	SF/MF/CII Outdoor	Utility would offer, organize and sponsor a series of educational workshops or other means for educating homeowners, landscapers and contractors in efficient landscaping and irrigation principals. Utilize guest speakers, native demonstration gardens, incentives, such as a nursery plant coupon. *"Support consistent and long term educational workshops and events." "For customers wishing to retain a lawn, promote the use of eco-friendly, high drought tolerant, low maintenance turf."*							0				

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	Public Education: Irrigation Focus	Train Landscape Mainte-nance Workers (Green Gardener Program)	ALL Outdoor	Utility would sponsor bilingual training for managers and workers in landscape maintenance methods that will save irrigation water. Model after Green Gardener Program. Santa Barbara County Water Agency example: http://www.greengardener.org/. With some of these programs, names of businesses that have obtained training are included in Utility publications and/or Web sites (as an incentive to participate). *"Provide the Qualified Water Efficient Landscaper (QWEL) course to landscapers."*							0				
	Public Education: Irrigation Focus	Networking with Landscap-ing Industry	ALL Outdoor	Meet with and become members in "Green Industry" organizations; partner with projects and outreach material development. Outreach to nurseries							0				

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				for information distribution, provide "water wise plant" signage, etc.											
	Public Education: Irrigation Focus	Landscape Water Calculator	ALL	Develop Landscape Watering Calculator and Watering Index, and actively market these. Consider cell phone app with Watering Index, following up in person with large landscape customers on a frequent basis to encourage use of Watering Index.							0				
	Public Education: Irrigation Focus	Climate appropri-ate (Water Efficient) Demonstra tion Gardens	ALL	Donate or acquire a portion of public or private land to create a demonstration garden displaying living examples of low water-using gardens and landscaping. The Utility would provide signs and brochures to educate those people visiting the garden.							0				

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Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
	Public Education	Promote Green Buildings	ALL	Assign Staff a position to work with local Green Building associations, developers, designers, vendors to promote incorporating water efficiency into building design. Possibly work with other partner utilities or agencies energy/wastewater/ stormwater. Co-sponsor award program.							0	Not WC Mea-sure			
	Public Education	Schools Education Programs	ALL	Work with local school districts to develop classroom programs that they would embrace. Consider poster contests, etc. Some programs would require dedicated utility staff to assist & present.							0	Yes			

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
Model-ing will be comple-ted at conclu-sion of Future Rate Study	Water Rates	Rate Structure Evaluation	ALL	Rates must meet Utility costs, but some features can improve customer accountability by better imposing cost impacts for high water usage. Conservation oriented rate structures in California generally collect less than 30% of water revenue through base charges. Tiered rate structures are the most popular form of conservation rates, and can be very effective provided there are sufficient tiers (3 to 4 is recommended), and price differences between tiers is sufficient and tiers are placed at usage levels that appropriately reflect low, medium and high usage levels for the Utility. This measure would also require a rate study. *Consider "drastically*							0	No		6) Drastically reduce the 'Ready to Serve' charge while increasing the per unit water charge in a revenue neutral manner. 7) Eliminate the 'Ready to Serve' charge, increase the per unit water charge in a revenue neutral manner, and charge a nominal fee when usage does not register as a billable water unit.	

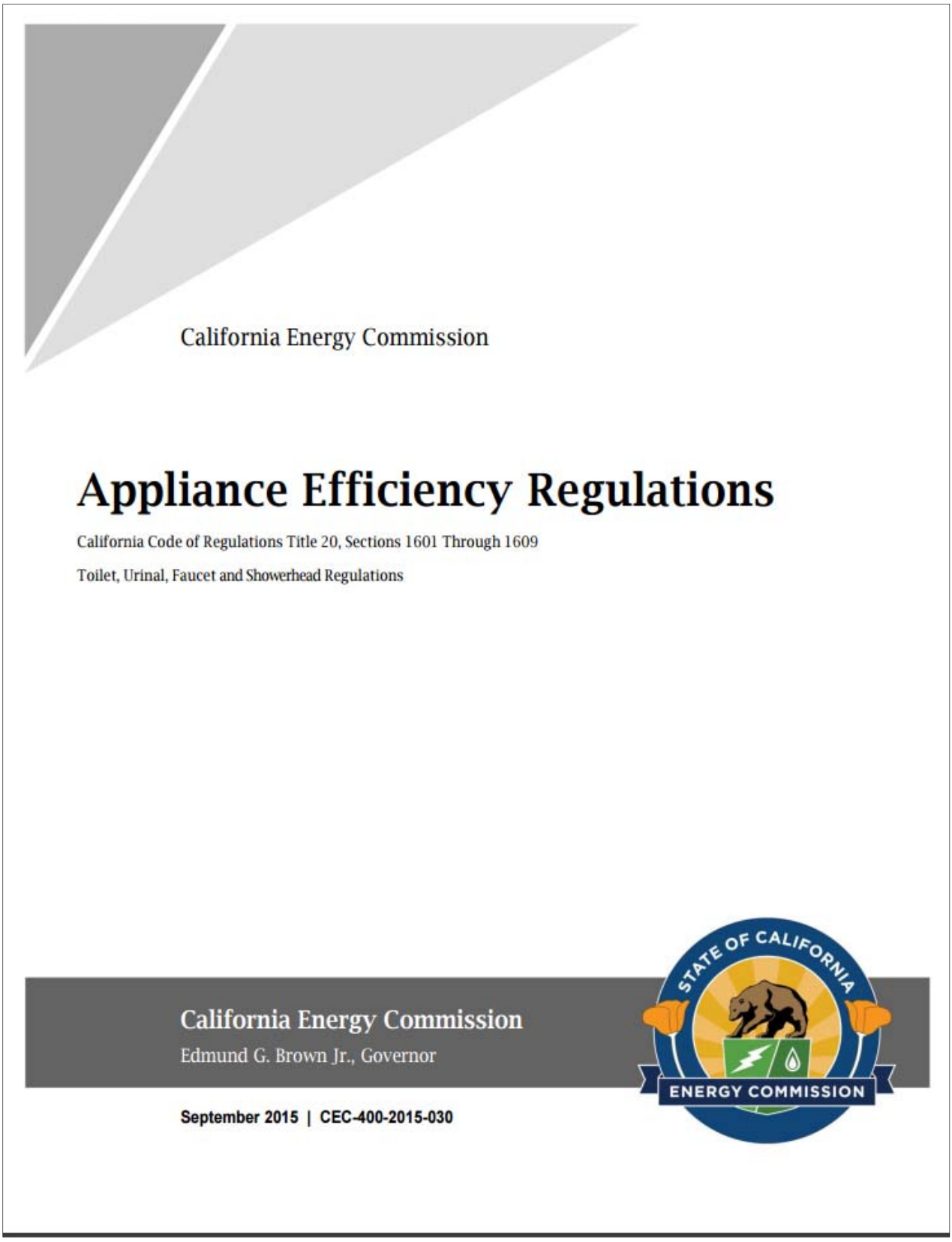
Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
				reducing" the base charge.											
	Water Rates	Modifica-tion to or Implemen-tation of Tiered Rate Conserva-tion Pricing	Multi-Family CII Outdoor is Primary Focus	Consider revising City's tiered rates or seasonal pricing for other customer classes. Some utilities utilize percentages of average winter usage as the basis for individualized summer tiers. Multi-Family Residential tiers could be based on number of housing units served by meters. This							0	No		4) Charge more for water usage. 8) Develop a separate billing category for individually metered apartments and multi-family	

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
				measure would require a rate study and advanced billing system capabilities. *Consider developing a separate billing category for individually metered apartments and multi-family residences.*										residences. 9) Increase the rates between tiers. 10) Study and implement a new and improved tiered rate structure that significantly encourages water conserva-tion.	
	Water Rates	Establish Separate Pricing Structure for Irrigation Accounts	All large irrigation	Implementing conservation-oriented pricing for dedicated irrigation customers would encourage more efficient irrigation practices. This is best combined with Measures 7B and 8. Would require a rate study. *Consider charging more for water used to irrigate golf courses.*							0	No		Charge more for water used to irrigate golf courses.	

Existing or Potential New Measures					Ranking Criteria and Score (0 to 5). See attachment for scale.					Ranking and Criteria (0 to 2). (2 = excellent)				Community Suggestions	WD Comments
Measure No. for Model-ing	Equip-ment or Program Type	Specific Program	Focus of Program	Measure Description	Water Savings Potential (Service Area Match)	Sustain-able Water Savings – emphasis on savings lifetime/ reliability	Quanti-fiable Water Savings	Widespread Community & Social Acceptance (Technology/ Market Maturity)	Feasibility of Implemen-tation/ Secondary Impacts – emphasis on ability to achieve objectives	Additional Service Area Benefits (GHG, Storm water)	Total Score	Pass Yes or No	Combine? Yes/No		
	Water Rates	Water Budget Based Billing	ALL	Develop individualized monthly water budgets for all or a selected category of customers. Water budgets are linked to a rate schedule where rates per unit of water increase when a customer goes above their budget, or decreases if they are below their budget. Budgets typically are based on such factors as size of the irrigated area and often vary seasonally to reflect weather during billing period. These rates have been shown to be effective in reducing landscape irrigation demand (AWWARF Reports). Could combine this measure with Measures 6A - 6C. This measure would require rate study and capable billing software.	4	4	4	4	3	2	21	Yes	No	Develop a formula for tying the price of water to population.	Major modification or New Billing System required

Notes: I – Indoor Use; L – Landscape Demand; I, L – Both Indoor and Sprinkling Demand; O – Other.

APPENDIX G – CALIFORNIA ENERGY COMMISSION APPLIANCE EFFICIENCY REGULATIONS



California Energy Commission

Appliance Efficiency Regulations

California Code of Regulations Title 20, Sections 1601 Through 1609

Toilet, Urinal, Faucet and Showerhead Regulations

California Energy Commission

Edmund G. Brown Jr., Governor

September 2015 | CEC-400-2015-030

California Energy Commission

Harinder Singh
Ken Rider
Tuan Ngo
Sean Steffensen
Betty Chrisman
Michael Murza
Jared Babula
Primary Author(s)

Harinder Singh
John Nuffer
Project Managers

Kristen Driskell
Supervisor
Appliances and Existing Buildings Office

Dave Ashuckian, P.E.
Deputy Director
Efficiency Division

Robert P. Oglesby
Executive Director

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Amendments to Appliance Efficiency Regulations

Section 1601. Scope.

...

This Article applies to the following types of new appliances, if they are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the state and those designed and sold exclusively for use in recreational vehicles, or other mobile equipment. Unless otherwise specified, each provision applies only to units manufactured on or after the effective date of the provision.

...

(h) Plumbing fittings, which are showerheads, lavatory faucets, kitchen faucets, metering faucets, replacement aerators, wash fountains, tub spout diverters, public lavatory faucets, and commercial pre-rinse spray valves.

...

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c) and 25960, Public Resources Code. Sections 16, 26 and 30, Governor's Executive Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c) and 25960, Public Resources Code. Section 16, Governor's Executive Order No. B-29-15 (April 1, 2015).

Section 1602. Definitions.

...

(h) Plumbing Fittings.

...

"Plumbing fitting" means a device that controls and guides the flow of water in a supply system. Examples include showerhead, lavatory faucet, kitchen faucet, metering faucet, lavatory replacement aerator, kitchen replacement aerator, wash fountain, commercial pre-rinse spray valve, public lavatory faucet, or tub spout diverter.

"Public lavatory faucet" means a fitting intended to be installed in non-residential bathrooms that are exposed to walk-in traffic.

"Showerhead" means a device through which water is discharged for a shower bath and includes a body sprayer and handheld showerhead but does not include a safety showerhead.

"Water use" means the quantity of water flowing through a showerhead or faucet, at point of use, as determined using the test method in Section 1604(h).

...

(i) Plumbing Fixtures.

"Dual-flush effective flush volume" means the average flush volume of two reduced flushes and one full flush.

"Dual-flush water closet" is a water closet incorporating a feature that allows the user to flush the water closet with either a reduced or a full volume of water.

"Plumbing fixture" means an exchangeable device, which connects to a plumbing system to deliver and drain away water and waste. A plumbing fixture includes a water closet or a urinal.

...

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c) and 25960, Public Resources Code. Sections 16, 26 and 30, Governor's Executive Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c) and 25960, Public Resources Code. Section 16, Governor's Executive Order No. B-29-15 (April 1, 2015).

2

Section 1604. Test Methods for Specific Appliances.

...

(h) Plumbing Fittings.

(1) The test method for commercial pre-rinse spray valves is 10 C.F.R. Sections 431.263 and 431.264.

(2) The test methods for showerheads are:

(A) **Maximum flow rate test.** The test method for determining maximum flow rate of a showerhead is 10 C.F.R. Section 430.23(t) (Appendix S to Subpart B of Part 430).

(B) **Minimum flow rate test.** The test method for determining minimum flow rate of a showerhead is ASME A112.18.1-2012 / CSA B125.1-2012, Section 5.12.

(C) **Showerheads with multiple nozzles.** Showerheads with multiple nozzles shall be tested with all nozzles in use at the same time.

(3) The test method for other plumbing fittings is 10 C.F.R. Section 430.23(s) (Appendix S to Subpart B of part 430).

(4) Showerhead-tub spout diverter combinations shall have both the showerhead and tub spout diverter tested individually.

...

(i) Plumbing Fixtures.

The test methods for plumbing fixtures are:

(1) **Water Closets.** The test method for testing gallons per flush of water closets is 10 C.F.R. Section 430.23 (u) (Appendix T to Subpart B of part 430). See Section 1604(i)(3) for the required waste extraction test.

(2) **Urinals.** The test method for testing gallons per flush of urinals is 10 C.F.R. Section 430.23(v) (Appendix T to Subpart B of part 430).

(3) Waste Extraction Test (Section 7.10) of ASME A112.19.2/CSA B45.1-2013.

The following documents are incorporated by reference in Section 1604.

...

The American Society of Mechanical Engineers (ASME)

ASME A112.19.2/CSA B45.1-2013	Ceramic Plumbing Fixtures
ASME A112.18.1-2012/CSA B125.1-2012	Plumbing Supply Fittings

3

Copies available from:

ASME Headquarters Two Park Avenue
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www.asme.org
Phone: 800-843-2762 (U.S./Canada)
001-800-843-2763 (Mexico)
973-882-1170 (outside North America)
Email: CustomerCare@asme.org

...

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c) and 25960, Public Resources Code. Sections 16, 26 and 30, Governor's Executive Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c) and 25960, Public Resources Code. Section 16, Governor's Executive Order No. B-29-15 (April 1, 2015).

4

Section 1605.1. Federal and State Standards for Federally-Regulated Appliances.

...

(h) Plumbing Fittings.

(1) **Metering Faucets and Wash Fountains.** The flow rate of wash fountains and metering faucets shall be not greater than the applicable values shown in Table H-1.

Table H-1: Standards for Plumbing Fittings

Appliance	Maximum Flow Rate
Wash fountains	$2.2 \times \frac{rim\ space\ (inches)}{20}\ gpm\ at\ 60\ psi$
Metering faucets	0.25 gallons/cycle[1,2]
Metering faucets for wash fountains	$0.25 \times \frac{rim\ space\ (inches)}{20}\ gpm\ at\ 60\ psi$[1,2]

[1]**Sprayheads with independently controlled orifices and metered controls.** The maximum flow rate of each orifice that delivers a preset volume of water before gradually shutting itself off shall not exceed the maximum flow rate for a metering faucet.

[2]**Sprayheads with collectively-controlled orifices and metered controls.** The maximum flow rate of a sprayhead that delivers a preset volume of water before gradually shutting itself off shall be the product of (a) the maximum flow rate for a metering faucet and (b) the number of component lavatories (rim space of the lavatory in inches [millimeters] divided by 20 inches [508 millimeters]).

(5) **Showerheads, lavatory faucets, kitchen faucets, aerators, and public lavatory faucets**. See Section 1605.3 (h) for standards for all showerheads, lavatory faucets, kitchen faucets, aerators, and public lavatory faucets sold or offered for sale in California.

...

The following documents are incorporated by reference in Section 1605.1.

...

(i) Plumbing Fixtures.

See Section 1605.3(i) for water efficiency standards for plumbing fixtures.

...

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c) and 25960, Public Resources Code. Sections 16, 26 and 30, Governor's Executive Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c) and 25960, Public Resources Code. Section 16, Governor's Executive Order No. B-29-15 (April 1, 2015).

5

Section 1605.2. State Standards for Non-Federally-Regulated Appliances.

...

(i) Plumbing Fixtures.

See Section 1605.3(i) for water efficiency standards for plumbing fixtures.

...

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c) and 25960, Public Resources Code. Sections 16, 26 and 30, Governor's Executive Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c) and 25960, Public Resources Code. Section 16, Governor's Executive Order No. B-29-15 (April 1, 2015).

Section 1605.3. State Standards for Non-Federally-Regulated Appliances.

...

(h) Plumbing Fittings.

(1) Tub Spout Diverters and Showerhead Tub Spout Diverter Combinations. The leakage rate of tub spout diverters manufactured on or after March 1, 2003 shall be not greater than the applicable values shown in Table H-2. Showerhead tub spout diverter combinations shall meet both the standard for showerheads and the standard for tub spout diverters.

...

(2) **Lavatory Faucets and Aerators.** The flow rate of lavatory faucets and lavatory replacement aerators shall be not greater than the applicable values shown in Table H-3.

Table H-3: Standards for Lavatory Faucets and Aerators

Appliance	Maximum Flow Rate		
	Manufactured prior to September 1, 2015	Manufactured on or after September 1, 2015, and prior to July 1, 2016	Manufactured on or after July 1, 2016
Lavatory faucets and aerators	2.2 gpm at 60psi[1,2]	1.5 gpm at 60 psi[1,2]	1.2 gpm at 60 psi[1,2]

[1]**Sprayheads with independently-controlled orifices and manual controls**. The maximum flow rate of each orifice that manually turns on or off shall not exceed the maximum flow rate for a lavatory faucet.
[2]**Sprayheads with collectively-controlled orifices and manual controls**. The maximum flow rate of a sprayhead that manually turns on or off shall be the product of (a) the maximum flow rate for a lavatory faucet and (b) the number of component lavatories (rim space of the lavatory in inches (millimeters) divided by 20 inches (508 millimeters).

...

(3) **Kitchen Faucets and Aerators and Public Lavatory Faucets and Aerators.** The flow rate of kitchen faucets, kitchen replacement aerators, public lavatory faucets, and public lavatory replacement aerators shall be not greater than the applicable values shown in Table H-4.

(A) For the plumbing fittings identified in Table H-4, noncompliant products may not be sold or offered for sale on or after January 1, 2016, regardless of manufactured date.

Table H-4: Standards for Kitchen Faucets and Aerators and Public Lavatory Faucets and Aerators

Appliance	Maximum Flow Rate	
	Sold or offered for sale prior to January 1, 2016	Sold or offered for sale on or after January 1, 2016
Kitchen faucets and aerators	2.2 gpm at 60 psi	1.8 gpm with optional temporary flow of 2.2 gpm at 60 psi
Public lavatory faucets and aerators	2.2 gpm at 60 psi	0.5 gpm at 60 psi

...

(4) **Commercial Pre-rinse Spray Valves**.

(A) Commercial pre-rinse spray valves manufactured on or after January 1, 2006, shall be capable of cleaning 60 plates in an average time of not more than 30 seconds per plate.

(B) See Section 1605.1(h) for water consumption standards for commercial pre-rinse spray valves.

...

(5) **Showerheads**. The flow rate of showerheads shall be not greater than the applicable values shown in Table H-5.

Table H-5: Standards for Showerheads

Appliance	Maximum Flow Rate		
	Manufactured on or after January 1, 1994 and prior to July 1, 2016	**Manufactured on or after July 1, 2016 and prior to July 1, 2018**	**Manufactured on or after July 1, 2018**
Showerheads	2.5 gpm at 80 psi	2.0 gpm at 80 psi[1,2,3]	1.8 gpm at 80 psi[1,2,3]

[1] The maximum flow rate shall be the highest value obtained through testing at a flowing pressure of 80 ±1 psi and shall not exceed the maximum flow rate in Table H-5.

[2] **Minimum flow rate.** The minimum flow rate, determined through testing at a flowing pressure of 20 ± 1 psi, shall not be less than 60 percent of the maximum flow rate in Table H-5. The minimum flow rate determined through testing at flowing pressures of 45 and 80 ± 1 psi shall not be less than 75 percent of the maximum flow rate in Table H-5.

[3] Showerheads with multiple nozzles. The total flow rate of showerheads with multiple nozzles must be less than or equal to the maximum flow rate in Table H-5 when any or all nozzles are in use at the same time.

...

(6) **Other Plumbing Fittings**. See Section 1605.1(h) for water efficiency standards for plumbing fittings that are federally-regulated consumer products.

...

(i) Plumbing Fixtures.

(1) The water consumption of water closets, and urinals, other than those designed and marketed exclusively for use at prisons or mental health care facilities shall be no greater than the values shown in Table I-2.

Table I-2 Standards for Plumbing Fixtures

Appliance	Maximum Gallons per Flush or Dual-flush effective flush volume	
	Sold or offered for sale on or after January 1, 2014[1]	**Sold or offered for sale on or after January 1, 2016[1]**
All water closets	1.28	1.28
Trough-type urinals	$\frac{\text{trough length (inches)}}{16}$	$\frac{\text{trough length (inches)}}{16}$
Wall mounted urinals	0.5	0.125
Other urinals	0.5	0.5

[1]For the items identified in Table I-2, non-compliant products may not be sold or offered for sale on or after the designated date, regardless of manufacture date

9

(2) Water closets sold or offered for sale or after January 1, 2016 shall pass the Waste Extraction Test (Section 7.10) of ASME A112.19.2.

...

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c) and 25960, Public Resources Code. Sections 16, 26 and 30, Governor's Executive Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c) and 25960, Public Resources Code. Section 16, Governor's Executive Order No. B-29-15 (April 1, 2015).

Section 1606. Filing by Manufacturers; Listing of Appliances in Database.

...

Table X Continued – Data Submittal Requirements

	Appliance	Required Information	Permissible Answers
H	Plumbing Fittings	*Type	Showerhead, lavatory faucet (independent or collective), public lavatory faucet, kitchen faucet, metering faucet (independent or collective), lavatory replacement aerator, kitchen replacement aerator, wash fountain, lift- type tub spout diverter, turn-type tub spout diverter, pull-type tub spout diverter, and push-type tub spout diverter.
		Flow Rate	
		Pulsating (for showerheads only)	Yes, no
		Minimum Flow Rate at 45 psi and 80 psi (for showerheads manufactured on or after July 1, 2016)	
		Minimum Flow Rate at 20 psi (for showerheads manufactured on or after July 1, 2016)	
		Rim Space (for wash fountains only)	
		Tub Spout Leakage Rate When New	
		Tub Spout Leakage Rate After 15,000 Cycles	
	Commercial Pre-rinse Spray Valves	Flow Rate (gpm)	
		Cleaning ability test	Pass, fail

...

Table X Continued – Data Submittal Requirements

	Appliance	Required Information	Permissible Answers
I	Plumbing Fixtures	*Type	Blowout water closet, gravity tank type water closet, dual-flush water closet, electromechanical hydraulic water closet, flushometer tank water closet, urinal, prison-type urinal, prison-type water closet, flushometer valve water closet, trough-type urinal, wall-mounted urinal, waterless urinal, vacuum other type urinal, vacuum type water closet
		Water Consumption (dual-flush effective flush volume for dual-flush water closet)	
		Passes waste extraction test	Yes, No
		Waste extraction value	grams
		Trough Length (trough-type urinals only)	

...

(4) Declaration.

(A) Each statement shall include a declaration, executed under penalty of perjury of the laws of California, that

...

4. the appliance was tested under the applicable test method specified in Section 1604, and, for the following appliances, was tested as follows:

...

j. for kitchen faucets that utilize an optional and temporary higher flow rate than 1.8 gpm, the higher flow rate has been tested utilizing the test procedure identified for kitchen faucets in Section 1604(h) at 60 psi and verified to have a flow rate less than or equal 2.2 gpm.

...

Note: Authority cited: Sections 25213, 25218(e), 25402(a)-25402(c) and 25960, Public Resources Code; and Sections 16, 26 and 30, Governor's Executive Order No. B-29-15 (April 1, 2015). Reference: Sections 25216.5(d), 25402(a)-25402(c), 25402.5.4 and 25960, Public Resources Code; and Section 16, Governor's Executive Order No. B-29-15 (April 1, 2015).

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APN | Address | Street | Intersection

005-152-30, 005-152-31, 005-152-32, 005-152-33

Select Overlay | Select Base Map | Property Report | Zoning Report

- Hazards and Geophysical
- Zoning
- Land Use
- General Plan
  - Urban Service Boundary
  - Rural Service Boundary
  - Gen'l Plan (BW text)
  - Gen'l Plan Land Use
  - Gen'l Plan Industrial
  - Gen'l Plan Areas
  - Gen'l Plan Futures
  - Gen'l Plan Scenic Areas
  - Gen'l Plan Public Facilities
  - Gen'l Plan Parks
  - Gen'l Plan Special Communities
  - Coastal Zone Residential Exclusion
  - Coastal Zone Appeal Jurisdiction
  - Coastal Zone
  - One Mile Buffer of Coastal Zone
- Special Districts
- Jurisdictional, Elections, Census
- School Districts and CSAs
- Utilities

4.6 PUBLIC SERVICES & UTILITIES

4.6.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Overview
- Fire Protection Services
- Police Protection Services
- Parks and Recreation
- Schools
- Wastewater Treatment
- Solid Waste Disposal
- Electrical & Natural Gas Utilities

This section provide the environmental setting for each of the public services and/or utilities listed above. Section 4.6.3 of this chapter provides the impact analyses for each of these services.

REGULATORY OVERVIEW

There are a number of state laws and regulations governing the provision of specified services. These are discussed below under the applicable service topic.

Pursuant to State law (Government Code Section 54773 et seq.) a Local Agency Formation Commission (LAFCO) was established in each county to promote the orderly development of local government agencies and efficient provision of services, to guide development away from prime agricultural land and to discourage urban sprawl. Pursuant to State law, LAFCOs must adopt a Sphere of Influence (SOI) for each governmental agency (including special districts), which is the probable physical boundary and service area of a local government. LAFCO is required to review and approve or disapprove governmental boundary change proposals with regards to spheres of influence, annexation, detachment, reorganization and/or extending services of a local agency.

The California Government Code Section 56430 requires LAFCOs to conduct Municipal Services Reviews (MSRs) that describe the municipal services provided by the agencies that are subject to LAFCO authority. MSRs are comprehensive studies designed to collect and analyze information about the governance structures and efficiencies of service providers, to estimate their ability to meet current and future service needs, and to identify opportunities for greater coordination and cooperation between providers. The Santa Cruz LAFCO completed its report in August 2005, and LAFCO approved the countywide service review in December 2007 (Resolution No. 2007-9). The review is a comprehensive overview of public services within Santa

Cruz County and includes the four cities and over 80 special districts providing municipal-type services such as water, wastewater service, fire protection, police protection, recreation and parks and solid waste. Pertinent findings are provided below for each service.

FIRE PROTECTION SERVICES

Regulatory Setting

The Uniform Fire Code published by the International Fire Code Institute and the Uniform Building Code (adopted in California as the California Building Standards Code) published by the International Conference of Building Officials both prescribe performance characteristics and materials to be used to achieve acceptable levels of fire protection. Amendments to the California Building Standards effective in 2008 increased the requirements for defensible space and require more fire-resistant building materials and design than prior codes in areas identified as having severe fire hazards.

The Federal Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390), adopted by Congress in October 2000, requires state and local governments to develop hazard mitigation plans as a condition for federal grant assistance. The City of Santa Cruz adopted its "Local Hazard Mitigation Plan" in September 2007. The detailed five-year plan identifies potential natural and man-made hazards, assesses their likely risk, and includes mitigation methods to reduce risks. The potential hazards identified in the plan include wildfires. Mitigation measures proposed to address these risks generally include prioritized actions that include hazard event planning, emergency prepardedness coordination and education, facility upgrades, monitoring actions and other actions in response to specific hazards. The mitigation plan will be reviewed and updated every five years.

Existing Facilities, Staff and Operations

The City Fire Department provides fire protection and emergency response for all areas within the City limits and maintains mutual aid agreements with other fire districts in the County, UCSC and California Department of Forestry (CDF) to provide fire protection to areas surrounding the City. The City serves the Paradise Park subdivision through an annexation to the service area that was approved by the Local Agency Formation Commission (LAFCO) of Santa Cruz County.

The City of Santa Cruz Fire Department operates out of three fire stations and houses its administrative functions at an office downtown. The three existing City fire stations are: Fire Station #1 at 711 Center Street, Fire Station #2 at 1103 Soquel Avenue, and Fire Station #3 at 335 Younglove Avenue. All facilities meet current building codes, including seismic retrofitting, fire sprinklers, and new electrical systems. The Department also maintains a Marine Rescue Headquarters (Station Four) on the Municipal Wharf.

The Department has five fire engines, one fire truck, and other related vehicles and equipment. The Department addresses its equipment and facilities needs through its planning efforts and budgeting process. The City's Fire Department is funded through the City's General fund.

The Department currently is staffed by 18 full-time firefighters, 12 fire engineers, 13 captains, three battalion chiefs, one fire chief, one fire prevention inspector and one deputy fire marshall, two division chiefs, one EMS program manager, and two administrative staff. Each shift has 15 assigned firefighters. The current level of firefighters represents approximately 0.75 firefighter (less than one) per 1,000 residents. The Fire Department has a minimum staffing standard of 12 firefighters and one battalion chief on duty per day.

The number of service calls received by the fire department in 2009 was approximately 6,850 calls. The majority of the calls are for non-fire emergencies, with about 80% of the calls being for medical assistance. Average response times from each of the three fire stations is approximately 3 to 3½ minutes. The Department's goal is to respond to emergency medical calls in less than five minutes 90% of the time and to fire emergency calls within eight minutes 90% of the time.

The existing number of fire stations and equipment/facilities are considered adequate to provide service throughout the City, except that the Department does not have a Training Facility, the construction of which is included as a recommendation in the Department's "Three Year Strategic Plan, 2009-2011." The Plan also recommends improvements to apparatus bays at Stations One and Three to accommodate new equipment, and investigation of constructing a new fire station at the present Station Two location and relocation of Station Four (Marine Rescue Headquarters). In the long-term the Department would like to relocate its downtown station and administration facilities in a combined facility with a Training Facility (Oliver, Ramos, personal communication, April 2011).

Wildland Fire Hazard

In addition to fires within developed City areas, the City is subject to "wildfires" in open space preserves and parks adjacent to developed areas. Wildfires are typically caused by human activities and are affected by the type and amount of vegetation, weather, fuel and topography. Wildland fire may be defined as any unwanted fire involving outdoor vegetation. The wildland/urban interface refers to development that has occurred in or near open space areas (City of Santa Cruz, September 2007).

Wildland fires present a risk to open space areas within the City of Santa Cruz and to adjacent residential homes. There are five wildland/urban interface areas within the City, including three areas designated as mutual threat zones – Delaveaga Park, Pogonip, and the Arroyo Seco/Meder Canyon (City of Santa Cruz, September 2007). Additional areas of concern for these wildland/urban interface zones include the Arana Gulch greenbelt property and Moore Creek Preserve, as well as Lighthouse Field and other smaller wildland/urban interface areas throughout the City (Ibid.). Figure 4.6-1[1] identifies areas of the City that pose serious wildfire hazards due to vegetation type, vegetation build-up and topographic conditions.

Mutual threat zones are defined as areas where a wildfire would threaten property within the City of Santa Cruz fire service area, as well as property covered by another fire protection

[1] 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.

service. For major emergencies that require more resources than can be provided by a single agency, the City of Santa Cruz, Santa Cruz County, the University of California at Santa Cruz and the State of California have an extensive mutual aid and emergency coordination system. The mutual threat zones are delineated in the Wildland Pre-Suppression Plan, which is used to identify non-State responsibility areas in which any fire is considered a threat to adjacent State responsibility areas. These geographic areas are designated because of the urban development that has occurred along their canyons and the vegetation types that are considered to pose a significant wildfire hazard (City of Santa Cruz, September 2007).

Recent wildland fires in the City of Santa Cruz include the Meder Canyon Fire in 1990, which covered several acres and was consumed in 20 minutes. A number of other wildland fires in the Santa Cruz area including the Santa Cruz Mountains have been a long-standing concern to the City of Santa Cruz. Priorities in the event of a wildfire are life safety, preservation of property and resource conservation (City of Santa Cruz, September 2007). Despite the fact that there has not been a recent wildland fire within the city limits, areas targeted in the City's Hazard Reduction Plan as "likely" to have a wildland fire include the Arroyo Seco/Meder Canyon, DeLaveaga, Pogonip, Moore Creek area and Arana Gulch (Ibid.), although wildland fires can occur in other areas. Increasing use of these areas by residents, transient encampments with fires and young adults exacerbates the risks (Ibid.).

Most wildland fire areas are adjacent to residential or open space areas. Only a few public buildings are immediately threatened by wildland fires. Public buildings that are in threatened areas are the historic Pogonip clubhouse, DeLaveaga Golf Club and associated buildings, 35 schools and day care centers and some park structures. There are eight commercial or industrial structures in the threat zone (City of Santa Cruz, September 2007).

POLICE PROTECTION SERVICES

The City of Santa Cruz Police Department provides crime protection and prevention activities throughout the City, including patrols, response to calls, education and community outreach. Its range of services include patrol, investigations, traffic, parks unit, street crimes unit, gang unit, dive team, hostage negotiation team, tactical team and School Resource office. The Department recently initiated an application for mobile phones/IPADs that allows citizens to download Crime Alerts and crime tips. The City has mutual aid agreements with county law enforcement (Sheriff's Office, Capitola, Scotts Valley, Watsonville, California Highway Patrol, State Parks and UCSC Police Departments).

The Police Department operates out of one police station/headquarters, located in downtown Santa Cruz. The Department is currently staffed by 94 authorized sworn officer positions, of which 88 are filled, 24 non-sworn (civilian) positions, including four community service officers, and three administrative staff. The current staff level represents a per capita ratio of approximately 1.57 sworn police officers per 1,000 city residents. A ratio of 1.5 officers per 1,000 population has been a national accepted minimum standard (Vogel, personal communication, April 2011). The Department has lost approximately ten sworn officers since 2000, and currently is understaffed by at least six officers (Ibid.).

The Department has divided the City into five main beats, and handled 78,132 calls in 2008 and 85,774 calls in 2009. The average response time is four minutes, 22 seconds, which is under the Department's target of four minutes, 30 seconds. Dispatching services are provided through the Santa Cruz Consolidated Emergency Communications Center.

The City of Santa Cruz funds its Police Department through the City's General Fund, grants, fees and service charges. The City also has a special revenue fund to account for state and federal grants received for police programs. The Department' existing facility and vehicles are adequate for the existing population; major capital improvements including replacing the building HVAC with an energy efficient system (Vogel, personal communication, April 2011).

PARKS AND RECREATION

Santa Cruz offers residents and visitors a wide range of parks, open space, beaches, trails, and recreational opportunities. The City has responsibility for management, maintenance and operation of over 1,700 acres of parks and open space lands, and various community/recreational facilities, and oversees development of new parks and improvements within City-owned parks, open space, and community facilities. The City also manages the Heritage Tree Program, Urban Forest Program, as well as maintains street and median landscaping in public rights-of-way.[2] Within the City limits, open space and beaches are also provided on State-owned lands, including three State Park units and the University of California campus. Maintenance operations of existing City-owned parks and recreational facilities are funded from the City's General Fund.

Regulatory Setting

STATE REGULATIONS

The Quimby Act (California Government Code §66477) was passed in 1975 and authorizes cities and counties to pass ordinances requiring developers to set aside land, donate conservation easements, or pay fees for park improvements. This provision of the State Subdivision Map Act enables cities and counties to require the dedication of land and/or payment of in-lieu fees for parks and recreation purposes as a condition of approval of a tentative map or parcel map subdivision. AB 1600 amended the Quimby Act in 1982 to hold local governments more accountable for imposing park development fees. The AB 1600 amendment requires agencies to clearly show a reasonable relationship between the public need for the recreation facility or park land and the type of development project upon which the fee is imposed. Cities and counties are required to show a strong direct relationship, or nexus, between the park fee exactions and the proposed project. Local ordinances must include definite standards for determining the proportion of the subdivision to be dedicated and the amount of the fee to be paid by the developer. AB 2936 was adopted as an amendment to

[2] Heritage trees and urban forest policies and actions are addressed in the BIOLOGICAL RESOURCES (Chapter 4.8) and AGRICULTURAL, FOREST AND MINERAL RESOURCES (Chapter 4.15) sections of this EIR.

the Quimby Act in 2002, and allows counties and cities to spend up to 10% of their Quimby Act fees to prepare master plans for park and recreation facilities every three years.

LOCAL REGULATIONS

Parks and Recreation Facilities Tax. The City imposes a "Parks and Recreation Facilities Tax" (pursuant to Chapter 5.72 of the Municipal Code) on new residential development (including mobile homes) within the City, payable at the time of issuance of a building permit. The collected taxes collected are placed into a special fund, and "shall be used and expended solely for the acquisition, improvement and expansion of public park, playground and recreational facilities in the city" (section 5.72.100). The current fee is $3.00 per square foot of residential building. Projects that have dedicated land or fees in accordance with Municipal Code Chapter 23.28 (described below) are exempt from this tax.

Public Dedications Pursuant to the California Subdivision Map Act. Chapter 23.28 regulates public dedications, including parks and open space, enacted pursuant to the authority granted by the California Subdivision Map Act in accordance with the City General Plan. Land dedication shall be based on two acres/1,000 population for neighborhood parks and 2.5 acres/1,000 population for community parks. The current in-lieu fee is $3.00/square foot for each residential dwelling unit to be constructed in the subdivision. Where the residential dwelling unit square footage is not specified as part of the plans for the project, a fee of $4,780.00 per residential lot is required under the current regulations. Payment shall be at the time of the filing of the final subdivision or parcel map.

Pursuant to section 23.28.020.1 of the City's Municipal Code, dedication of land or payment of fee in lieu thereof, or both, may be a condition of approval of a final subdivision map or parcel map for park or recreational purposes. (Condominium conversions are exempt from dedication requirements.) The dedication shall be for usable open space that is composed of land that offers natural advantages for the type of facilities to serve the subdivision. A fee in lieu of such dedication shall be required, when no portion of the proposed usable open space is planned to be located within the limits of the subdivision. Only the payment of a fee may be required in the case of a subdivision of fifty or fewer parcels. Section 23.28.020.4 requires establishment of a permanent maintenance program for usable open space lands dedicated under these provisions of this title.

Pursuant to section 23.28.020.3, natural ravines and natural waterways or other natural areas within the boundaries of a subdivision shall be reserved for public purposes, such as recreation, stormwater disposal, etc., as provided by the General Plan and Coastal Land Use Plan through dedications or easements for public use. Pursuant to section 23.28.040 and in accordance with, the provisions of Article 3.5 of the Subdivision Map Act, the General Plan, and Coastal Land Use Plan, the city shall increase public access to the public natural resources in conjunction with the review of subdivisions of land.

Parks, Community Facilities, and Recreational Programs

The City of Santa Cruz offers a range of neighborhood parks, community/regional parks, community facilities, and recreational programs. Most of these parks, facilities and programs are operated and maintained by the City Parks and Recreation Department. Some facilities

and programs are operated and organized in partnership with community organizations. These parks, facilities and programs provide recreational opportunities for residents and visitors of all ages and interests.

NEIGHBORHOOD AND COMMUNITY/REGIONAL PARKS

Neighborhood Parks. Neighborhood parks serve the recreational needs of those living within the City's primarily residential neighborhood areas. Neighborhood parks provide recreational facilities such as children's play areas, playing fields, basketball and tennis courts, and picnic areas. Some of the City's community garden plots are also located within neighborhood parks. Community garden provide residents with a space to grow small scale vegetable gardens.

The City's standard is to provide neighborhood parks at a ratio of 2.0 acres per 1,000 people. The location of neighborhood parks is ideally within approximately one-half[3] mile of neighborhood areas. There are 23 existing neighborhood parks, as summarized on Table 4.6-1and shown on Figure 4.6-2, which total approximately 57 acres. There are approximately 45 acres of school playing fields, for a total of approximately 102 acres of neighborhood parks within the City. In accordance with the City's existing General Plan, neighborhood park acreages include both City and non-City managed lands such as public school playing fields. The City of Santa Cruz and City School Districts entered into a joint use agreement in 1963 that allow use of selected school playground facilities and indoor facilities to the City and use of City facilities by the school districts..

To meet increasing demand for off-leash dog use, the Parks and Recreation Department has also designated off-leash areas within neighborhood parks throughout the City. These areas may be fenced or designated through signage. The City has designated the following parks as being available to off-leash dog use:

- DeLaveaga Park (service road into Lower DeLaveaga Park): sunrise to sunset.
- Frederick Street Park: off-leash area from sunrise to sunset.
- Grant Street Park: within off-leash area from sunrise to sunset.
- Mitchell's Cove Beach: before 10AM and after 4PM.
- Pacheco Dog off-leash area: fenced area from sunrise to sunset.
- University Terrace Park: fenced off-leash area from sunrise to sunset.

Community Parks. Community Parks are designed to serve the entire community. They are generally larger than neighborhood parks and offer facilities such as athletic fields, group picnic areas, bike and skateboard parks, lawn bowling, bocce ball, community meeting/event facilities, swimming pools, and locations for outdoor special events. The City's standard for community/regional parks is 2.5 acres per 1,000 people. Ideally these parks are located within 1.5 miles of neighborhood areas.

[3] The draft General Plan 2030 indicates neighborhood parks should be within one-half of a mile (about five blocks).

There are six existing community parks, totaling approximately 366 acres within the City as summarized below and on Table 4.6-1, and shown on Figure 4.6-2.

- Depot Park (8.5 acres), which opened in 2005, presently features a full-size soccer field, a plaza/public art area, a wood ramp bike park, picnic areas, children's' play features, the rehabilitated historic Depot building used for community and recreational programs, a trail connection through the park to the beach area, restrooms, and parking lots. The Monterey Bay Marine Sanctuary Visitor Center will be developed within the southern portion of Depot Park, across the street from Monterey Bay and the Municipal Wharf. The Depot Park Master Plan also includes a future site for the Natural History Museum.
- Harvey West Park (55 acres) presently features ball fields, group picnic areas, a children's playground, two outdoor swimming pools, the Clubhouse/Scouthouse, Wagner and Kids cottages, a Park Rangers' facility, restrooms, and parking areas. The park also features trails through the woodlands, including a trail connection to the adjacent Pogonip trail system. In recent years the pool has been closed seasonally due to City budget constraints and most recently has been operated by a private entity on a limited basis.
- Lower DeLaveaga Park (35 acres) presently features two soft ball fields, a large turf area, a bocce ball court, a volleyball court, a children's playground, individual and group picnic areas, restrooms and parking lots. Branciforte Creek flows along the western edge of the park, with the forested hillsides of the DeLaveaga greenbelt property rising along the eastern boundary of the developed park. Trail entrances at the edges of the park connect to the trail system within the DeLaveaga greenbelt.
- DeLaveaga Golf Course (250 acres) is part of DeLaveaga Park and includes a golf course, clubhouse and other open space land used for passive recreation.
- San Lorenzo Park (13 acres) presently features an open turf area along the San Lorenzo River, a duck pond and stage, a lawn bowling facility, a children's' playground, paved trails, and a restroom. The turf area often serves as a location for outdoor special events.
- Ken Wormhoudt Skate Park AY Mike Fox Park (4 acres), located along the San Lorenzo River further to the south, features the Ken Wormhoudt Skate Park and a roller-hockey practice area. The 15,000 square foot concrete skate park includes a full pipe, bowls and street skating features.

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, multi-use trails. An accepted national standard for regional parks is 20 acres per 1,000 people. City residents are in close proximity to a number of regional parks, each offering an array of activities. These parks include: DeLaveaga Park (upper) and greenbelt preserves within the City, and nearby Henry Cowell and Wilder Ranch State Parks (see Figure 1-2). State and municipal beaches and the Yacht Harbor also offer recreational opportunities serving the regional community as further discussed below.

TABLE 4.6-1: City Parks and Open Space Lands

TYPE	FACILITY	SIZE (in acres)
Neighborhood Parks		
	▪ Beach Flats Park – 122 Raymond St.	0.3
	▪ Bethany Curve Greenbelt – Delaware to West Cliff	2.6
	▪ Central Park – 301 Dakota St.	0.2
	▪ Derby Park – 509 Woodland Way	3.8
	▪ Frederick Street Park – 168 Frederick Street	4
	▪ Garfield Park – 624 Almar Ave.	1.8
	▪ Grant Park – 150 Grant St.	2.4
	▪ John Franks Park – Marnell St.	0.3
	▪ Laurel Park – 301 Center St.	1
	▪ Lighthouse Neighborhood Park – Lighthouse Ave.	1.7
	▪ Mission Plaza – 103 Emmet St.	1
	▪ Moore Creek Overlook – Cypress St.	0.12
	▪ Lower Ocean Street Park – 258-262 San Lorenzo Blvd.	0.5
	▪ Ocean View Park – 102 Ocean View Ave.	2.5
	▪ Rincon Park – 601 Chestnut St.	0.1
	▪ Poets Park – 200 Raymond St.	0.13
	▪ Rincon Park – 601 Chestnut St.	0.1
	▪ Round Tree Park – 205 Nobel	0.13
	▪ Star of the Sea – Frederick St. & Darwin St.	2.1
	▪ Trescony – Trescony St.	2
	▪ Tyrell Park – Santa Cruz Museum	1.5
	▪ University Terrace – Meder Street	8.5
	▪ West Cliff	14.5
	▪ Westlake Park – Bradley Dr. @ Spring St.	6
	▪ School Playing Fields [1]	44.6
	TOTAL ACRES (rounded)	102
Community Parks [2]		
	▪ Depot Park	8.5
	▪ Harvey West Park	55
	▪ DeLaveaga Park – Lower	35
	▪ DeLaveaga Golf Course	250
	▪ San Lorenzo Park – 137 Dakota St.	13
	▪ Ken Wormhoudt Skate Park at Mike Fox Park	4
	TOTAL ACRES (rounded)	366
Greenbelts & Open Space Lands with Recreational Uses		
	❑ Arana Gulch – Agnes St.	68.9
	❑ Arroyo Seco Canyon – Meder St.	N/A
	❑ DeLaveaga Park – Upper (minus Golf Course)	275
	❑ Jessie Street Marsh	2.29
	❑ Moore Creek Preserve	246
	❑ Neary Lagoon – 100 California St.	44
	❑ Pogonip – 333 Golf Club Drive	640
	TOTAL ACRES (rounded)	1,276

CONTINUED ON NEXT PAGE

TABLE 4.6-1: City Parks and Open Space Lands

TYPE	FACILITY	SIZE (in acres)
City-Owned Beaches		
	❑ Main Street Beach	26.4
	❑ Cowell Beach	4.9
	❑ Wharf	8.2
	❑ Mitchell's Cove	0.4
	❑ Its Beach (west portions)	N/A
	TOTAL ACRES (rounded)	40

[1] School sites are given credit for ¾ of their field acreage at: Santa Cruz & Harbor High Schools; Branciforte and Mission Hill Middle Schools; Bay View, DeLaveaga, Loma Prieta, Gault, Branciforte & Westlake Elementary Schools; Pacific Collegiate School; Holy Cross
[2] Loch Lomond Park (100 Loch Lomond Way, Felton) provides recreational opportunities outside City limits.

Existing Park Deficiencies. The City's desired ratio for neighborhood parks is to provide 2.0 acres of parkland per 1,000 people. Given an estimated current population of 58,982 (California Department of Finance, May 2010), a total of 118 acres of neighborhood parkland would be required to meet this level of service. Presently the City has approximately 102 acres of neighborhood parkland (including school play grounds). Thus, the City would require 16 additional acres of neighborhood parkland to meet the current desired level of neighborhood parks. According to the Parks and Recreation Department, recreational programming of services currently meets the community's demand. However, like many local jurisdictions, Santa Cruz experiences a shortage of athletic fields. At this point, no plans or funding exists to increase the number of facilities. Currently one one-half acre neighborhood park (Lower Ocean) is scheduled for construction. No others are currently programmed.

The City's desired ratio for community parks is to provide 2.5 acres of parkland per 1,000 people. Given the current population, a total of 148 acres of community parkland would be required to meet this level of service. The City presently has approximately 366 acres of community parklands, which exceeds the City's desired ratio.

The City of Santa Cruz is not a regional park agency; therefore, the City does not have a desired ratio for regional parks. The City also does not have a desired ratio for open space, but City does, however, provide a substantial level of open space parkland. Together, Pogonip, Arana Gulch, Upper DeLaveaga, Moore Creek Preserve, and Neary Lagoon total approximately 1,500 acres. This represents a ratio of 27 acres of open space per 1,000 people. (Open space and greenbelt lands are discussed further below.)

COMMUNITY FACILITIES, RECREATIONAL PROGRAMS, AND EVENTS

Community facilities, recreational programs, and special events serve the needs and interests of individuals, neighborhoods, groups, and the community of Santa Cruz. Events, held at community facilities and park, attract both residents and visitors.

Community Facilities. Community Facilities provide locales for public events and reservable spaces for concerts, meetings, classes, and other events. In recent years, the City has

coordinated with community organizations regarding operation of some facilities due to City budget constraints. The City owns and maintains a number of community facilities that support social, recreational and special event programs as described below.

- The Civic Auditorium, dedicated in 1940, is located within downtown Santa Cruz. The auditorium provides space for concerts, expos, and meetings.
- Louden Nelson Community Center, located to the south of downtown adjacent to Laurel Park, serves as a multi-cultural center for classes, theatre, events, and recreational programs. The community center was originally constructed as an elementary school, but was later reopened as a City facility in the 1970s.
- The Beach Flats Community Center, presently operated by a community organization, provides programs and services for residents.
- The Harvey West Park Facilities include a community swimming pool and Clubhouse that offer reservable space for community and private events.
- The City-owned Natural History Museum in located within the Seabright neighborhood, on the edge of Tyrell Park overlooking Monterey Bay. The exhibits and programs are housed in the modified 1915 Carnegie library building. The Natural History Museum is presently operated by the Museum Association. A proposed new location for the museum is included in the Depot Park Master Plan.
- The Surfing Museum, also presently operated by the Santa Cruz Surfing Club Preservation Society, is located within the memorial lighthouse at Lighthouse Point.

A community/environmental education center is proposed for the historic Clubhouse in the Pogonip Master Plan but is presently unfunded.

Recreational Programs. Recreational Programs offered by the City Parks and Recreation Department are designed to be affordable and available to residents and nonresidents of all ages and interests. Activities include a variety of classes and outings, sports leagues, and programs for older adults. Classes and programs are held at various City parks, beaches, and community centers, and at other locations such as schools.

Community Events. Community Events offered by the City include a variety of cultural and recreational events attracting residents and visitors. Events sponsored by the City are often held in cooperation with organizations and private entities. Some of the events which have been sponsored by the Parks and Recreation Department over the years include music/art festivals, chowder cook-offs, and outrigger canoe races. The City Parks and Recreation Department also hosts cultural events in coordination with the Sister Cities Committee.

Community Gardens. Community gardens are public and privately owned lands used for small scale flower and vegetable gardens. These gardens—a specialized type of park—provide the community with food, greenery, and therapeutic and relaxing recreation. The gardens can be created on small, undevelopable parcels of land or as temporary uses on other parcels.

Greenbelt and Open Space Lands

Open space lands provide wildlife habitat, protect natural resources, and offer opportunities for recreation, scenic views, and outdoor/environmental education. The City owns and manages over 1,500 acres of greenbelt and open space lands. The greenbelt properties (Arana Gulch, DeLaveaga, Moore Creek Preserve, and Pogonip) provide large acreages of open space and natural areas encircling the City's urban core. Open space and wetland areas within the City's central area include the San Lorenzo River corridor, Neary Lagoon, and Jessie Street Marsh. Moore Creek (east branch) and Arroyo Seco feature undeveloped canyons within the northwestern area of the City.

Within the City limits, State-owned lands also provide open space and protect natural resources. State Park units featuring open space include Natural Bridges State Beach (SB) and Lighthouse Field SB. Beyond the City limits to the west and north, Wilder Ranch State Park and Henry Cowell Redwoods State Park provide vast areas of open space. State parks are described in the following "Coastal Recreation" subsection. The University of California campus lands also feature areas of undeveloped open space. Antonelli Pond, a wetland area within the Moore Creek corridor, is owned and managed by the Land Trust of Santa Cruz County.

Management of natural resources and public use within the City's open space areas is guided by master or management plans. These plans provide a long-term vision for each open space area, including guidelines for protecting and enhancing natural and historic resources, and developing trails and other recreational uses.

CITY-OWNED GREENBELT LANDS

In 1979, the City of Santa Cruz identified six properties along the City's boundaries as Greenbelt lands, totaling approximately 1,500 acres. With only DeLaveaga under City ownership at that time, the City embarked on an effort to acquire and protect 1,000 acres over the next 20 years. Today, the City-owned Greenbelt lands include DeLaveaga, Pogonip, Arana Gulch and Moore Creek Preserve. These sites and other natural areas are further described below.

DeLaveaga, located on the City's northeastern boundary, was donated to the City and County as a public park in the late 1800s by Jose Vicente DeLaveaga. Today, the 525-acre upper DeLaveaga is owned and managed by the City of Santa Cruz. (Some parcels, however, are under state ownership as part of the State Armory). Habitat areas within DeLaveaga include oak woodlands, redwood groves, grasslands, coastal prairie, and the west branch of Arana Gulch creek. A Park Master Plan was prepared for DeLaveaga in 1960, which includes a broad range of proposed uses. The plan was not been updated.

Upper DeLaveaga features the municipal DeLaveaga Golf Course and Clubhouse, a disc golf course, an archery range, an approximately 8-mile network of multi-use trails, and parking areas. A gun range, which had been in existence for approximately 50 years, was closed to public use, and the site was remediated after lead contamination was identified. A Golf Course Master Plan was adopted by the City Council in 2003 and identifies improvements to upgrade the existing golf course, including improvements to the golf course, drainage system, and landscaping, and future construction of a new clubhouse.

Pogonip is located approximately one mile north of downtown Santa Cruz between the University of California campus and the San Lorenzo River corridor. This 614-acre greenbelt was acquired by the City in 1989, and features coastal prairie, woodlands, creeks, springs and a reach of the San Lorenzo River known as Sycamore Grove. An adjacent 25-acre parcel, known as the Wavecrest "greenbelt" parcel, was later purchased by the City in 1997. Pogonip, once part of the Cowell Ranch landholdings, was extensively logged and features historic resources associated with the lime production industry (mid-to-late 18th century). The property also includes a rustic clubhouse, constructed in 1911 as part of the Casa del Rey Golf Course. The two-story Craftsman Bungalow style structure and meadow area were later used for polo grounds. Prior to City ownership, the clubhouse was also used as a private social club, but due to its deteriorated condition, the building has been closed since 1993.

The *Pogonip Master Plan,* adopted by City Council in 1998, addresses public access, recreational uses, historic resource rehabilitation and preservation, and natural resource management and protection. The Master Plan includes a trail system, rehabilitation of the historic clubhouse as a community facility, a permanent agricultural garden site for the Homeless Garden Project, and outdoor education areas. Limited parking within the lower and main meadow areas, minimal improvements to the one-lane access road to the clubhouse, and a Ranger facility are also addressed in the Master Plan. Dogs on-leash are allowed, but off-leash dog and off-trail use is prohibited. Specific uses identified in the plan include:

- A 9-mile trail system featuring both unpaved service roads and single-track trails open primarily to pedestrians.
- A multi-use trail (pedestrians, bicycles, horses) connector trail linking Henry Cowell Redwoods State Park, Pogonip and the University of California property.
- Rehabilitation of the historic clubhouse to serve as a staging area for educational programs, a meeting and retreat center, and a site for special events.
- Preservation and interpretation of the historic limekilns, roads and associated features.
- An outdoor education camp in the lower meadow and a nature/education area within Sycamore Grove.
- A permanent garden site for the Homeless Garden Project.

To date, the trail system has been implemented including a multi-use regional trail connection linking State Park lands, Pogonip, and the UC campus open space. Limited rehabilitation of the historic Clubhouse has occurred, but it remains closed to public access and complete rehabilitation for public use is presently unfunded. At present, the parking lots, outdoor education areas, and Homeless Garden agricultural garden have not yet been implemented.

Arana Gulch, totaling 67.7 acres, is situated along the City's eastern boundary, to the north of the Santa Cruz Harbor. Acquired by the City in 1994, this greenbelt property features coastal prairie, riparian and oak woodland, seasonal wetlands, and the lower reaches of Arana Gulch Creek. Historically the property was used for cattle grazing and dairy operations. The current unimproved trail system, much of which existed prior to City ownership as cattle trails or unpaved access roadways, provides pedestrian, bicycle, and on-leash dog use access.

The *Arana Gulch Master Plan,* adopted by the City in 2006 and pending Coastal Commission approval, includes a trail system featuring paved multi-use trails (wheelchair accessible), a new west entrance and bridge spanning Hagemann Gulch, unpaved pedestrian trails, interpretive displays and overlooks. Most of Arana Gulch would continue to remain undeveloped, with a focus on management and protection of the sensitive habitat areas. No on-site parking or restrooms are proposed within the greenbelt property. Specific public use guidelines contained in the Master Plan are outlined below. The Master Plan also identifies three resource management areas for coastal prairie/Santa Cruz tarplant (30.2 acres), riparian and wetland areas, and Hagemann Gulch riparian woodland; resource management guidelines are included in the Master Plan for each of these areas.

- Provide multi-use wheelchair accessible interpretive trails connecting the surrounding neighborhoods to the Upper Santa Cruz harbor.
- Establish a new west entrance at Hagemann Gulch to provide a trail connection between Arana Gulch and the Seabright neighborhood. Provide a multi-use trail and bridge crossing over Hagemann Gulch, featuring an interpretive overlook.
- Provide a pedestrian-only interpretive loop trail encircling the coastal prairie.
- Improve the existing pedestrian trail along the western edge of the Arana Gulch Creek management area.
- Allow dogs on-leash on designated trails. Prohibit off-leash dog use and off-trail use to avoid impacts to tarplant populations and other plant and animal species.

Moore Creek Preserve is located on the western edge of the City, north of Highway 1 and extending to the UCSC campus. This 246-acre natural area, acquired by the City in 1998, features the west branch of Moore Creek, coastal prairie, and oak woodlands. The State of California holds two conservation easements over the property. Numerous threatened and endangered plant and wildlife species have been documented within the Preserve. Historically the property was used for cattle grazing.

The *Moore Creek Preserve Interim Management Plan*, adopted by City Council in 2002, serves as a guide for management of the Moore Creek Preserve until preparation/approval of a long term Park Master Plan for the property. The State of California conservation easements include restrictions on various uses and activities. Existing interim uses include hiking trails (approximately 3 miles), cattle grazing, and study, preservation, enhancement and protection of native species and their habitat. Dogs are prohibited within the Preserve. The interim trail system is based primarily on trails and unpaved service roads which existed prior to City ownership and are largely a result of cattle grazing operations. No onsite parking, public access road, or restroom facilities are included in the Interim Plan. A coastal development permit was approved for construction of a bridge to mitigate existing trail impacts to Moore Creek. The *Interim Management Plan* also identifies three plant community resource management areas and addresses specific management of habitat areas for special status species.

CITY-OWNED WETLANDS AND OTHER OPEN SPACE

The City owns and manages several other open space and wetland areas in the central area of the City. These include the San Lorenzo River, Branciforte Creek, Jessie Street Marsh, and Neary Lagoon. In the northwest area of the City, Arroyo Seco and Moore Creek (east branch) canyons provide undeveloped open space areas through residential areas.

The San Lorenzo Riverway includes the lower reach of the River through central Santa Cruz, along the eastern edge of the downtown south to Monterey Bay. The river has been channelized since the late 1950s, with extensive native tree and shrub planting completed as part of the levee improvement project in the 1990s. Multi-use paved trails exist on the levee on both sides of the river, except for a short segment in the vicinity of the County Building north of Soquel Avenue.

Recreational opportunities include trail use, nature viewing, bird watching, and fishing. Public access is provided by a continuous paved pathway/service road, extending approximately 2.5 miles on each levee from Highway 1 southward, provides public access. A new pedestrian-bicycle path was developed that extends north from the northern edge of the western levee, under Highway 1 and connects to the Tannery Arts Project residences.

Improved public access is addressed in the *San Lorenzo Urban River Plan*. This document is the outcome of a planning process initiated by City Council in 1999 to update plans for the San Lorenzo River, Jessie Street Marsh, and Branciforte Creek. The plan serves as a guide for restoring and managing natural resources, riverfront development, and public access improvements for the lower San Lorenzo River. It includes conceptual ideas to promote river-oriented development, site specific recommendations for public areas along the river, and restoration recommendations.

Neary Lagoon is a City-owned wetland and natural area situated in the central part of the City. Acquired by the City in 1967, the 14-acre lagoon and surrounding riparian and woodland habitat within the management area total 44 acres. Neary Lagoon was originally an oxbow of the San Lorenzo River that was gradually isolated from the main river channel and reduced dramatically in size over the past century.

The Neary Lagoon Management Plan, adopted by City Council in 1992, is a comprehensive guide integrating previous documents prepared. The Management Plan addresses public access and use, hydrology, water quality, vegetation management and habitat restoration, and wildlife and fishery management. Public access includes an interpretive trail system, nature observation areas, interpretive exhibits, and recreational facilities within designated areas. The access is designed to encourage pedestrian use, including wheelchair accessibility. Most of the public use components of the plan have been implemented. Public use guidelines contained in the Management Plan discourage bicycle riding except on designated through trails, and dogs are prohibited within the management area.

Jessie Street Marsh is a City-owned wetland and open space located just to the north of the San Lorenzo River mouth. Historically, Jessie Street Marsh was part of a large tidal estuary open to the San Lorenzo River. After construction of the river levees, the tidal flows were blocked.

Freshwater continues to flow into the marsh area from storm water runoff and springs along the bluff.

The marsh area presently has informal unimproved pathways, with no developed site amenities. A developed trail descends down the bluff from Ocean View Park, along the southern Jessie Street marsh area, to East Cliff Drive. The *Jessie Street Marsh Management Plan*, adopted by the City Council in 1999, was prepared to provide a long-term plan to preserve and enhance the natural resources of the marsh, improve water quality, manage flood waters, and provide appropriate public access. This plan, not yet implemented due to budget constraints, includes recommendations for trails, interpretive signs, overlook and nature viewing areas and improved access to adjacent Ocean View Park to the northeast. An overview of proposed public access management actions:

- Construct a bridge over the marsh channel and a boardwalk adjacent to the marsh plain near Lemos Avenue and Jessie Street.
- Construct footpaths within the upper and lower marsh areas, including a connection to East Cliff Drive.
- Construct a new trail and steps to Ocean View Park and improve the existing trail connection to the adjacent park.
- Construct gates, fencing and install boulders to inhibit inappropriate public access.
- Install interpretive signs to create a nature walk experience.

Branciforte Creek flows along the boundary of Lower DeLaveaga Park and continues southward, under Highway 1, to its confluence with the San Lorenzo River at the southern end of San Lorenzo Park. The lower one-mile reach of Branciforte creek was channelized in a concrete flood control channel in the late 1950s. From approximately Market Street northward, Branciforte Creek remains a natural channel with native riparian vegetation on the stream banks.

Public trail access is provided along sections of the service access road along the channel. The confluence of the creek and the San Lorenzo River is recognized as an important bird watching area and overlook area. Much of the natural channel is located within private residential properties, though public access is provided along the natural creek channel within Lower DeLaveaga Park. The *San Lorenzo Urban River Plan* includes recommendations for enhancing the creek corridor, improving water quality, and providing interpretive signage.

Arroyo Seco Canyon extends from University Terrace Park/Meder Street southward to just north of Mission Street/Highway 1. An intermittent creek, City sewer line and utility access route extend along the bottom of the canyon. The access route, maintained by the City's Public Works Department, is also used as a trail by residents. Private residential parcels extend into the undeveloped canyon.

Moore Creek Canyon (East Branch) extends from the UC campus lands southward, paralleling Western Drive, to its confluence with the west branch of Moore Creek just north of Highway 1. This corridor features an intermittent creek flowing through a steep-sided canyon bordered by residential areas. The east branch corridor includes private and public parcels.

The *Moore Creek Corridor Access and Management Plan* (1987) includes recommendations for public access, land dedication, open space easements, and resource management. The plan's goal is to provide public access in a manner compatible with private property, existing development, and the constraints of the natural setting. Presently, there is limited public access within the eastern Moore Creek Canyon.

STATE-OWNED OPEN SPACE

Two State Park units, Lighthouse Field and Natural Bridges State Beaches, offer open space and recreational opportunities within the City limits. The UC campus also features large open space areas and trails accessible to the public. State Park General Plans are the primary management documents for State Park units.

Lighthouse Field State Beach (SB) is a 36-acre open space situated along Monterey Bay, featuring coastal terrace, ocean cliffs, and Its Beach. The open space features grassland (primarily non-native), willows, Monterey cypress trees, and eucalyptus groves. The State of California acquired the field area and coastline west of Lighthouse Point in 1978. A 30-year agreement between the State/City/County regarding local management and maintenance of Lighthouse Field SB expired and has not been extended. At present, this State Park unit is managed and operated by California State Parks.

The *Lighthouse Field State Beach General Plan* (1984) identifies two zones within the property. The 32-acre Field Zone is designated as a low intensity use area, featuring trails and open space. The Coastal Zone is designated as a moderate to high-intensity use area, featuring coastal access, the Surfing Museum, a restroom and maintenance facility, picnicking, and parking areas. Use is restricted to day use only, with no overnight parking or camping. The parking lots and restroom/maintenance facility that presently exist were developed further to the south, toward Lighthouse Point, than depicted in the General Plan conceptual development diagram. A parking area along Pelton Avenue that is identified in the Plan has not been constructed. This eucalyptus/cypress grove area is now recognized as overwintering Monarch butterfly habitat.

Natural Bridges State Beach (SB) is a 65-acre open space and wetland situated on Monterey Bay, on the western boundary of the City. Primary resources include the natural rock bridge, a beach, Monarch butterfly over wintering habitat, and the Moore Creek wetland. The initial state park acreage was established in 1933, with additional lands acquired later.

Public facilities identified in the *Natural Bridges State Beach General Plan* (1992) include a visitors' center, picnic areas, trails and walkways, restrooms, and day-use parking areas. The main entrance is presently located at the terminus of West Cliff Drive. The plan proposes developing a new main entrance off of Delaware Avenue, which is the location of the original entrance in the 1950s. Two preserves are designated within Natural Bridges State Beach: the Monarch Butterfly Natural Preserve and the Moore Creek Wetland Preserve.

UCSC – the University of California Santa Cruz is a 2,020-acre campus, of which approximately 53% is located within city limits. The campus offers amenities for active and passive recreation on the main campus, and the north and upper campuses currently are undeveloped and in open space. Active recreation facilities include playing fields and a swimming pool. 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 throughout the campus, designed primarily to provide access to campus facilities, also provide recreational opportunities for walking and hiking. The "Cowell Wilder Regional Trail" (open to hikers, bicyclists and equestrians) is located on the north campus (outside city limits) and provides a connection to between Wilder Ranch State Park to the west and Pogonip and Henry Cowell State Park to the east (University of California Santa Cruz, September 2006 – DEIR, Volume Two).

Trails

Santa Cruz has an extensive trail network, featuring paved and unpaved pathways connecting open space, parks, the coast, downtown, and neighborhood areas. This network includes multi-use trails, some of which are wheelchair accessible, and hiking only trails. Together, the City-owned greenbelt lands, open spaces and coastal pathways provide over 50 miles of trails. In addition, State Parks, the UC campus lands, and the Santa Cruz Harbor offer many more miles of publicly accessible trails. The paths and trails support walking, jogging, hiking, and bicycling. The city and regional trail systems provide not only recreation, but access to and connections between various parks, recreation facilities, and natural and urban areas. Promenades and hiking trails (including those along the Beach/Boardwalk, San Lorenzo River Corridor, Downtown, and West Cliff Drive) provide opportunities to enjoy unique natural and historic areas. The network of walkways, bikeways, and trails will become increasingly important for

The Santa Cruz Circle Trail concept focuses on establishing a continuous trail route through the City's greenbelt lands, along the San Lorenzo River, the coastline and the harbor, to create a continuous pathway encircling the City and linking downtown. Santa Cruz also features several regional trail connections, including the California Coastal Trail and Henry Cowell Redwoods State Park/Pogonip/UCSC/Wilder Ranch State Park regional trail.

The Santa Cruz County Regional Transportation Commission (SCCRTC), in association with other regional agencies, envisions the planning and construction of a Monterey Bay Sanctuary Scenic Trail (MBSST). The MBSST Network will be a multi-use system of bicycle and pedestrian facilities that allows the public to enjoy and experience the Monterey Bay National Marine Sanctuary from the vantage point of the shoreline. The master planning process is in progress, and it is envisioned that some of the recent local coastal trail projects will be part of this network, such as the Wilder Ranch Bicycle and Pedestrian Path, the Watsonville Slough Trails, the Monterey Rail/Trail, and the Monterey Bay Sanctuary Scenic Trail. Specific alignments have not yet been developed in the City of Santa Cruz.

Coastal Recreation

The City's coastline along Monterey Bay, totaling approximately 4.6 miles, is a prime recreational destination for residents and over two-million visitors a year. Coastal recreation offers opportunities for a variety of activities, including: ocean and wildlife viewing; beach/coastside walking, jogging and bicycling; surfing, bodyboarding, swimming, and standup paddling; fishing; kayaking and boating; windsurfing/kiteboarding; sunbathing; and picnicking. Coastal facilities and visitors centers also offer educational opportunities about the coastal and marine environment.

Coastal recreation within the City of Santa Cruz includes City and State beaches, coastal pathways, the Municipal Wharf, Santa Cruz Surfing Museum, Santa Cruz Harbor, and the Boardwalk Amusement Park. Coastal-oriented environmental education facilities include the Seymour Marine Discovery Center at UCSC's Long Marine Laboratory and the future Monterey Bay National Marine Sanctuary Visitors' Center.

CITY BEACHES AND THE MUNICIPAL WHARF

City-owned and managed beaches include Main Beach, Cowells Beach, the western portion of Its Beach, and Mitchell's Cove. Main Beach is a broad expanse of sand extending from the San Lorenzo River mouth west to the Municipal Wharf. Volleyball courts are available on Main Beach. Cowells Beach lies to the west of the wharf, extending to the West Cliff Drive bluff. Both beaches are heavily used by visitors and residents during summer months for sunbathing, wading and swimming. Cowells Beach is also a popular surf break with access from the beach and a stairway along West Cliff Drive. The City of Santa Cruz provides seasonal life guard towers and service on Cowells and Main Beach. Dogs are prohibited by the City on Main Beach and Cowells Beach.

On the coastal bluff along West Cliff Drive, a pedestrian/bicycle path extends from Cowells Beach to Natural Bridges State Beach. Situated along West Cliff Drive, two smaller sandy beaches are accessible by stairways. Its Beach, located to the west of Lighthouse Point, is owned by the City and State. The access stairs are located on State Parks property. Further to the west is Mitchell's Cove, which is open to off-leash dog use during certain hours.

Stairways along the West Cliff Drive pedestrian/bicycle path also provide access to popular surfing breaks, including Steamer Lane and Mitchell's Cove. Stairs are located (east to west) at Pelton Avenue next to the Surfer Statute, Steamer Lane, Its Beach and Mitchells Cove. Other surfing breaks along West Cliff Drive are not accessible by constructed stairways.

Lighthouse Point, owned and managed by the City, features the Surfing Museum which is located within the Abbott Memorial Lighthouse. The Point offers an overlook of the Steamer Lane surfing area and opportunities for viewing sea lions, otters, migrating whales, and marine birds. A grassy area at Lighthouse Point is used for informal play and picnicking, and special events.

The Municipal Wharf, constructed in 1914, extends 2,700 feet into Monterey Bay and separates Main Beach from Cowells Beach. Popular with visitors and residents, the wharf features public walkways, overlooks, seating areas, interpretive exhibits, restaurants, shops, kayak and boat rentals, and parking areas. Nature viewing and fishing are also popular activities.

STATE BEACHES

Seabright Beach is part of the Twin Lakes State Beach park unit. This wide beach extends from San Lorenzo Point southward to the west jetty of the Santa Cruz Harbor. Access to the beach is provided at the end of Cypress Avenue, a stairway at Third Avenue, and from the Harbor. A restroom is located at the Cypress Avenue entrance. Portable lifeguard towers are installed seasonally. The *Twin Lakes State Beach General Plan* (1992) plan proposes a year-round lifeguard facility and a new restroom between Third Avenue and the jetty. Popular activities include sunbathing, wading and swimming, beach walking/jogging, picnicking, and fires within designated rings. Dogs are restricted to on-leash use only.

A sandy cove beach located within Natural Bridges State Beach is popular for sunbathing, wading and swimming, tide pool visitation and surfing. Its Beach (eastern portion) is part of Lighthouse Field State Beach. This small pocket beach varies in size depending on the season and tides. Popular activities include sunbathing, wading and bodyboarding. Dogs are restricted on on-leash use only. The sandy beach area along the Santa Cruz Boat Harbor is owned and managed by the Port District. To the east within the County, the Twin Lakes State Beach also includes smaller sand beaches.

SCHOOLS

Regulatory Setting

Local school districts are empowered under state law to impose school impact fees, which are collected by local governments at the time of building permit issuance. In 1998, the California State Legislature enacted SB 50, which made significant amendments to existing State law governing school fees. SB 50 prohibited state or local agencies from imposing school impact mitigation fees, dedications, or other requirements in excess of those provided in the statute. Government Code Section 65995(e) provides that where payment has been made to a school district in accordance with the school fee program that payment is considered full mitigation for school impacts. The legislation also prohibits local agencies from denying or conditioning any project (including a general plan) based on the inadequacy of school facilities.

Section 23.28.030 of the City's Municipal Code regulates dedication of land as a condition of approval of a final subdivision map in accordance with the provisions of Section 66478 of the Map Act.

Schools and Enrollments

Schools and educational services are provided to City residents by the Santa Cruz City Schools District (SCSD), as well as a number of private schools, for grades K through 12. SCSD is composed of two separate districts: the Elementary District (K-6) and the High School District (7-12), governed by a common board and administration. The Elementary District draws students from the city of Santa Cruz and includes four K-5 schools, one K-6 school and two 6-8 schools serving 2,624 students in grades K-6 (City of Santa Cruz Elementary and High School District, June 2010).

The High School District encompasses much of the northern portion of Santa Cruz County drawing its student population from the communities of: Davenport, Bonny Doon, Scotts Valley, Santa Cruz, Live Oak, Soquel and Capitola. The secondary District includes two middle schools (grades 6-8), three comprehensive schools, a continuation school, an independent studies program and a K-12 home study program with a combined enrollment of 4,217 students (City of Santa Cruz Elementary and High School District, June 2010).

Table 4.6-2 identifies school capacities and projected enrollments. It should be noted that Soquel High School and Delta Charter School are not located within the City. The Branciforte Small Schools campus includes the Alternative Family Education, Ark Independent Studies, Costanoa Continuation School, and Monarch Elementary School. The existing combined

enrollment for the Santa Cruz City Schools is 6,841 students based on data in the District's annual budget (Santa Cruz City Schools, June 2010). Delta Charter Show (grades 9-12, located outside City limits) serves 190 students (Ibid.). The enrollment numbers in Table 4.6-2 were provided by the School District during the preparation of this EIR.

TABLE 4.6-2
School Capacities & Projected Enrollments

School	Capacity	Projected Enrollment
Elementary Schools		
▪ Bay View Elementary	604	*547*
▪ Delaveaga Elementary	641	633
▪ Gault Elementary	480	450
▪ Westlake Elementary	604	584
SUBTOTAL	*2,329*	*2,214*
Middle Schools		
▪ Branciforte Middle	651	471
▪ Mission Hill Middle	690	606
SUBTOTAL	*1,341*	1,077
High Schools		
▪ Harbor High	1,155	995
▪ Santa Cruz High	1,362	1,137
▪ Soquel High	1,447	997
SUBTOTAL	*3,964*	*3,129*
Branciforte Small Schools	*517*	469
TOTAL ALL GRADES	**8,151**	**6,889**

SOURCE: Santa Cruz City Schools

The Santa Cruz City Elementary and High School Districts currently charge school impact fees. In justification studies conducted in 2006, it was indicated that enrollment in the Elementary School District had exceeded its facility capacity of 2,028 students for K-6 grades and would continue to exceed facility capacity through the 2015-16 school year. Similarly, the High School District also had exceeded its facility capacity of 4,638 students for 7-12 grades.

WASTEWATER TREATMENT AND COLLECTION

Regulatory Setting

FEDERAL AND STATE REGULATIONS/REQUIREMENTS

The Clean Water Act (CWA) regulates the discharge of pollutants to waters of the United States from any point source, enacted in 1972. The California State Water Resources Control Board (State Board) and the nine Regional Water Quality Control Boards (RWQCB) have the authority in California to protect and enhance water quality, including administration of the National Pollutant Discharge Elimination System (NPDES) permit program for discharges, storm water and construction site runoff. The discharge of treated wastewater is included in the NPDES program. Wastewater systems are closely regulated for health and environmental

concerns. The RWQCB regulates operations and discharges from sewage systems through the NPDES permit.

Federal, state and local regulations are enforced by the City of Santa Cruz through permitting, monitoring and inspections of Significant Industrial Users (SIU). SIUs are defined in accordance with the Code of Federal Regulations 40 CFR 403.3 (t) as:

- All industrial users subject to Categorical Pretreatment Standards, or
- Any other user that has any one or more of the following characteristics:
  - An average discharge flow of equal to or greater than 25,000 gallons per day of process wastewater to the wastewater treatment facility (WWTF),
  - Contributes a process wastestream which is 5% or more of the average dry weather hydraulic or organic capacity of the WWTF,
  - Has a reasonable potential to adversely affect WWTF operations, or
  - Violates any pretreatment standard or requirement (in accordance with 40 CFR 403.8 (f) (6)) (City of Santa Cruz website: "Industrial Waste Discharge Program").

LOCAL REGULATIONS/REQUIREMENTS

Chapter 16.08 ("Sewer System Ordinance") of the City of Santa Cruz Municipal Code regulates discharge to sanitary sewer and requires that all wastewater be discharged to public sewers, with the exception of graywater as allowed by Municipal Code Chapter 16.08. Septic tanks and cesspools are not allowed within city boundaries except as specified for limited conditions in Chapter 6.20 of the Municipal Code.

The Monterey Bay Unified Air Pollution Control District's Rule 216 requires any entity seeking to obtain an Authority to Construct or a Permit to Operate for a Wastewater or Sewage Treatment facility to obtain a permit from the District. The purpose of this Rule is to ensure that the projected served population of a Wastewater or Sewage Treatment facility is consistent with the Air Quality Plan as approved by the Monterey Bay Unified Air Pollution Control District for addressing the current State Implementation Plan requirements for maintaining federal and state ambient air quality standards.

Wastewater Treatment

OVERVIEW

The City of Santa Cruz owns and operates a regional wastewater treatment facility (WWTF), located on California Street adjacent to Neary Lagoon, that provides secondary level of treatment. The City treats sewage from domestic and industrial sources and discharges the treated effluent into the Pacific Ocean under the provisions of a waste discharge permit (NPDES No. CA0048194) issued by the California RWQCB, Central Coast Region (Order No. R3 - 2005 - 0003). Monterey Bay, into which the region's treated wastewater is disposed, was designated in 1992 as a National Marine Sanctuary. Wastewater influent and effluent characteristics are carefully monitored for compliance with state water quality requirements. The City also participates in a regional receiving water monitoring program with other dischargers in the Monterey Bay area (City of Santa Cruz Water Department, February 2006).

SERVICE AREA

The City of Santa Cruz WWTF serves a population of approximately 130,000 in the cities of Santa Cruz and Capitola and parts of unincorporated Santa Cruz County (see Figure 4.6-3). In addition to the City of Santa Cruz, the WWTF also serves the Santa Cruz County Sanitation District and Community Service Areas (CSA) 10 and 57 as further described below. The City also provides capacity for the City of Scotts Valley to discharge its treated wastewater into the Pacific Ocean via the City's discharge. The City of Santa Cruz accounts for its wastewater system as an enterprise activity, primarily relying on service charges for funding (Local Agency Formation Commission of Santa Cruz County, June 2005).

The Santa Cruz County Sanitation District provides wastewater collection service for the City of Capitola and the unincorporated communities of Aptos, Soquel and Live Oak. The District receives periodic inquiries regarding sewer service in the La Selva Beach area due to septic problems in that area, but that area lies outside its current sphere of influence (Local Agency Formation Commission of Santa Cruz County, June 2005).

County Service Areas 10 and 57 (Rolling Woods and Graham Hill) are also served by the City's WWTP. CSA 57 serves the Woods Cove subdivision off Graham Hill Road; the service area encompasses 0.1 square miles and has a current service population of 14 (7 connections). The area is expected to reach a population of 120 by 2015 as a result of buildout of the approved 60-lot Woods Cove subdivision.[4] CSA 10 serves a portion of the developed Rolling Woods subdivision also located off Graham Hill Road (Local Agency Formation Commission of Santa Cruz County, June 2005).

TREATMENT LEVELS AND PLANT CAPACITY

Treatment Process. The City's WWTF was upgraded in 1998 to provide secondary treatment in order to meet state and federal waste discharge requirements. The City's treatment plant currently produces wastewater of a quality that would be classified as Disinfected Secondary-23. The treatment process consists of a series of steps, including screening, aerated grit removal, primary sedimentation, trickling filter treatment, solids contact, secondary clarification, and ultraviolet disinfection.

The City's treated wastewater is potentially suitable for some agricultural applications and for limited public access irrigation. However, the level of treatment is not sufficient for general irrigation or unrestricted use on playgrounds, parks, schoolyards, etc. Additional treatment above that currently provided would be needed to meet the state public health and safety requirements for these uses. In addition to the treatment upgrades, a distribution system, including pumps, meters, storage facilities, and separate piping would be required to convey the recycled water to customers (City of Santa Cruz Water Department, February 2006).

[4] The Board of Supervisors approved the Tentative Map on November 27, 1996. Subsequent to that, the County did supplemental environmental review to consider the developer's request to change from onsite sewage treatment to a transmission main to the City of Santa Cruz. In September 1998, the County filed a negative declaration and the County approved the revised sewer option on October 20, 1998 (County Application Number 98-0121) (McCormick, Santa Cruz LAFCO, personal communication, October 2009).

Treatment Capacity. The WWTF has a permitted wastewater treatment capacity of 17.0 million gallons per day (mgd) (City of Santa Cruz, 2009). In 2009, the WWTP treated 2.84 billion gallons of wastewater effluent at an average daily rate of 9.2 mgd (Ibid.). Daily dry weather flow averaged 8.5 mgd for June, July and August. With the closure of businesses within the city over the last 10 years (including, Lipton, Wrigley, Salz Tannery, and Texas Instruments), the amount of wastewater treated at the facility has decreased over that time period. Approximately 150 acre-feet per year (0.2 mgd) of treated water is retained for use at the treatment plant (Local Agency Formation Commission of Santa Cruz County, June 2005). The plant also treats excess dry weather flow of approximately ½ mgd from Neary Lagoon, typically from April through October.

The Santa Cruz County Sanitation District has treatment capacity rights of 8 mgd at the City of Santa Cruz WWTF. The City contributes approximately 5.0 mgd with a remaining capacity of 4.0 mgd. The Sanitation District contributes 5.5 mgd with a remaining capacity of 2.5 mgd. Approximately 50% of the wastewater treated at the plant is generated within the City of Santa Cruz. The total remaining treatment plant capacity, therefore, is 7.5 mgd.

WWTF MAINTENANCE & IMPROVEMENTS

The agreement between the Sanitation District and the City stipulates that the District shall pay 8/17 (47%) of the project costs for treatment modifications, while operational and maintenance costs are split in proportion to the total flow, Biological Oxygen Demand (BOD) and Suspended Solids (SS) actually discharged[5] by each agency (Local Agency Formation Commission of Santa Cruz County, June 2005).

The WWTF has been upgraded several times since 1928 when the plant began operations (City of Santa Cruz, 2007-Annual Report). The WWTF was upgraded in 1998 to provide a secondary biological treatment system consisting of trickling filters/solids contact tanks to improve effluent quality and satisfy federal requirements and the California Ocean Plan. According to the City's website[6], other major accomplishments at the WWTF in the last five years include:

- Completion of a photovoltaic system.
- Integration of a 1.3-megawatt cogeneration system into the facility power grid.
- Completion of a Carbon Absorption Odor Control System.
- Implementation of staffing reorganization to optimize plant efficiency.

Treated Effluent Disposal

The treated effluent is disposed into the Monterey Bay via a deep ocean outfall constructed in 1987. The outfall extends 12,250 feet on the ocean bottom and terminates one mile offshore at a depth of approximately 110 feet below sea level. A 1,200-foot diffuser at the end of the

[5] Flows are measured daily and monthly averages are prepared. SS are measured daily and BOD is measured weekly.

[6] http://www.ci.santa-cruz.ca.us/pw/index.html, "Wastewater Treatment Facility."

pipe provides an initial dilution of greater than 139 parts seawater to one part wastewater (City of Santa Cruz Water Department, February 2006).

As previously indicated, the City of Scotts Valley discharges its treated effluent via the City's ocean outfall. The Scotts Valley Wastewater Treatment Plant has a permitted capacity of 1.5 million gpd and treats water to secondary and tertiary levels. Secondarily treated effluent that is not used for recycled water is transmitted via a main to Santa Cruz and discharged to the ocean through the outfall shared with the City of Santa Cruz.

Wastewater Collection

The City of Santa Cruz wastewater collection system serves approximately 15,000 connections. The collection system includes 23. The City maintains over 160 miles of sewer pipeline ranging in size from 6 to 54 inches in diameter. The City has a hydraulic model for the sewer system, and continues to focus on collections system projects that reduce infiltration and inflow into the system (Wolfman, personal communication, April 2011).

The City addresses infrastructure needs during the annual budgeting process. The City's proposed 2011-2012 Capital Improvement Program includes a number of projects for improvements to the wastewater system. In addition to rehabilitation and replacement projects, the CIP includes a number of projects where closed circuit TV will be used to identify problem areas and improve maintenance and repairs. The CIP also includes funding for replacing worn and obsolete equipment, and improving automation at the wastewater treatment plant. The CIP is reviewed and adopted annually (Local Agency Formation Commission of Santa Cruz County, June 2005).

SOLID WASTE DISPOSAL

Regulatory Setting

The City's landfill operation is required to comply with the regulations, plans, and permits required by the California Integrated Waste Management Board and California Regional Water Quality Control Board, California Air Resources Board, and the Monterey Bay Unified Air Pollution Control District.

The California Integrated Waste Management Act of 1989 (AB 939) (Chapter 1095, Statutes of 1989, et seq.) was adopted in an effort to improve planning for solid waste facilities and reduce the volume and toxicity of solid waste that is disposed. The act requires each of the cities and unincorporated portions of counties throughout the State of California to divert 25% by 1995 and 50% by the year 2000 of the solid waste tonnage that was disposed in 1990. It also requires local governments to prepare and implement plans that would improve waste resource management by integrating solid waste management with source reduction, reuse, recycling, and composting measures.

City of Santa Cruz Solid Waste Collection and Disposal

Solid waste collection and disposal, including recycling services, are provided by the City of Santa Cruz to residents, businesses and institutions within the City's boundaries, is provided at the Resource Recovery Facility (RRF), which includes a sanitary landfill, recycling center, greenwaste drop-off area, and Household Hazardous Waste Drop-Off Facility. The City owns and operates this facility, including a Class III sanitary landfill, which is located approximately three miles west of the City off Highway 1 on Dimeo Lane. The site covers 100 acres with 67 acres available for disposal use (Local Agency Formation Commission of Santa Cruz County, June 2005). The City's Resource Recovery Facility (RRF) and Recycling Center is located at the landfill site. The RRF only accepts municipal solid waste and serves as a sorting facility to remove any recyclable or composting materials. The Recycling Center accepts a variety of recyclable materials.

The City's solid waste operations are in full compliance with federal, state, and local air, water and waste regulations for collection vehicles, processing operations, and landfill disposal operations. The City has implemented several best management practices to improve its solid waste services, including a landfill gas collection system that is used to run an engine to produce electricity and use of bio-diesel for collection and landfill equipment to reduce CHG emissions (Local Agency Formation Commission of Santa Cruz County, June 2005).

In the mid-1990s the permitted disposal area of the landfill increased from 40 to 67 acres. The additional acreage was designed with a liner system that meets EPA requirements for new municipal solid waste landfills. The new area replaced the former leachate evaporation ponds, which were cleaned and closed in 1997. The expansion increased the life of the landfill by approximately 30 years at that time, (City of Santa Cruz Department of Planning and Community Development, April 2004), but the lifespan has been increased through additional waste reduction as discussed further below.

Since 1990 the Public Works Refuse Division has focused on maximizing the capacity of the RRF, waste diversion, and implementing environmental improvements to minimize the impacts of the facility to public health and the surrounding environment (City of Santa Cruz Department of Planning and Community Development, April 2004). Major capital improvement projects that have been implemented at the RRF to minimize its impact to the environment include the following:

- Construction of two triple lined leachate collection impoundments.
- Construction of a three-mile leachate pipeline from the landfill to the City's sanitary sewer system.
- Construction of a groundwater cutoff wall downgradient of the landfill's lowest elevation.
- Construction of a freshwater bypass tunnel system to reroute two streams around the landfill.
- Construction of two of the four lined cells planned for the 27-acre expansion area.
- Expansion of the recycling processing facility and conversion to an automated, single-stream processing line.
- Construction of a gas trench wall to prevent offsite migration of landfill gas.

- Improvement of the landfill gas collection and power generation system.
- Improvement of leachate containment and erosion control methods.
- Expansion of environmental monitoring network, including groundwater, soil pore gas, surface water and air quality (City of Santa Cruz Department of Planning and Community Development, April 2004).

The City of Santa Cruz met has met the state-mandated waste diversion goals of 25% of their 1990 waste-streams from landfill disposal by 1995 and 50% by 2000 through community education regarding the three "R"s (i.e. reduce, reuse and recycle) and the implementation of expanded curbside recycling programs. The programs included the collection of most forms of clean paper (e.g. office, junk mail, newspaper, magazines, paper board, and card board), containers (e.g. glass, metal, aluminum, and plastic nos. 1-7), and yard waste materials. The programs also included the diversion and reuse of construction and demolition debris (e.g. concrete rubble, asphalt, and wood) and wastewater treatment plant sludge. In the year 2000, the City established a Zero-Waste goal with the ultimate intention of eliminating the City's need for a landfill (City of Santa Cruz Department of Planning and Community Development, April 2004). As of 2009, the City had achieved a diversion rate of 63-65%, which exceeds the state requirements.

Assuming growth trends similar to the past 10-15 years in the City of Santa Cruz, the RRF has more than adequate capacity to accommodate all municipal solid waste generated by City residents, visitors and businesses. Based on continued waste reduction, annual aerial surveys, and calculations, the landfill is estimated to have capacity through the year 2058 (Arman, personal communication, April 2011). State law requires that facilities begin planning for future waste disposal/reuse facilities at least 15 years in advance of existing landfill closure dates, which would be after the year 2030 and the proposed *General Plan 2030* planning horizon.

Planned programs and improvements include the following as outlined in the *General Plan 2030* Background Report City of Santa Cruz Department of Planning and Community Development, April 2004 include expansion of the waste diversion programs and continued pursuit of operational improvements and efficiencies to increase the life of the landfill. Several capital improvement projects are planned to promote waste diversion, improve the environment, and maintain the landfill's capacity. These include two additional lined landfill cells and improvements at the wastewater treatment plant to enable food wastes to be added to the digesters to generate gas for energy generation. The City recently acquired a 5.5-acre parcel adjacent to the landfill on the south, which will be used for support uses ancillary to the landfill and RRF uses. Specific uses have not been identified, but the property will not be used for landfill disposal operations.

ELECTRICAL & NATURAL GAS UTILITIES

Pacific Gas and Electric Company (PG&E) provides electrical and natural gas service to the City. Incorporated in California in 1905, PG&E is one of the largest combination natural gas and electric utilities in the United States. PG&E and other utilities in the state are regulated by the California Public Utilities Commission (Pacific Gas and Electric Company website, 2011). It currently provides service to approximately 15 million people throughout a 70,000-square-mile service area in northern and central California from Eureka in the north to Bakersfield in the

south, and from the Pacific Ocean in the west to the Sierra Nevada in the east. The service area includes 141,215 circuit miles of electric distribution lines, 18,616 circuit miles of interconnected transmission lines. 42,141 miles of natural gas distribution pipelines and 6,438 miles of transportation pipelines. PG&E and other utilities in the state are regulated by the California Public Utilities Commission (Pacific Gas and Electric Company website, 2011).

The state's per capita electrical use in 2009 was 6,691 kilowatt hour per capita, the lowest of any state in the nation (California Energy Commission website, 2011). Within PG&E's service area, electrical use is projected to increase by approximately 1.22% between 2010 and 2020, which is a lower increase than experienced between 1990 and 2000, but slightly higher than between 2000 and 2010 (California Energy Commission, December 2009). Total efficiency/conservation electricity consumption savings are projected to reach 80,000 gigawatt hours in 2020; the majority of savings from building and appliance standards (Ibid.). State projections indicated that natural gas consumption will increase only minimally during the same time period (Ibid.).

State forecasts show a similar electrical and natural gas trend for the PG&E service area with a slightly higher rate of increase in electrical consumption between 2010 and 2020 (1.27%) (California Energy Commission, December 2009). However, the per capita electricity consumption is projected to slightly decline in PG&E's service area due to continued savings from energy efficiency programs (Ibid.). Forecasts show an overall decrease in natural gas consumption over 1990 levels by the year 2020 (Ibid.).

Data developed as part of the preparation of the City's draft "Climate Action Plan" reveals that approximately 290,000,000 kilowatt hours (kWh) of electricity were consumed within the City in 2008 and approximately 18,000,000 therms of natural gas was used. This accounts for municipal, residential and commercial/industrial uses. Nearly 8,000,000 kWh of electricity was generated by renewable sources.

Studies have demonstrated the value and cost-effectiveness of weather-stripping, replacing single pane windows, old appliances and lighting, and increasing insulation in reducing energy use and saving money. Significant energy and cost savings have already been achieved through the implementation of such measures throughout the City of Santa Cruz, although further savings could be achieved (City of Santa Cruz Climate Action Program, September 2010). Over the past 15 years, the combined influences of energy efficiency rebate programs, a public education campaign, and significant increases in energy prices have led to a 22% reduction in energy use within Santa Cruz homes. While this drop in energy use is significant, home energy use in Santa Cruz is again on the rise, but still far below 1996 levels (Ibid.).

In 2007, Santa Cruz became one of the first municipalities in the nation to require new construction to include the adoption of environmentally superior building materials and designs. Builders in Santa Cruz now use best practices for their construction projects that enhance building energy efficiency and water conservation as well as to improve air quality, waste reduction and recycling, and erosion and runoff control. The Green Building Program currently includes residential and commercial development (City of Santa Cruz Climate Action Program, September 2010). Reviews conducted as part of the preparation of the City's draft "Climate Action Plan" indicates that an "award-winning" home under the City's Green Building Program

produces a home that is more efficient than standard homes built in 2008 and almost twice as efficient as homes built in 1990 (City of Santa Cruz, September 2010).

The AMBAG Energy Watch Program is a partnership between AMBAG and PG&E, which seeks to reduce energy use in the Monterey Bay region by providing the resources listed below to eligible PG&E customers.

- Energy assessments and audits;
- Direct installation of energy efficient equipment;
- Technical assistance and financial incentives for energy efficient retrofits in municipal buildings;
- Energy efficiency seminars and training courses in the region; and
- nformation on other PG&E energy efficiency programs and services

Additionally, the Monterey Bay Regional Energy Plan was prepared by AMBAG to update goals and actions Program regarding energy use in the Monterey Bay region. A draft update to the 2006 Plan reported that the Energy Watch Program tracked and reported the following energy savings in 2008 throughout the region: 5,201,582 killowatt hours (kWh) for municipalities; 17,697,292 kWh the hospitality industry; and 1,293,653 kWh for residential uses (AMBAG, 2008).

4.6.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The proposed *General Plan 2030* includes goals, policies and actions that address provision of public services. In general, Policies LU1.3 and LU1.4 seek to ensure that facilities and services required by future development are available and that new development pays its proportional share. The Plan also seeks to provide community services and facilities to meet needs of the population (CC2.1) and update and replace facilities (CC2.1.1).

Goals, policies and actions in the following chapters also address specific public services.

- The CIVIC AND COMMUNITY FACILITIES chapter of the draft *General Plan 2030* includes the following four goals addressing public services:

  GOAL CC4 *A sustainable and efficient wastewater system.*

  GOAL CC6 *Minimal solid waste production.*

  GOAL CC7 *A safe and secure community.*

  GOAL CC8 *Excellent educational opportunities and resources.*

These goals address the following public services:

- Wastewater - one goal with three associated policies and eight specific actions;
- Solid Waste Management – one goal with four associated policies and 27 actions;
- Police Protection – one goal with six associated policies and 23 actions ; and
- Schools – two policies with four actions that address school sites and facilities and two additional policies and accompanying actions that address educational programs and safe access to schools.

- The HAZARDS, SAFETY & NOISE chapter of the draft *General Plan 2030* includes two policies and 13 specific actions related to fire protection and safety and provision of emergency access.

- The PARKS, RECREATION AND OPEN SPACE chapter of the draft *General Plan 2030* includes goals, policies and actions that address parks and recreational facilities, open space, trails and recreation programs. This chapter includes three goals with 16 associated policies and 38 specific actions that address parks, open space and recreational facility public services. A fourth goal with policies and actions address recreational programs, activities and events. These goals are identified below. Several policies and actions in other chapters of the proposed General Plan also seek to protect, preserve and/or manage open space and natural areas throughout the City (CD 1.1.3, LU 2.3, LU 3.11 NRC 1.1 river access]).

  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 draft plan also strives to maintain park service standards, which call for a neighborhood park at ratio of 2.0 acres per 1,000 population (PR1.3.2) and a community parks ratio of 2.5 acres per 1000 population (PR1.3.3). Service standards are not provided for other public services, although Action CC7.1.7 calls for updating and maintaining police response time standards, while Action CC9.4.2 seeks to provide emergency services at accident or disaster scenes within an average time of 4 minutes or less and within 5 minutes or less 90 percent of the time.

- The NATURAL RESOURCES AND CONSERVATION chapter of the draft *General Plan 2030* includes the following goal with four associated policies and 20 accompanying actions related to energy conservation. Its four policies and accompanying actions would promote reduction of electricity and natural gas consumption, use of renewable

energy sources, and use of energy-efficient lighting, vehicles, and water fixtures and appliances.

GOAL NRC7 *Reduction in energy use, and significant production and use of renewable energy.*

PROPOSED IMPROVEMENTS

The draft *General Plan 2030* includes several policies and actions that address specific improvements or general types of future improvements to public service facilities. Generally, the plan calls for updating and replacing facilities as appropriate (CC2.1.1) and providing community facilities to meet the needs of the City's population (CC2.1). Specific referenced service improvements include maintenance and upgrading the sewer system (CC4.1, CC4.1.1 - CC4.1.3, CC4.1.5); monitoring the wastewater treatment plant capacity to address future needs (CC4.1.8); and exploring the potential for recycling wastewater (CC4.3). The draft Plan the development of a new countywide Emergency Operations Center facility (HZ1.1.5), but a specific location within the City or elsewhere in the county is not identified.

Policy LU4.3 encourages the development and expansion of neighborhood facilities such as parks, schools, daycare centers, and neighborhood commercial services. However, there are no specifically designated new park or school sites. A number of policies promote provision of trails and access to open space lands and the coast (PR4.1 and accompanying actions) with enhancing the recreational value of the San Lorenzo River walkway and East and West Cliff Drive pathways (PR4.1.3) and creating a continuous pathway along the coast by enhancing the physical links between West Cliff and East Cliff Drives and the Beach Promenade (PR4.1.4).

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 that have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Some of the draft *General Plan 2030* policies and actions support specific types of land uses and/or development, including new mixed-use use districts and/or intensified redevelopment, as summarized in the LAND USE (Chapter 4.1) section of this EIR.

4.6.3 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:

6a Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or need for new or physical altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

- Fire Protection
- Police Protection
- Schools

6b Increase the use of existing neighborhood and community parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

6c Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

6d Result in wastewater flows exceed sewer line or treatment plant capacity or contribute substantial increases to flows in existing sewer lines that exceed capacity.

6e Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs.

6f Result in the wasteful or inefficient use of energy.

IMPACT ANALYSIS

Based on the significance criteria identified above, the following impact analyses address potential impacts to the City's fire and police services (6a); potential impacts on City park facilities (6b-c); potential impacts on school facilities (6a); potential impacts related to wastewater collection and disposal (6d); potential impacts on landfill capacity (6e); and potential impacts related to energy use (6f).

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. This potential development, as summarized in the LAND USE (Chapter 4.1) section of this EIR, could result in development of 3,350 residential units, 3,140,000 square feet of commercial, office and industrial development and 300 new hotel

rooms. This level of development could result in an increased population of 8,040 residents and 8,665 new jobs.

The proposed General Plan also includes other policies and actions that could result in development that supports year-round expanded performances, events, and/or visitors. These potential uses include:

- 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), 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).

New development accommodated under the proposed General Plan will result in the demand for public services. The proposed *General Plan 2030* includes goals, policies and actions that address provision of public services. In general, Policies LU1.3 and LU1.4 seek to ensure that facilities and services required by future development are available and that new development pays its proportional share. The Plan also seeks to provide community services and facilities to meet needs of the population (CC2.1) and update and replace facilities (CC2.1.1). The impacts associated with specific services are presented below.

Impact 4.6-1 Fire Protection
Adoption and implementation of the *General Plan 2030* could indirectly result in increased population associated with potential development that could be accommodated by the Plan that would result in increased fire protection and emergency service demands. However, future development and growth would not result in the need to construct new or expanded fire stations. This is considered a *less-than-significant impact*.

According to the City's Fire Department, there are adequate fire protection facilities to serve the projected growth increases associated with implementation of the proposed Draft *General Plan 2030*. No new fire stations or facilities will be needed to maintain acceptable response times and service levels (Oliver, personal communication, April 2011). New development and growth accommodated by the draft plan would not reduce response times or require new or physically altered fire protection facilities that could result in significant physical impacts.

The Department's current need for a Training Facility, however, will continue in the future, and the Department plans to investigate the possibility to consolidate administration and training facilities with future fire station improvements, including potential reconstruction of Fire Station Two and relocation of Fire Station One. No sites have been identified for potential relocation. Fire Station Two is located adjacent to a city-owned, paved, public parking lot. If future

expansion were to occur at this location, there no significant impacts are expected to occur, as the site is within a developed urban area.

The draft plan includes policies and actions that would serve to reduce impacts on the City's Fire Department. Draft Policy HZ1.2 seeks to respond to emergencies rapidly. Specific actions call for annual review of service calls (HZ1.2.1) and response times and making continuous operational improvements to arrive on emergency scenes within an average time of 4 minutes or less and within 5 minutes or less 90 percent of the time (HZ1.2.2). Additionally, Policy HZ1.4 and its five specific actions seek to continue to meet fire safety and firefighting needs with staff training and equipment maintenance (HZ1.4.1), promoting built-in fire extinguishing and alarm systems (HZ1.4.2), ensuring adequate fire flow to new uses (HZ1.4.3), and continued mutual aid services with other agencies (HZ1.4.4, HZ1.4.5). A number of actions also seek to ensure that new development is sited and designed to accommodate facility emergency access and response (HZ1.2.5, HZ1.2.6, HZ1.5.5) and that street widths are adequate to safely accommodate emergency vehicles (M3.2.3). These policies and actions (as summarized on Table 4.6-3) serve to maintain fire department operations and response time and reduce impacts on fire protection services.

TABLE 4.6-3
Proposed General Plan Policies & Actions that Avoid or Reduce Fire Protection Service Impacts

Type of Measure / Action	Policies / Actions
PROVIDE ADEQUATE EMERGENCY RESPONSE & PREPAREDNESS	• Adequate emergency response times: HZ1.2, HZ1.2.1, HZ1.2.2 • Ensure emergency preparedness: HZ1.1; HZ1.1.1 (annually update the Emergency Operations Plan.); HZ1.1.2 (City staff training) • New development design and access to maintain emergency response times with adequate access: HZ1.1.3, HZ1.2.5, HZ1.2.6 • Ensure that street widths are adequate to safely serve emergency vehicles: M3.2.3
PROVIDE ADEQUATE FIRE PROTECTION	• Meet fire safety & firefighting needs: HZ1.4, HZ1.4.1 (staff training and equipment maintenance) • Adequate emergency response times: HZ1.2, HZ1.2.1, HZ1.2.2 • Adequate fire flow: CC3.4.1, HZ1.4.3 • Pre-fire surveys of select buildings: HZ1.2.3 • Fire prevention: HZ1.4.2 (built-in extinguishing & alarm systems), HZ1.5.6 (abatement of hazardous buildings and conditions) • Adequate emergency access in new development: HZ1.2.5, HZ1.2.6, HZ1.5.5 • Promote fire safety & prevention programs: HZ1.5.8
REDUCE WILDLAND FIRE HAZARDS	• Reduce wildfire hazards: HA1.5, HZ1.5.1, • Regulate development siting/design to reduce wildland fires: HZ1.5.3 (setbacks), HZ1.5.4 (fire-resistant/retardant building materials), • Continued mutual aid with other agencies: HZ1.4.4, HZ1.4.5 • Promote fire safety & prevention programs: HZ1.5.8 • Maintain & update wildland interface zones: CD1.4.4

Future growth could result in an indirect increased risk of wildfires in the urban-rural interface and adjacent to the City's greenbelt areas. None of the major vacant sites are within identified fire hazard zones. The City does not have the resources to adequately police and protect greenbelt areas, which increases the frequency of illegal camping that can result in fires in limited access and canyon areas (City of Santa Cruz, September 2007). Despite the fact that there has not been a recent wildland fire within the city limits, residential development into or adjacent to wildland/urban interface areas increases the danger to life and property should a fire occur. Areas targeted as "likely" to have a wildland fire include the Arroyo Seco/Meder Canyon, DeLaveaga, Pogonip, Moore Creek area and Arana Gulch. Increasing use of these areas by residents, transient encampments with fires, and young adults looking for a place to gather exacerbates the risks (Ibid.).

Policy HZ1.5 seeks to reduce potential wildfire hazards through regulation of development in and adjacent to fire hazard areas (HZ1.5.2) with adequate siting, design, and emergency access provided by new development to reduce potential hazards and facilitate emergency response (HZ1.5.3, HZ1.5.4, HZ1.5.5). The City of Santa Cruz also has initiated a number of wildfire mitigation programs in recent years including vegetation management programs at DeLaveaga Park and at the Arroyo Seco Canyon areas (City of Santa Cruz, September 2007). The City continues to maintain cooperative agreements to work with the County, UCSC, the California Department of Forestry and other fire protection agencies to collaboratively avoid or minimize the threat from wild-land/urban interface fires. The City's adopted "Local Hazard Mitigation Plan" (City of Santa Cruz, September 2007) also includes the following mitigation strategy to avoid or reduce potential wildfires that have been included in the draft General Plan.

- Cooperative fire protection agreements with other agencies.
- Reduction of fire risk in wildland/urban interface areas through improved vegetation management and appropriate code enforcement.
- Promotion of built-in fire extinguishing and warning fire alarm systems.
- Creation of a proactive (not reactive) hazard abatement program.
- Land use planning to reduce incidence of human caused wildfire.
- Adequate staffing to meet needs of City population and development.
- Fire prevention programs in schools, institutions & commercial buildings.

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 demands for fire protection services. However, there are adequate fire protection facilities to serve the projected growth increases associated with implementation of the proposed Draft *General Plan 2030*, and no additional equipment or facilities will be needed to maintain acceptable response times and service levels (Oliver, personal communication, April 2011). New development and growth accommodated by the draft plan would not reduce response times or require new or physically altered fire protection facilities that could result in significant physical impacts. Furthermore, the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize adverse impacts on fire protection services as summarized on Table 4.6-3. With implementation of these proposed policies and actions, as well as implementation of the City's "Local Hazard Mitigation Plan", the

proposed *General Plan 2030*'s indirect impact on fire protection services would be considered less-than-significant.

Mitigation Measures

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

Impact 4.6-2 Police Protection
Adoption and implementation of the *General Plan 2030* could indirectly result in increased population associated with potential development that could be accommodated by the Plan that would result in increased police protection service demands. However, future development and growth would not result in the need to construct new or expanded police stations. This is considered a *less-than-significant impact*.

According to the City's Police Department, there are adequate police protection facilities to serve the projected growth increases associated with implementation of the proposed Draft *General Plan 2030*. No additional equipment or facilities personnel will be needed to maintain acceptable response times and service levels (Vogel, personal communication, April 2011). New development and growth accommodated by the draft plan would not reduce response times or require new or physically altered police protection facilities that could result in significant physical impacts.

The draft plan includes policies and actions that would serve to reduce impacts on the City's Police Department. Policy CC7.1 and its specific accompanying actions seek to ensure adequate police training and resources. Specific actions seek to ensure appropriate police staff, stations, equipment and training to meet demands of increased population and tourism (CC7.1) and implement officer training and crime prevention programs (CC7.1.2, CC7.1.3). Additionally, the draft plan seeks to provide and rapid and timely response to emergencies (CC7.1.6, HZ1.2) with updating and maintaining police response time standards (CC7.1.7). Specific actions call for annual review of service calls (HZ1.2.1) and response times and making continuous operational improvements to arrive on emergency scenes within an average time of 4 minutes or less and within 5 minutes or less 90 percent of the time. (HZ1.2.2). A number of policies also seek to reduce police service demand through land use planning and project designs (CC72.5, CC7.2.7). Other actions promote cooperate with other County agencies on public safety and police issues (CC7.3, CC7.3.1, CC7.3.2). Taken together, these policies and actions (as summarized on Table 4.6-4) serve to ensure adequate police department operations and response time and reduce police protection service demand, and, thus, reduce potential impacts on police protection services.

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 demands for police protection services. However, there are adequate police protection facilities to serve the projected growth increases associated with implementation of the proposed Draft *General Plan 2030*, and no additional

equipment or facilities will be needed to maintain acceptable response times and service levels. New development and growth accommodated by the draft plan would not reduce response times or require new or physically altered police protection facilities that could result in significant physical impacts. Furthermore, the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize adverse impacts on police protection services as summarized on Table 4.6-4. With implementation of these proposed policies and actions, the proposed *General Plan 2030*'s indirect impact on police protection services would be considered less-than-significant.

Mitigation Measures

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

TABLE 4.6-4
Proposed General Plan Policies & Actions that Avoid or Reduce Police Protection Service Impacts

Type of Measure / Action	Policies / Actions
PROVIDE ADEQUATE EMERGENCY RESPONSE & PREPAREDNESS	• Adequate emergency response times: HZ1.2, HZ1.2.1, HZ1.2.2 • New development design and access to maintain emergency response times with adequate access: HZ1.1.3, HZ1.2.5, HZ1.2.6
PROVIDE ADEQUATE POLICE PROECTION	• Ensure appropriate staff (including training), stations, equipment to meet population demands: CC7.1, CC7.1.1, CC7.1.2 • Timely response: CC7.1.6, CC7.1.7, HZ1.2, HZ1.2.1, HZ1.2.2 • Update police response standards: CC7.1.7 • Reduce demand through land use planning & project designs: CC7.2.5, CC7.2.7 • Participate in crime reduction & prevention programs: CC7.1.3, CC7.2.2, CC7.2.3

Impact 4.3 Parks and Recreation
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would result in an indirect demand for parks and recreational facilities. However, the estimated growth would not increase use of parks or recreational facilities such that a substantial physical deterioration would occur. With implementation of proposed policies and actions, in combined with existing regulations, impacts to parks and recreational facilities is considered a *less-than-significant impact*.

The proposed *General Plan 2030* will result in additional development and population growth, resulting in increased demands for park and recreational facilities. The Plan seeks to provide neighborhood parks at a ratio of 2.0 acres per 1,000 residents and to provide community parks at a ratio of 2.5 acres per 1,000 residents. This is the same standard included in the

City's existing General Plan. As previously discussed, the City currently does not meet the desired level of service for neighborhood parks and is deficient by approximately 16 acres. Thus, existing developed neighborhood parks could be considered at capacity use, in general, based on the City's park service standards.

The projected population increase of 8,040 new residents would result in an additional need for 16 acres of neighborhood parks and 20 acres of community parks to meet the proposed park service standard. Under existing conditions and with future growth, a total of 32 additional neighborhood park acres would be required to meet the City's service standard.[7] The City currently has sufficient community park land as summarized on Table 4.6-1.

The *General Plan 2030* does not identify any specific new park and recreation facility sites. Thus, the increased population accommodated by the proposed General Plan would result in an increased use of existing parks and recreational facilities. The largest projected increases in population would be distributed along existing transportation corridors throughout the City and in downtown. Thus, it is anticipated that the increased use of parks and recreational facilities would be distributed throughout existing neighborhood and community parks. A geographically widespread increase in use would not likely result in substantial physical deterioration of specific parks and recreational facilities, although maintenance is an ongoing requirement, including school playgrounds and joint use facilities.

The proposed *General Plan 2030* does not include any goals or policies regarding construction or expansion of a specific park or recreational facility, the construction or expansion of which may result in potentially significant impacts. The draft plan does call for developing new or expanding existing athletic fields (PR1.2.2), and coordinating with local schools to expand park and recreation opportunities. However, specific sites or locations are not identified. As specific park and recreational facility expansion projects are proposed in the future, project-specific environmental analyses will be completed as required to analyze potential significant impacts and provide the appropriate project-level mitigation as may be needed.

The proposed *General Plan 2030* includes a number of policies that serve to mitigate potential impacts to existing parks and recreation facilities as a result of new residential development and population growth accommodated by the draft *General Plan 2030*. The policies, which are summarized on Table 4.6-5, address development of new parks which would lessen the projected increased use of existing parks, as well as, maintenance of existing parks and recreational facilities. The plan seeks to update and modify park system and services to accommodate changes in the population and its recreational need (PR1.1.1). A number of policies and actions seek to provide a system of parks and recreational facilities (PR1.1.1), planning for new parks and facilities (PR1.1.2, PR1.1.4), evaluating and acquiring parks (PR1.1.3, PR3.2 [parcels that provide access to City-owned open space lands]), developing new or expanding existing athletic fields (PR1.2.2), and coordinating with local schools to expand park and recreation opportunities (PR1.2.1, PR1.2.3). To this end, the plan establishes service standards (PR1.3, PR1.3.2, PR1.3.3), seeks to ensure that adequate park land is provided in conjunction with new development (PR1.3.1), and requires park dedication or payment of in-lieu fees from new development (PR1.7, PR1.7.1). Thus, while specific new park locations are not

[7] This is based on an existing population of 58,982 in 2009 and 102 existing acres of neighborhood parks and 366 acres of community parks as summarized on Table 4.6-1.

designated in the proposed *General Plan 2030*, the policies and actions set forth a strategy to plan and acquire additional park lands in the future.

The draft plan also seeks to ensure ongoing maintenance needs are addressed in the development and funding plans for any new or expanded parks, recreational facilities, or open space areas (PR1.3.4, PR1.10). Maintenance of the City's Parks and Facilities tax also is recommended (PR1.9, PR1.91, PR1.9.2).

A number of policies and actions also promote provision of trails and access to open space lands and the coast (PR1.4) with enhancing the recreational value of the San Lorenzo River walkway and East and the West Cliff Drive pathways (PR4.1.3) and creating a continuous pathway along the coast by enhancing the physical links between West Cliff and East Cliff Drives and the Beach Promenade (PR4.1.4).

TABLE 4.6-5
Proposed General Plan Policies & Actions that Reduce Parks Impacts

Type of Measure / Action	Policies / Actions
PLAN & PROVIDE FOR NEW PARKS	• Provide & manage parks: PR1.1 • Develop and maintain city Master Parks Plan: PR1.1.2, Pr1.1.4 (plan for adequate parks and recreation facilities) • Level of Service standards: PR1.3, PR1.3.2, PR1.3.3 • Evaluate lands for small parks: PR1.1.3 • Coordinate with schools to expand parks: PR1.2.1, PR1.2.3 • Examine developing new or expanding existing athletic fields: PR1.2.2 • Development park dedication or in-lieu fees: PR1.7, 1.7.1 • Maintain a Parks and Recreation Facilities excise tax on new construction: PR1.9, PR1.9.1, PR1.9.2 • Acquire parcels that provide access to City-owned open space lands and coast: PR3.2
ENSURE MAINTENANCE & MANAGEMENT	• Ensure ongoing maintenance: PR1.3.4 • Identify maintenance funding sources: PR1.10 • Protect & Manage open space: LU2.3 LU2.3.1, LU2.3.2, LU2.3.3, LU2.3.4 (UCSC), LU3.11 • Greenbelt Management: LU2.3.3, LU3.11.3, NRC6.3
PROVIDE ACCESS TO OPEN SPACE LANDS & COAST	• Assure access to open space lands and coast: PR1.6.5, PR3.1 • Coastal access: PR3.2, PR3.3, PR3.3.5 • Access to river & riparian: NRC1.1, NRC1.1.2
PROVIDE TRAILS	▪ Provide and maintain Integrated trail system: PR4.1, PR4.1.1 ▪ Provide and maintain trails in parks: PR4.2, PR4.2.1, PR4.2.2 ▪ Require development to dedicate trails or easements along planned trail routes: PR4.2.3

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development and increased population accommodated by the plan would result in demands for parks and recreational facilities. Increased use of existing parks and school playgrounds is

expected to be spread out throughout the City so that no substantial deterioration would occur at any one facility. With implementation of the proposed *General Plan 2030* goals, policies and actions that set forth measures to avoid and minimize adverse impacts on parks and recreational facilities as summarized on Table 4.6-5, as well as compliance with local regulations, the proposed *General Plan 2030*'s indirect impact on parks and recreational facilities would be considered less-than-significant.

Mitigation Measures

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

Impact 4.6-4 Schools
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would generate elementary school student enrollments that could exceed capacity of existing schools. This is considered a *potentially significant impact*.

Future residential development accommodated by the proposed *General Plan 2030* could result in construction of 3,350 new residential units. Based on student generation rates per dwelling unit of 0.273 for grades K-6 and 0.207 for grades 7-12[8], future development and growth could result in the addition of 915 students in grades K-6 and approximately 695 students in grades 7-12 for a total potential increase of 1,610 students by the year 2030.

The existing combined enrollment for the Santa Cruz City Schools is 6,841 students (Santa Cruz City Schools, June 2010). The addition of additional students in the next 20+ years could increase this total by approximately 1,610 students with approximately 915 elementary school students and 695 high school students. There would be adequate high school capacity to accommodate this growth. Elementary school enrollments could exceed school facility enrolments depending on the timing of growth. Discussions with the school district indicated that the level of enrollment likely could be accommodated within existing school facilities, including using Natural Bridges Elementary School, if needed, which is currently leased as a charter school. The School District collects school impact fees that can be used for facility expansion and/or installation of classroom modules. Such expansion, if required, would be located within existing development footprints and would not be expected to result in significant physical impacts.

The proposed *General Plan 2030* includes a number of policies that serve to mitigate potential impacts to existing school facilities as a result of new residential development and population growth accommodated by the draft *General Plan 2030*. The policies, which are summarized in Table 4.5-6, address ensuring and planning for adequate school sites (CC8.2, CC8.2.2) and cooperating with the school district to monitor impacts of housing on elementary school populations (CC8.1.1). The plan also encourages joint-use facilities that combine educational and community uses (CC8.2.1).

[8] Student generation rates were determined in the School Districts' "Developer Fee Justification Study" (October 5, 2006).

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but increased population resulting from development accommodated by the plan could increase student enrollments in grades K-12, which could exceed existing school facility capacities depending on the timing and rate of growth as the increase would not happen all at once. With required payment of school impact fees to fund necessary facility expansion and/or additions, in conjunction with potential reuse of the former Natural Bridges Elementary School if needed, the impact would be mitigated to a less-than-significant level. Potential addition or expansion of school classroom facilities is not expected to result in significant physical impacts due to the location of existing facilities within developed footprints. Implementation of the proposed *General Plan 2030* includes goals, policies and actions also set forth measures to avoid and minimize adverse impacts on school facilities as summarized on Table 4.5-6.

Mitigation Measures

No mitigation measures are required beyond payment of school impact fees that will be collected at the time of issuance of a building permit.

TABLE 4.5-6
Proposed General Plan Policies & Actions that Reduce School Impacts

Type of Measure / Action	Policies / Actions
PLAN FOR SCHOOL SITES	• Ensure and plan for adequate future sites for educational facilities: CC8.2, CC8.2.2 • Monitor impact of housing on elementary school populations: CC8.1.1 •
COORDINATE WITH SCHOOL DISTRICT	• Cooperate with school district : CC8.1.1
MAXIMIZE OPPORTUNITIES & ENCOURAGE JOINT-USE FACILITIES	• Encourage joint-use facilities for educational and community uses: CC8.2.1 • Maximize educational, developmental, and recreational opportunities: CC8.3

Impact 4.6-5 Wastewater Collection & Disposal
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would result in indirect generation of wastewater that could be accommodated by the existing wastewater treatment plant and collection system improvements, as needed and supported in the General Plan. This is considered a *less-than-significant impact*.

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 indicated above, anticipated development accommodated by the proposed plan could result in an increase in population and employees that would result in increases in wastewater generation.

Wastewater generation can be generally estimated based on water demand. Typically, wastewater flows are derived from water demand. The City Public Works Department generally estimates wastewater flows as a percentage of water use. Based on the water demand rates identified in Table 4.5-4 in the WATER SUPPLY (Chapter 4.5) section of this EIR, this would equate to an average daily wastewater flow increase of approximately 0.55 million gallons as summarized in Table 4.6-7. This amount is well within the remaining treatment plant capacity – both the permitted capacity as well as the City's remaining portion (4.0 mgd). No major sewer line problems or constraints have been identified (Wolfman, personal communication, April 2011), and sewer line replacement would be scheduled in the future as needed.

TABLE 4.6-7
Estimated Project Wastewater Flows

General Plan Use	Amount	Annual Water Demand (MGY)	Average Daily Water Demand (gpd)	Average Daily Wastewater flow (mgd)
Residential - SFD	840 units	60	165,385	0.124
Residential - MFD	2,510 units	64	175,345	0.158
Commercial	1,087,983 sq. ft.	72	197,260	0.158
Hotel Rooms	311 rooms	11	30,140	0.024
Office	1,273,913 sq. ft.	23	63,100	0.055
Industrial	776,926 sq. ft.	9	24,660	0.020
	TOTAL	**239**	**655,890**	**0.539**

Assumes 75% of total residential units (3,350) are multi-family units.
Wastewater generation assumed as 90% of multi-family residential water use, 75% of single-family residential water use, and 80% of non-residential water use.

The Draft *General Plan 2030* includes goals, policies and actions that set forth measures to avoid provide adequate services. Goal CC4 and its three supporting policies and eight accompanying actions seek to maintain a sustainable and efficient wastewater system. These include maintenance and upgrade of the wastewater collection, treatment and disposal systems (CC4.1, CC4.1.1 and CC4.1.3). Periodic updates of wastewater master plans are supported (CC4.1.5), including monitoring treatment plant capacity and development of a plan to address future needs (CC4.1.8). The plan calls for exploring the potential for tertiary treatment and recycling wastewater (CC3.10, CC4.2, CC4.3). Table 4.6-8 summarizes policies that directly or indirectly address wastewater collection or treatment.

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 growth with resulting increases in wastewater generation. However, the City's wastewater treatment plant has adequate capacity to

serve anticipated growth, and with implementation of proposed policies and actions, the collection system will be maintained and upgraded as needed. Thus, there would a less-than-significant impact on wastewater treatment and collection facilities.

Mitigation Measures

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

TABLE 4.6-8
Proposed General Plan Policies & Actions that Reduce Wastewater Impacts

Type of Measure / Action	Policies / Actions
ENSURE ADEQUATE PROVISION OF SERVICES	▪ Ensure that facilities and services required by a development are available: LU1.3 ▪ Report annually on the state of City facilities and services: LU1.3.2 ▪ Ensure that new development pays its proportional share of the costs of expanded infrastructure needed to serve new development: LU1.4
WASTEWATER	▪ Provide adequate, environmentally sound wastewater system: CC4.1 ▪ Maintenance, upgrade & planning sewer system: CC4.1, CC4.1.1 - CC4.1.3, CC4.1.5 ▪ Monitor wastewater treatment plant capacity to address future needs: CC4.1.8 ▪ Explore recycling wastewater: CC3.10.1, CC4.2, CC4.3

Impact 4.6-6 Solid Waste Disposal
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would result in indirect generation of solid waste that could be accommodated within the remaining landfill capacity. This is considered a *less-than-significant impact*.

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 indicated above, anticipated development accommodated by the proposed plan could result in an increase in population and employees that would result in increases in solid waste generation. The City's population is estimated to increase by approximately 8,040 residents due to development and growth accommodated by the proposed plan.

Development and growth accommodated under the proposed plan is estimated to result in a solid waste generation of approximately 20 tons per day based on a per capita rate of 5.0 pounds/day provided by City staff (Arman, personal communication, April 2011). This amount of solid waste could be accommodated within the remaining capacity of the City's landfill, which is on expected to have capacity through the year 2058 (Ibid.).

The Draft *General Plan 2030* includes goals, policies and actions that set forth measures to reduce solid waste generation and promote recycling as summarized on Table 4.6-9, which would further reduce the net increase in solid waste. In particular, Policy CC6.1 seeks to achieve a "zero waste" goal. The City has also achieved a solid waste reduction of 63-65%, which exceeds the state requirement of a 50% reduction by the year 2000. With increasing waste diversion, the landfill capacity has expanded (Arman, personal communication, April 2011).

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 growth with resulting increases in solid waste generation. However, the City's landfill has adequate capacity to serve anticipated growth. Thus, there would a less-than-significant impact on wastewater treatment and collection facilities.

Mitigation Measures

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

TABLE 4.6-9
Proposed General Plan Policies & Actions that Reduce Solid Waste Impacts

Type of Measure / Action	Policies
REDUCE SOLID WASTE	• Zero Waste goal: CC6.1 • Reduce recyclable materials at landfill: CC6.4.4, CC6.1.13 (plastic bags), CC6.1.17 & HZ2.1.4 (ban polystyrene foam), CC6.4.4
PROMOTE / SUPPORT RECYLING	• Prepare & implement recycling and reduction plans and incentives to encourage recycling: CC6.1.1, CC6.1.2, CC6.1.3, CC6.1.7 (new development), CC6.1.14 • Provide efficient waste & recycling service: CC6.2, CC6.2.2 • Encourage use of recycled materials: CC6.1.9, CC6.1.10, CC6.1.12, CC6.1.19 (industrial uses) • Require commercial, industrial recycling & waste audits: CC6.1.4, CC6.1.5, CC6.1.6 (cement/asphalt recycling) • Develop food waste & composting program: CC6.1.15, CC6.1.16
LANDFILL MANAGEMENT & PLANNING	• Develop comprehensive operating plan for Resource Recovery Facility: CC6.3, CC6.3.1 • Develop waste management alternatives: CC6.1.18 • Efforts to extend landfill life: CC6.4, CC6.4.2

Impact 4.6-7 Energy Use
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development that would result in indirect energy demands, which would not be wasteful or an inefficient use with implementation of state and local regulations and proposed *General Plan 2030* policies and actions. This is considered a *less-than-significant impact*.

Future development would be accommodated by the draft *General Plan 2030* would result in consumption of electricity and natural gas lighting, heating and cooling of residences and other buildings. Energy use resulting from potential new development was factored into the greenhouse gas emissions calculations as discussed in Appendix E. The calculations show an energy demand of approximately 40,650 megawatt hours and 9,600 therms in 2030 without implementation of energy efficiency measures or standards. This estimated electrical use represents a per capita use of approximately 1,800 kwh per capita, which is below state projections for the PG & E planning area

Overall, the future consumption of electrical and natural gas resources would not represent unnecessary, inefficient, or wasteful use of resources given the implementation of proposed policies that address lighting and energy conservation measures. Several policies in the proposed General Plan promote energy conservation, which could minimize or incrementally reduce the consumption of these resources. Specifically, GOAL NRC7 seeks to reduce energy use with a significant production and use of renewable energy. Its four policies and accompanying actions would promote reduction of electricity and natural gas consumption, use of renewable energy sources, and use of energy-efficient lighting, vehicles, and water fixtures and appliances. A summary of the proposed *General Plan 2030* policies that serve to reduce energy and fossil fuel consumption is presented in Table 4.6-10.

In addition, new structures will be required to be constructed in accordance with specifications contained in Title 24 of the California Code of Regulations and the City's Green Building Regulations. Anticipated changes in state building and energy efficiency requirements to help reduce greenhouse gas emissions will also reduce the rate of energy consumption increases. Such measures have been factored into California energy forecasts which predict an overall reduction in per capita use of electricity due to energy efficiency standards and conservation.

In addition, new structures will be required to be constructed in accordance with specifications contained in Title 24 of the California Code of Regulations and the City's Green Building Regulations. Anticipated changes in state building and energy efficiency requirements to help reduce greenhouse gas emissions will also reduce the rate of energy consumption increases. However, future construction activities would result in the irretrievable commitment of nonrenewable energy resources, primarily in the form of fossil fuels (including fuel oil, natural gas, and gasoline) for automobiles and construction equipment.

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 demand for electric and natural gas services. However, with implementation of local and state regulations, as well as proposed

General Plan 2030 policies and actions, energy-efficient building designs, material and appliances would be incorporated into future developments and energy use would not be considered wasteful or inefficient. Thus, there would a less-than-significant impact related to energy use.

Mitigation Measures

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

TABLE 4.6-10
Proposed General Plan Policies and Actions that Reduce Energy Use

Type of Measure / Action	Policies / Actions
ENERGY CONSERVATION AND EFFICIENCY	• Reduce electricity and natural gas use by 20%: NRC7.1.1 • Adopt Model Lighting Ordinance: NRC7.1.2 • Improve energy efficiency in parks: NRC7.1.10 • Continue to install energy efficient systems in park and recreational facilities: NRC7.1.11 • Install energy-efficient street lighting: MC.2.10
PROMOTE RENEWABLE ENERGY	• Increase local use and production of renewable energy:NRC7.1.3 • Require passive heating and cooling in new development: NRC7.1.4 • Require City facilities to increase green electricity: NRC7.1.5
PROMOTE ENERGY EFFICIENT TRANSPORTATION	• Reduce consumption of fuels: NRC7.3.1 • Purchase City vehicles with fuel efficient or alternative fuel systems: NRC7.3.2, NRC7.3.4 • Establish telecommuting for City staff: NRC7.3.3 • Investigate partnerships with UCSC for electric car use: NRC7.3.5 • SEE TABLE 4.4-4 in Chapter 4.4 for policies-actions to reduce auto use.
PROMOTE ENERGY EFFICIENT WATER PROVISION & USE	• Install energy and water efficient appliances: NRC7.4.1 • Require new development to use high efficiency fixtures: NRC7.4.2 • Support gray water collection and reuse: NRC7.4.2, NRC7.4.3
EDUCATION & COORDINATION	• Cooperate with other agencies: NRC7.1.7 • Educate public: NRC7.1.8 • Support legislation on renewable energy: NRC7.1.9

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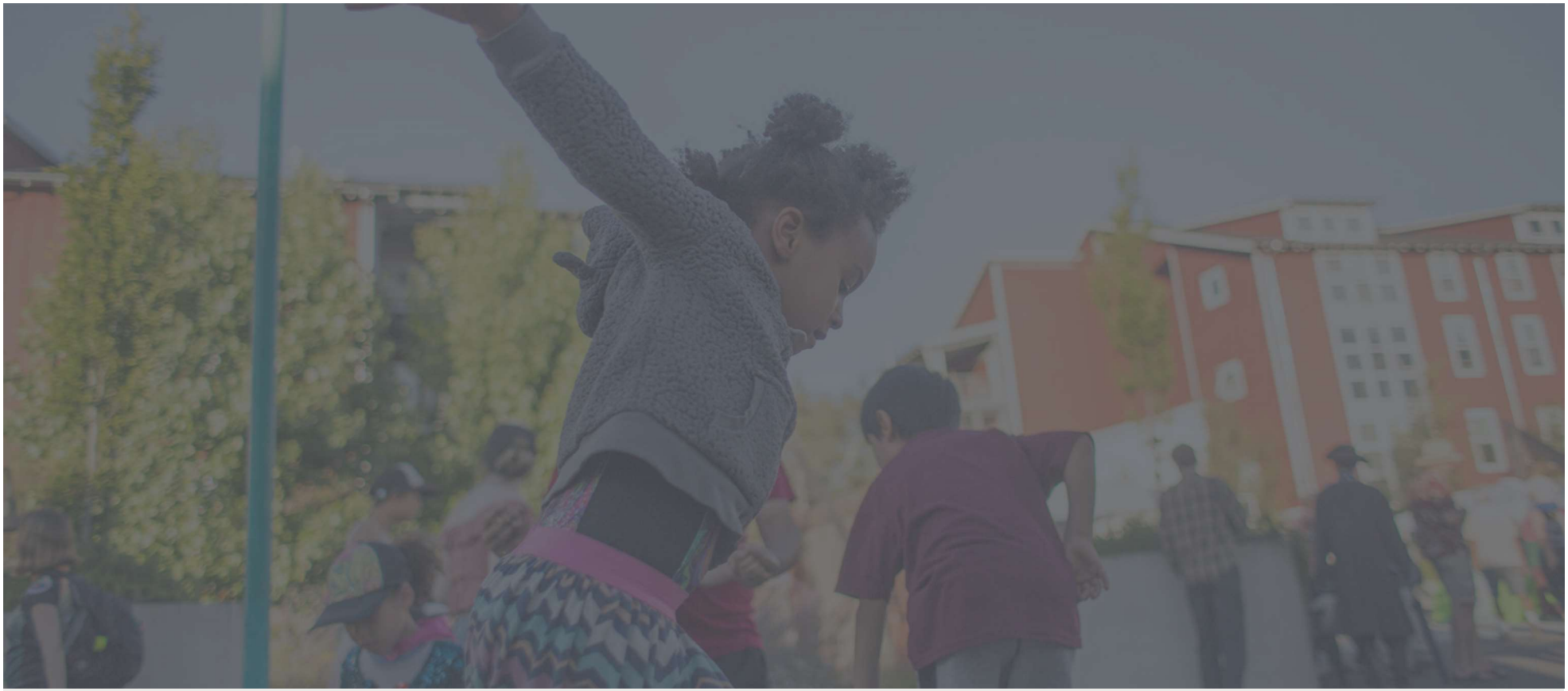

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