Moving the Needle: Green & Complete Streets in the SF Bay Area

Wednesday, 10/29/25

Santa Clara Valley *Urban Runoff* Pollution Prevention Program

2025 State of the Estuary Conference

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Presentation Outline

What is Green (Stormwater) Infrastructure?

- Types and scale/location of implementation
- Green Streets and Complete Streets
- GSI benefits

Stormwater NPDES Permit Requirements

Implementation in the SF Bay Area (2005-2025)

- Example projects
- Implementation drivers
- Successes and challenges

Summary and Resources

Source: Lotus Water

What is Green (Stormwater) Infrastructure?

GSI or GI: An approach that uses vegetation, soil, pervious pavement and natural processes to manage stormwater runoff, while creating healthier, cooler urban areas

GSI Categories

Parcel-Scale

Green Streets

- Street Projects
- Block-Scale Stormwater Management
- Primarily Local/State Transportation Funding

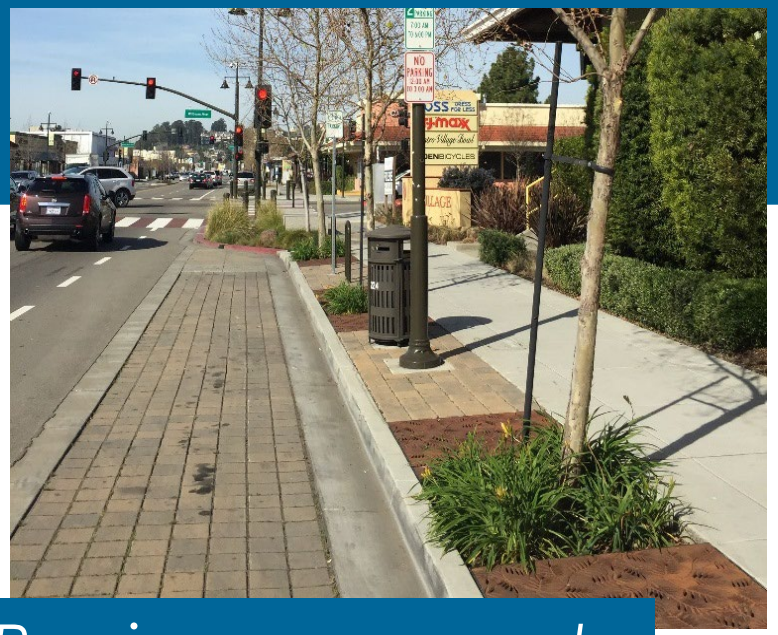
Source: SMCWPPP

Regional Projects

Types of GSI

- Pervious Pavement
- Infiltration Facilities
- Rainwater Harvesting
- Green Roofs
- Bioretention
- Green Streets
- Regional Facilities

Rainwater Cistern (Hayward)



Pervious pavement (Castro Valley)

Subsurface Infiltration System (Conteches.com)

Green Roof (San Jose)

Types of GSI: Bioretention in Streetscapes

Stormwater Planter

Stormwater Curb-Extension

Tree Well Filter

Credit: ICPI

Types of GSI: Pervious Pavement in Roadways

Interlocking Concrete Pavers

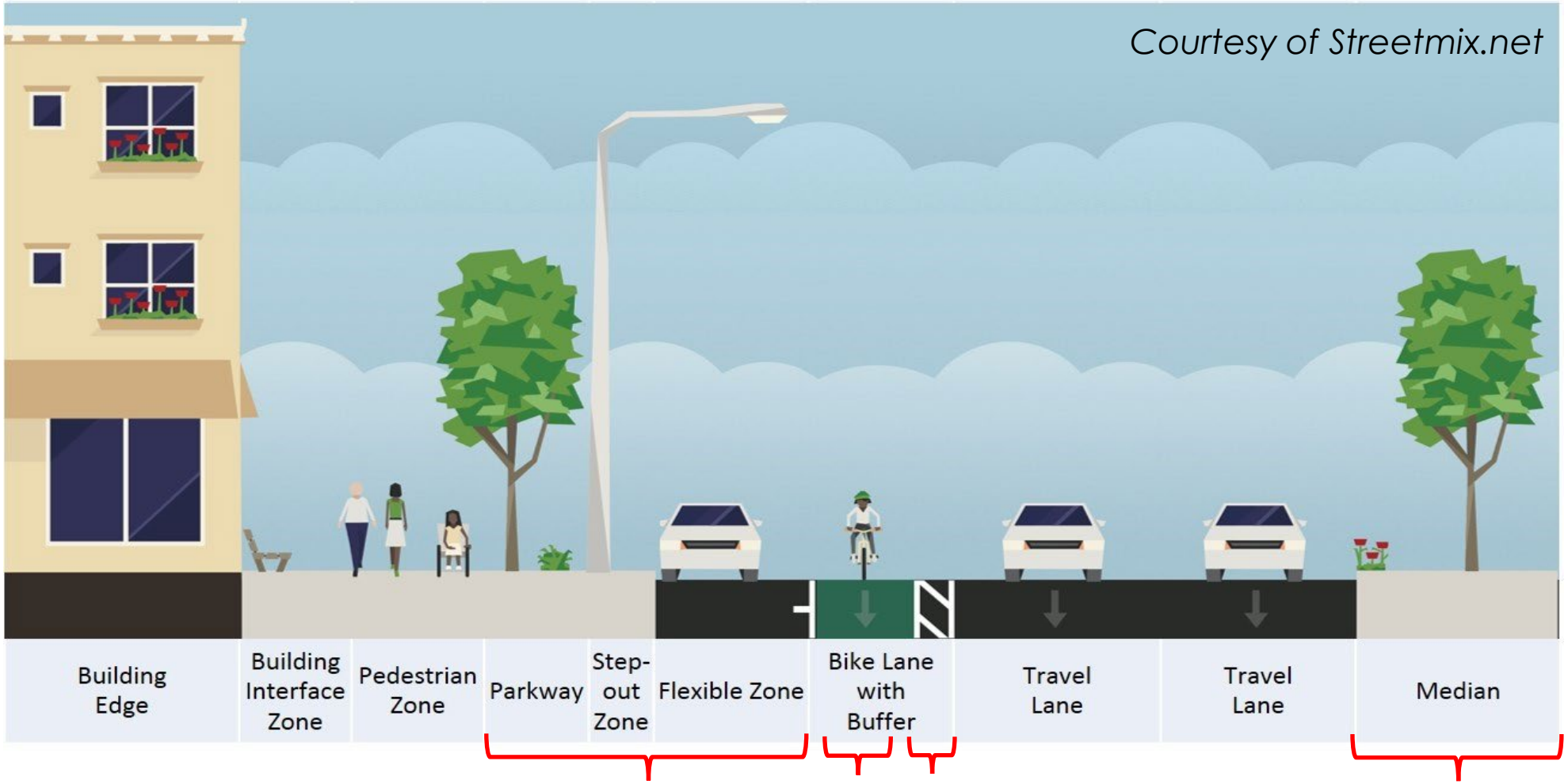
Credit: City of Berkeley

Pervious Concrete

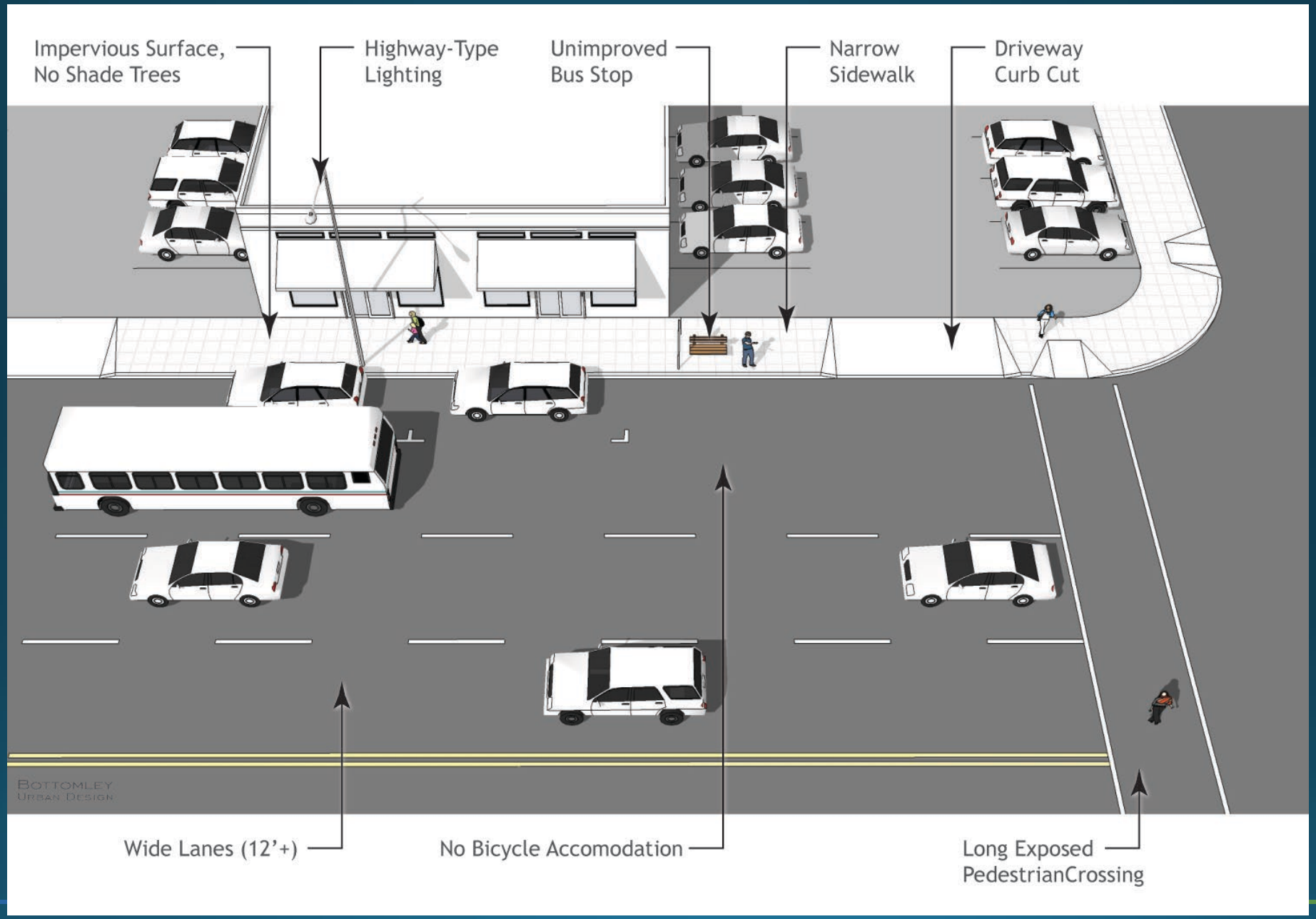
Pervious Pavers

Grid Pavement

Streetscape Stormwater Opportunities



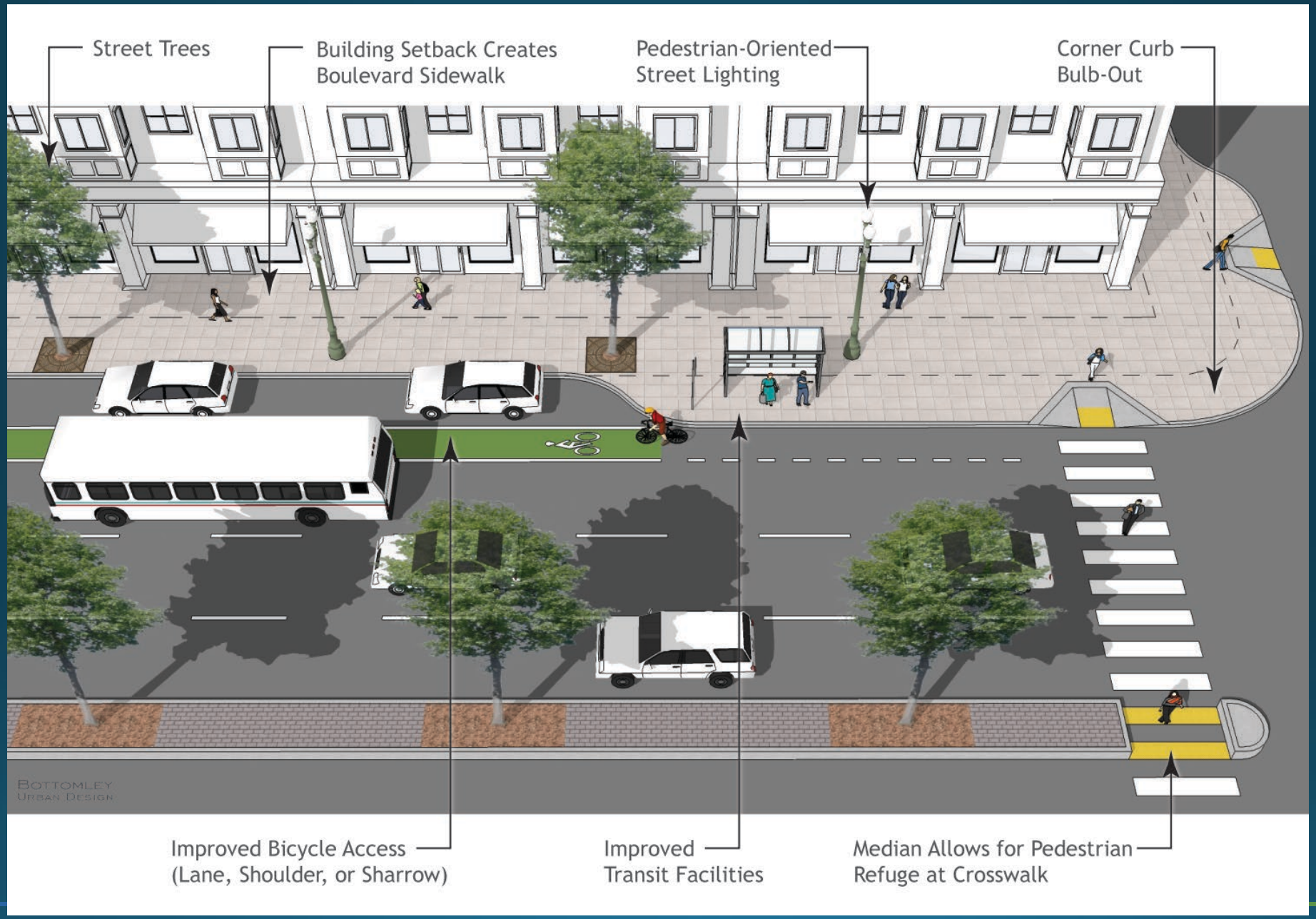
Typical Street



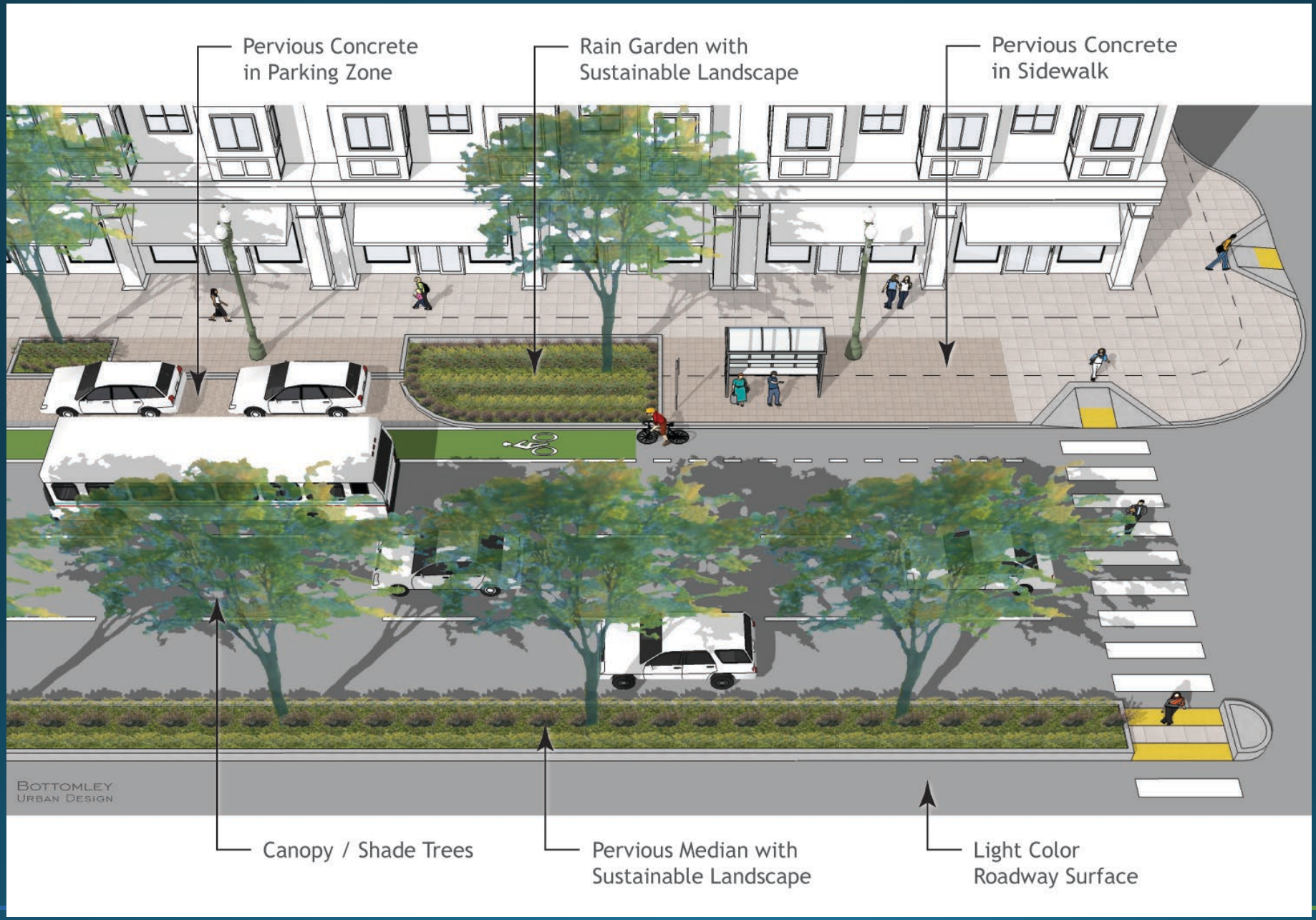
URBAN GREENING BAY AREA

BASMAA Bay Area Stormwater Management Agencies Association

Complete Street



Green and Complete Street



URBAN GREENING BAY AREA

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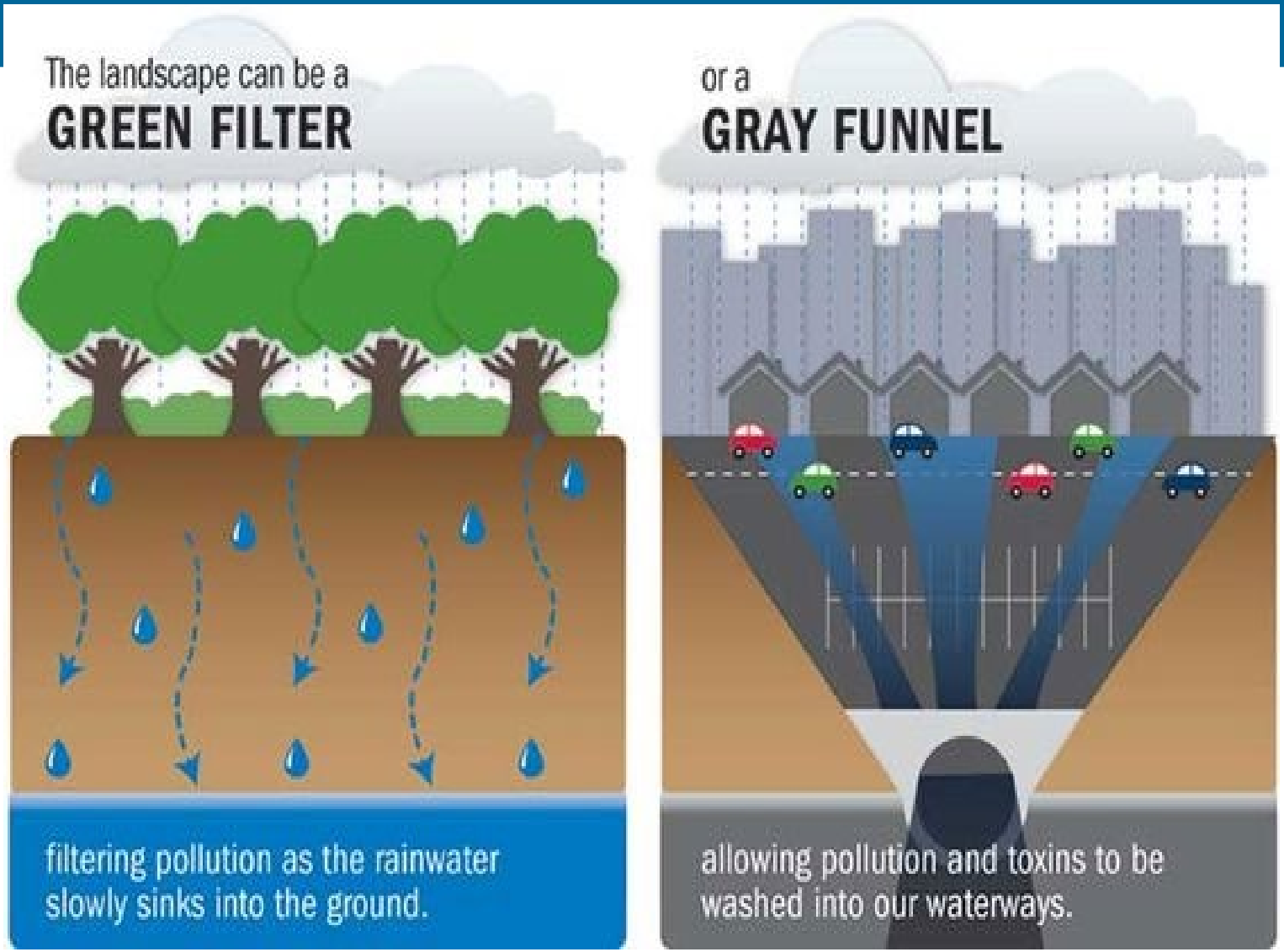
GSI Benefits

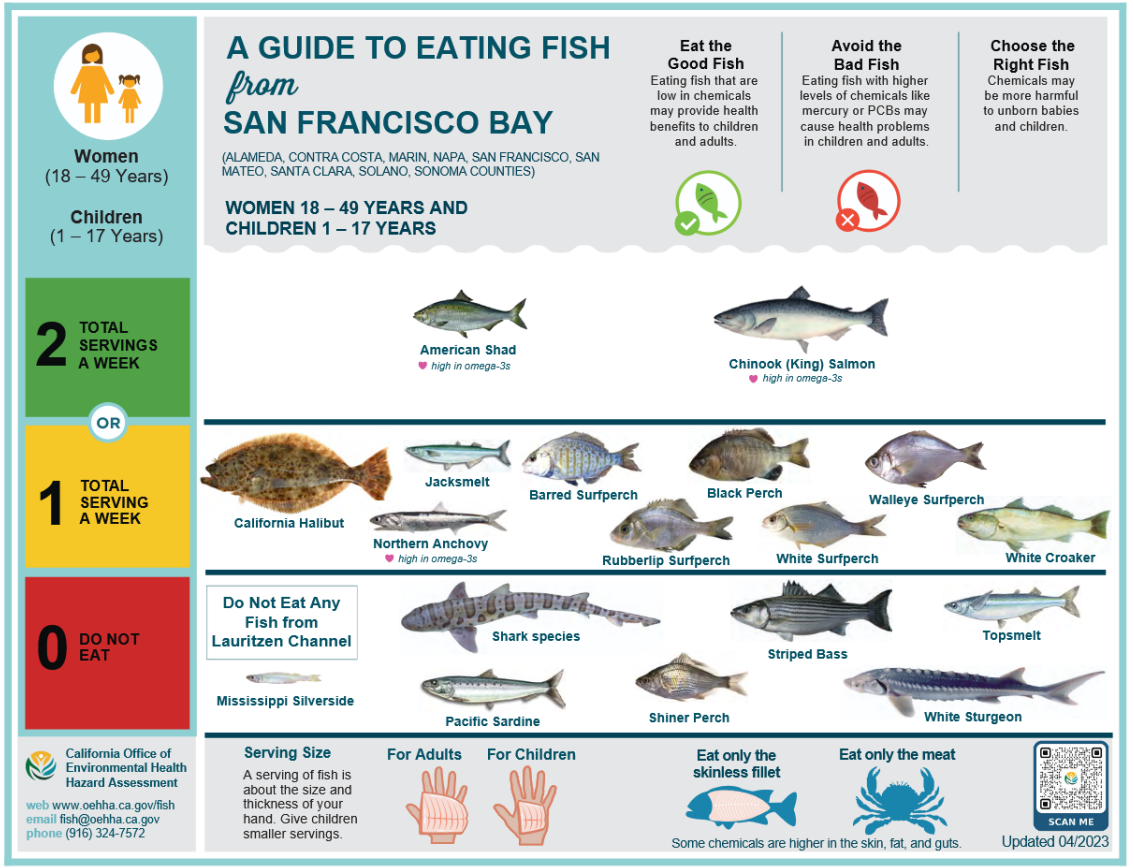
- Flow reduction
- Pollutant reduction
- Reduced local flooding
- Urban greening/shade
- Urban heat reduction
- Climate resiliency
- Increased wildlife habitat
- Cooler buildings
- Cleaner air
- More beautiful streets!



Source: Chesapeake Bay Foundation

Stormwater Background
Water Quality Impacts of Urbanization

- Uses of San Francisco Bay and many local creeks are impaired by numerous pollutants
- Stormwater is now recognized as a valuable resource
- But runoff is still the largest way that pollutants are conveyed to the Bay
- Stormwater regulations (the MRP) require pollutant and flow controls



Source: https://www.smchealth.org/safe-eat-fish-san-francisco-bay

Bay Area Stormwater Permit Requirements Municipal Regional Permit (MRP)

- The 3rd regional stormwater permit (MRP 3) was approved in 2022 for 79 permittees in:
  - Alameda, Contra Costa, San Mateo, and Santa Clara Counties, and Fairfield-Suisun and Vallejo
- There are other stormwater permits for San Francisco and North Bay communities
- The MRP requires certain types of roadway projects to implement GSI and GSI retrofits to address runoff from existing impervious surfaces

SF Bay Area: Green Street Implementation

- ~200 green streets from 2005 and 2025 (in the five MRP counties)
- ~15 green streets in San Francisco
- MTC and the Bay Area Air District are beginning to recognize the value of green streets

Oakland

Vallejo

San Jose

Credit: City of San Jose

Colma

Source: Urban Rain Design

El Cerrito


THE CITY OF
EL CERRITO
GREEN STREETS
SAN PABLO AVENUE
BUFFERED BIKE LANE
PILOT PROJECT
BIKE
LANE
LANE

San Francisco

Hacienda Avenue (Campbell)

Green Street Example

Before:

- Road 65-70 ft wide
- Pavement in need of repair
- No bike facility
- Discontinuous sidewalks

Credit: City of Campbell

Hacienda Avenue (Campbell)

Green Street Example

After:

- Reconstructed pavement
- 63 biotreatment areas
- 60 street trees
- Bike lanes
- Traffic-calming bulbouts
- Continuous sidewalks

Credit: City of Campbell

Implementation Drivers

Stormwater-Related:

- Some road projects trigger GSI requirements
- Opportunities in capital improvement projects
- GI implementation targets

Other Programs:

- Transportation – combining GSI less expensive
- Urban forestry
- Climate resilience/adaptation – urban heat
- Public health – walking/biking, air pollution
- Flood resilience/management
- Urban greening/nature

Implementation Successes

Successes:

- Achieving multiple benefits meets municipal goals and public expectations
- Public agencies gaining more experience with construction and O&M
- Use of urban forestry GSI measures to treat stormwater
- Use of pervious pavement in more applications to reduce O&M costs
- Training is happening! (ReScape, Watershed Project, Grassroots Ecology)

Implementation Challenges

Challenges:

- Finding opportunities for complete AND green street projects
- Utilities in roadways
- Meeting public expectations for GSI aesthetics at a reasonable cost
- Training maintenance staff on landscape O&M aesthetics and performance
- Learning from other jurisdictions – some staff feel their jurisdiction is unique
- Adapting to a changing climate (hotter and drier) in combination with sandy GSI soil

Construction Funding Challenges

Grants and Transportation Funding:

- Many transportation projects have insufficient funds for GSI
- Funding can have limitations on GSI expenditures
- Regional (larger) projects are more cost-effective

Stormwater Fees:

- California law makes it difficult to enact or raise stormwater fees – it's not classified the same way as sewer, trash or water fees

Funding for municipal GSI projects is needed

- Such as Measure W in the Los Angeles area

Maintenance Funding Challenges

Transportation Projects:

- Grant funding not typically for maintenance
- GSI maintenance can be expensive

Landscaping:

- Landscape maintenance is costly
- GSI vegetation is often new landscaping in roadways
- More GSI equals larger maintenance burden

Public Perception:

- The public is sometimes reluctant to pay for maintenance and wants to see new projects

Bay Area Green Street Summary

Significant Green Street Implementation to-date in the San Francisco Bay Area

- 200+ projects
- Integration with Complete Streets

Multiple environmental benefits

- Water quality benefits
- Urban heat reduction
- Better coordination with complete streets, urban forestry and climate resiliency is yielding more projects

SF Bay Area Bioretention Resources

SCVURPPP GSI Handbook (2019 and 2025)
https://scvurppp.org/2019/09/01/scvurppp-green-stormwater-infrastructure-handbook/

SCVURPPP GSI Vegetation Guide (2023)
https://scvurppp.org/2023/06/30/green-stormwater-infrastructure-vegetation-guide/

City of San José GSI Maintenance Field Guide (2019)
www.sanjoseca.gov/home/showdocument?id=40709

SMCWPPP GI Design Guide (2024)
https://www.flowstobay.org/wp-content/uploads/2024/05/SMCWPPP_GIDG-3rd-Edition-2024_web.pdf

San Francisco GI Maintenance Guide Book (2018)
https://sfpuc.sharefile.com/share/view/sb83923c24cb4298a

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