Triple Bottom Line Evaluation for Capital Projects

Karen Kubick, Wastewater Enterprise Capital Program Director

YARRA VALLEY WATER
San Francisco’s Combined Sewer System

49 Square Miles in SF
800,000+ SF Population
3 Treatment Facilities
1,000+ Miles of Pipes
40 Billion Gallons Treated/Year
100-Year-Old System
Some of Our Priority Challenges

- Aging Infrastructure
- Climate Change
- Combined Sewer Discharges
- Localized Flooding
Levels of Service Goals

- Provide a Compliant, Reliable, Resilient, & Flexible System that **Respond to Catastrophic Events**
- Integrate Green & Grey Infrastructure to **Manage Stormwater** and **Minimize Flooding**
- Provide **Benefits** to Impacted **Communities**
- Modify the System to **Adapt to Climate Change**
- Achieve **Economic & Environmental Sustainability**
- Maintain **Ratepayer Affordability**
Sewer System Improvement Program (SSIP)

Grey. System and Seismic Reliability & Redundancy

Green. Innovative Stormwater Management Solutions

Clean. Protecting Public Health & the Environment
## Total Program Cost

<table>
<thead>
<tr>
<th>Category</th>
<th>PHASE I</th>
<th>PHASE II</th>
<th>PHASE III</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment Plants</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Biosolids Digester Facilities Project</td>
<td>$2,047</td>
<td></td>
<td></td>
<td>$3,669</td>
</tr>
<tr>
<td>• Southeast Plant Improvements</td>
<td></td>
<td>$1,215</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Oceanside Plant Improvements</td>
<td></td>
<td></td>
<td>$407</td>
<td></td>
</tr>
<tr>
<td>• North Point Facility Improvements</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Collection System</strong></td>
<td>$412</td>
<td>$1,928</td>
<td>$476</td>
<td>$2,816</td>
</tr>
<tr>
<td>• Reliability and Operational</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Green Infrastructure Projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Central Bayside Syst. Improvements</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>City &amp; Consultant Program Management</strong></td>
<td>$125</td>
<td>$152</td>
<td>$43</td>
<td>$320</td>
</tr>
<tr>
<td><strong>Land Acquisition</strong></td>
<td>$128</td>
<td></td>
<td></td>
<td>$128</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$2,712</td>
<td>$3,295</td>
<td>$926</td>
<td>$6,933</td>
</tr>
</tbody>
</table>

*All dollars in Millions
SSIP Phase 1 Projects $2.7B

Citywide Collection System Projects

- Advanced Rainfall Prediction
- Operational Decision System
- Large Sewers, Tunnels and Odor Control
- Pump Stations and Force Main Improvements
- CSD Structure and Transport/Storage Boxes
- Interdepartmental Projects
- Urban Watershed Stormwater Management

- Chinatown Green Alley EIP
- Lake Street Drainage Improvements
- Central Subway Sewer Improvements
- Van Ness BRT Sewer & GI Improvements
- Wiggle Neighborhood Green Corridor EIP
- Marin and Kansas Streets Sewer Improvements
- Cesar Chavez Green Infrastructure
- Mission & Valencia Green Corridor EIP
- Upper Yosemite Green Corridor EIP
- Holloway Green Street EIP
- Visitacion Valley Green Nodes EIP
- Rutland and Schwerin Sewer Improvements

- Baker Beach Green Street EIP
- Sunset Boulevard Greenway EIP
- 17th and Folsom Wet Weather Storage
- Upper Yosemite Creek Daylighting EIP
- Oceanside Treatment Plant Upgrades
- Southeast Treatment Plant Upgrades

Visitacion Valley Green Nodes EIP
Rutland and Schwerin Sewer Improvements
Upper Yosemite Creek Daylighting EIP
Mission & Valencia Green Corridor EIP
Van Ness BRT Sewer & GI Improvements
Wiggle Neighborhood Green Corridor EIP
Marin and Kansas Streets Sewer Improvements
Cesar Chavez Green Infrastructure
Lake Street Drainage Improvements
Central Subway Sewer Improvements
Van Ness BRT Sewer & GI Improvements
Wiggle Neighborhood Green Corridor EIP
Marin and Kansas Streets Sewer Improvements
Cesar Chavez Green Infrastructure
Mission & Valencia Green Corridor EIP
Upper Yosemite Creek Daylighting EIP
Holloway Green Street EIP
Visitacion Valley Green Nodes EIP
Rutland and Schwerin Sewer Improvements
- Baker Beach Green Street EIP
- Sunset Boulevard Greenway EIP
- 17th and Folsom Wet Weather Storage
- Upper Yosemite Creek Daylighting EIP
- Oceanside Treatment Plant Upgrades
- Southeast Treatment Plant Upgrades
Urban Watershed Assessment

Inter-Agency Coordination and Involvement

- Watershed Characterization
- Watershed Opportunities
- Develop Watershed Alternatives
- Evaluate Watershed Alternatives
- Recommended Projects, Programs & Policies and Implementation Strategy

Public Outreach and Engagement

- Characterization
- Public Outreach
- Triple Bottom Line Analysis
Triple Bottom Line for the SFPUC

1. To inform and support the analytical process for developing alternatives by considering social and environmental components in the process alongside performance and economic considerations.

2. To provide decision-making support for SFPUC project leaders; and

3. To increase project selection transparency and facilitate a reporting-out of expected project benefits.
TBL Approach: Balancing the Value Proposition

Traditional Emphasis

- Engineering Performance
- Financial Cost

TBL Model

Environmental Benefit

- Natural Resources
- Community development
- water quality

AIR QUALITY
- Economic development / employment

Social Benefit
TBL Implementation


Triple Bottom Line Sample Output

Ordinal ranking system limits impression of false precision.

Have the option to show or hide those criteria not impacted.

Size of radial slices can be sized according to community importance.

Size of financial slices are proportional to their share of life cycle costs.

 ordinal ranking system limits impression of false precision.

Have the option to show or hide those criteria not impacted.

Size of radial slices can be sized according to community importance.

Size of financial slices are proportional to their share of life cycle costs.

Ordinal ranking system limits impression of false precision.

Have the option to show or hide those criteria not impacted.

Size of radial slices can be sized according to community importance.

Size of financial slices are proportional to their share of life cycle costs.
TBL Output Example
Locating The Project

Watershed Needs

Physical Suitability

Synergy Screening

Location Alternatives

Preferred Project Location

Concept Planning

Length
Area Managed
Construction Cost Projection
Annual Stormwater Managed

Preferred Project Location:
- Cabrillo Street
- Arguello Boulevard
- Baker Beach
Sunset Watershed Alternatives Analysis

Sunset Boulevard Green Retrofit

Sloat/W Potral Green Retrofit

Irving Street

Social

E1 Climate
E2 Habitat
E3 Water Use
E4 Water Quality
E5 Air Quality
E6 Natural Resource Inputs

Environmental

F1 Annualized Capital Costs
F2 Annualized Other Costs

Financial

Note: Financial criterion ratings are based on cost effectiveness (annualized cost per annual CSD volume reduction) and select projects only.
Sunset Watershed Alternatives Analysis

Sunset Blvd.

Potential Bioretention Rain Garden

370'
ROW
70'
74'
ROW
82'
Landscaped Median

Sloat w/Portal Green Retrofit

Vegetated Bioretention Bulb Out
Permeable Paving in Parking Lane
Sloat Boulevard

Sunset Boulevard Green Retrofit

Soot/W Portal Green Retrofit

<30% of the mean in cost effectiveness

Adds recreation space in defined area of need

-600K gallon/year due to conversion from grass to drought tolerant plantings

Average in cost effectiveness among alternatives evaluated

Adds open space but not in area of defined need

Converts grey areas to green infrastructure requiring occasional irrigation during drought
THANK YOU.

sfwater.org/SSIP
SSIP@SFWATER.ORG
SFWATER.ORG