Green Streets in the San Francisco Bay Area

Josh Bradt, Oct 24, 2018

SAN FRANCISCO ESTUARY PARTNERSHIP

URBAN GREENING BAY AREA

PARTNERS

- San Francisco Estuary Partnership
- San Francisco Estuary Institute
- Environmental Protection Agency - Region 9
- SF Bay Regional Water Quality Control Board
- Bay Area Stormwater Agencies Association
- Association of Bay Area Governments
- City of San Jose
- City of San Mateo
- City of Oakland
- City of Richmond
- Contra Costa County

PRODUCTS

- GreenPlan-IT 2.0
- LID Tracker Tool
- Conceptual Standard Details
- Implementation Projects
- Road Map of Funding Solutions for Sustainable Streets

36"

22"

GREEN STREETS BLUE BAY

GREEN STREETS CLEAN POLLUTED WATER BEFORE IT DRAINS TO THE BAY

WHAT ARE GREEN STREETS?

When it rains, stormwater races off roof tops, sidewalks, and streets, picking up pollutants such as motor oil, heavy metals, pesticides, trash, and pet waste. The contaminated water typically flows untreated into storm drains, creeks, and ultimately into the San Francisco Bay.

Green Streets **collect** stormwater in specially designed basins, filled with carefully selected plants and soils. The plants and soil organisms **clean** the water by filtering and breaking down various pollutants. The cleansed stormwater **returns** to the storm drain system or soaks into the native soil (replenishing groundwater).

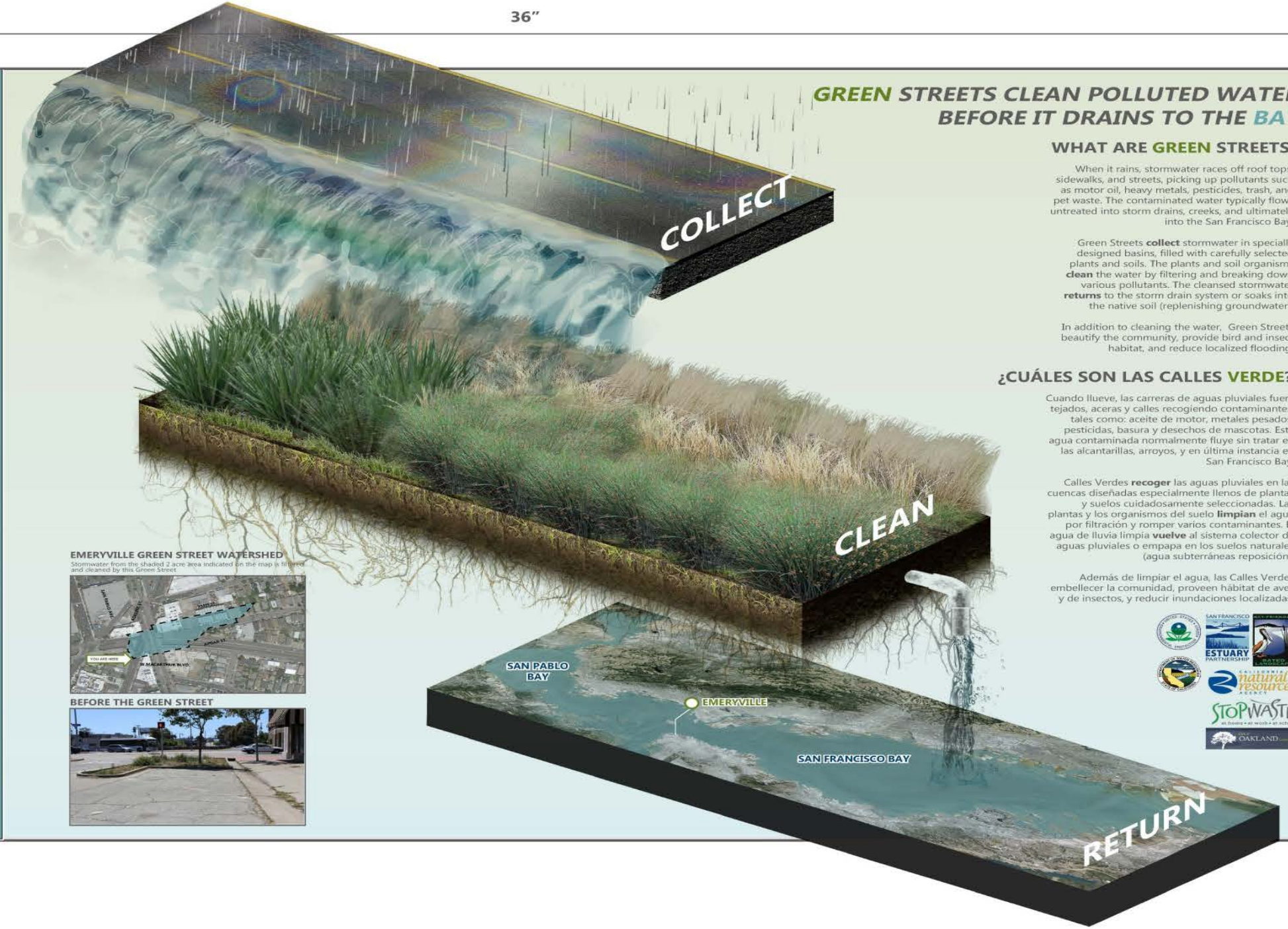
In addition to cleaning the water, Green Streets beautify the community, provide bird and insect habitat, and reduce localized flooding.

¿CUÁLES SON LAS CALLES VERDE?

Cuando llueve, las carreras de aguas pluviales fuera tejados, aceras y calles recogiendo contaminantes, tales como: aceite de motor, metales pesados, pesticidas, basura y desechos de mascotas. Esta agua contaminada normalmente fluye sin tratar en las alcantarillas, arroyos, y en última instancia en San Francisco Bay.

Calles Verdes **recoger** las aguas pluviales en las cuencas diseñadas especialmente llenos de plantas y suelos cuidadosamente seleccionadas. Las plantas y los organismos del suelo **limpian** el agua por filtración y romper varios contaminantes. El agua de lluvia limpia **vuelve** al sistema colector de aguas pluviales o empapa en los suelos naturales (agua subterráneas reposición).

Además de limpiar el agua, las Calles Verdes embellecer la comunidad, proveen hábitat de aves y de insectos, y reducir inundaciones localizadas.

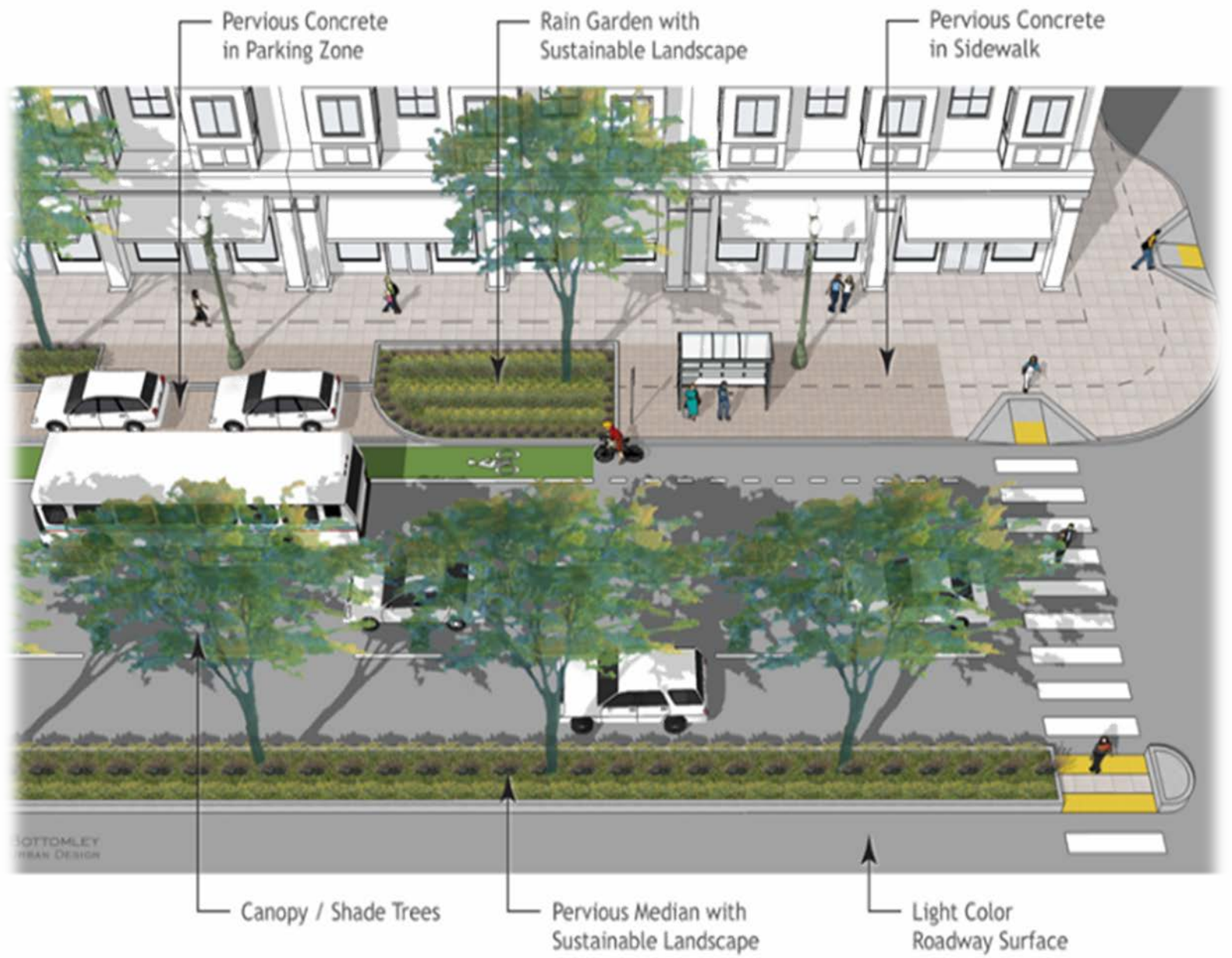


EMERYVILLE GREEN STREET WATERSHED

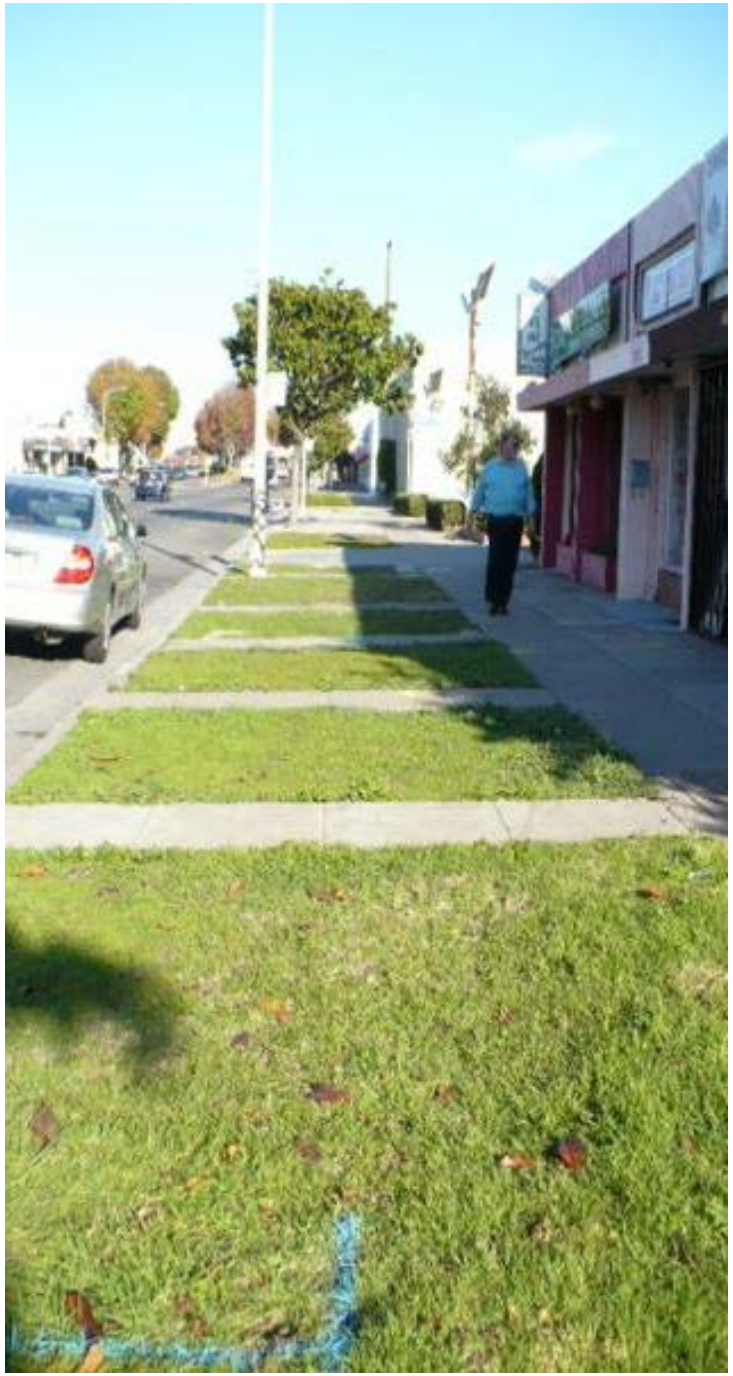
Stormwater from the shaded 2 acre area indicated on the map is filtered and cleaned by this Green Street.

BEFORE THE GREEN STREET

Complete Street + GI = Sustainable Street



El Cerrito Rain Gardens



Hacienda Ave Green Street
City of Campbell

Hacienda Ave Green Street
City of Campbell


Tree Well Filters
City of Fremont

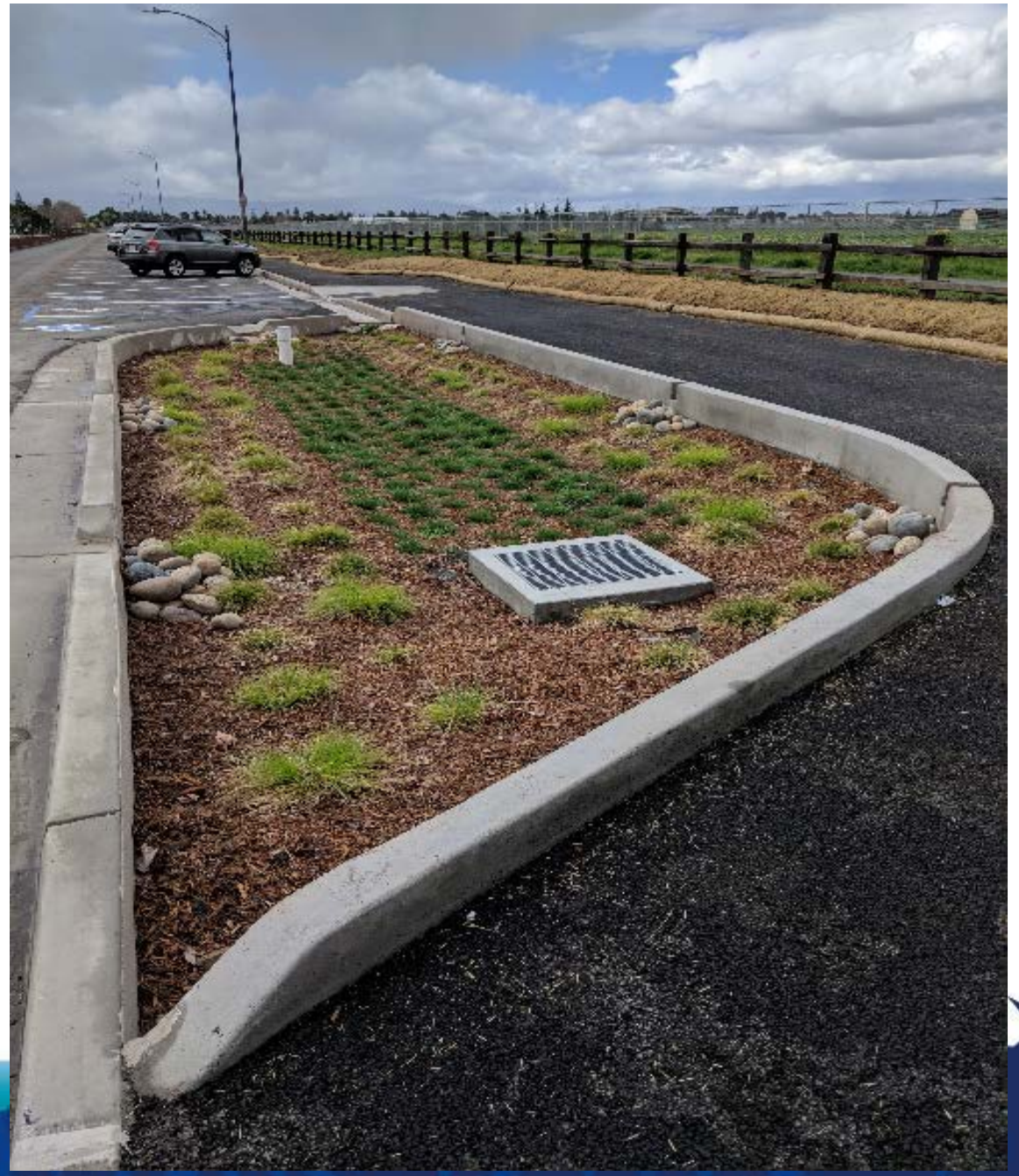
Permeable Paving
City of Berkeley

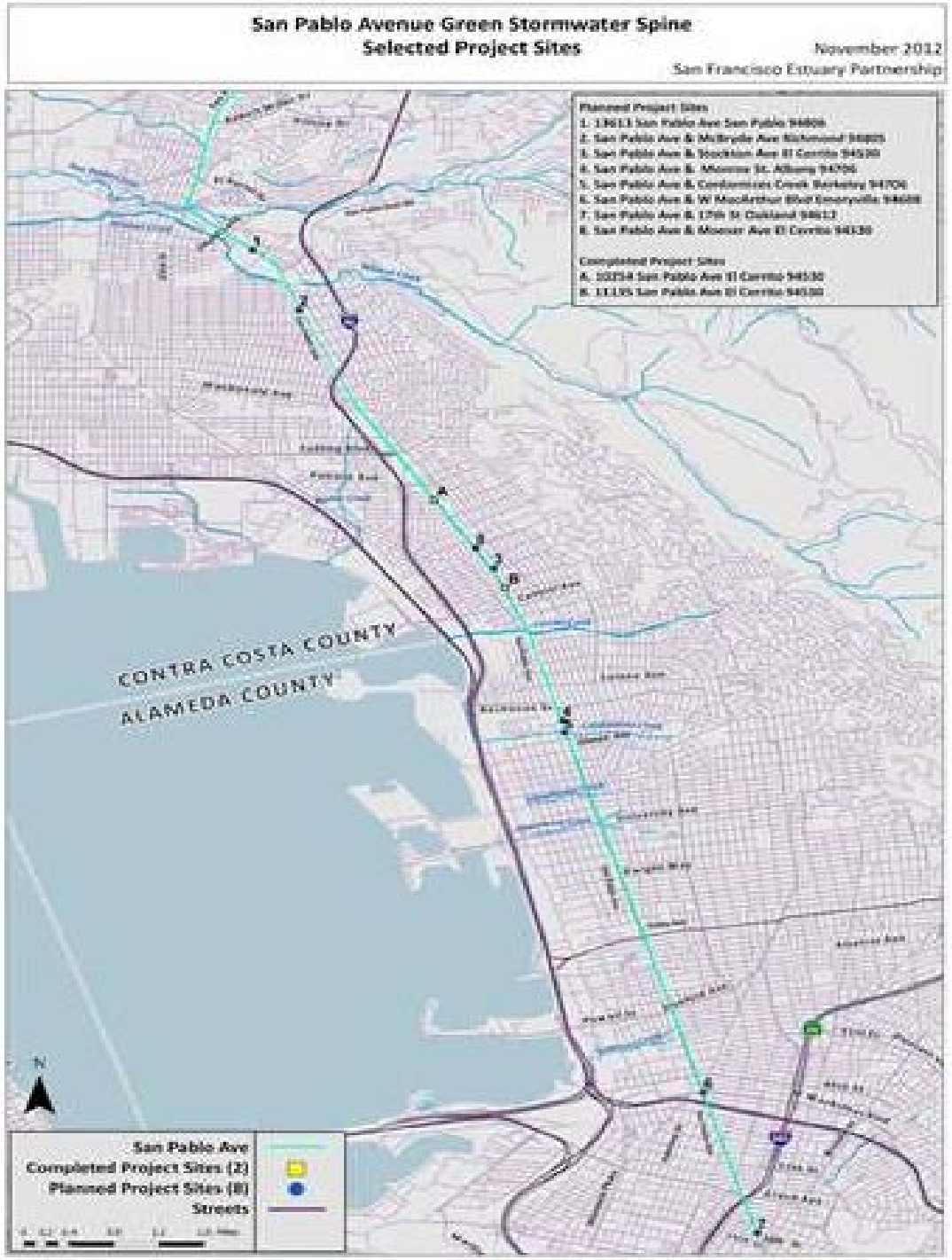
Bio-retention Basin, Ohlone Green Way
City of El Cerrito

MUNICIPAL REGIONAL PERMIT 2.0 GREEN INFRASTRUCTURE PLANNING REQUIREMENTS	DUE DATES	URBAN GREENING BAY AREA
Interdepartmental coordination: draft budget & procedures, ID updates to planning docs	2/2017	
GI Planning Framework, approved by City Council, Board, or Manager	6/2017	
Regionally consistent tracking & reporting of GI measures and load reductions achieved	12/2017	**LID Tracker**
Mechanism to ID & prioritize projects w/targets for imperv. surface ↓, Hg & PCB capture	3/2018	**GreenPlan-IT**
Prioritized project list w/early implementation opportunities	3/2018	**3 GI projects**
Develop GI Design Guidelines, specifications and typical details	6/2018	**Conceptual Details**
Analyses of potential funding options and applicability to local conditions	7/2018	**Funding Road Map**
Outreach & education to practitioners, general public (via website), and elected officials	6/2019	
Update planning docs, ordinances, policies, and resolutions	7/2019	
SUBMIT GREEN INFRASTRUCTURE PLAN TO WATER BOARD, SEPTEMBER 2019		

Chynoweth Ave Green Street

City of San Jose

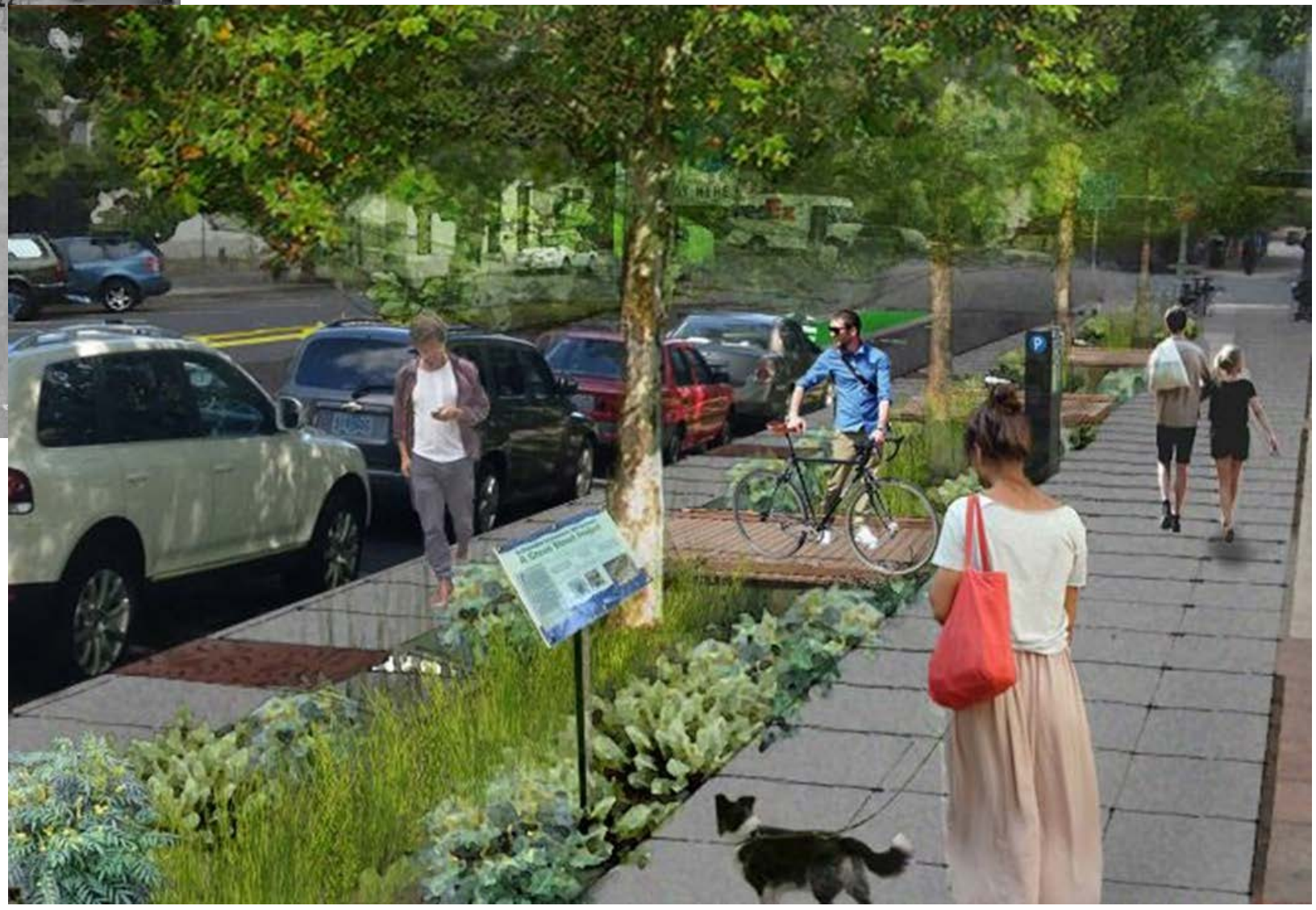




San Pablo Ave Green Stormwater Spine

- Oakland
- Emeryville
- Berkeley
- Albany
- El Cerrito
- Richmond
- San Pablo

Oakland Site



Stormwater Improvement Concept Plan

Scale: 1"=20'
January 2013

1. Existing median is removed and travel lanes remain as asphalt.
2. New painted bike lanes are proposed on both sides of the street (by others)
3. Stormwater planters and street trees accept runoff from both San Pablo Avenue and adjacent private property.
4. Boardwalks allow pedestrians to access parking and sidewalks.
5. Parallel parking configuration allows for greater space efficiency along the street.
6. A 4.5' egress zone allows pedestrians to safely exit their vehicles and pay parking meters.
   The existing ADA marked parking stall is retained at this location.
7. The east side of San Pablo Avenue could be converted to mirror west side improvements in the future.

San Pablo Avenue Green Stormwater Spine Project

City of Oakland, California

Nevue Ngan Associates
QUADRIGA
WILSEY HAM


TARGET
123
STOP

Stormwater Improvement Concept Plan

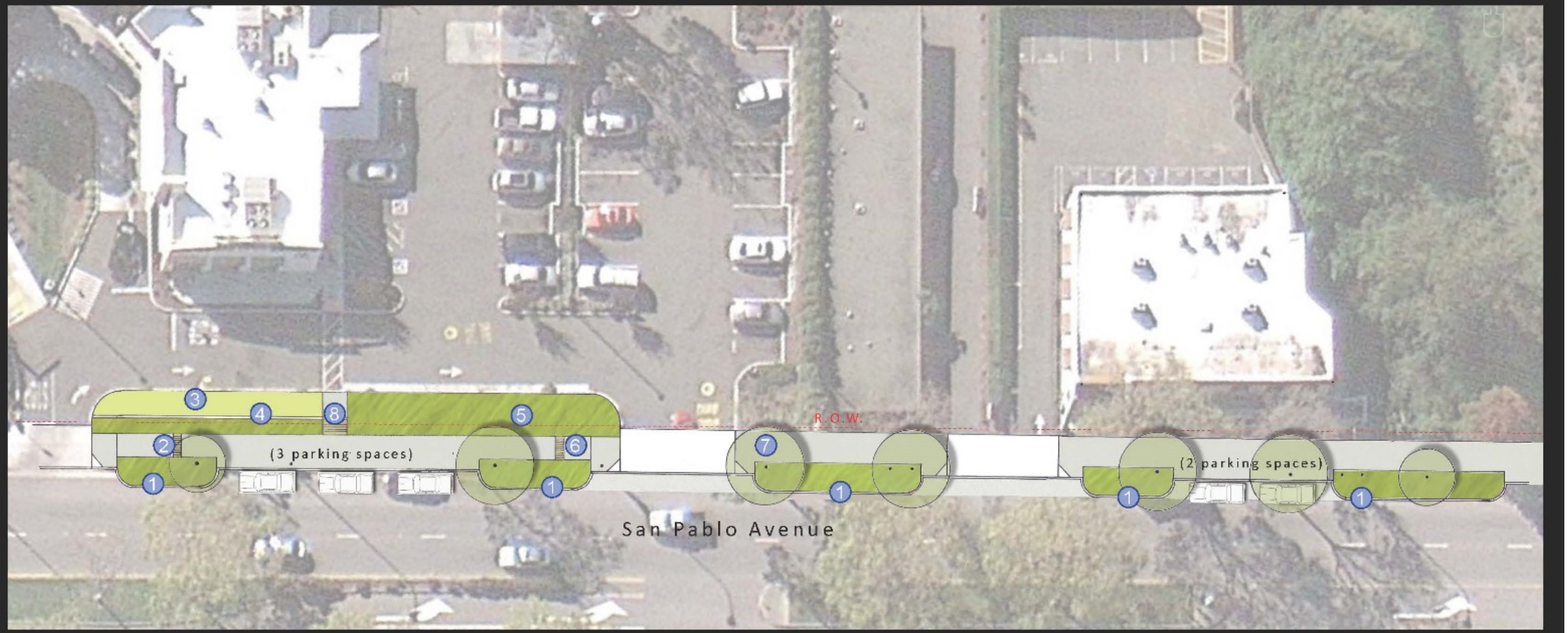
Scale: 1"=20'
January 2013

1. Entry point of stormwater flow from Apgar Street.
2. Low-flow green gutter. Higher flows spill over a small retaining wall into larger adjacent rain garden.
3. Rain garden landscape area.
4. Existing sewer manhole location.
5. Side slope landscape transitions grade from street level to the basin's finished elevations.
6. On-street asphalt parking zone (Capacity is for five vehicles)
7. New sidewalk paving to match existing brick paving along San Pablo Avenue (by private development?)
8. Pedestrian boardwalk crossing over rain garden system.
9. Expanded sidewalk area overlooks rain garden cells and allow for addition space for cafe/plaza seating.
10. Overflow from rain garden system.
11. Existing street trees to remain.
12. Sidewalk zone to be paved with standard scored concrete.

San Pablo Avenue Green Stormwater Spine Project

City of Emeryville, California

[nev-ū-non]
Nevue Ngan Associates
QUADRIGA landscape architecture and planning, inc. sacramento | santa rosa
WILSEY HAM ENGINEERING ■ PLANNING ■ SURVEYING



Stormwater Improvement Concept Plan

Scale: 1"=25'
January 2013

1. Stormwater curb extensions capture runoff from San Pablo Avenue.
2. Grated trench drains allow stormwater to flow into adjacent sidewalk planter.
3. Existing private landscaping/signage/utilities are retained.
4. Sidewalk planter accepts stormwater from San Pablo Avenue. A small concrete curb wall helps provide grade separation and protection of existing signs and utilities. This will require acceptance and coordination of improvements with private owner.
5. An existing vegetated swale is modified to capture stormwater from both San Pablo Avenue and McDonald's parking lot. This will require acceptance and coordination of improvements with private owner.
6. Grated trench drains allow stormwater overflow to flow into a stormwater curb extension in San Pablo Avenue.
7. All existing trees are retained with streetscape improvements.
8. Boardwalk allows stormwater to follow under pedestrian pathway.

San Pablo Avenue Green Stormwater Spine Project

City of Berkeley, California

[nev-u-ser]
Nevue Ngan Associates
QUADRIGA landscape architecture and planning, Inc.
WILSEY HAM ENGINEERING ■ PLANNING ■ SURVEYING

Berkeley Site

Stormwater Improvement Concept Plan

Scale: 1"=40'
January 2014

1. Stormwater curb extension extends out into San Pablo Avenue and captures street runoff. Existing drain inlet is modified to capture overflow.
2. Landscaped curb extensions located within the parking zone of the street helps define parking spaces along San Pablo Avenue.
3. Existing trees are preserved and protected.
4. 5' wide separated bike path with 2' buffer zone is located along existing curb line. Bike path runoff flows towards on-street parking zone.
5. Bike path transitions from a separated condition to a integrated condition at intersection.
6. 2' painted bike buffer zone.
7. Sidewalk is expanded to varying widths(possibly retained at current widths at existing tree locations).
8. Pervious paving system between existing trees captures rainfall and runoff from sidewalk zone.
9. To accommodate new improvements, travel lanes are reconfigured and shifted to the west.
10. Existing median must be altered to accommodate new lane configurations.
11. Traffic lanes transition to match current traffic layout.

El Cerrito Urban Greening Grant Project

City of El Cerrito, California

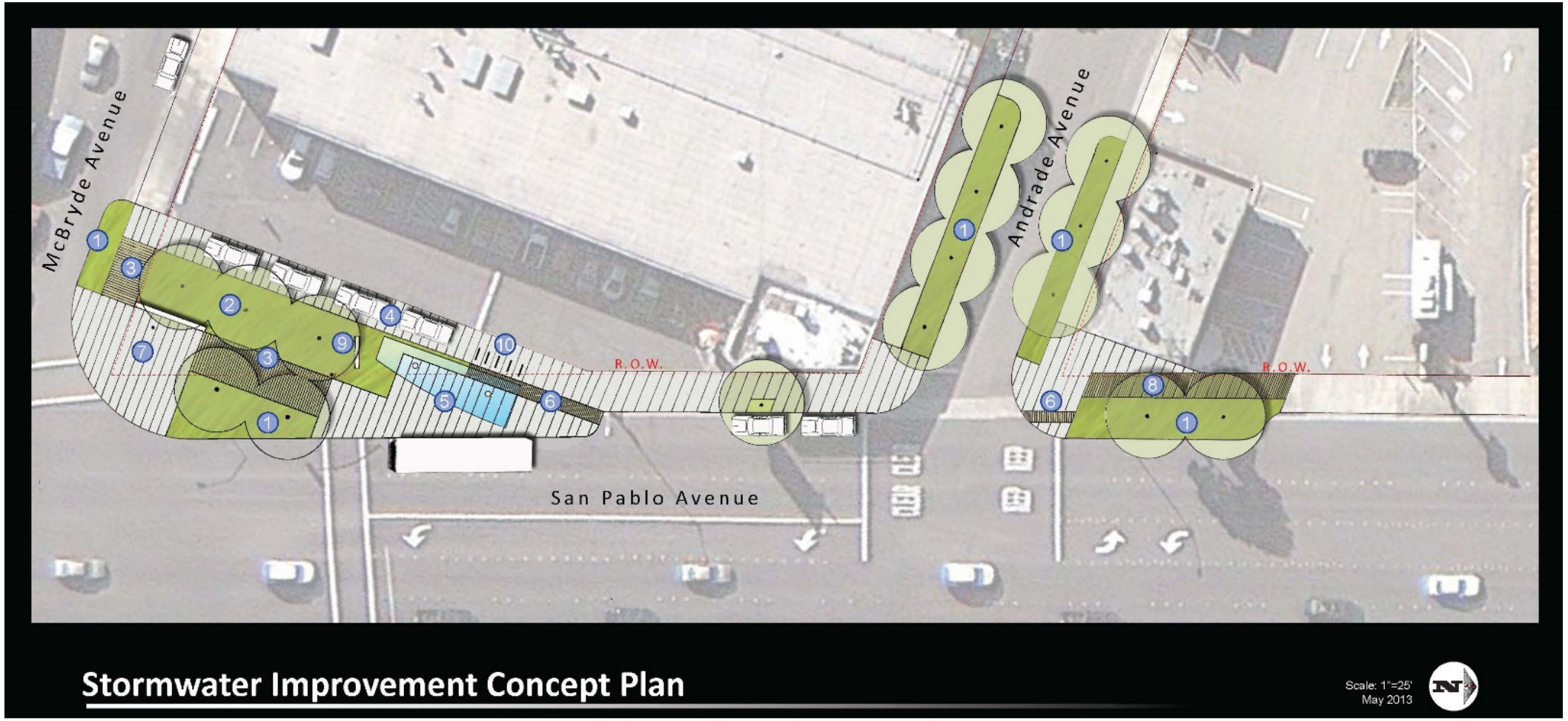
Urban Rain | Design
The Office of Kevin Robert Perry, ASLA

[nev-ū-non]
Nevue | Ngan | Associates

QUADRIGA
landscape architecture and planning, inc
sacramento | santa rosa

WILSEY HAM
ENGINEERING ■ PLANNING ■ SURVEYING


PARKING AT REAR
Super COIN LAUNDRY
ANDERSON APPLIANCE
BIKE ROUTE
SMOG and GO
SMOG CHECK
IN BACK
I-80 BIKEWAY
EL CERRITO
Alvarado B
TAQUERIA
PUPUSAS
ANDERSON APPLIANCE
Super COIN-OP Laundry
STOVES
REFRIGERATORS
FREEZERS
WASHERS
DRYERS



Stormwater Improvement Concept Plan

Scale: 1"=25'
May 2013

1. Stormwater curb extensions capture runoff from San Pablo Avenue, Andrade Avenue, and McBryde Avenue.
2. A new rain gardens capture stormwater from private parking lot. This will require acceptance and coordination of improvements with private owner.
3. Boardwalks allow stormwater to be connected between the curb extensions and rain garden.
4. Existing parking spaces are modified to allow for only parallel parking, however, additional parallel parking is allowed on McBryde Avenue
5. A new bus stop canopy conveys stormwater to adjacent rain garden (by others).
6. Trench drains used for stormwater conveyance.
7. A new corner plaza for placemaking opportunity (art, pedestrian seating, other amenities by others).
8. Boardwalk allows for additional stormwater storage adjacent to stormwater curb extension.
9. Existing private signage/utilities are to be protected within rain garden.
10. Optional new bike racks (by others)

San Pablo Avenue Green Stormwater Spine Project

City of Richmond, California

Nevue Ngan Associates

QUADRIGA landscape architecture and planning, inc.

WILSEY HAM ENGINEERING PLANNING SURVEYING


Super COIN-OP Laundry
SATOU
HAIR BRAIDING
510 302.5274
DROP OFF LAUNDRY
PARKING AT REAR
Super COIN LAUNDRY
SMOG CHECK
San Pablo Ave

ROADMAP OF FUNDING SOLUTIONS
FOR SUSTAINABLE STREETS

Prepared by the
Bay Area Stormwater Management Agencies Association
for the Urban Greening Bay Area Initiative
Final April 26, 2018

URBAN GREENING BAY AREA

- Prioritize Sustainable Streets in Funding Sources
- Improve Conditions for Projects Funded by Multiple Grants
- Additional Funding Options development
- *Road Map Committee to Track Actions and Progress*

THANKS!

Please visit:

https://www.sfestuary.org/green-streets/

for additional resources

You can find me at

Josh.Bradt@sfestuary.org

5-WAY ROUNDABOUT PROJECT

CITY OF HEALDSBURG SOUTH ENTRY TO DOWNTOWN

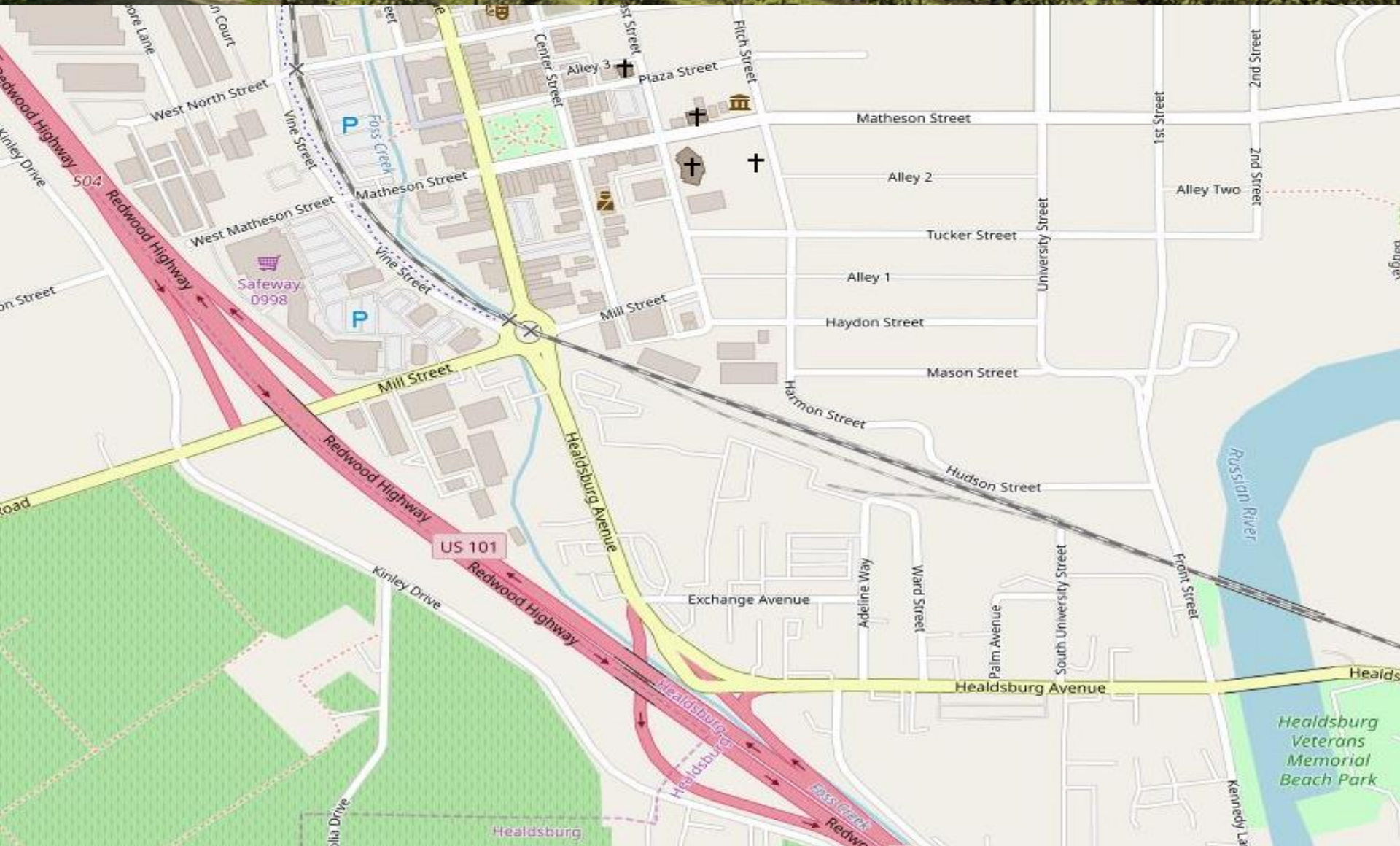
METROPOLITAN TRANSPORTATION COMMISSION

LARRY ZIMMER – CITY OF HEALDSBURG DIRECTOR OF PUBLIC WORKS

WHERE IS THE CITY OF HEALDSBURG?

San Francisco Bay Area – 9 Counties of the MTC

PROJECT LOCATION



CENTRAL HEALDSBURG

Tourism based

- Plaza is the City's tourism center
- Fine Dining
- High end shopping
- Summer Concerts in the Park
- Weekly Farmers Market
- Winery Tasting Rooms
- Wine Tours
- Hotels, Inns, Bed and Breakfasts
- Art Galleries

CITY OF HEALDSBURG

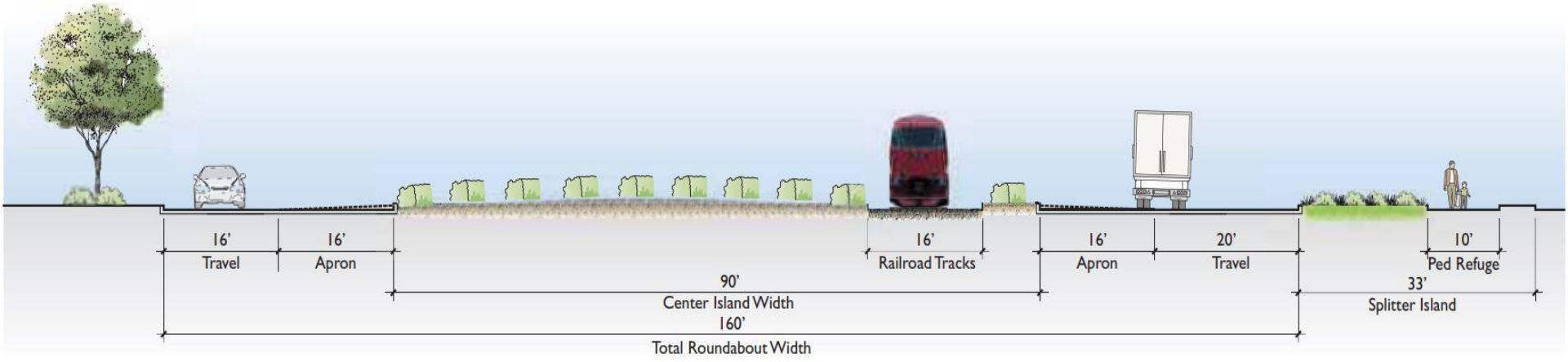
TRANSPORTATION MODES

- U.S. Highway 101
- SMART Train
- Heavy Pedestrian Traffic
- Local and Long Distance Cycling
- Bike Share
- The Russian River
- Foss Creek and Trail
- Agricultural Vehicles
- Large Trucks

CITY OF HEALDSBURG

PLANNING DOCUMENTS

T-A-13 of the City of Healdsburg general plan: The City will seek to improve motor vehicle, bicycle and pedestrian circulation at the intersection of Healdsburg Avenue, Mill Street and Vine Street.



CITY OF HEALDSBURG


18" Reinforced Concrete
12" DI
4" AC
6" VCP
Unknown
HEALDSBURG AVE
24"
8" CI
8" VCP
24" AC
72" BOX
72" BOX
N34
12" AC
24"
8" PVC
4"
8"
30" CONC
12" AC
MILL ST
8" CI
8" CI
8" CI
8" CI
4" AC
Unknown BOX
24" TECHITE?
HEALDSRIRG AVE
60" Cured In Pla

ADDRESSING PEDESTRIAN CONCERNS

Previous configuration not conducive to pedestrian travel

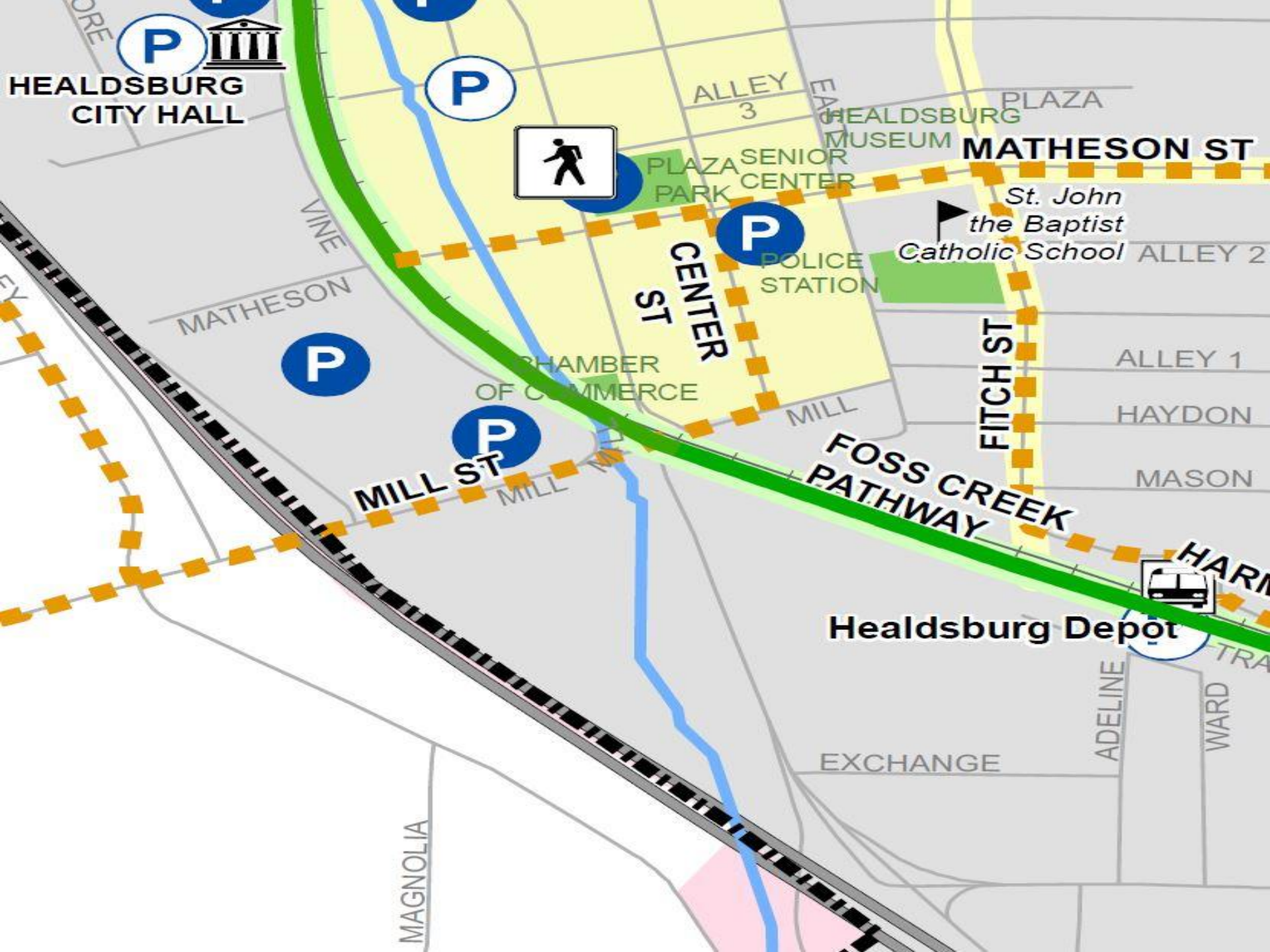
- Missing crosswalks
- Long travel lengths with no islands
- Consistency in each street branch

CITY OF HEALDSBURG

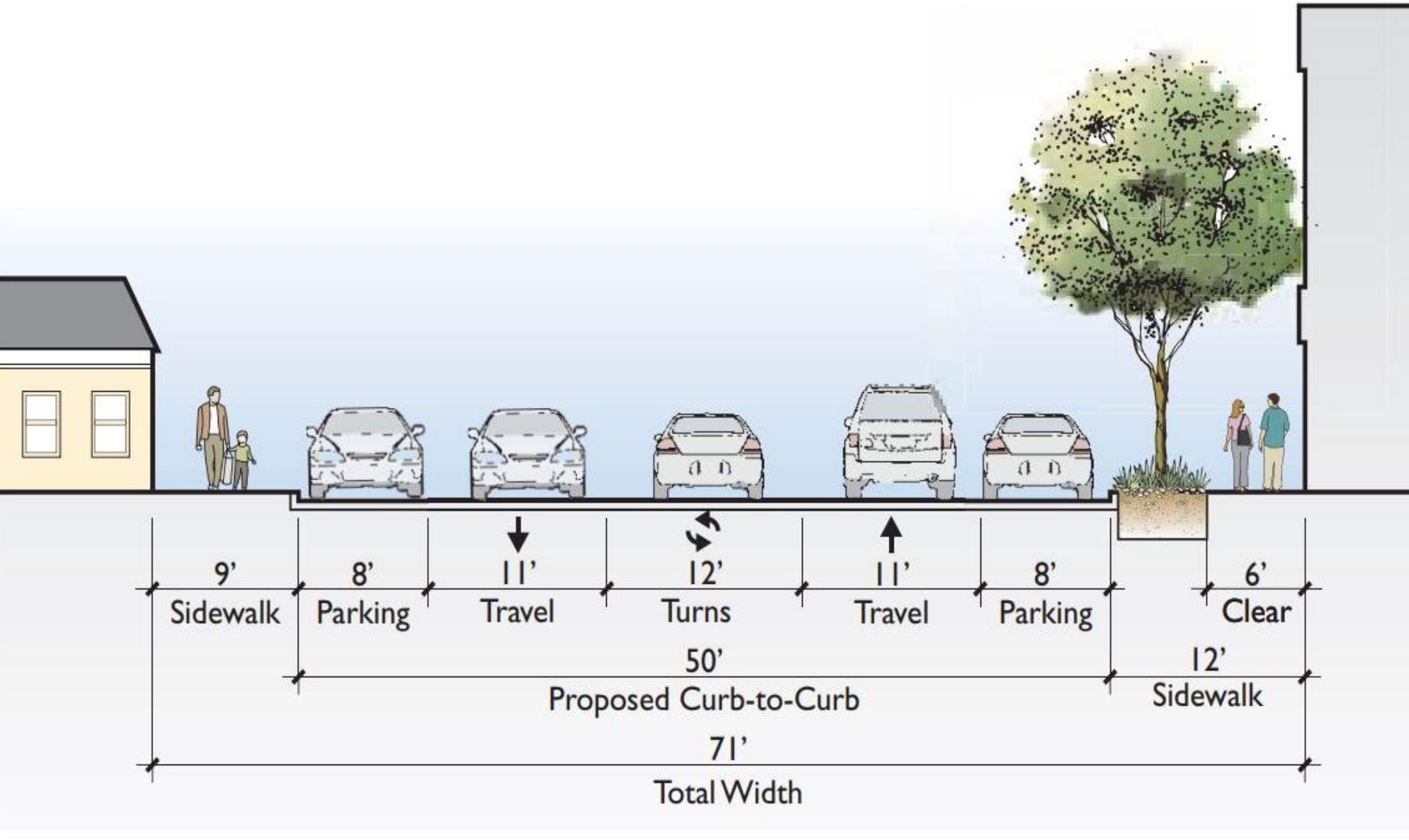

YIELD
SALES SERVICE


Exchange
Vineyard Plaza


ONE WAY
Healdsburg Ave

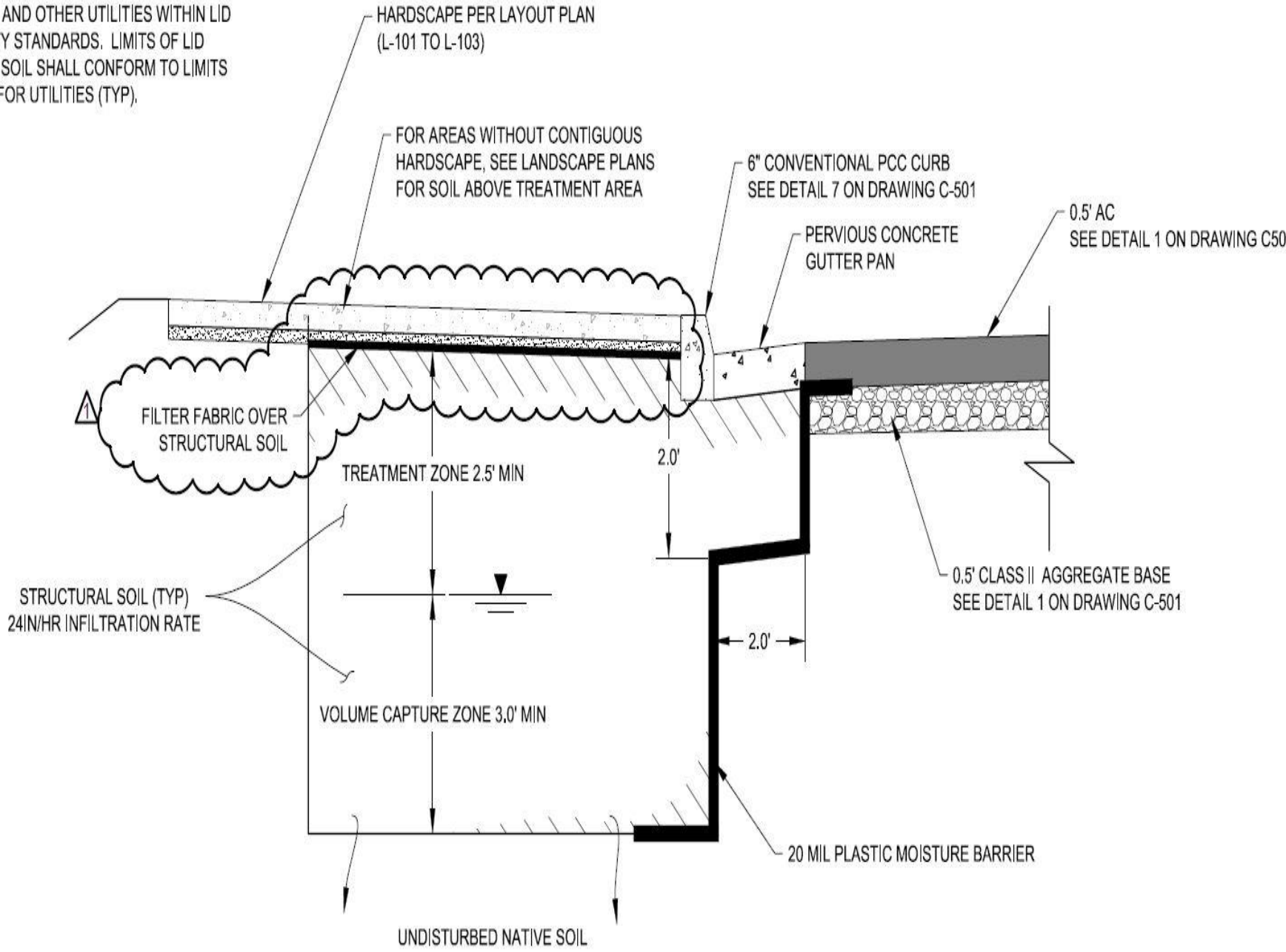

HEALDSBURG
CITY HALL
ALLEY
3
HEALDSBURG
MUSEUM
PLAZA
MATHESON ST
PLAZA
PARK
SENIOR
CENTER
St. John
the Baptist
Catholic School
ALLEY 2
VINE
CENTER
ST
POLICE
STATION
MATHESON
FITCH ST
ALLEY 1
HAYDON
MILL
MILL ST
FOSS CREEK
PATHWAY
MASON
Healdsburg Depot
EXCHANGE
ADELINE
WARD
MAGNOLIA

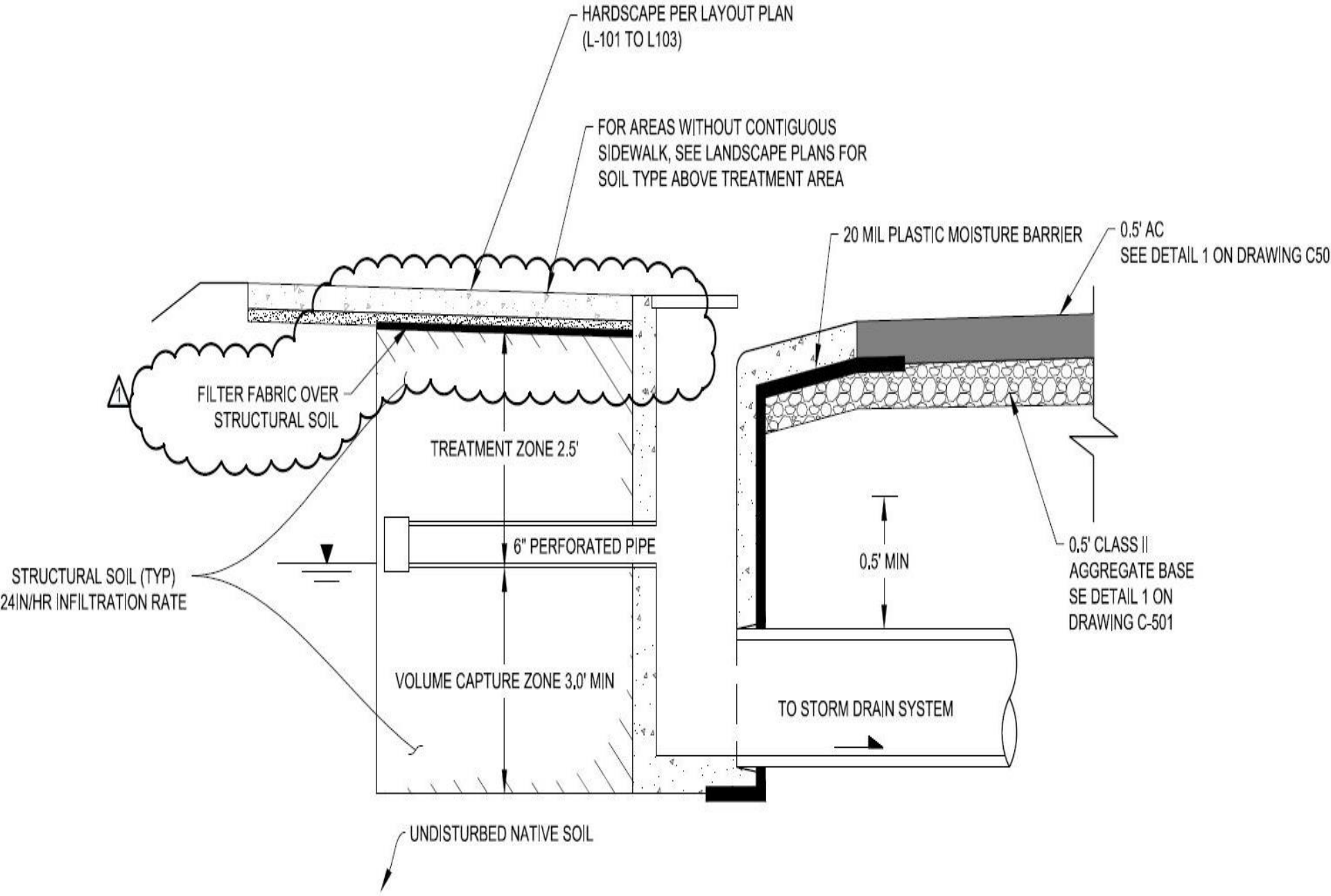
AREA PLAN DESIGN CROSS SECTION



NOTE:

1. CONTRACTOR SHALL INSTALL FIRE HYDRANTS, LIGHT POLES, AND OTHER UTILITIES WITHIN LID AREA PER CITY STANDARDS. LIMITS OF LID STRUCTURAL SOIL SHALL CONFORM TO LIMITS OF BACKFILL FOR UTILITIES (TYP).




HARDSCAPE PER LAYOUT PLAN
(L-101 TO L103)
FOR AREAS WITHOUT CONTIGUOUS
SIDEWALK, SEE LANDSCAPE PLANS FOR
SOIL TYPE ABOVE TREATMENT AREA
20 MIL PLASTIC MOISTURE BARRIER
0.5' AC
SEE DETAIL 1 ON DRAWING C50
1
FILTER FABRIC OVER
STRUCTURAL SOIL
TREATMENT ZONE 2.5'
6" PERFORATED PIPE
0.5' MIN
0.5' CLASS II
AGGREGATE BASE
SE DETAIL 1 ON
DRAWING C-501
STRUCTURAL SOIL (TYP)
24IN/HR INFILTRATION RATE
VOLUME CAPTURE ZONE 3.0' MIN
TO STORM DRAIN SYSTEM
UNDISTURBED NATIVE SOIL


Singletree Cafe
FLO Wine Bar + Pub
Mill Street Antiques
The Parish Cafe
Sonoma Cider
up the street
7600
Biagi
JOMAG


Sonoma Cider
CAUTION


WELLS FARGO
McNeilus
PLASTIC SHEE

FOSS CREEK

LET'S NOT FORGET OUR WATERWAYS


ROCKPILE
ONE WAY


NOTICE
177
boutique

GREENIFICATION OF CENTRAL HEALDSBURG AVENUE

QUESTIONS?

October
2018

Green Streets Planning Innovations Forum

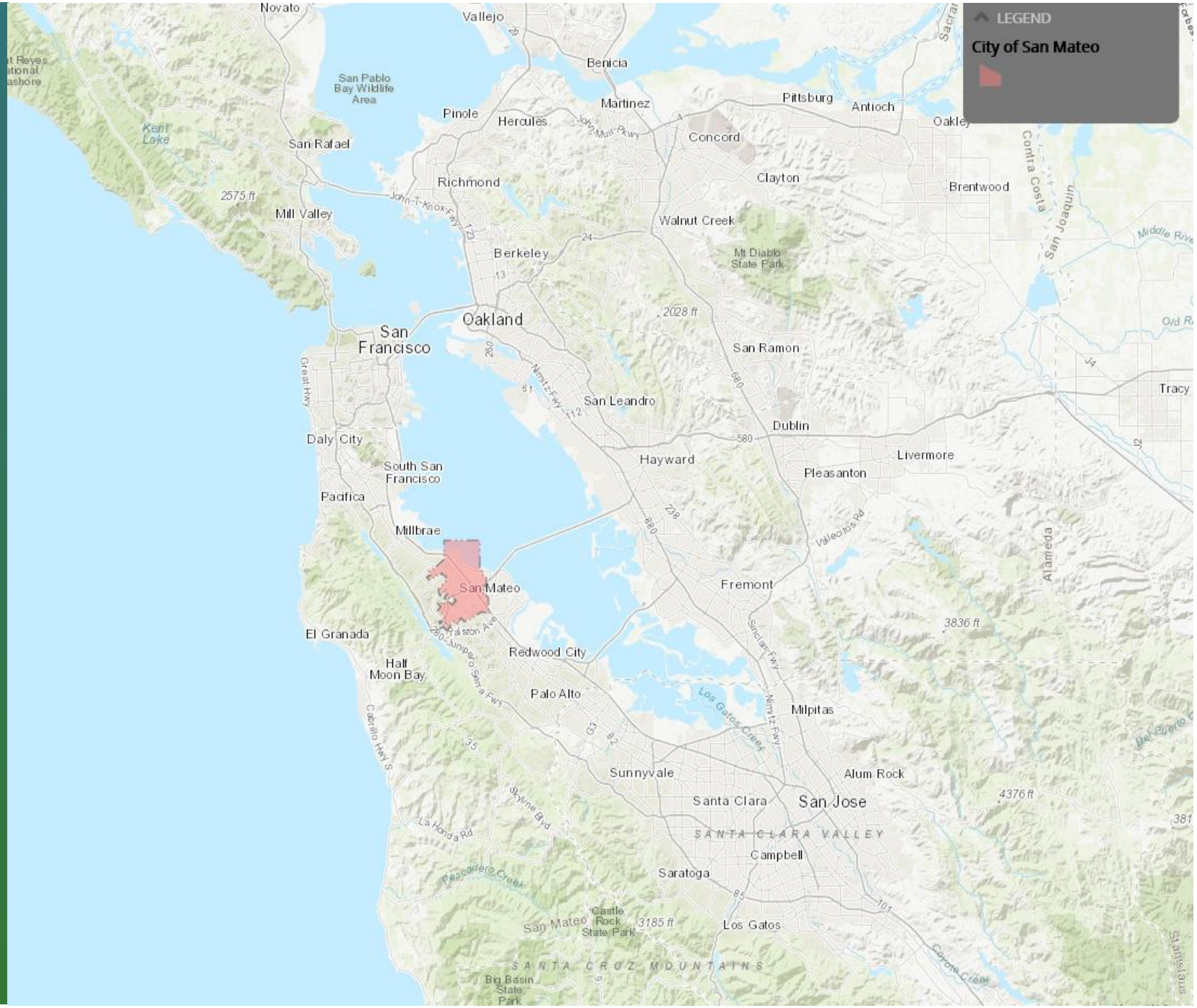
City of San Mateo

Otis Chan, P.E., Senior Engineer

Leo Chow, Assistant Engineer

City of San Mateo

- A city on the San Francisco Peninsula in Northern California's Bay Area, approximately 20 miles south of San Francisco, and 31 miles northwest of San Jose.



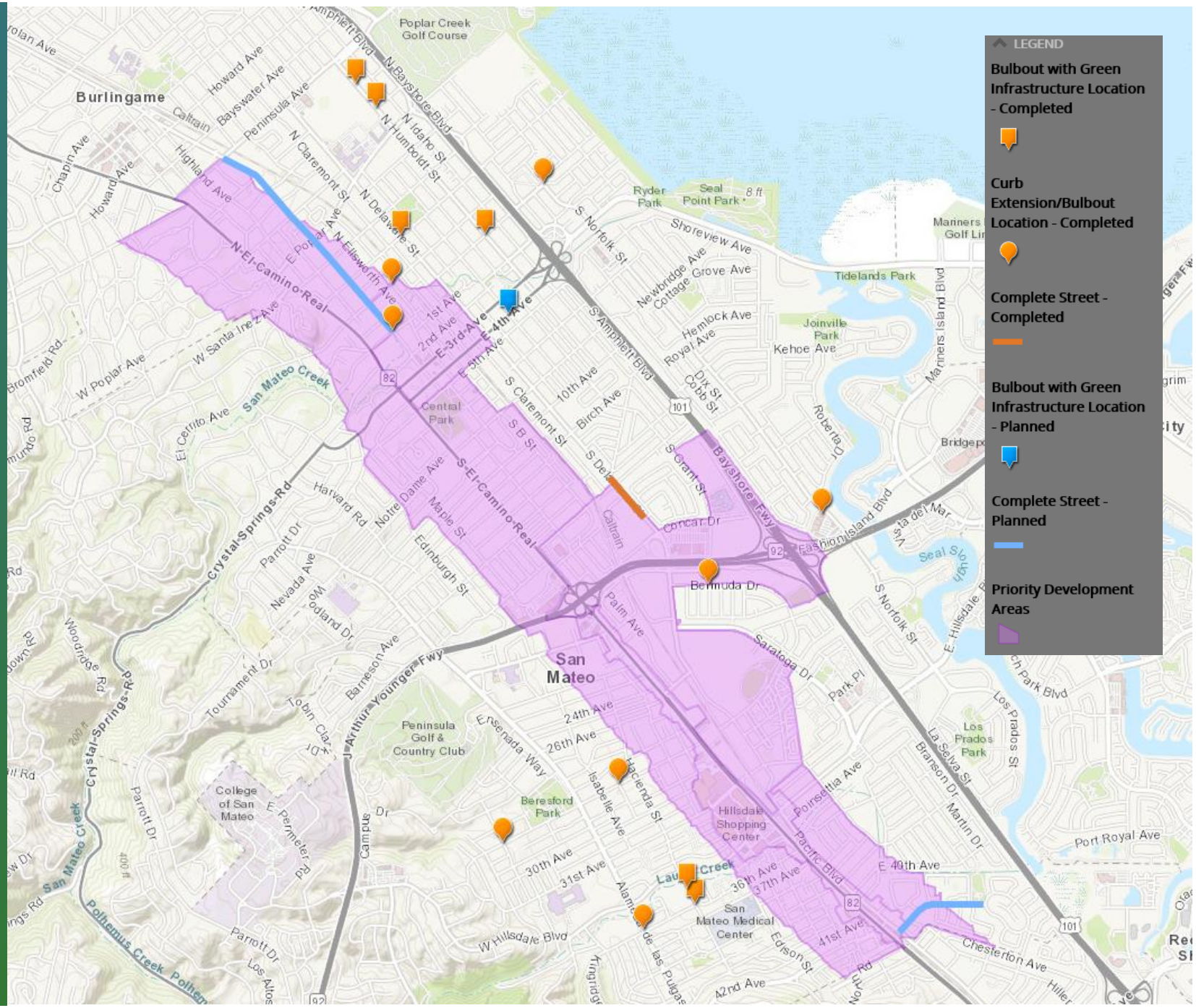
Green Infrastructure

Green Infrastructure

- takes advantage of landscape and urban design components of streets by various elements to capture, slow, and treat stormwater runoff.

Green Streets

- incorporate environmental features like trees, rain gardens, and infiltration planters to slow the course of runoff and filter it naturally before it reaches major waterways and sensitive plant and animal life.



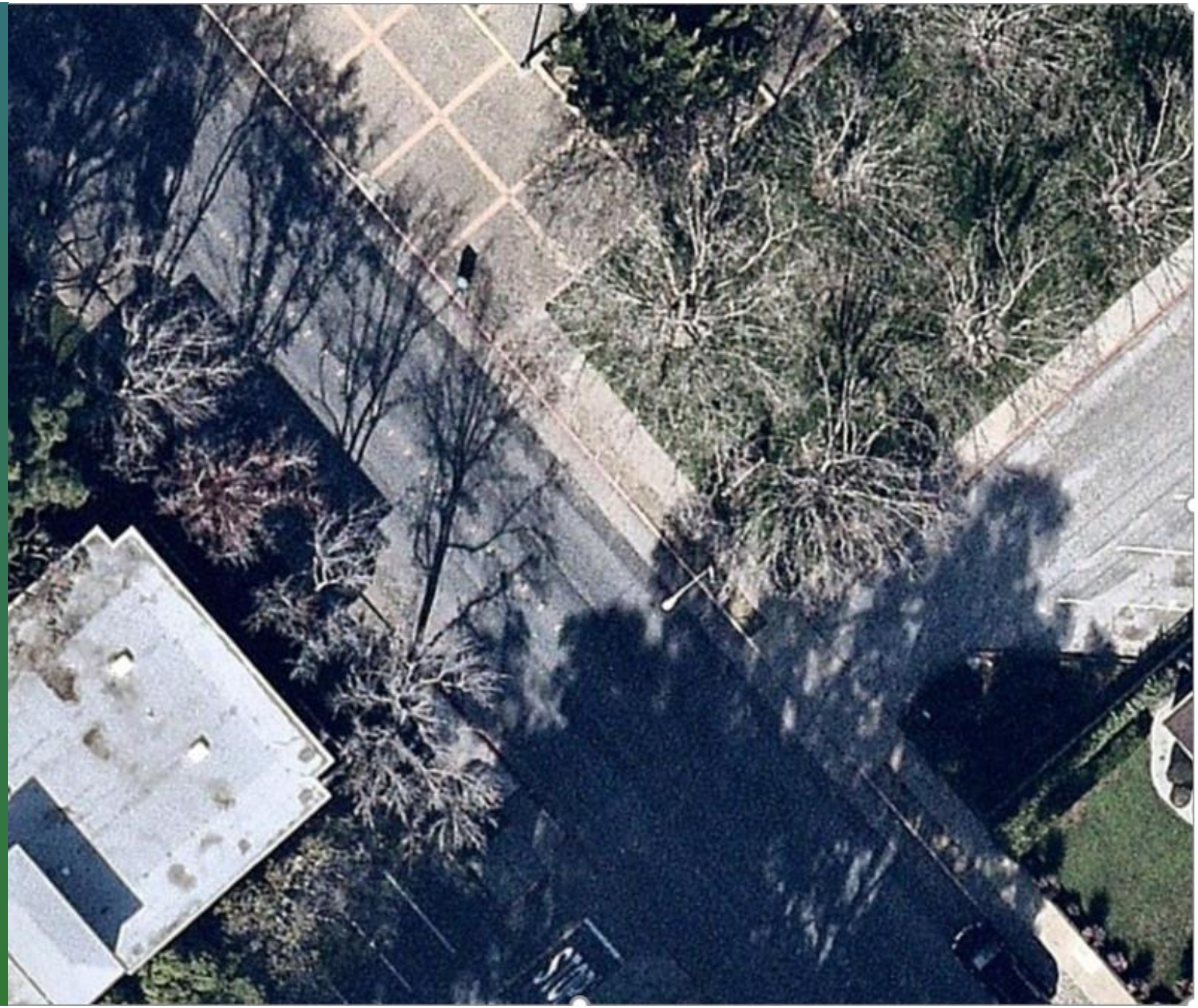
800 N Humboldt St

Pros:

- Green infrastructure
- Shorten crosswalks
- ADA
- Enhance pedestrian safety by installing Solar RRFB
- Overflow will drain into catch basin

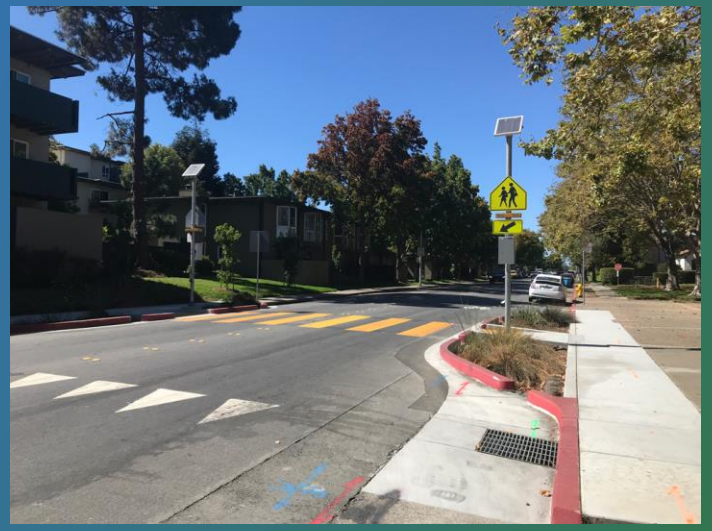
Cons:

- Education – Pedestrians do not like pushing the button when crossing the street
- Drivers do not yield to pedestrian when the RRFB are not flashing



800 N Humboldt St

Post construction



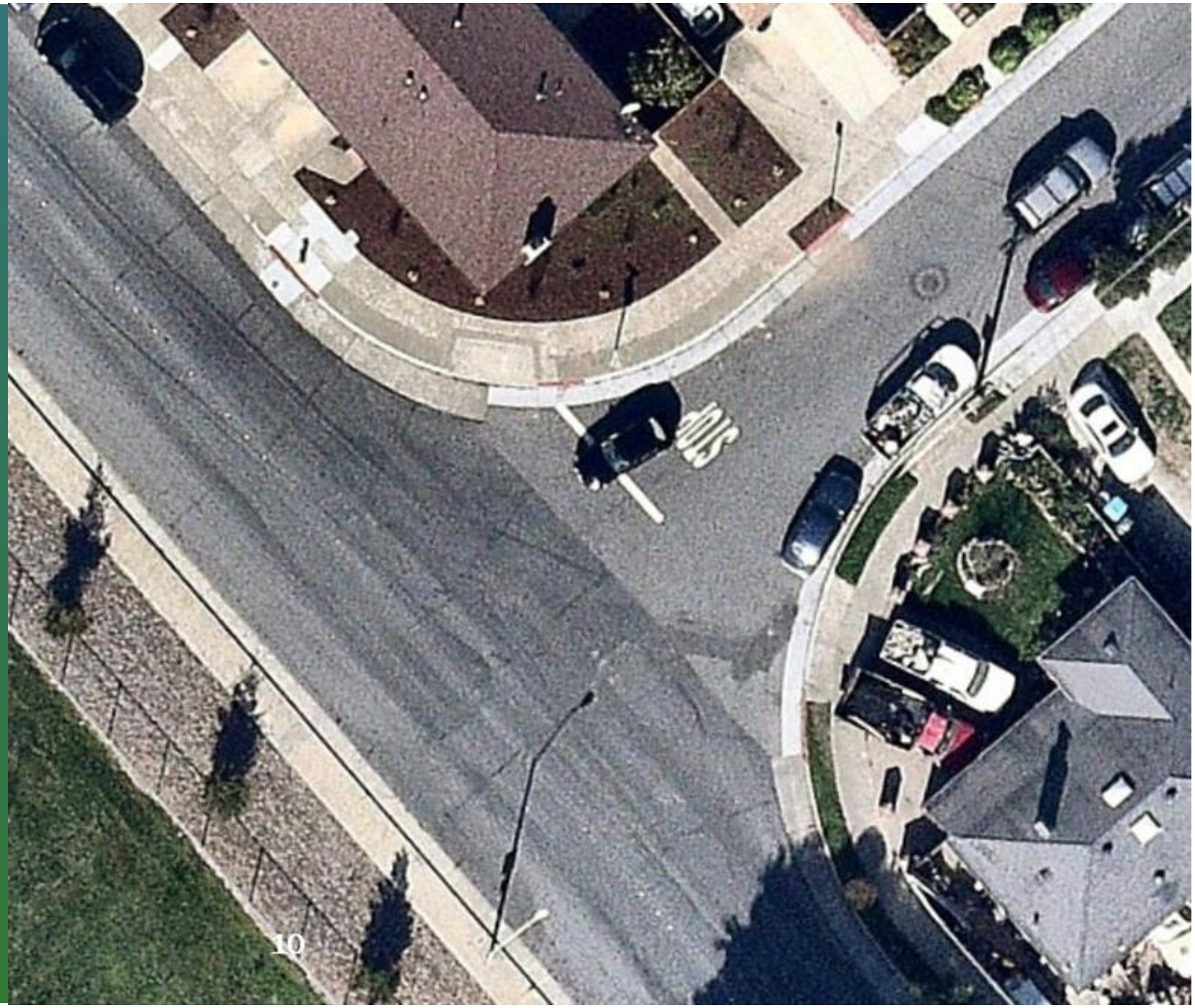
N Humboldt St at College Ave

Pros:

- Green infrastructure
- Shorten crosswalks
- ADA
- Encourage pedestrian usage by installing pedestrian scale streetlight

Cons:

- Additional cost for landscape maintenance
- Additional electrical bill for the streetlights
- Additional “Yield to pedestrian” signage



N Humboldt St at College Ave

Post construction

S Humboldt St at Cypress Ave

Pros:

- Green infrastructure
- Shorten crosswalks
- ADA
- Installed overflow catch basin

Cons:

- Additional cost for long term maintenance of catch basin

S Humboldt St at Cypress Ave

Post construction

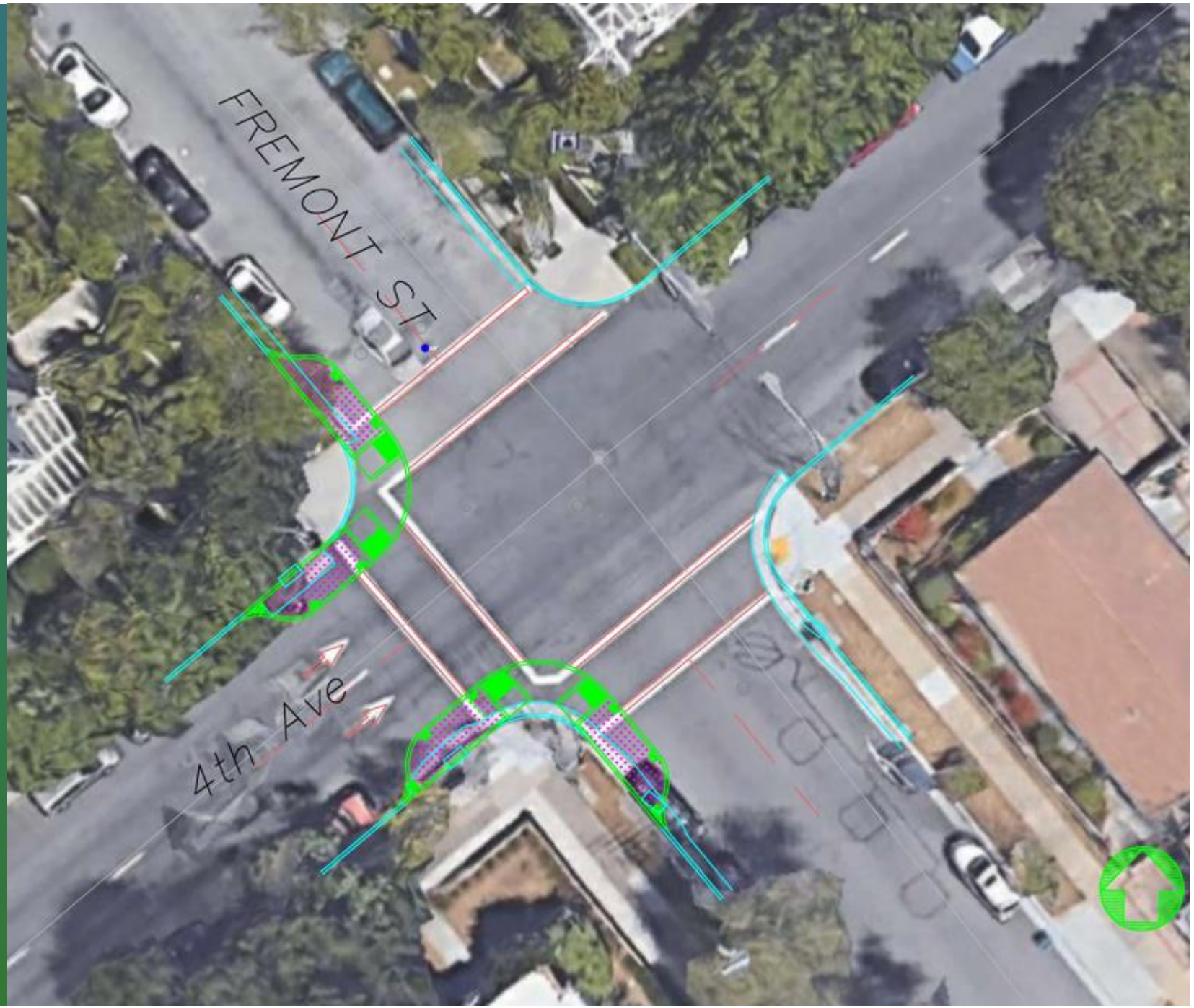
E 4th Ave at S Fremont St

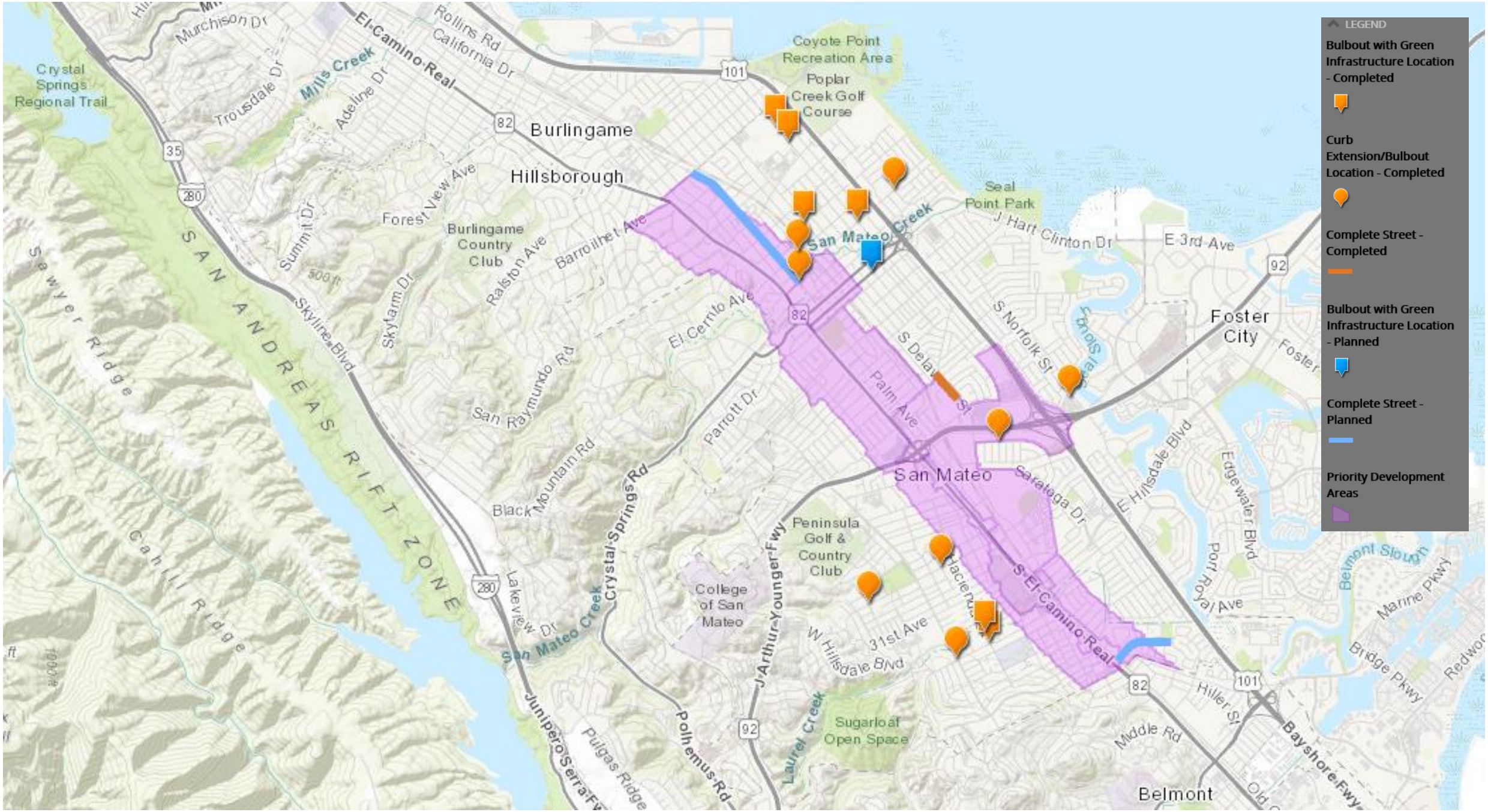
Pros:

- Green infrastructure
- Shorten crosswalks
- ADA

E 4th Ave at S Fremont St

Proposed design




LEGEND
Bulbout with Green Infrastructure Location - Completed
Curb Extension/Bulbout Location - Completed
Complete Street - Completed
Bulbout with Green Infrastructure Location - Planned
Complete Street - Planned
Priority Development Areas
Burlingame
Hillsborough
San Mateo
Foster City
Belmont
Coyote Point Recreation Area
Poplar Creek Golf Course
Seal Point Park
Burlingame Country Club
Peninsula Golf & Country Club
College of San Mateo
Sugarloaf Open Space
Crystal Springs Regional Trail
SAN ANDREAS RIFT ZONE
Sewer Ridge
Cahill Ridge
Pulgas Ridge
San Mateo Creek
Mills Creek
Laurel Creek
Belmont Slough
El Camino Real
Crystal Springs Rd
J Arthur Younger Fwy
Polhemus Rd
Bayshore Fwy
Skyline Blvd
Black Mountain Rd
San Raymundo Rd
Parrott Dr
Palm Ave
Saratoga Dr
E Hillsdale Blvd
W Hillsdale Blvd
31st Ave
Middle Rd
Hiller St
Marine Pkwy
Bridge Pkwy
Port Royal Ave
Edgewater Blvd
Foster
Murchison Dr
Rollins Rd
California Dr
Trousdale Dr
Adeline Dr
Forest View Ave
Summit Dr
Skytarm Dr
Ralston Ave
Barroilhet Ave
El Cerrito Ave
Lakeview Dr
J Hart Clinton Dr
E 3rd Ave
S Norfolk St
S Delaware St
Hacienda
101
82
280
35
92

THANK YOU!

City of San Mateo

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