

# Integration with Pedestrian and Cyclist Infrastructure

- Phil Erickson  
Community Design + Architecture
- Concepts and design issues for creating green and complete — *Sustainable Streets*

# Complete and Green Streets

- Combining two concepts for street design:

**Complete Streets + Green Streets = Sustainable Streets**

- Multiple benefits of streets:
  - For all users
  - Reduce carbon footprint
  - Promote improved public health
  - Support economic vitality
  - Placemaking
  - Green infrastructure
    - Manage and improve stormwater quality
    - Reduce water demand
    - Complement urban habitats



# Sustainable Streets

## Complete Streets for All Users

- Balancing Travel Needs and Purposes
  - Mobility
  - Access



Source: Sfgate.com



Source: annarbor.com

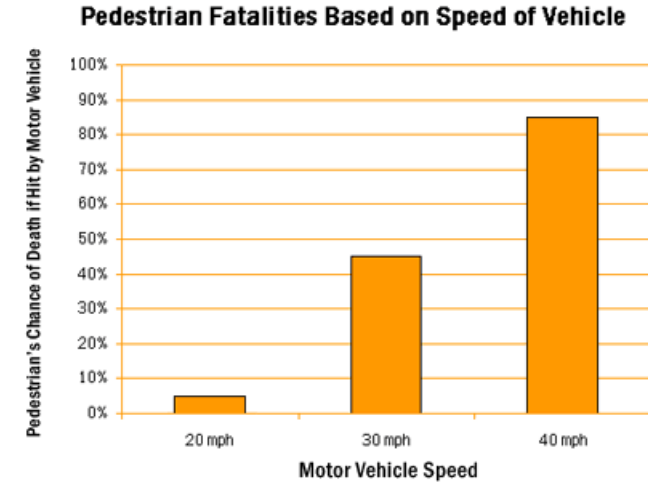
# Sustainable Streets

## Complete Streets for All Users

- Balancing Travel Needs and Purposes
  - Mobility
  - Access
  - Safety



Source: <http://mywheelsareturning.com>



Source: <http://www.walkinginfo.org>



# Sustainable Streets

## Complete Streets for All Users

- Balancing Travel Needs and Purposes
  - Mobility
  - Access
  - Safety
  - Enjoyment



Source: joyandphil.blogspot.com



Source: City of San Leandro



Source: City of San Leandro

# Sustainable Streets



Source: City of Emeryville for all

- Improve Water Quality
- Embrace Natural Processes
- Provide Cost Effective Solutions
- Create Unique and Attractive Neighborhoods

# Sustainable Streets Benefits

## Promote Public Health

- “Active Transportation” health benefits of walking and biking

*An adult needs 150 min. of moderate activity per week to experience health benefits of physical activity*

*“Physical Activity Guidelines for Americans” USHHS, 2008*

- Less than 10% of Americans achieve this level of activity



Source: blog.al.com



# Sustainable Streets Benefits

## Support Economic Vitality

- Street trees and walkable environments can positively impact retail sales & rents
  - 3-15% increase in home values
  - Polling of shoppers indicates
    - 9-12% more spending<sup>1</sup>
    - Spend more time in treed district
  - Improved productivity of workers with views and access to trees/vegetation



Source: [joyandphil.blogspot.com](http://joyandphil.blogspot.com)



Source: [www.ca-ilg.org.com](http://www.ca-ilg.org.com)

1. *Public Response to the Urban Forest in Inner-City Business Districts* by Kathleen L. Wolf, *Journal of Arboriculture* 29(3), May 2003



# Sustainable Streets Challenges

Combines issues that are in different practice “silos”

- Combines
  - Urban design and landscape
  - Transportation
  - Stormwater
- Traditional decision-making and funding are not structured to address
- Slowly changing, but challenging
  - Berkeley Measure M parcel tax for repaving, complete streets and green infrastructure
  - Chicago Metropolitan Agency for Planning potential sales tax for transit and green infrastructure



Source:  
[www.extension.org/pages/62210/designing-around-drainage-areas](http://www.extension.org/pages/62210/designing-around-drainage-areas)



Source: <http://www.cityofberkeley.info>



## 2014 Capitals

**Olympia, WA**

Montpelier, VT

Madison, WI

Lansing, MI



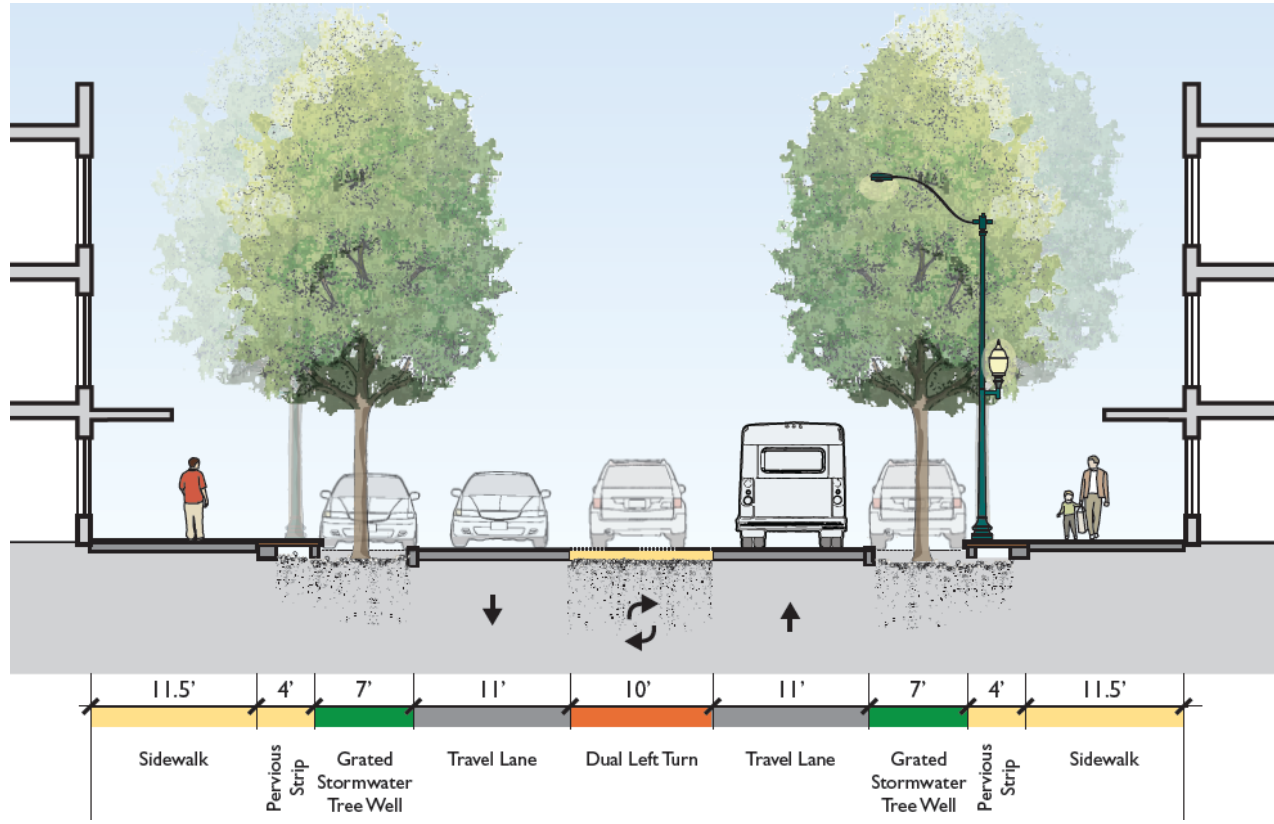
# Capitol Way

## Existing Street



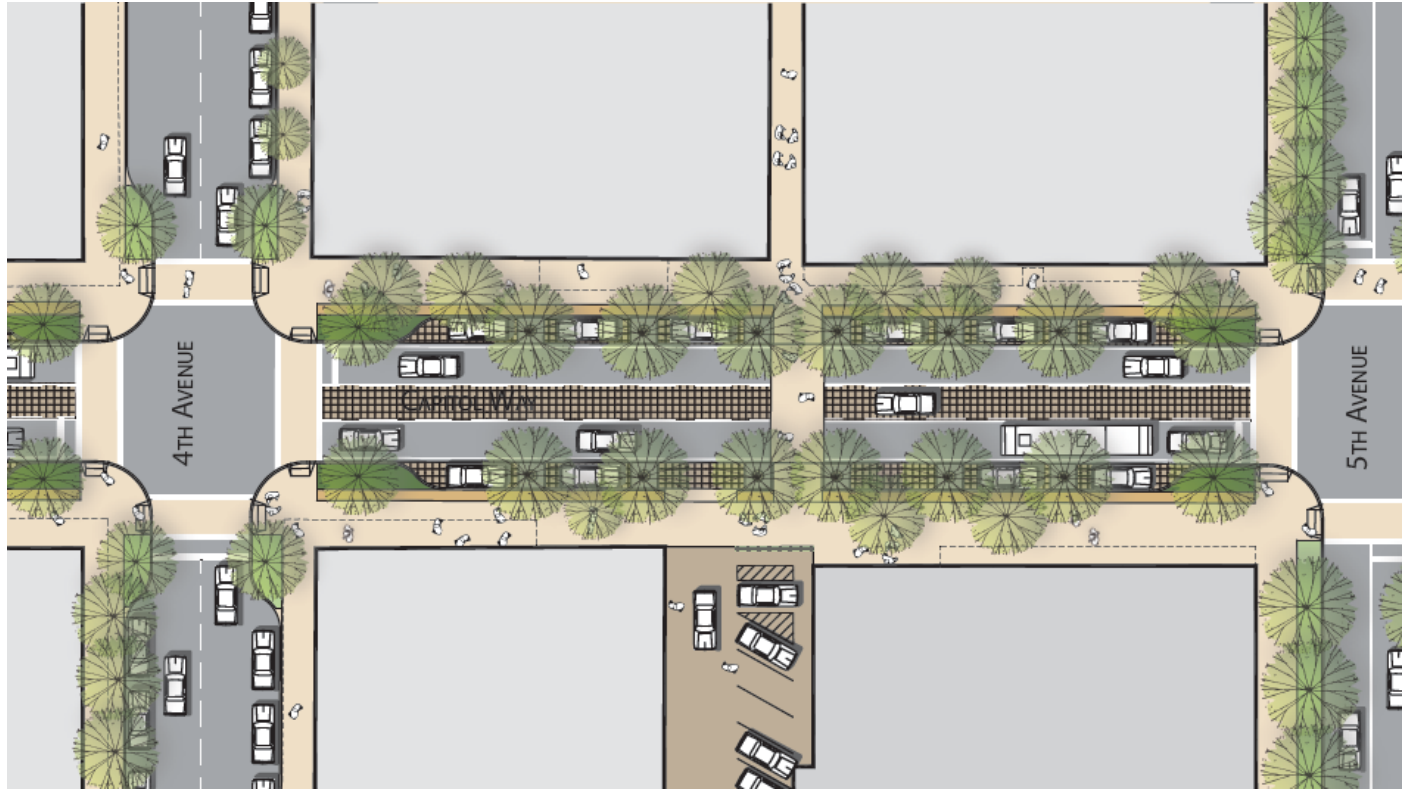
# Capitol Way

## Sustainable Street Concept



# Capitol Way

## Sustainable Street Concept



# Capitol Way

## Existing Street



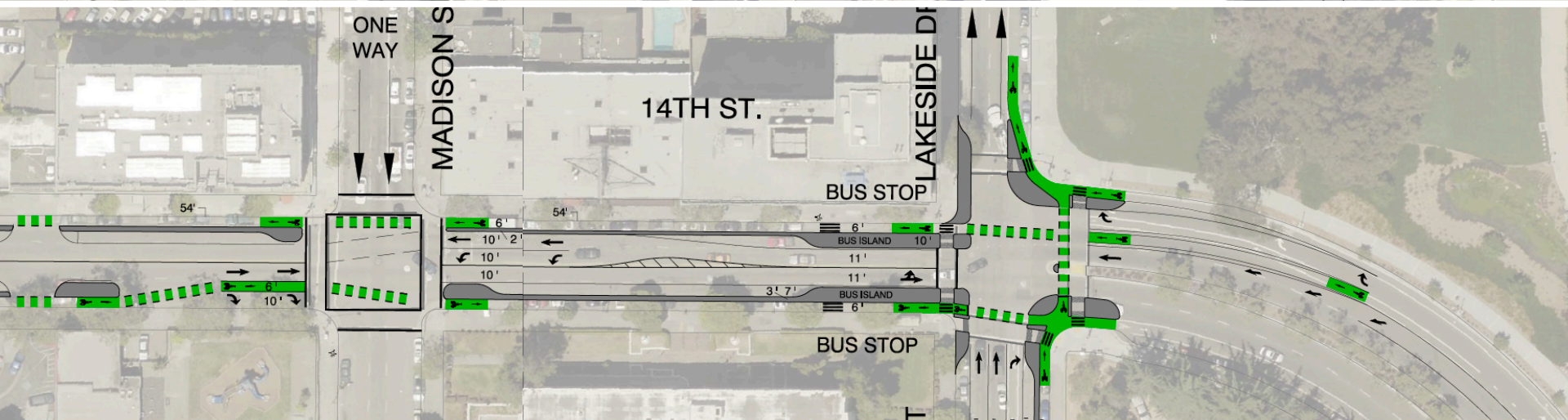
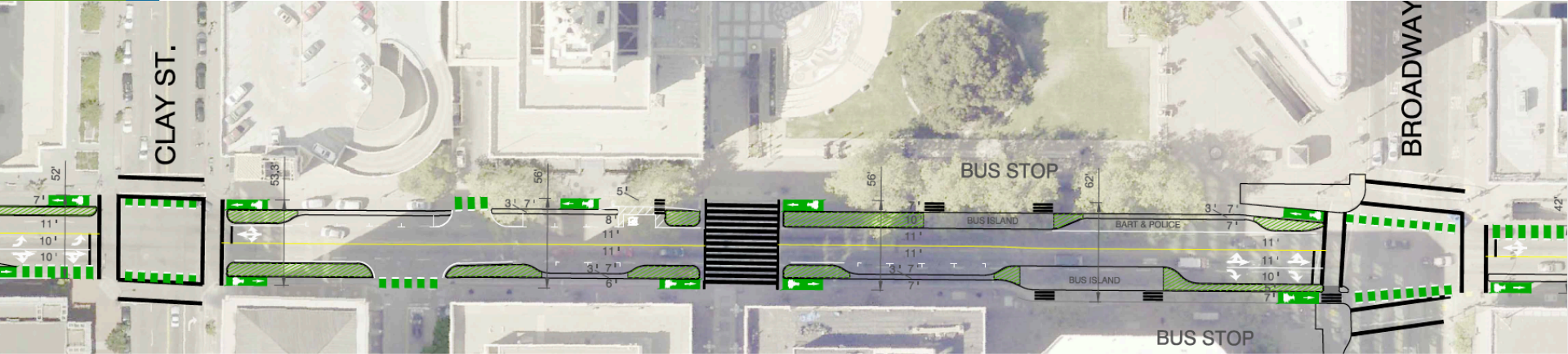


# Capitol Way

## Sustainable Street Concept

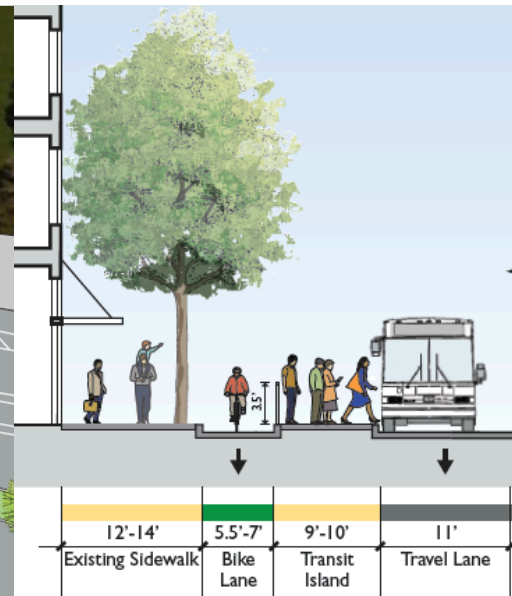
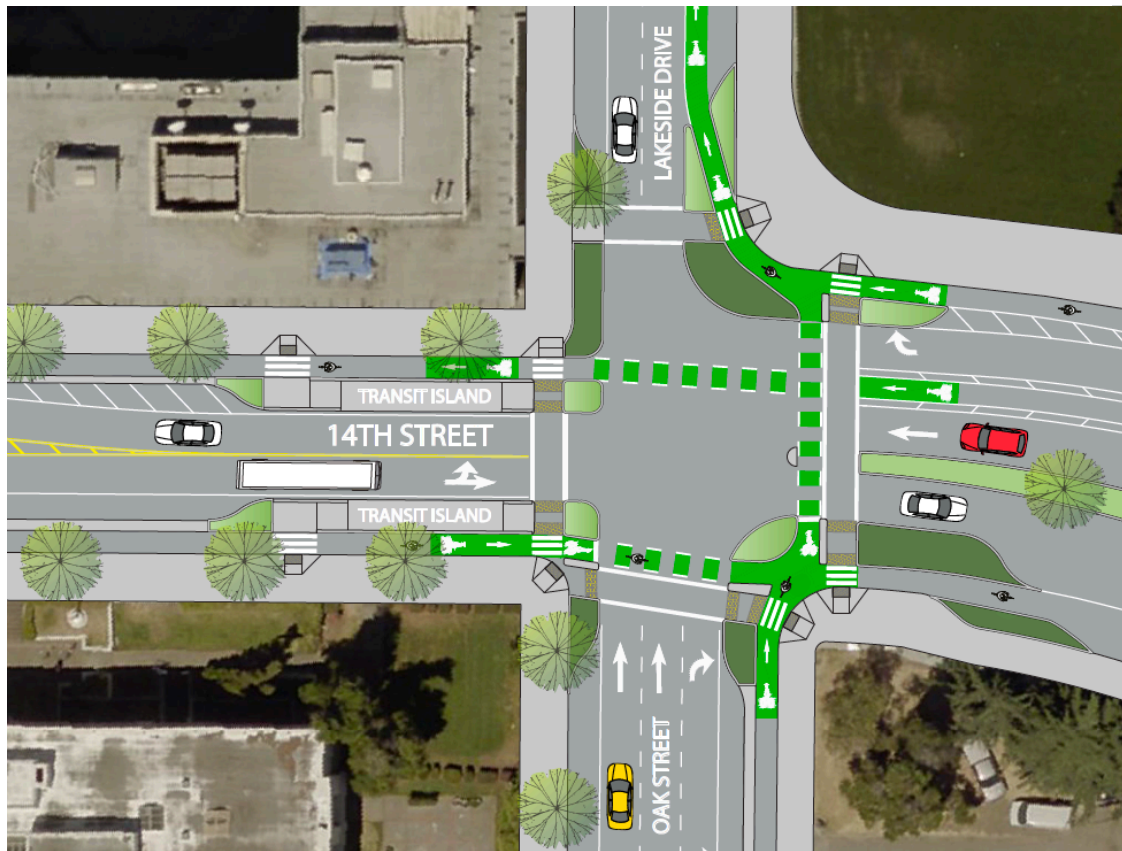


# 14<sup>th</sup> Street Complete Street





# 14<sup>th</sup> Street Complete Street



# 14<sup>th</sup> Street, Oakland ATP Grant: Existing





# 14<sup>th</sup> Street, Oakland ATP Grant: Design Concept





# 14<sup>th</sup> Street, Oakland ATP Grant: Existing

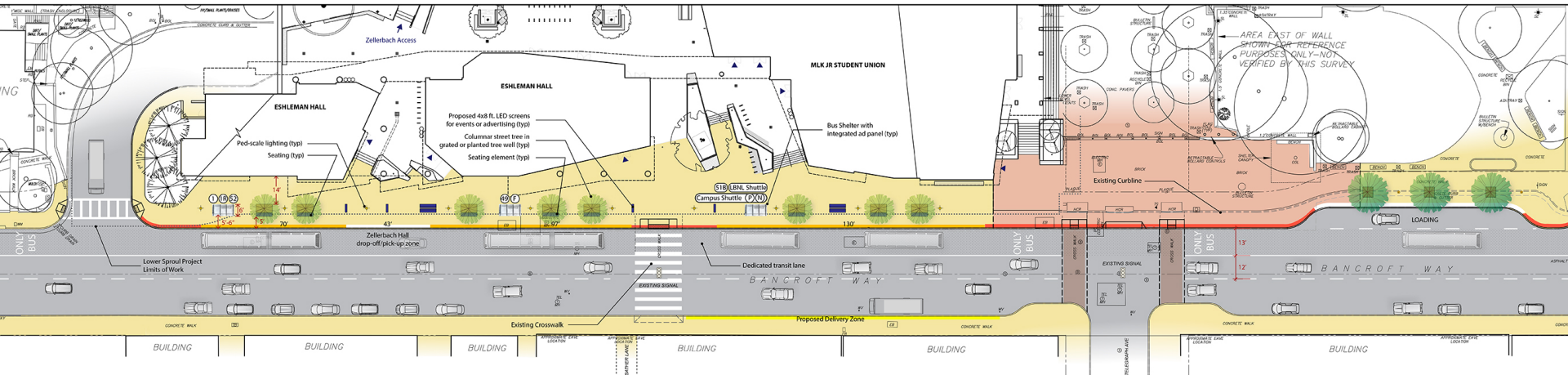
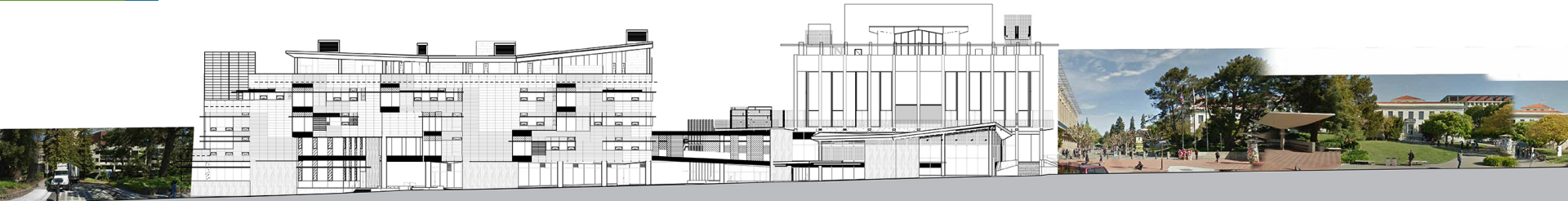




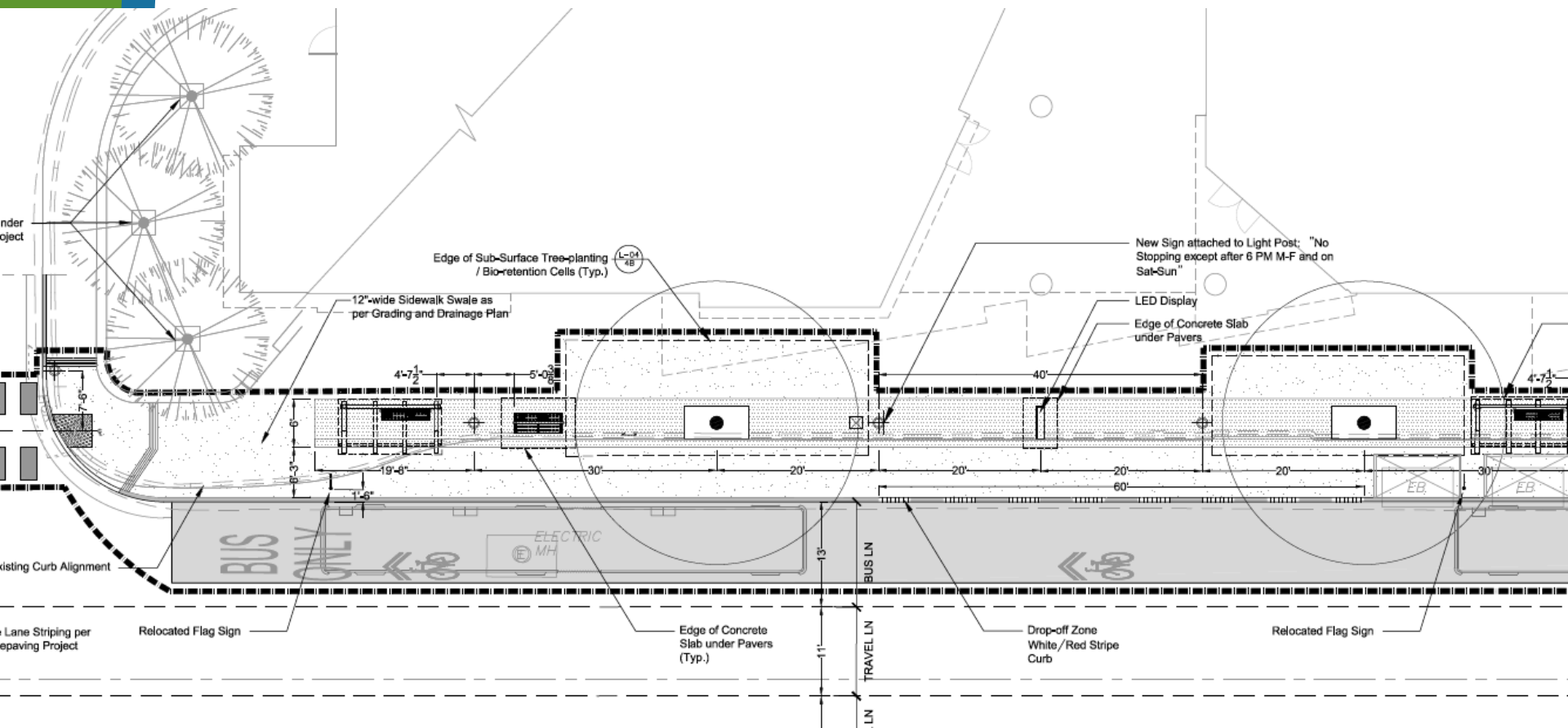
# 14<sup>th</sup> Street, Oakland ATP Grant: Design Concept

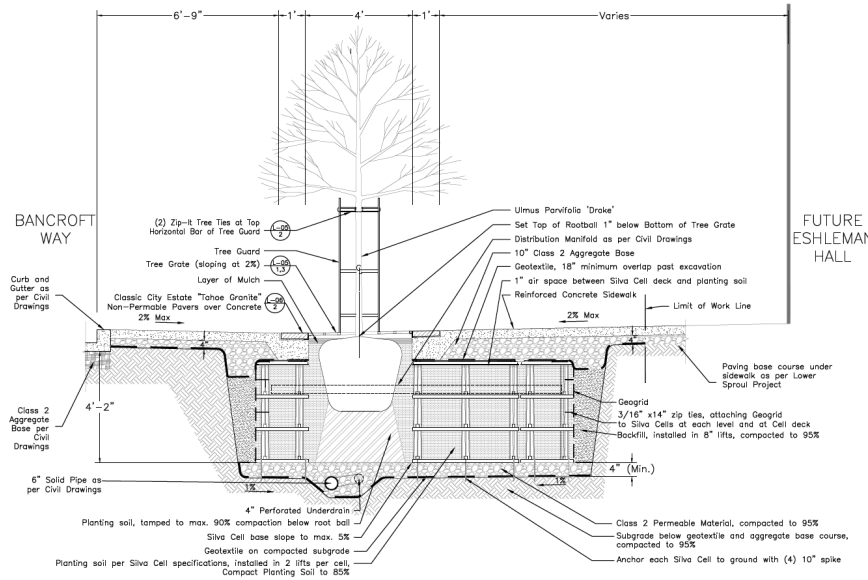


# Bancroft Way Streetscape

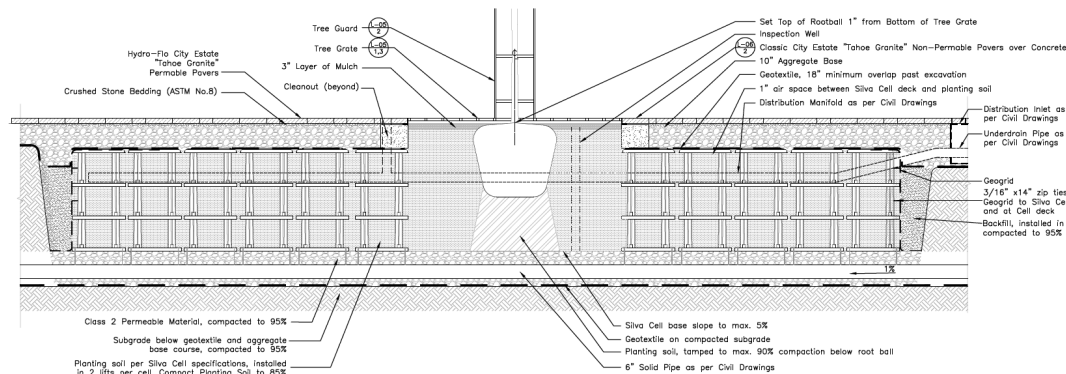






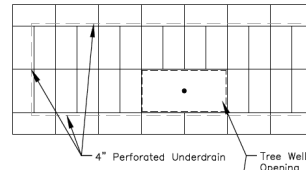


1 SILVA CELL - LATERAL CROSS-SECTION  
SCALE: 1" = 2"  
Note: 1"-3" spacing is required between Silva Cell Stacks (shown at 1")

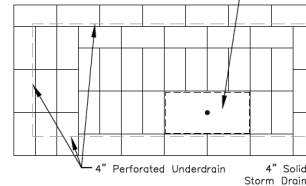


2 PERMEABLE PAVERS DETAIL  
SCALE: 1" = 2"

4A SILVA CELL LAYOUT - THREE CELLS DEEP



4B SILVA CELL LAYOUT - TWO CELLS DEEP



4 SILVA CELL LAYOUT DIAGRAM  
SCALE: NTS



3 SILVA CELL - LONGITUDINAL CROSS-SECTION  
SCALE: 1" = 2"  
Note: 1"-3" spacing is required between Silva Cell Stacks (shown at 1")

# Bancroft Way Streetscape



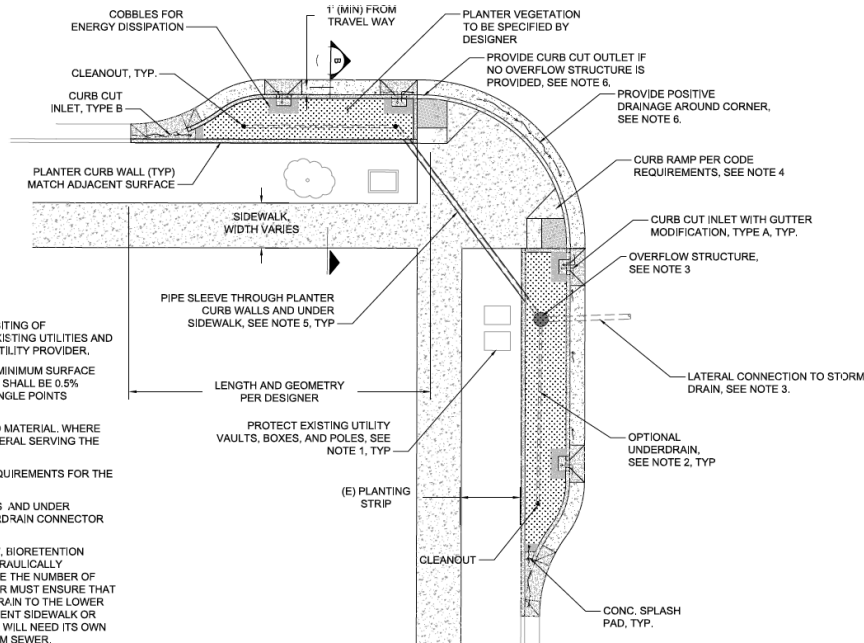


# BASMAA Efforts

- Urban Greening Bay Area
  - <http://www.sfestuary.org/our-projects/water-quality-improvement/greenplanning/>
  - Regional Roundtable on Sustainable Streets
    - Addressing coordination of transportation, climate change, and green infrastructure funding
  - GI and pedestrian/bicycle intersection improvements
    - Design charrette
    - Design of intersections in San Jose and City of San Mateo
    - Design detail guidance
- GI Facility Sizing Analysis
  - Evaluating effectiveness of smaller GI facilities within streets

# BASMAA Efforts

## ■ Charrette and Design Details



### NOTES:

1. AVOID UTILITY CONFLICTS WHEREVER FEASIBLE IN THE SITING OF BIORETENTION PLANTERS. IF UNAVOIDABLE, PROTECT EXISTING UTILITIES AND MAINTAIN MINIMUM SETBACKS AS REQUIRED BY LOCAL UTILITY PROVIDER.
2. PROVIDE UNDERDRAIN WHERE REQUIRED TO MEET THE MINIMUM SURFACE WATER DRAWDOWN TIME. LONGITUDINAL SLOPE OF PIPE SHALL BE 0.5% MINIMUM. PROVIDE CLEANOUT AT UPSTREAM END AND ANGLE POINTS EXCEEDING 45 DEGREES.
3. DESIGNER TO SPECIFY OVERFLOW STRUCTURE SIZE AND MATERIAL, WHERE FEASIBLE, CONNECT TO THE EXISTING STORM DRAIN LATERAL SERVING THE CORNER CATCH BASIN BEING REMOVED, IF ANY.
4. ADHERE TO ALL LOCAL AND FEDERAL ACCESSIBILITY REQUIREMENTS FOR THE SIDEWALK AND CURB RAMP DESIGNS.
5. PROVIDE PIPE SLEEVES THROUGH PLANTER CURB WALLS AND UNDER SIDEWALK TO ALLOW FOR THE PASSING OF SOLID UNDERDRAIN CONNECTOR PIPES.
6. IF THE GRADES AND EXISTING SITE CONSTRAINTS ALLOW, BIORETENTION PLANTERS ON EITHER SIDE OF THE CORNER CAN BE HYDRAULICALLY CONNECTED TO OPTIMIZE TREATMENT AREA AND REDUCE THE NUMBER OF CONNECTIONS TO THE STORM SEWER SYSTEM. DESIGNER MUST ENSURE THAT THE HIGHER BIORETENTION PLANTER CAN POSITIVELY DRAIN TO THE LOWER BIORETENTION PLANTER WITHOUT FLOODING THE ADJACENT SIDEWALK OR ROADWAY. IF INFEASIBLE, EACH BIORETENTION PLANTER WILL NEED ITS OWN OVERFLOW STRUCTURE AND CONNECTION TO THE STORM SEWER.

BASMAA URBAN GREENING TYPICAL GI DETAILS

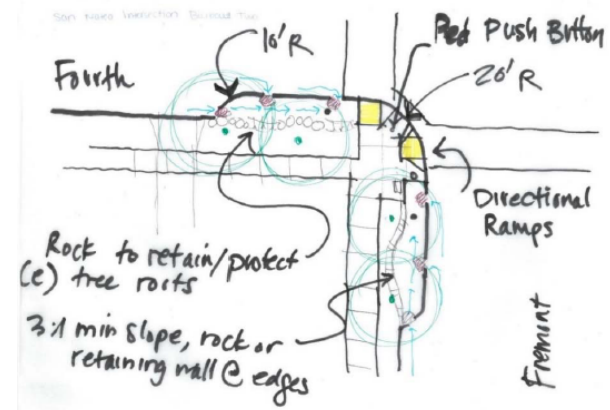
BULBOUT ALTERNATIVE 2

WALLED BIORETENTION ON BOTH SIDES OF CORNER, CURB CUT INLETS TYPE A & B

SCALE:  
1"=10'  
DRAWN BY:  
RF  
CHECKED BY:  
SD

DATE:  
APRIL 14, 2017

SHEET NUMBER  
C-1.2



Source: [http://www.sfestuary.org/wp-content/uploads/2017/05/Charrette-Summary\\_Final.pdf](http://www.sfestuary.org/wp-content/uploads/2017/05/Charrette-Summary_Final.pdf)

Source: [http://www.sfestuary.org/wp-content/uploads/2017/05/FinalGIDetails\\_Com piled.pdf](http://www.sfestuary.org/wp-content/uploads/2017/05/FinalGIDetails_Com piled.pdf)

