Stormwater Management
Cayuga Ave Neighborhood Meeting

Wednesday, November 4, 2015
Agenda

1. Background and Cayuga Sewers Overview
2. Citywide Flood Resilience
3. What You Can Do to Prepare (Short Term)
4. Capital Improvement Considerations (Long Term)
STORMWATER MANAGEMENT

Cayuga Neighborhood

BACKGROUND
San Francisco’s Combined Sewer System
San Francisco’s Historic Waterways

WAWONA

FOLSOM

CAYUGA
Area Sewer Sizes

- 8'6" (1910s)
- 7'6" x 8'3" (1960s)
- 9'0" (1985)
- 9'6" (1910s)
- 5'3" (1910s)
- 36" Overflow (2007)
- 4' x 6'6" Tunnel (1925)
- 2 @ 6' x 10'6" 1960s

N

San Francisco Water Power Sewer
Sewer Main Profile Along Cayuga St
Terminology: Storm Size
Terminology: Storm Size

- **Storm Return Period**
- **Chance of Storm Occurring in a Given Year**

<table>
<thead>
<tr>
<th>Storm Return Period</th>
<th>Chance of Storm Occurring in a Given Year</th>
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</thead>
<tbody>
<tr>
<td>5-year storm</td>
<td>$1/5 = 20%$</td>
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<tr>
<td>10-year storm</td>
<td>$1/10 = 10%$</td>
</tr>
<tr>
<td>25-year storm</td>
<td>$1/25 = 4%$</td>
</tr>
<tr>
<td>50-year storm</td>
<td>$1/50 = 2%$</td>
</tr>
<tr>
<td>100-year storm</td>
<td>$1/100 = 1%$</td>
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CITYWIDE FLOOD RESILIENCE
What is Flood Resilience?

The capacity to anticipate risk, limit impact, and recover quickly when damage occurs from flooding events.

Flood Resilience Program Goals

• **Infrastructure (long term):** develop a risk-based framework to identify and prioritize capital investments

• **Other flood risk reduction measures (short and long term):**
  - Engage all stakeholders including residents, businesses, other City Departments.
  - Provide “safety net” beyond what the collection system can manage
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WHAT YOU CAN DO TO PREPARE (SHORT TERM)
Floodwater Grant Program

- Modified to include special projects
- Increased funding
- Encroachment fees waived
- Backflow preventer requirements reduced
### SFPUC Floodwater Grant Program

**Example Concepts for Special Projects**

**Summer 2015**

<table>
<thead>
<tr>
<th>Item</th>
<th>Availability</th>
<th>Photo</th>
<th>Advantages and Limitations</th>
<th>Installed by</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Permanent Structures</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Overland flow onto a property/parcel from sidewalk or public right of way.</td>
<td>Walls</td>
<td><img src="image1.jpg" alt="Photo 1" /></td>
<td><strong>ADVANTAGES:</strong> Continuous protection&lt;br&gt;&lt;br&gt;<strong>LIMITATIONS:</strong> Grant only covers walls facing public right of way <em>(not facing an adjacent property)</em></td>
<td>General Contractor</td>
</tr>
<tr>
<td>Low overland flow through pedestrian or garage door.</td>
<td>Raised Floors</td>
<td><img src="image2.jpg" alt="Photo 2" /></td>
<td><strong>ADVANTAGES:</strong> Continuous protection&lt;br&gt;&lt;br&gt;<strong>LIMITATIONS:</strong> Limited height, reduces headspace, construction may be difficult and/or costly</td>
<td>General Contractor</td>
</tr>
<tr>
<td>Low overland flow through a pedestrian door.</td>
<td>Raised Sidewalk/Berm/Threshold</td>
<td><img src="image3.jpg" alt="Photo 3" /></td>
<td><strong>ADVANTAGES:</strong> Continuous protection&lt;br&gt;&lt;br&gt;<strong>LIMITATIONS:</strong> Limited height, commercial Americans with Disabilities Act (ADA) restrictions</td>
<td>General Contractor</td>
</tr>
</tbody>
</table>
Plan, Prepare, Protect

- Elevate your belongings
- Maintain your sewer pipes/laterals
- Help keep catch basins clean – call 311
- Maintain roof drains and downspouts
- Sandbag delivery prior to major rain events
FEMA Flood Insurance

• Available for SF residents and businesses at affordable rates

• SFPUC conducted training for SF insurance agents

• Contact risk.management@sfgov.org
STORMWATER MANAGEMENT

Cayuga Neighborhood

CAPITAL IMPROVEMENT CONSIDERATIONS (LONG TERM)
Citywide Challenges to Sewer System

- Aging Infrastructure
- Seismic Reliability
- Combined Sewer Discharges
- Climate Change
- Odors, Noise & Visual
- Environmental Stewardship
- Stormwater Management

Image of the Golden Gate Bridge in a stormy setting.

19
10-year storm

10% chance of occurring in a given year
Surface Inundation Today
(Design Storm Simulations)

- 5-year storm (20% chance)
- 10-year storm (10% chance)
- 25-year storm (4% chance)
## Historical Flooding

### Recent storms causing flooding

<table>
<thead>
<tr>
<th>Storm Date</th>
<th>Cayuga</th>
<th>Folsom</th>
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<tbody>
<tr>
<td>Dec 3 &amp; 11, 2014</td>
<td>X (25-year)</td>
<td>X</td>
</tr>
<tr>
<td>Dec 2, 2012</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Apr 12, 2012</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Jan 18, 2010</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Oct 19, 2009</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Feb 25, 2004</td>
<td>X (100-year)</td>
<td>X</td>
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Capital Investment at Cayuga

The City is moving forward with a project on Cayuga where flooding is most pronounced: from Rousseau to I-280.
Regrading at the End of Cayuga
Description:
Re-grade/depress Caltrans property at I-280 to detain excess surface water. Build a wall to support I-280 berm and reduce water running onto freeway. Connect drain to College Hill Tunnel.

Key Considerations:
Caltrans coordination
Geotechnical/structural feasibility
Utility relocation
Ensuring freeway flooding doesn’t get worse

Project Cost Range:
~$12 – $15 M
Benefits and Limitations of Regrading Project

• This project would reduce the depth of flooding at the bottom of Cayuga in all storms where flooding occurs.

• No capital improvement could be built that would eliminate flooding in all storms.
Project Progress

Work to Date:

- Preliminary meetings with Caltrans
- Completed field survey
- Preliminary geotechnical analysis

Next Steps:

- Continue concept development and feasibility evaluation
- Environmental review, permitting
- Design, Bid/Award, Construction

Note: This is a lengthy process and multi-agency effort.
Thank you

Questions?