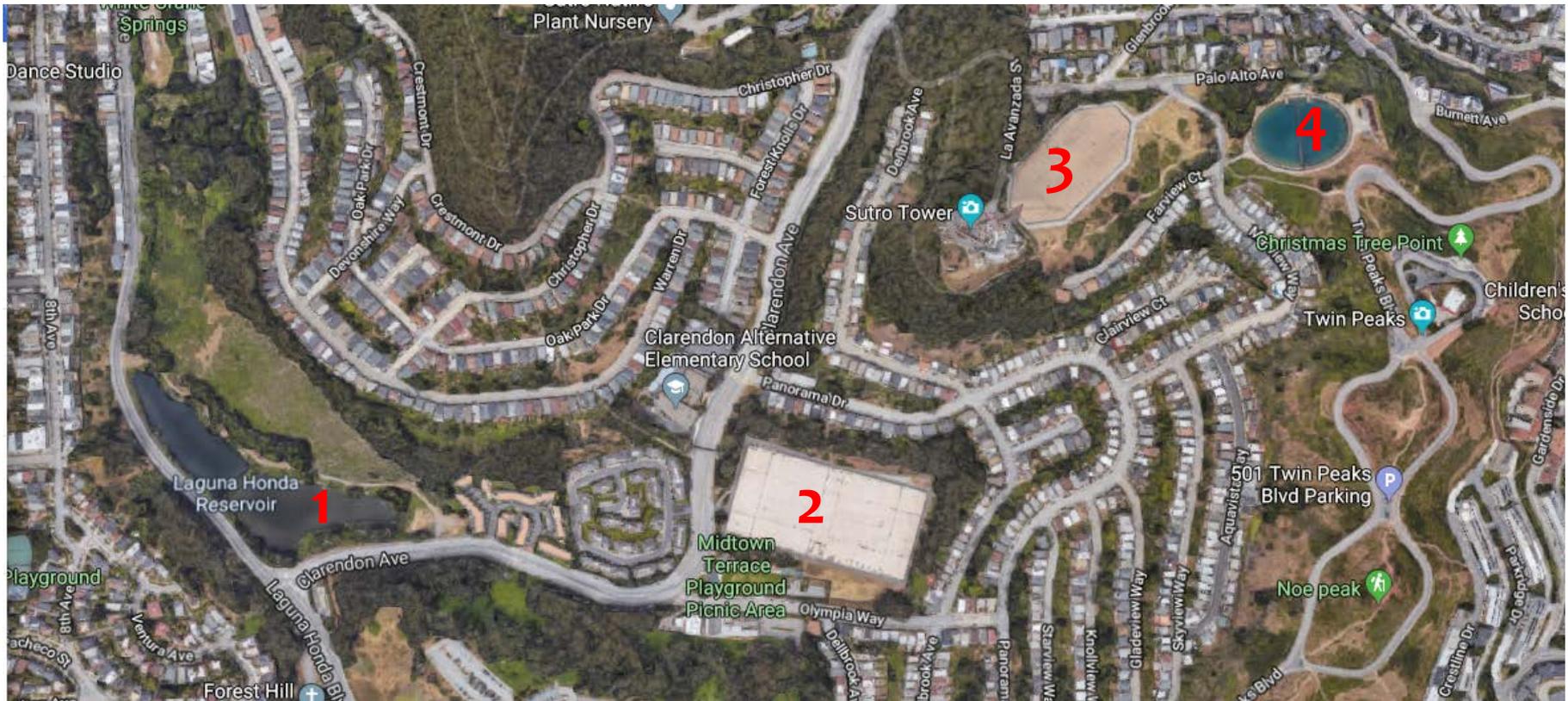


SFPUC Urban Canopy

- Undeveloped Lands:
 - Lake Merced
 - Lombard Reservoir Lands
 - O'Shaughnessy Tract
 - Sunset Reservoir
 - Laguna Honda Reservoir
 - Twin Peaks Reservoir Lands
 - Summit Reservoir Lands
 - Sutro Reservoir Lands



Location of Land



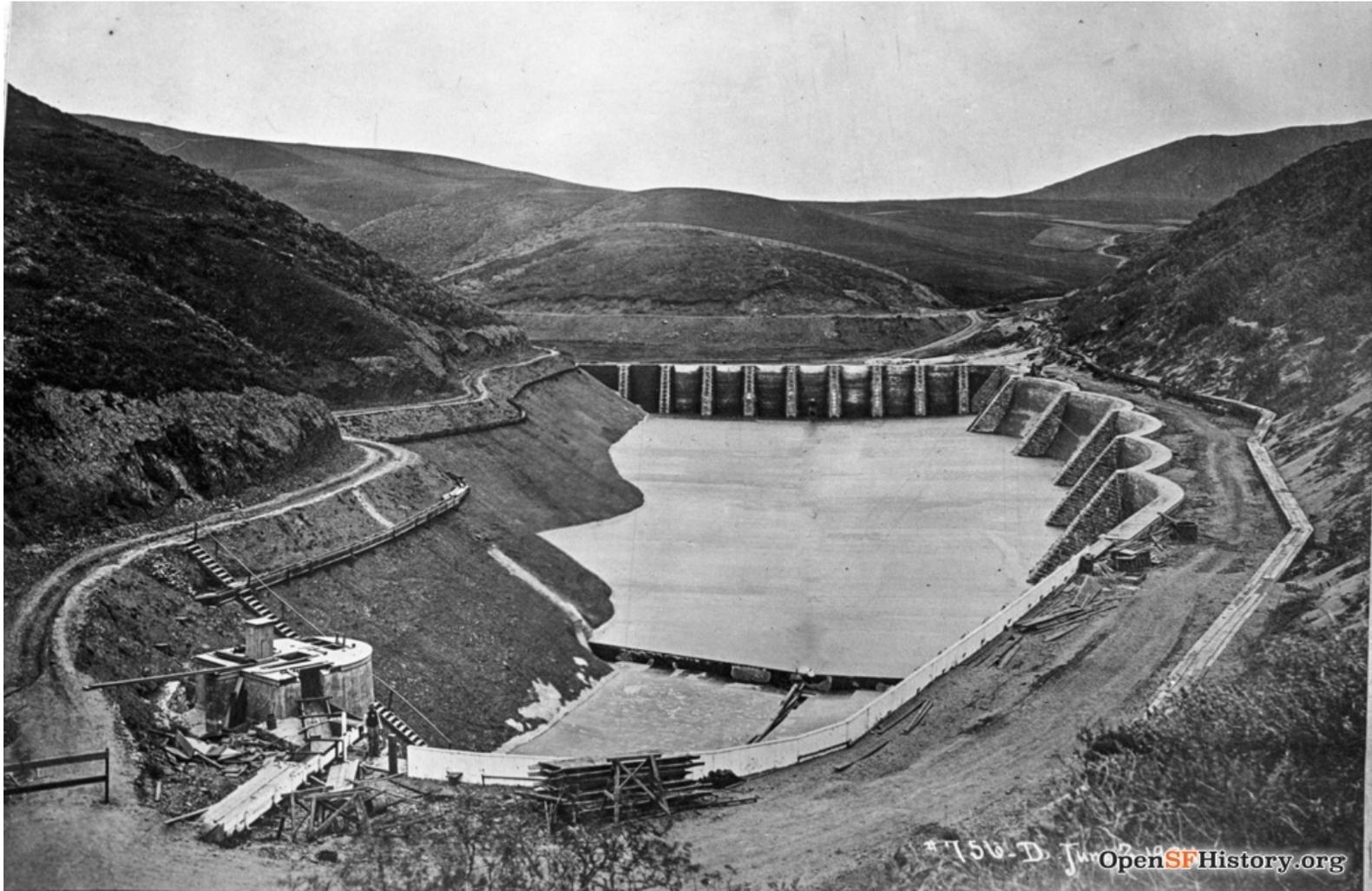
1. Laguna Honda Reservoir Area
2. Sutro Reservoir
3. Summit Reservoir
4. Twin Peaks Reservoir



SFPUC Tree Management

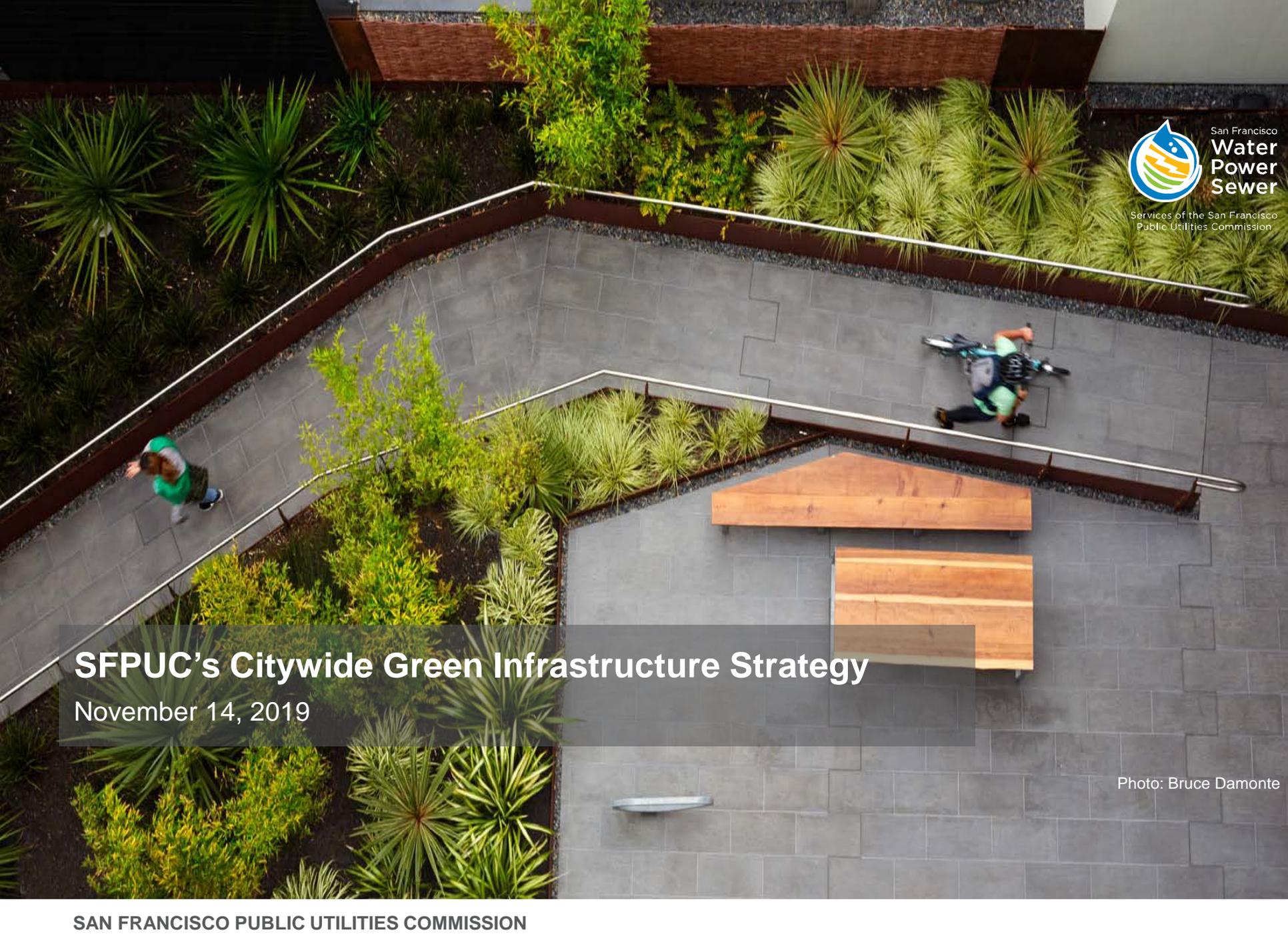
- SFPUC has approximately 4,000 trees on our property within SF (approx. half at Lake Merced – maintained by RPD)
- Proactive Maintenance Measures:
 - Tree trimming and removal of dead trees
 - Planting of native vegetation
 - Management of grasslands and shrubs
 - Working with neighbors to identify property ownership and responsibility

Historic Photo – Laguna Honda Reservoir



SFPUC Green Infrastructure Program

Sarah Minick



SFPUC's Citywide Green Infrastructure Strategy

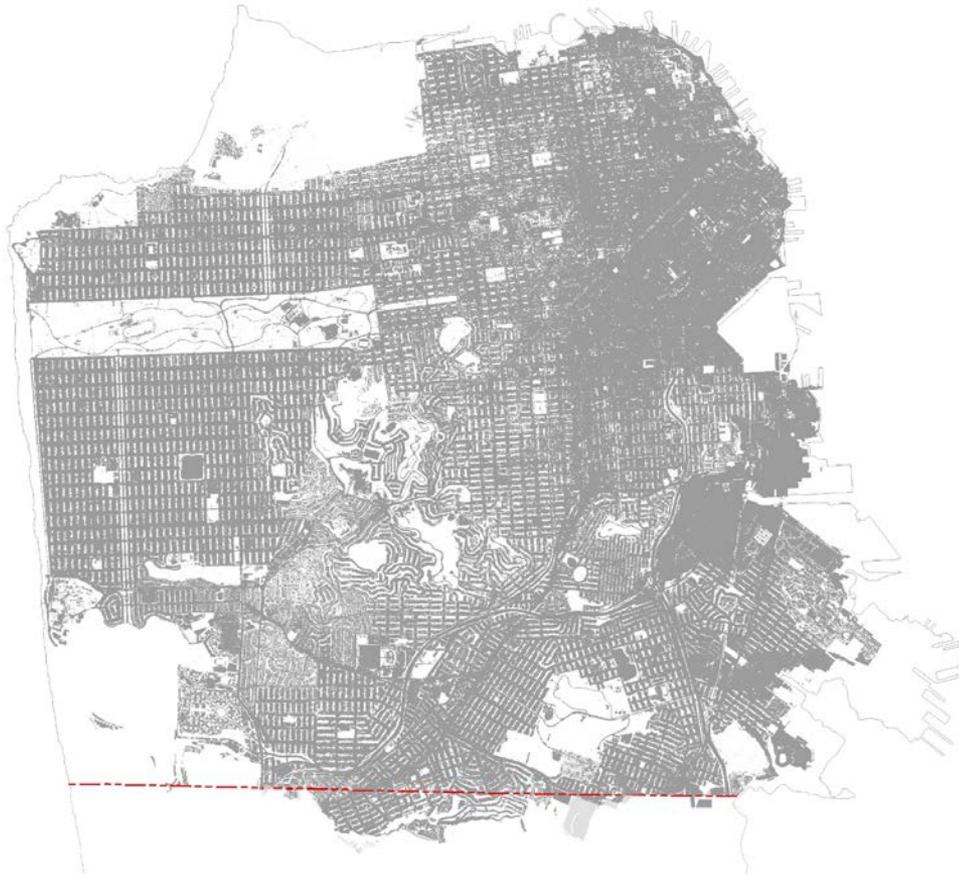
November 14, 2019

Photo: Bruce Damonte

**EVERY YEAR, OVER 10 BILLION
GALLONS OF RAIN FALL ON OUR CITY**



Impervious Surface Map of San Francisco



- Private Parcels
- Public Parcels
- Streets

Our Combined Sewer System

3

Treatment Facilities

1,000+

Miles of Pipes

27

Pump Stations

52

Transport/Storage Boxes,
Tunnels, Force Mains, Outfalls

23,000

Catch Basins

40 Billion Gallons

Treated/Year



Green Infrastructure Technologies

CREEK
DAYLIGHTING



CONSTRUCTED
WETLANDS



VEGETATED
ROOF



BIORETENTION
PLANTER



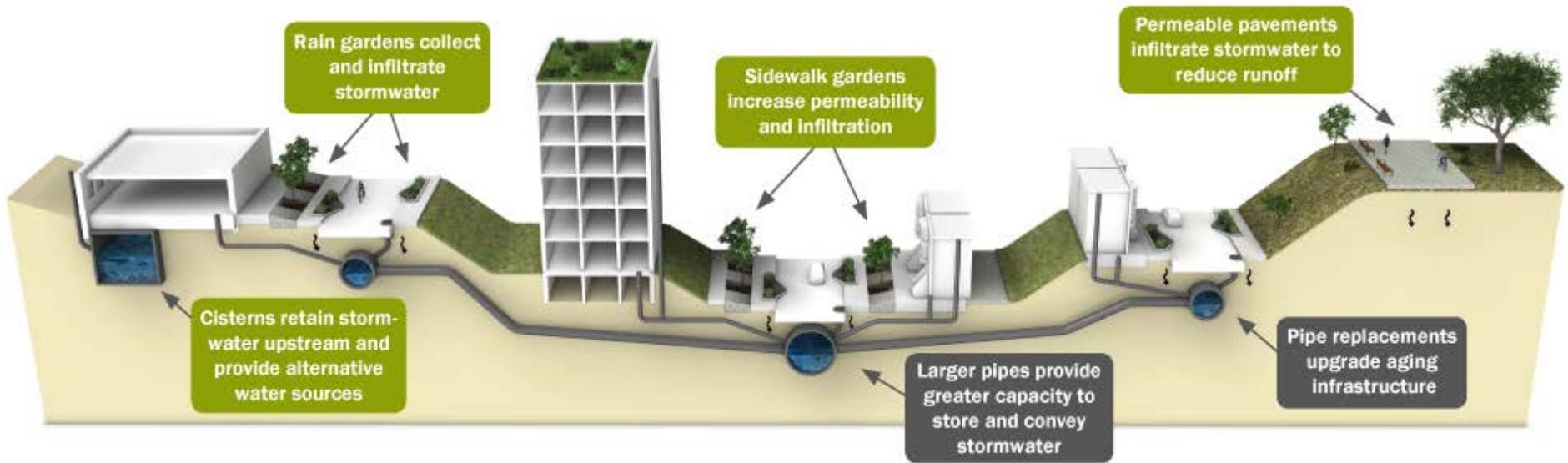
RAINWATER
HARVESTING



PERMEABLE
PAVING



Green Infrastructure Technologies



Green Infrastructure Citywide Strategy

Regulation

Incentives

Capital Projects

Technical Assistance

Strategic Partnerships

Green Infrastructure Citywide Strategy

Regulation

SMO

Incentives

Watershed Stewardship
Grants

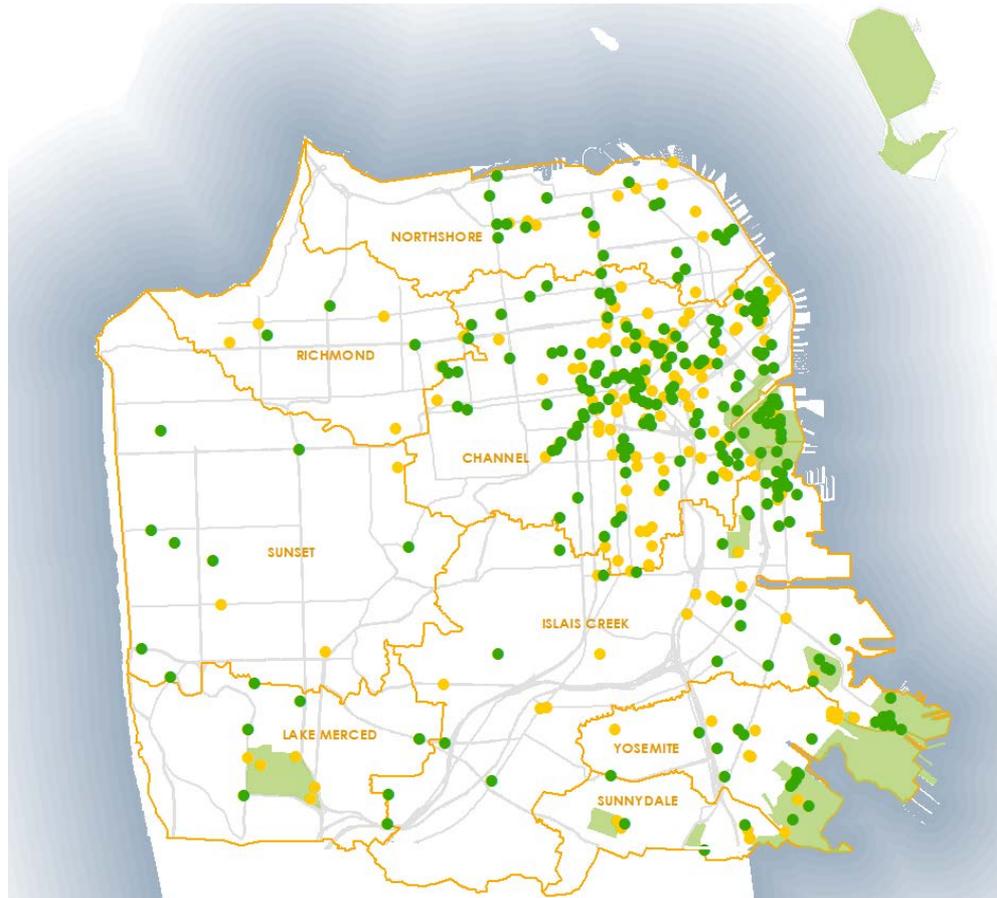
Capital Projects

EIPs

Technical Assistance

Strategic Partnerships

Stormwater Management Ordinance



SMO Projects:
272 Completed
171 In Progress
Redevelopment Areas



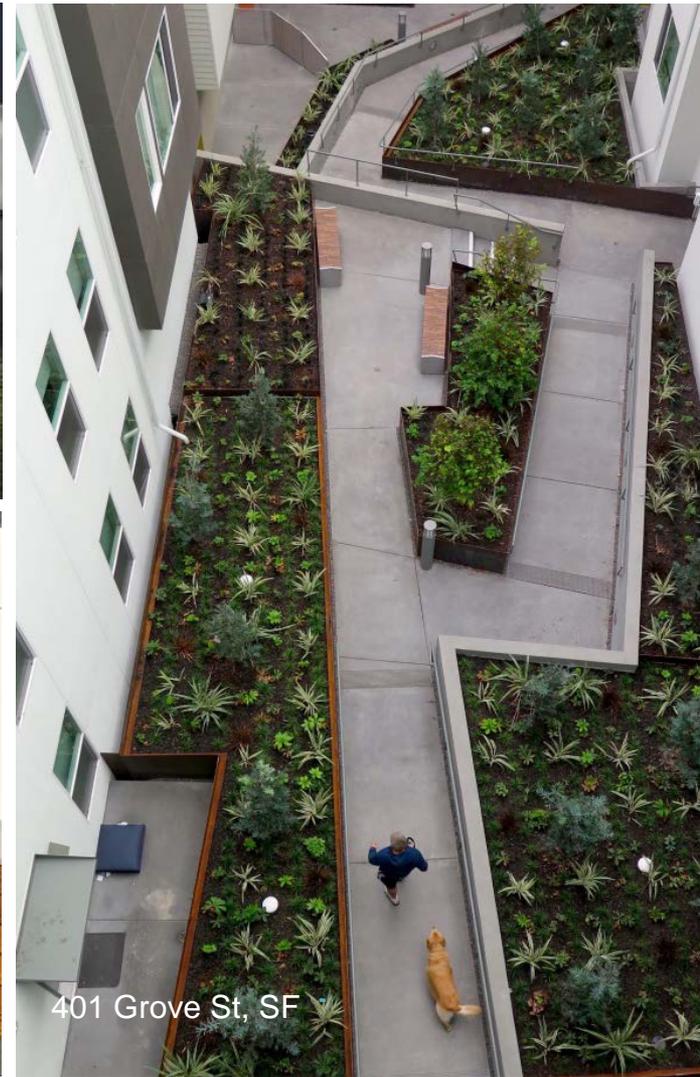
1645 Pacific Ave, SF



325 Octavia Blvd, SF



401 Grove St, SF



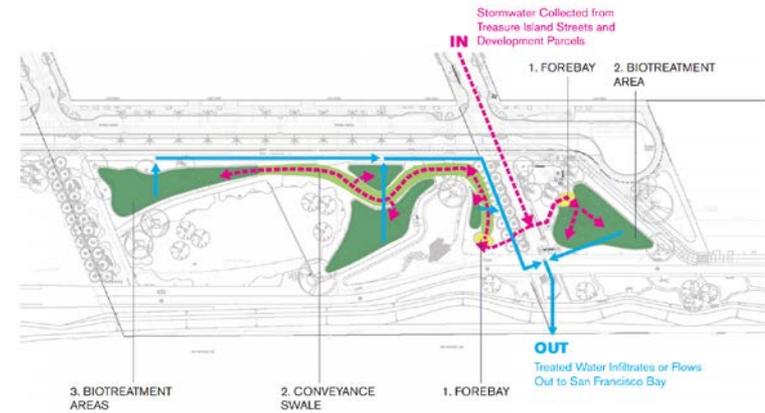
401 Grove St, SF

Redevelopment Areas

Hunters Point – Alice Griffith



Treasure Island



Green Infrastructure Citywide Strategy

Regulation

SMO

Incentives

Watershed Stewardship
Grants

Capital Projects

EIPs

Technical Assistance

Strategic Partnerships

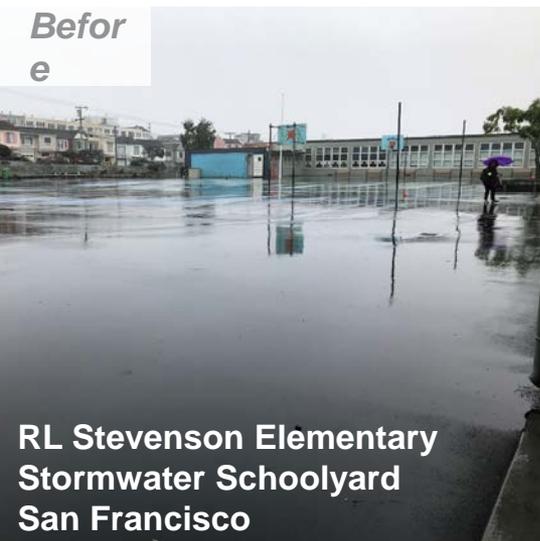
Watershed Stewardship Grant Program

- Funds sidewalk landscaping, rainwater harvesting, & green infrastructure projects in the public realm
- Engages communities
- Provides opportunities for education & outreach
- \$1.3 million granted to 38 projects over 10 years



SFPUC's Green Infrastructure Grant Program

- Launched in February 2019
- \$6.4M available
- Targeting large, highly impervious parcels
- Funds design & construction of green infrastructure facilities
- Property owner responsible for maintenance



Awarded Projects – Current Conditions



Lafayette Elementary School

\$489,142



Bessie Carmichael Middle School

\$428,057



St. Thomas More School

\$1,118,958

Green Infrastructure Citywide Strategy

Regulation

SMO

Incentives

Watershed Stewardship
Grants

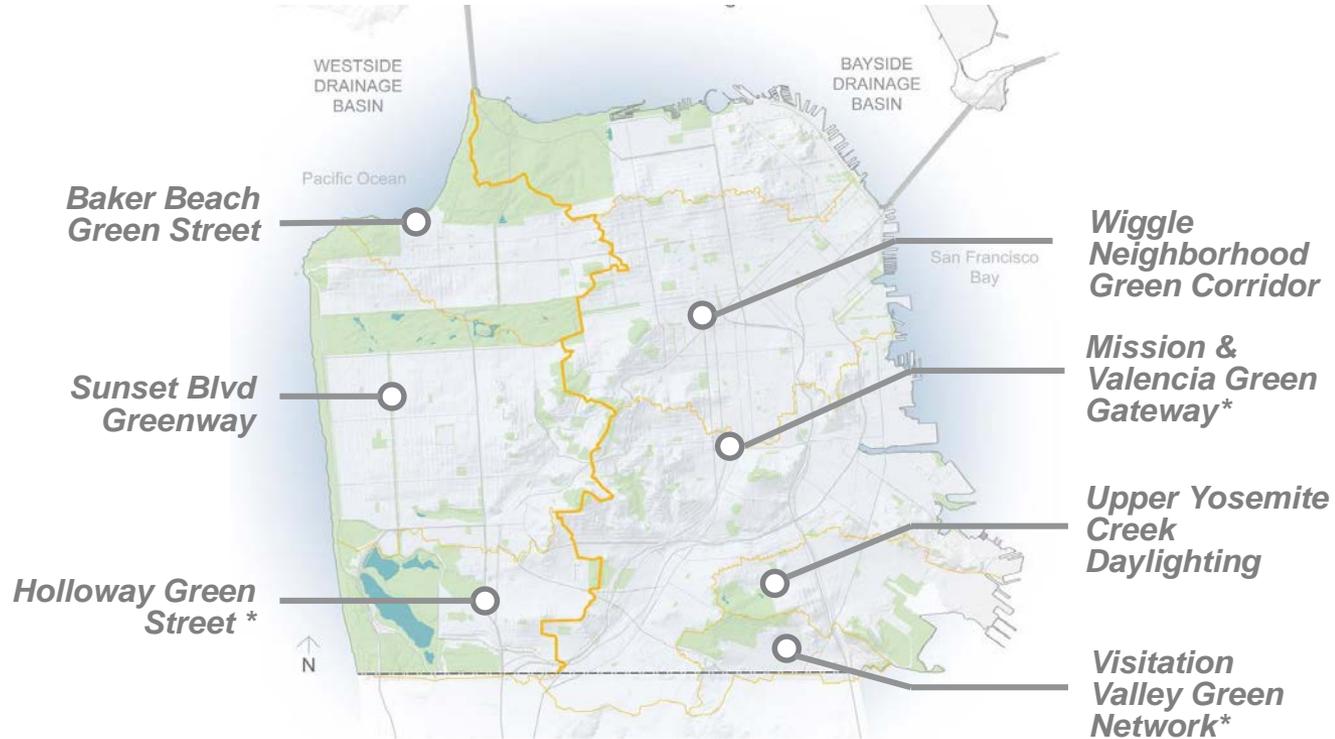
Capital Projects

EIPs

Technical Assistance

Strategic Partnerships

Early Implementation Projects (EIPs)



* project currently being monitored



View Valley Green Nodes



Mission-Valencia Green Gateway



Mission-Valencia Green Gateway



Holloway Green Street



The Wiggle



Sunset Blvd Greenway

Green Infrastructure Citywide Strategy

Regulation

SMO

Incentives

Watershed Stewardship
Grants

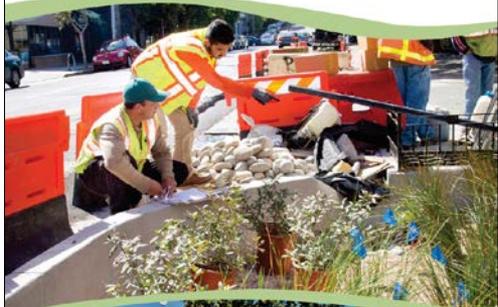
Capital Projects

EIPs

Technical Assistance

Strategic Partnerships

GREEN INFRASTRUCTURE CONSTRUCTION GUIDE BOOK



San Francisco Water Power Sewer IMPROVEMENT PROGRAM Grey, Green, Clean.

let the rain soak in

creating rain-friendly sidewalk landscaping

Sidewalk landscaping is an excellent way for you to help make the city more porous and allow stormwater to soak into the ground.

Trading grey sidewalks for green landscaping not only reduces the volume and rate of water delivered to the sewer system, it also filters the stormwater, recharges the groundwater, and contributes to a livable neighborhood.

By designing for the rain, you're doing your part to use stormwater as a resource, and keep our Bay and ocean clean.

Urban Watershed Management Program
San Francisco Public Utilities Commission



SAN FRANCISCO stormwater management requirements and design guidelines



Vegetation Palette

Color palette by Sherry Ruffolo, Project Director, Green Streets

GREEN INFRASTRUCTURE MAINTENANCE GUIDE BOOK



San Francisco Water Power Sewer IMPROVEMENT PROGRAM Grey, Green, Clean.



SAN FRANCISCO rainwater harvesting manual for non-potable residential uses

watershed stewardship curriculum FOR SAN FRANCISCO SCHOOLS



Green Infrastructure Citywide Strategy

Regulation

SMO

Incentives

Watershed Stewardship
Grants

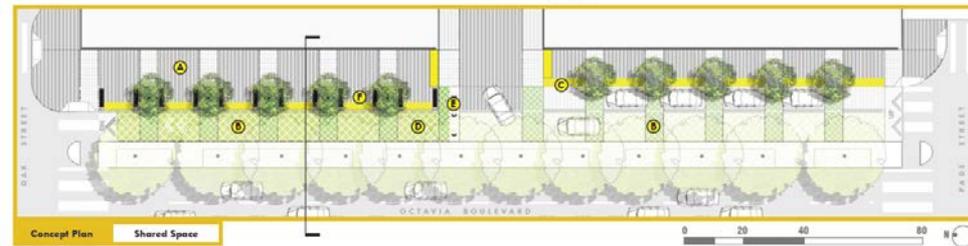
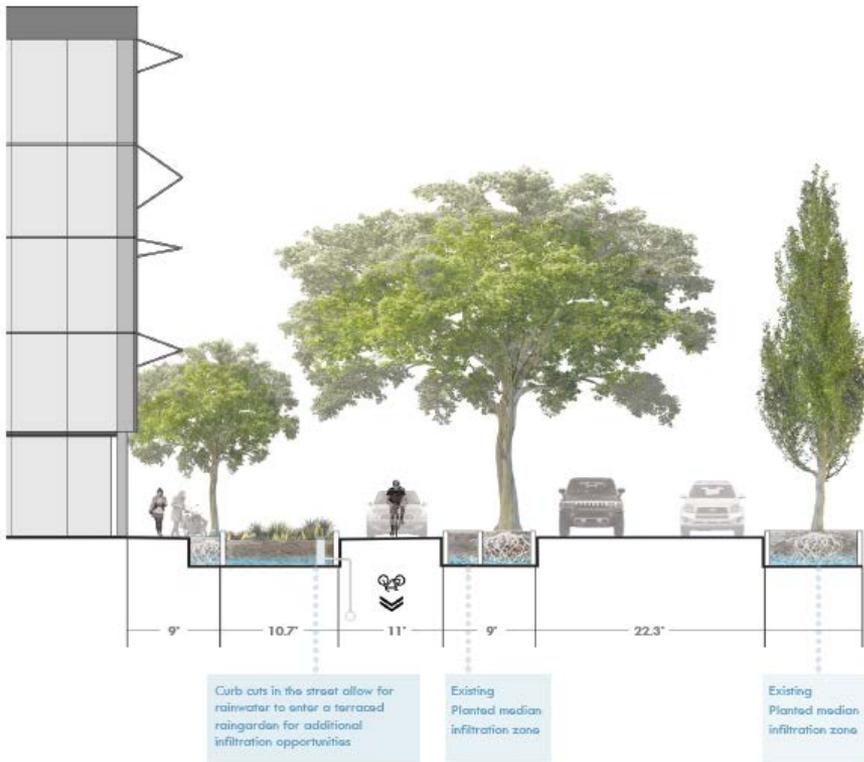
Capital Projects

EIPs

Technical Assistance

Strategic Partnerships

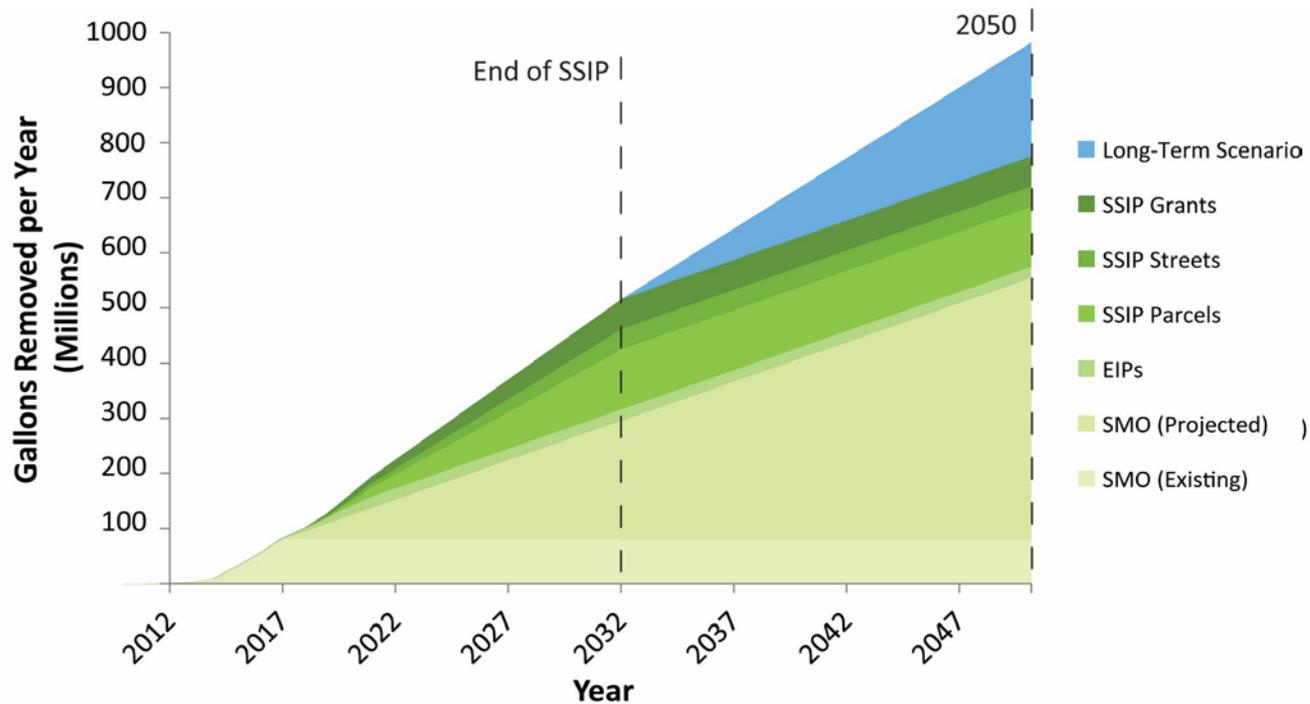
Octavia Boulevard Enhancement Project



Green Infrastructure Long Term Goal

By 2050 we will ...

Remove 1 Billion Gallons of stormwater/year using GI



1 Billion Gallons by 2050

San Francisco could have...

- about **200 blocks** of green streets
- about **8 miles** of daylighted creeks
- about **50** stormwater schools
- about **50** stormwater parks



Green Infrastructure Has Come a Long Way...



Scaling up Green Infrastructure

- Investigating stormwater credit trading and off-site compliance
- Exploring joint capital project delivery with partners
- Expanding our technical assistance portfolio
- Working on integrated project solutions with City Family partners



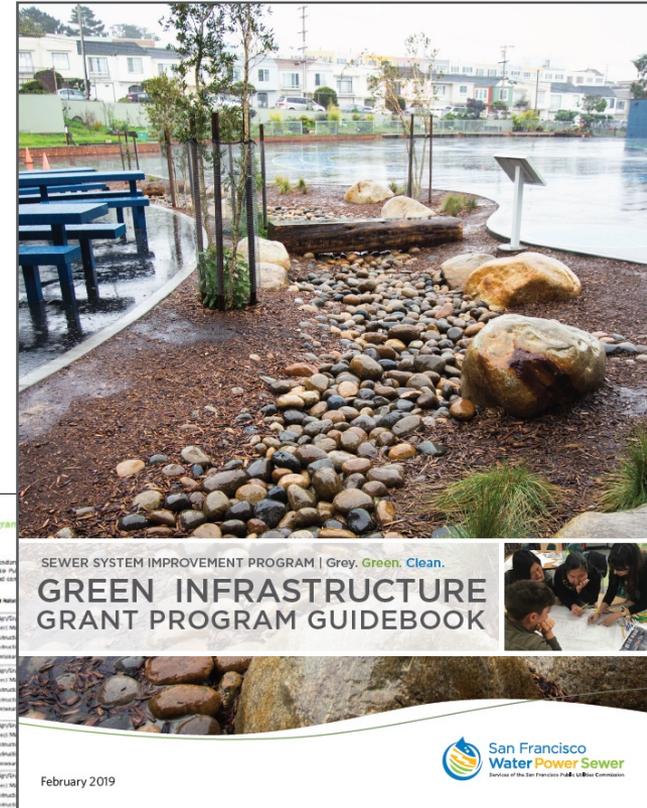
Thank You!



Technical Assistance Program

Pre-Application

- Pre-Application Meeting
- Grant Workshops
- Site Visits with SFPUC Engineers
- Opportunity and Constraints Evaluation
- GI Vendor List
- Contractor Training
- Maintenance Training



GREEN INFRASTRUCTURE GRANT PROGRAM
SFPUC Green Infrastructure Grant Program
Green Infrastructure Vendor Resource List

The SFPUC has generated a Green Vendor Resource List to serve as a resource for participants in the Green Infrastructure Grant Program. The vendor contributions, and ongoing operations and maintenance. By providing this sample list of current technologies and companies, the San Francisco Public Utilities Commission is to be the primary, quality or completion of the same information, or the completion or effectiveness of listed technologies and services. List or separate the user might incur as a result of the use of, or reliance upon, the information and companies listed.

Contact Information	Name	Title	Scale of Work	Project Phase
AKS Associates, Inc. 120 West Street, Ste 124 San Francisco, California 94102 www.aksassociates.com	Name: Joe Bergman Title: Civil Engineer Phone: 415.558.2688 Email: joe@aksassociates.com @ GSFUtility.com	<input checked="" type="checkbox"/> Large Parcel (Commercial/Industrial/Multi-Family) <input checked="" type="checkbox"/> Small Parcel (Residential) <input checked="" type="checkbox"/> Streets	<input checked="" type="checkbox"/> Design/CM <input checked="" type="checkbox"/> Design/CM <input type="checkbox"/> Construction <input type="checkbox"/> Construction <input type="checkbox"/> Maintenance	
BeClear Environmental 1700 Avenida Central Suite 210 Carlsbad, California 92008 http://www.be-clear.com	Name: Mike Garcia Title: Regional Sales Manager N. CA. Phone: 714.436.1717 Email: mike.garcia@be-clear.com @ GSFUtility.com	<input checked="" type="checkbox"/> Large Parcel (Commercial/Industrial/Multi-Family) <input checked="" type="checkbox"/> Small Parcel (Residential) <input checked="" type="checkbox"/> Streets	<input checked="" type="checkbox"/> Design/CM <input checked="" type="checkbox"/> Design/CM <input type="checkbox"/> Construction <input type="checkbox"/> Construction <input type="checkbox"/> Maintenance	
EEF Engineers 180 California St Suite 800 San Francisco, California 94111	Name: Erik Skarstrom Title: Project Manager Phone: 950.452.4149 Email: erik@eef.com @ GSFUtility.com	<input checked="" type="checkbox"/> Large Parcel (Commercial/Industrial/Multi-Family) <input checked="" type="checkbox"/> Small Parcel (Residential) <input checked="" type="checkbox"/> Streets	<input checked="" type="checkbox"/> Design/CM <input checked="" type="checkbox"/> Design/CM <input type="checkbox"/> Construction <input type="checkbox"/> Construction <input type="checkbox"/> Maintenance	
EEF Engineers 130 California Street San Francisco, California 94111	Name: Mike Loomis Title: Associate Phone: 415.558.7657 Email: mike@eef.com @ GSFUtility.com	<input checked="" type="checkbox"/> Large Parcel (Commercial/Industrial/Multi-Family) <input checked="" type="checkbox"/> Small Parcel (Residential) <input checked="" type="checkbox"/> Streets	<input checked="" type="checkbox"/> Design/CM <input checked="" type="checkbox"/> Design/CM <input type="checkbox"/> Construction <input type="checkbox"/> Construction <input type="checkbox"/> Maintenance	
Engineering/Remediation Services Group, Inc. 414 Montgomery Street San Francisco, California 94104 http://www.ersg.com	Name: Kate Aulis Title: Senior Project Engineer Phone: (415)486.7152 Email: kate@ersg.com @ GSFUtility.com	<input checked="" type="checkbox"/> Large Parcel (Commercial/Industrial/Multi-Family) <input type="checkbox"/> Small Parcel (Residential) <input type="checkbox"/> Streets	<input type="checkbox"/> Design/Construction <input checked="" type="checkbox"/> Impact Management <input checked="" type="checkbox"/> Construction Management <input checked="" type="checkbox"/> Construction <input type="checkbox"/> Maintenance	

This list is being provided solely for the convenience of the public and any interested parties. By providing this sample list of current technologies and companies, the San Francisco Public Utilities Commission does not endorse, warrant, or make representations or endorsements as to the accuracy, quality or completion of the same information, or the completion or effectiveness of listed technologies and companies. The City and County of San Francisco will not be responsible for any loss, damage, cost or expense for any right-of-use or other information contained herein.

Technical Assistance Program

- 14 Site visits with technical team
- 12 Opportunities Analyses given to potential grantees
- 6 Pre-application meetings

Glen Park Greenway - Green Infrastructure Grant Planning - Option 2

In this option, all stormwater management facilities would be located on the school side of the SFPUC Right of Way. The flat portion of the school's parking lot would be improved by means of permeable pavers and/or bioretention planters (1), thereby also helping beautify the parking area. Additionally, raingardens and/or terraced raingardens (2) would be installed between the parking lot and the SFPUC Right of Way, thereby enhancing both the school site and the greenway. All together, these stormwater facilities would manage primarily runoff from the school's parking lot (A). The existing drain would be re-used as an overflow structure (3). None of the project's components would run through the SFPUC Right of Way.

PROs: parking lot beautification; no coordination on SFPUC ROW needed
 CONs: some coordination needed with Archdiocese for elements located in parking lot



Legend

- Drainage Management Area
- Potential Stormwater Facility Footprint*
- SFPUC Right of Way for Sewer Access
- Pedestrian Path through Greenway (no re-alignment needed)
- Existing Sewer Pipes**
- Surface Flow Direction

* Location of flat portion of parking lot, ideal for permeable pavement, is approximate.
 ** Pipe alignment is approximate. Underground utility survey needed to establish exact alignment.

DMA	Acres	Surface Type
A	0.6	Parking Lot of Saint John's School's plot
Total	0.6	

GREEN INFRASTRUCTURE GRANT PROGRAM CROCKER AMAZON PARK

A Bioretention and Permeable Pavement - Parking Re-Design

Alternative A for the Crocker Amazon Park parking lot on Geneva Avenue could include reconfiguring the surface parking lot to drain to bioretention swales and incorporate permeable pavement parking spaces. With this project the existing parking lot could be redesigned to maximize the overall number of parking spaces throughout. Speed bump berms could be used to direct flow to the swales, and to prevent run-on to the permeable pavement which can cause clogging. Distributing green infrastructure in multiple locations throughout the parking lot would reduce the size of the bioretention proposed in Alternative A, therefore reserving more space for parking needs.

This alternative could also include diverting flow from the existing 15-inch storm drain that collects runoff from the site to a bioretention planter along Geneva Avenue. A more detailed study would be needed to determine the drainage area and stormwater flow of the 15-inch storm drain, and the sizing of the bioretention planter. Additionally, it is likely that the quality of the stormwater runoff from the turf field would need to be characterized and to test for pollutants that could accumulate in the bioretention planter over time, potentially threatening human and environmental health.



IMPERVIOUS AREA	AREA
Parking lot	39,000 sf
New Permeable Pavement	4,000 sf
43,000 sf (0.99 acres)	
15" SD Drainage Area	
	*81,000 sf
	**84,000 sf (1.9 acres) with 15" SD Drainage Area

* Drainage area to 15" storm drain assumed to include the pavement paths presented in Alternative B. Additional impervious area may drain to this pipe that is not included here. Additional pervious area from the surrounding hillside may also drain to this storm drain. SFRPD should do a detailed study to determine source of stormwater flow.



Integrated Stormwater Management

Projects:

- Grey to increase capacity
- Green to remove stormwater

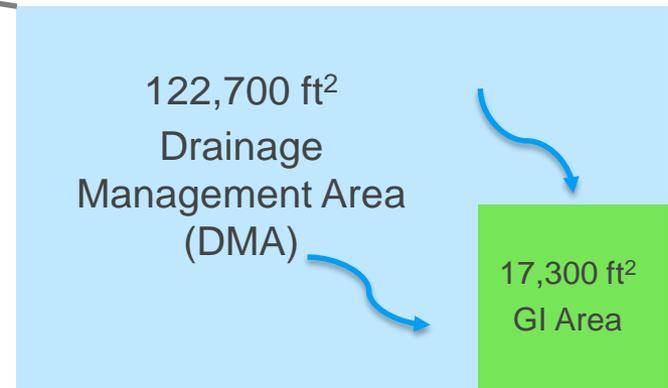
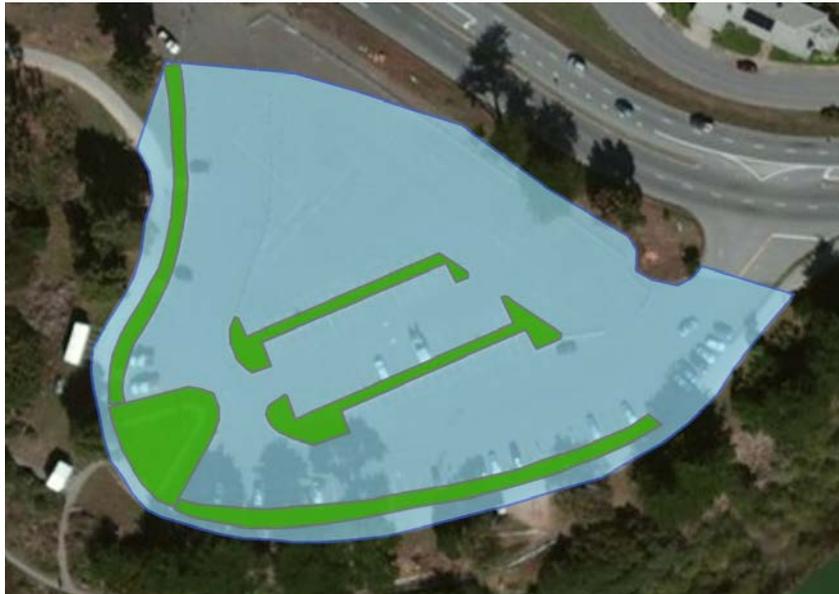
Programs and Policies:

- Flood resilience programs
- GI grants (\$40M)
- SMO

- High Flood Risk
- SSIP Flood Projects
- SSIP GI Capital Projects
- Flood Program & Policies
- SSIP GI Grants
- SMO

How Does Green Infrastructure Work?

Green Infrastructure collects stormwater runoff from an impervious surface, or Drainage Management Area (DMA)



$$\text{Sizing Ratio} = \text{GI Area} / \text{DMA} = 14\%$$