



Crossroad Lab

Mountain View, CA



San Jose, CA



San Jose, CA



Quick-Build

Constructing Projects Rapidly for Social Distancing
Planning for Social Cohesion

Project Management and Delivery

Vignesh Swaminathan, PE
CEO and President
Crossroad Lab

Experience:

Downtown Operations (City of San Jose)

(Parking, Events, CIP, and Traffic Control)

Civil Engineer Roadway (MTCO)

(Highways, Structures, Drainage, Civil, Complete Intersections)

Crossroad Lab

(Protected Intersections, ADA, CycleTracks, Feasibility, PSE)

Sustainability Commissioner

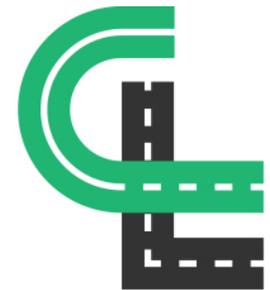
(Energy Management, Waste Diversion, LID, Climate Action Plan)

VTA Citizen Advisory Committee and Measure A Citizen Watchdog Committee

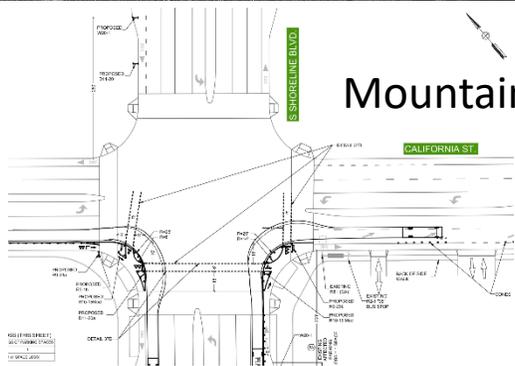
(Transit, Active Transportation, Congestions Management, Funding)

Greenway Stimulus Board Member

(Labor, Materials, Intersections, Equity, Stakeholders, Foundations)



Crossroad Lab



Mountain View, CA



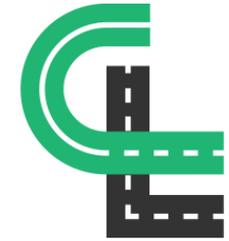
Don't Give Up at the Intersection

Designing All Ages and Abilities
Bicycle Crossings



National Association of
City Transportation Officials

May 2019



Crossroad Lab



San Jose, CA

Mountain View, CA

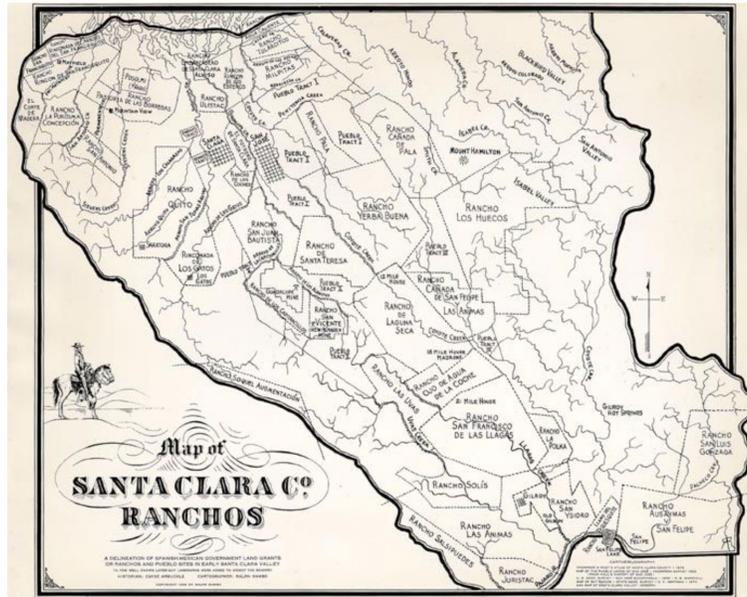


San Jose, CA

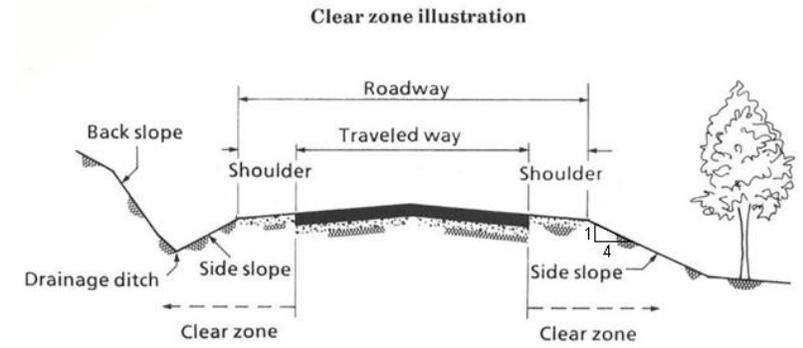




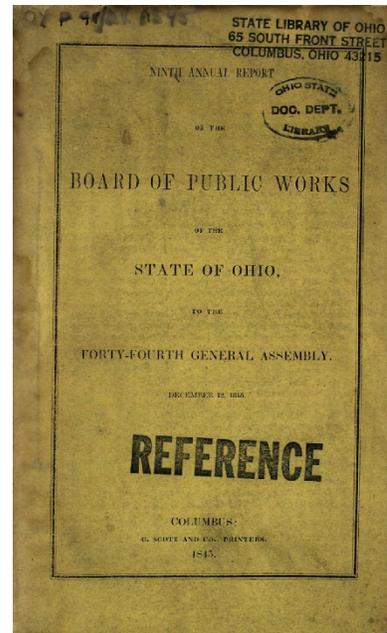
Ohlone Tribes



Santa Clara, CA



Seattle, WA



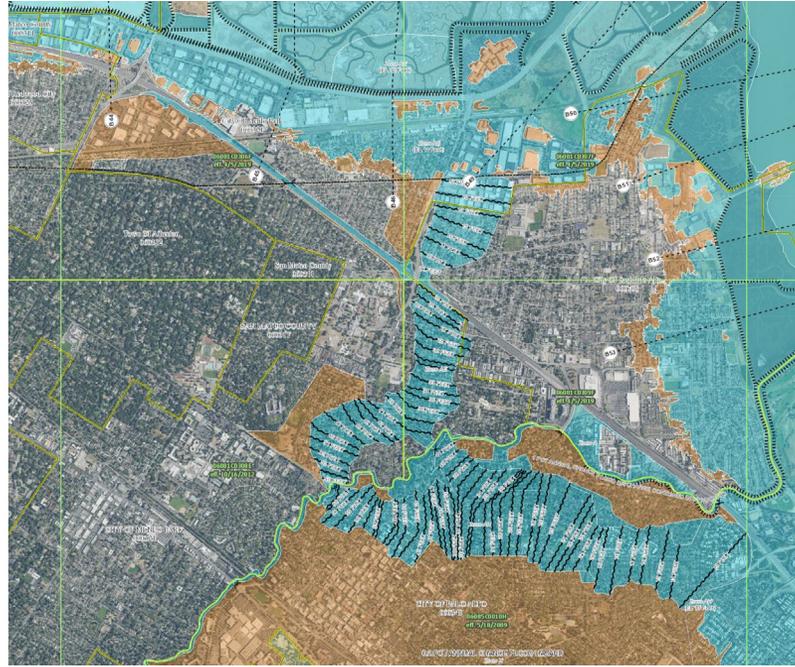
San Mateo County

Sustainable Green Streets and Parking Lots Design Guidebook

First Edition | January 2009

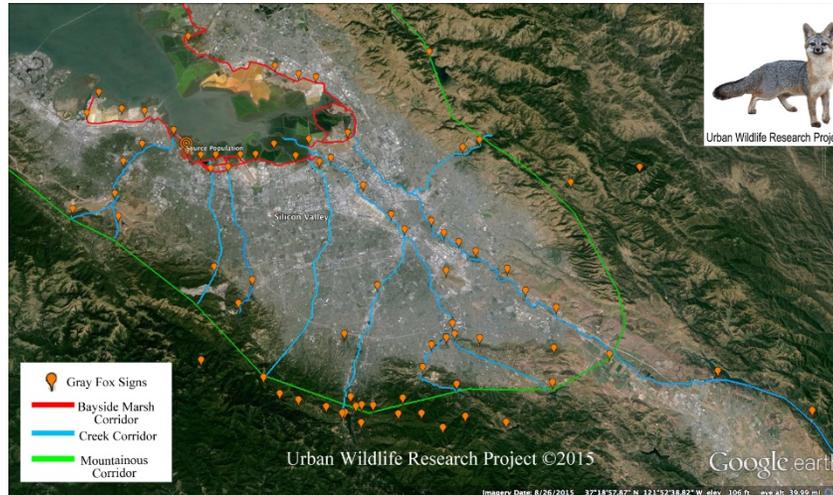


© San Mateo Countywide Water Pollution Prevention Program 2010. All rights reserved.



SHARE THE CITY WITH FLOWERS & FRIENDS

Wildlife Corridors



- Gray Fox Signs
- Bayside Marsh Corridor
- Creek Corridor
- Mountainous Corridor

Urban Wildlife Research Project ©2015

Google earth



Stevens Creek Trail



From Pop-Up to Permanent



DEMONSTATION San Jose, CA



Mountain View, CA

Fremont, CA

PILOT PROJECT

San Jose, CA (New Bart Station)



INTERIM DESIGN



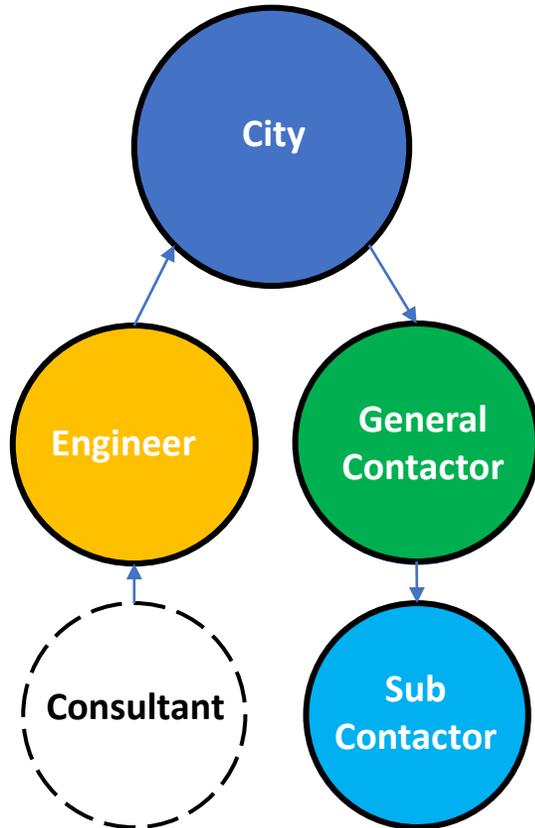
PERMANENT INSTALLATION



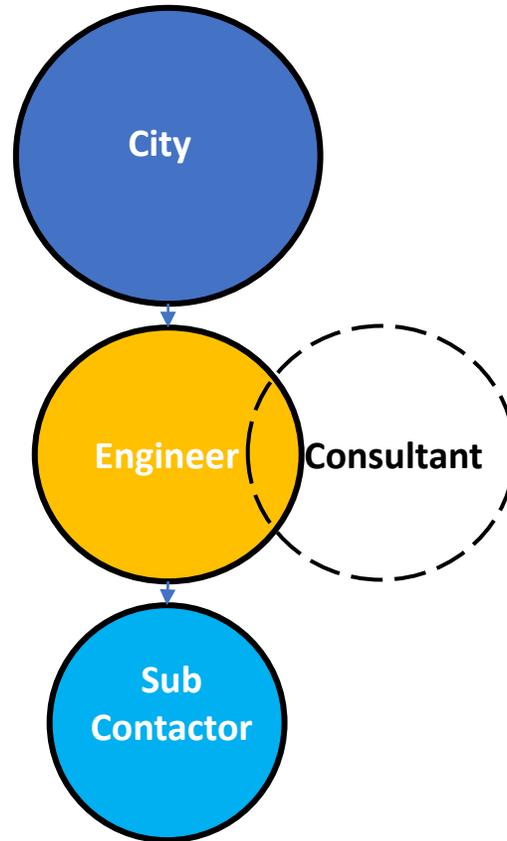
PERMANENT INSTALLATION

Project Delivery Methods

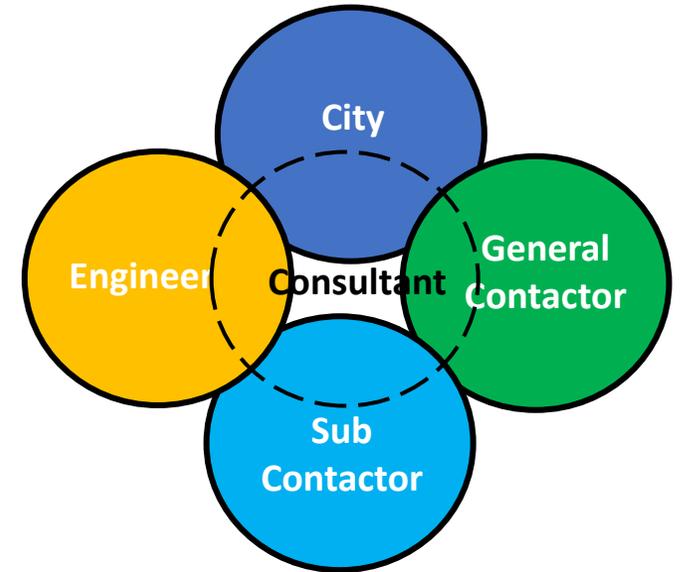
Design-Bid-Build



Design-Build



Integrated Project Delivery



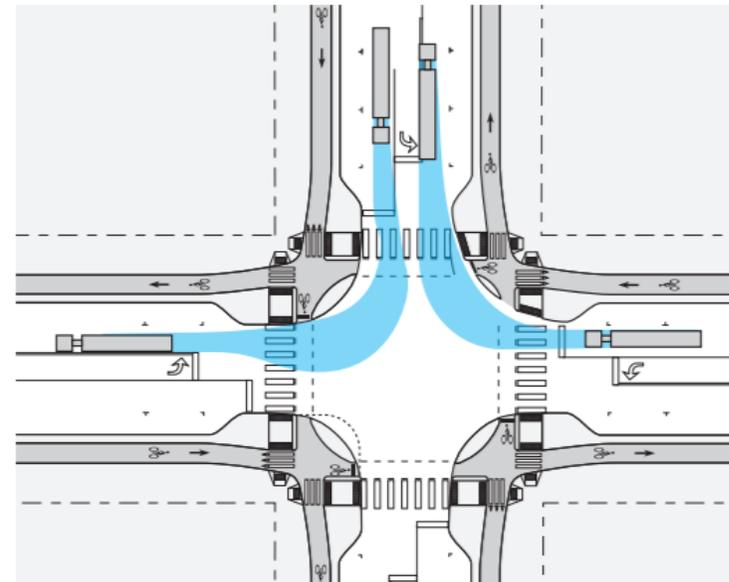
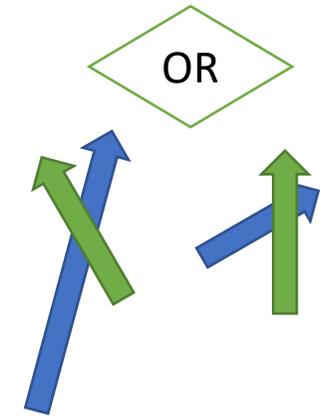
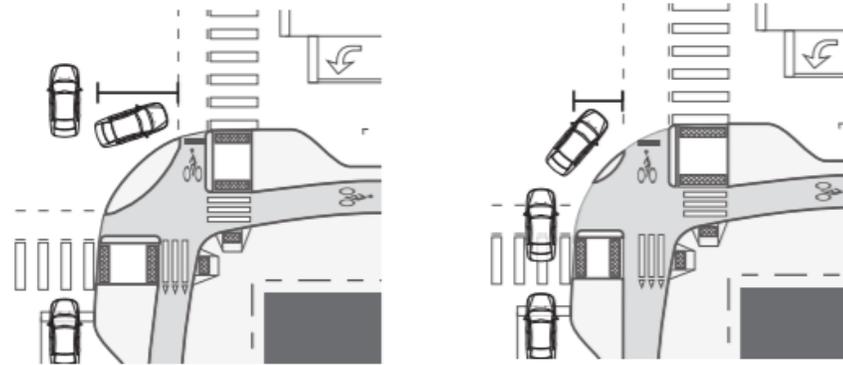
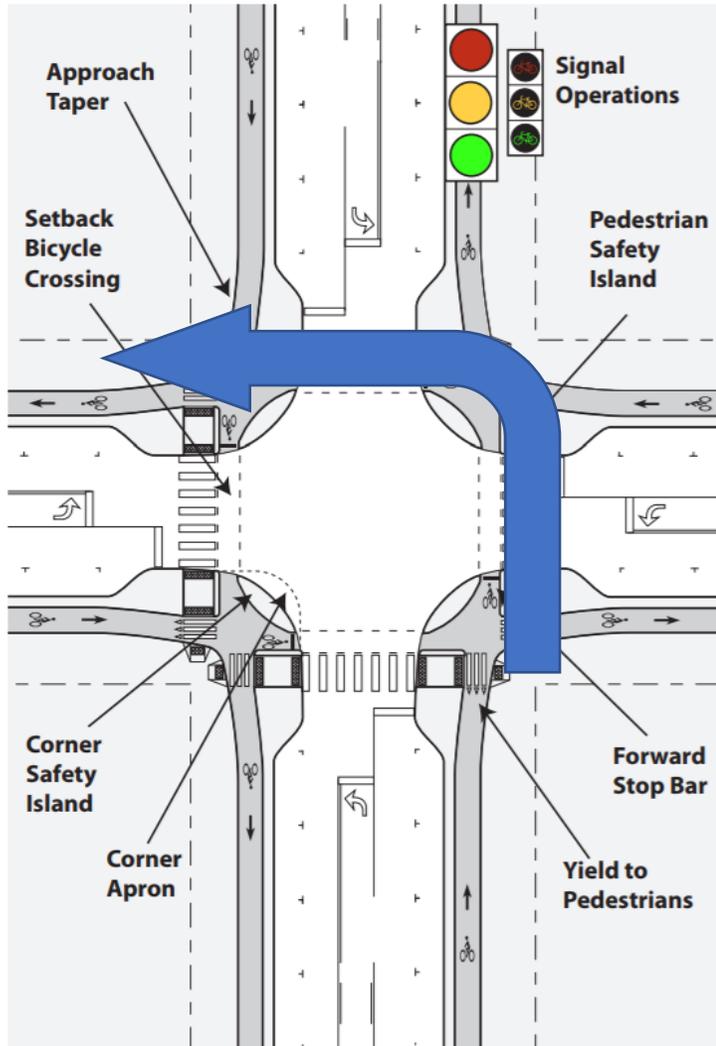
100%

Percent Design Complete When the Contractors are Engaged

0%

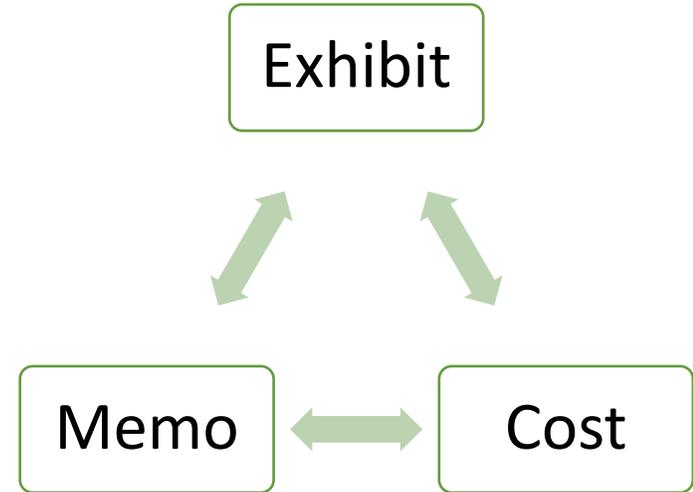
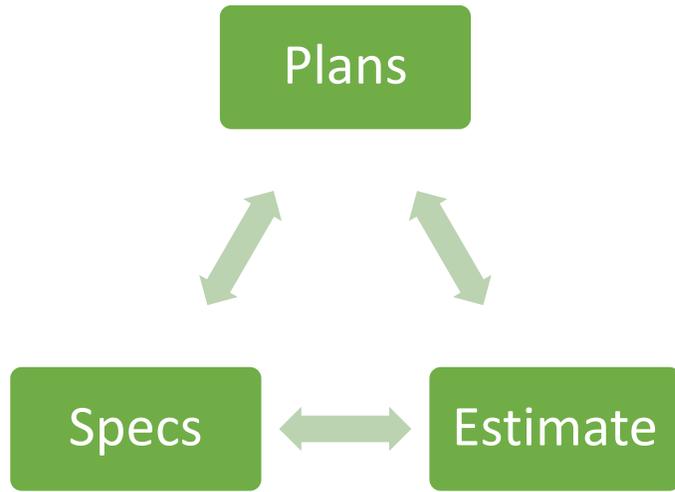


Protected Intersections

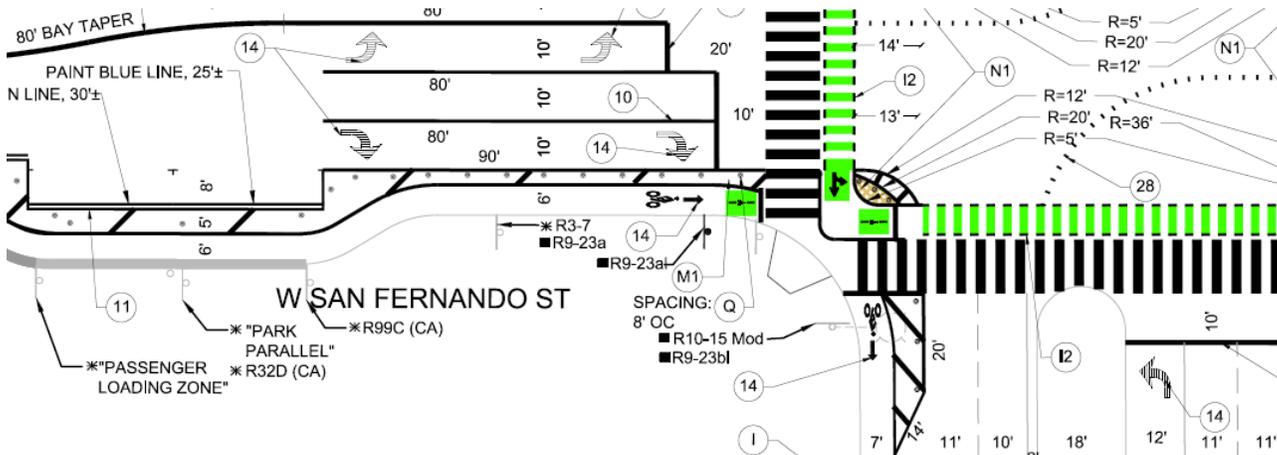


Alta: Evolution of the Protected Intersection

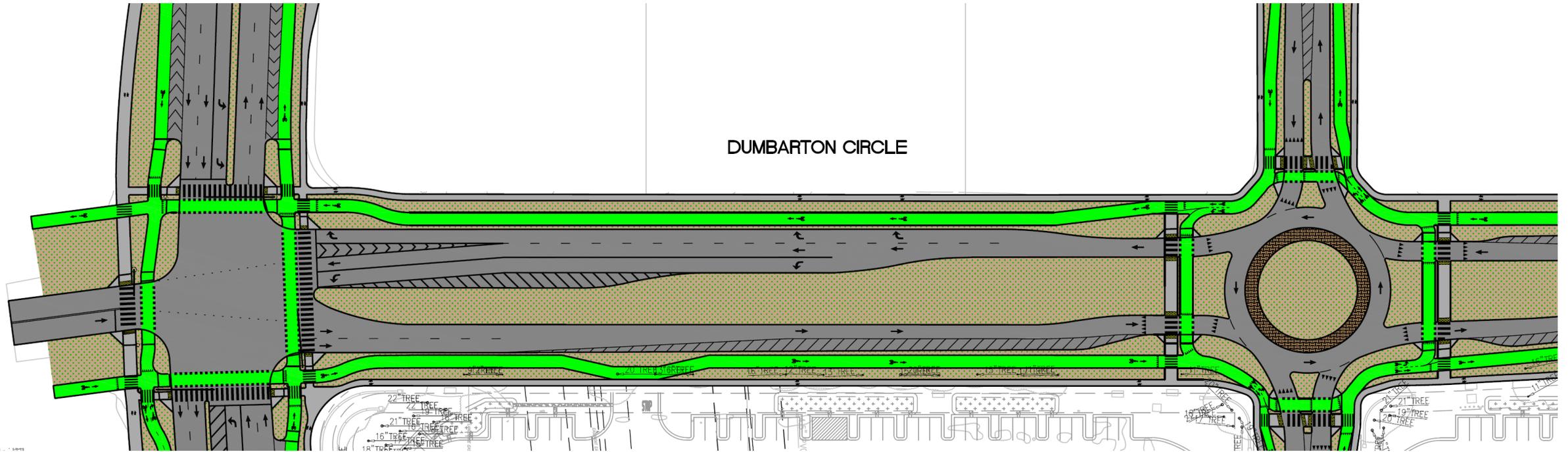
Communication in Engineering



San Jose, CA



Exhibit

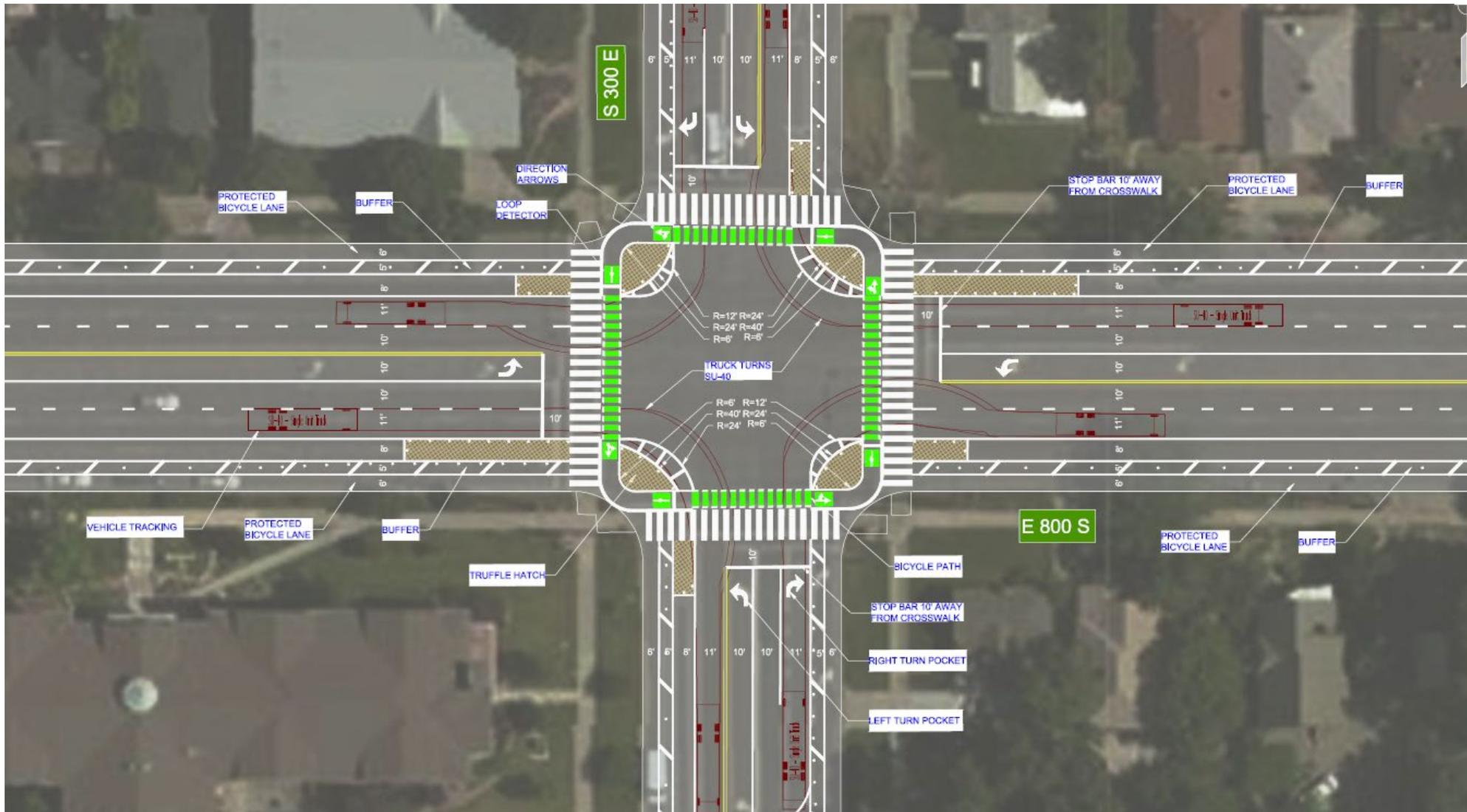


Fremont, CA



Crossroad Lab

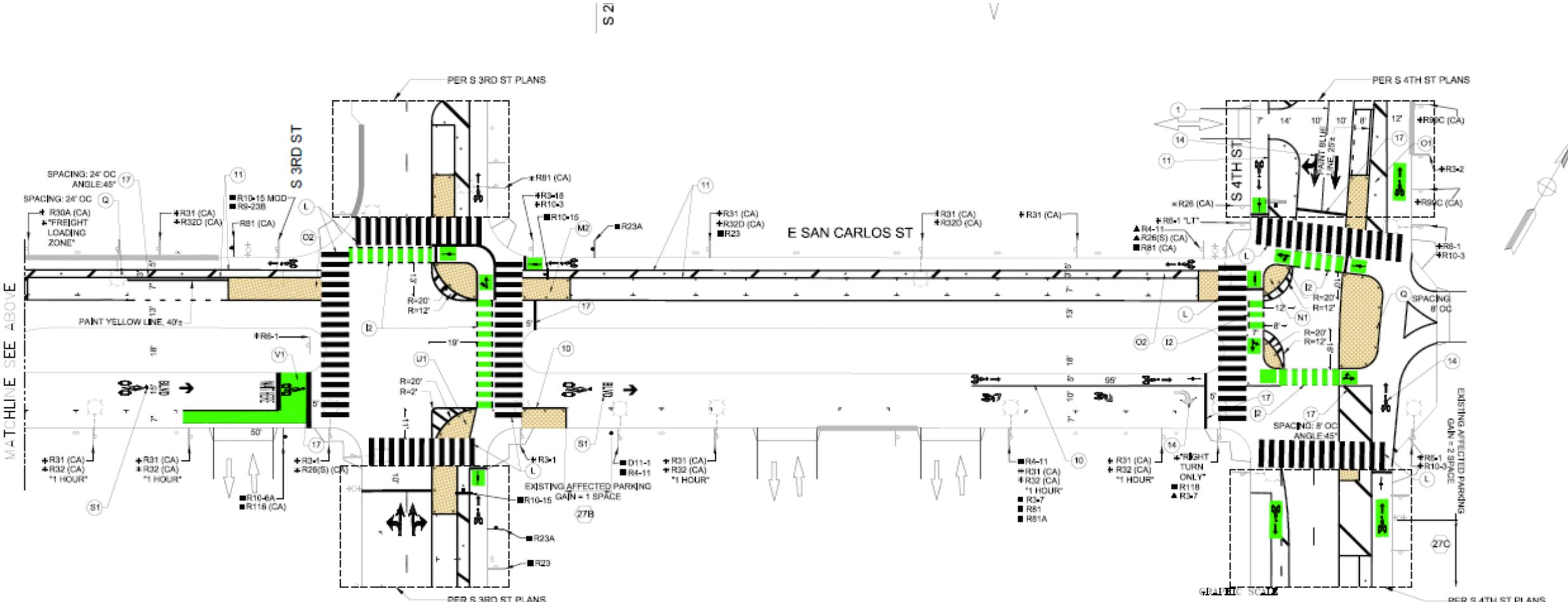
Exhibit



Salt Lake City, UT



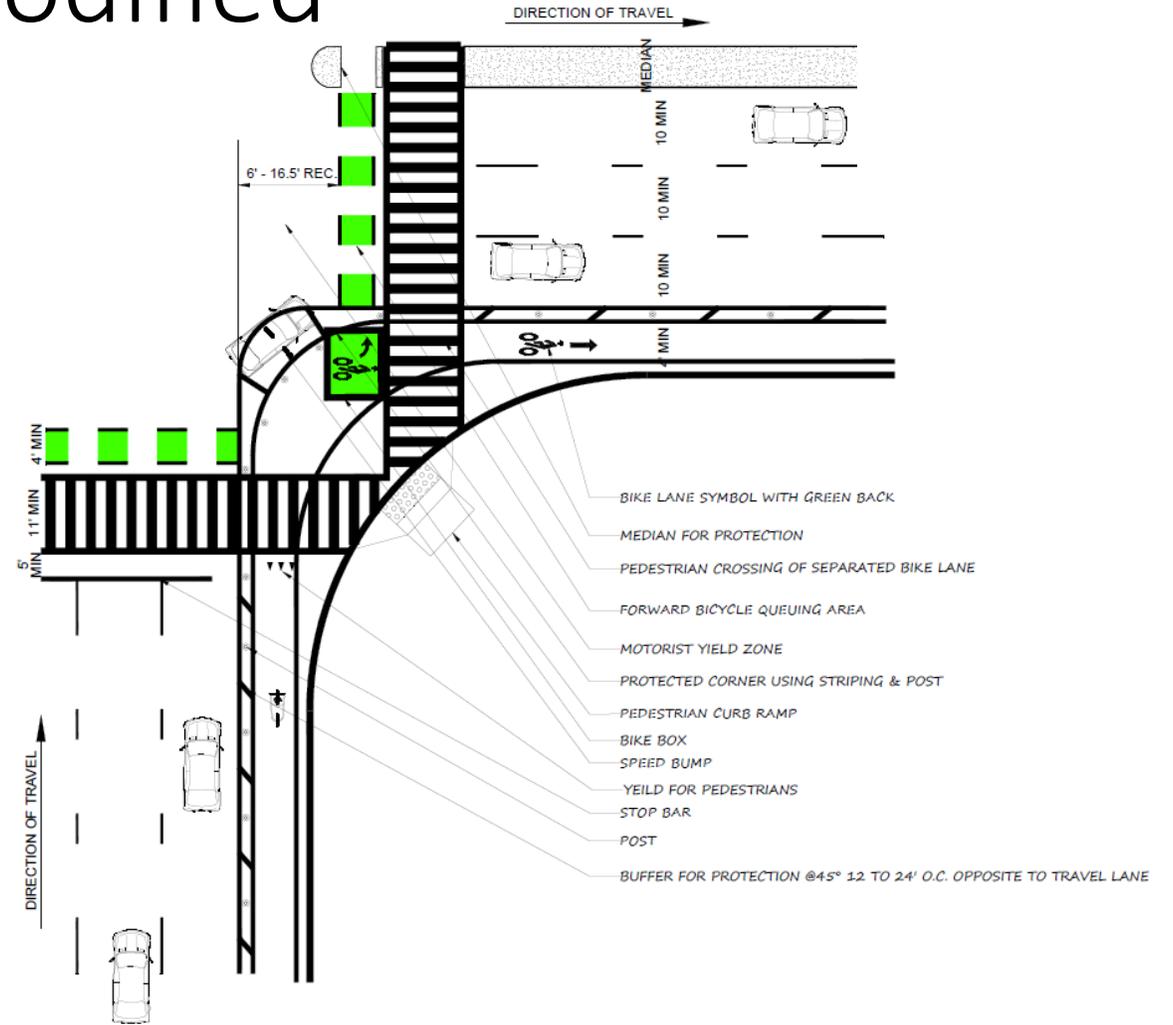
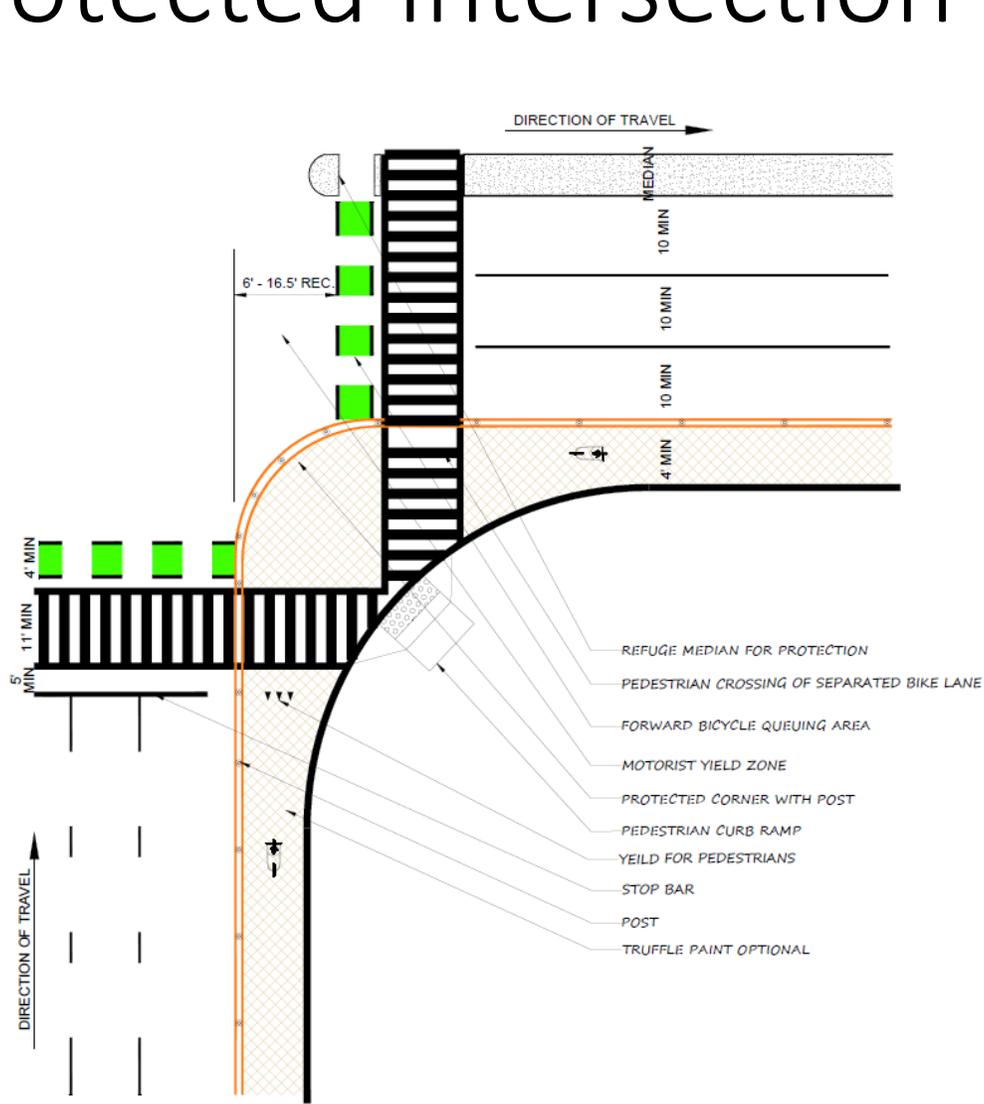
Plans



San Jose, CA



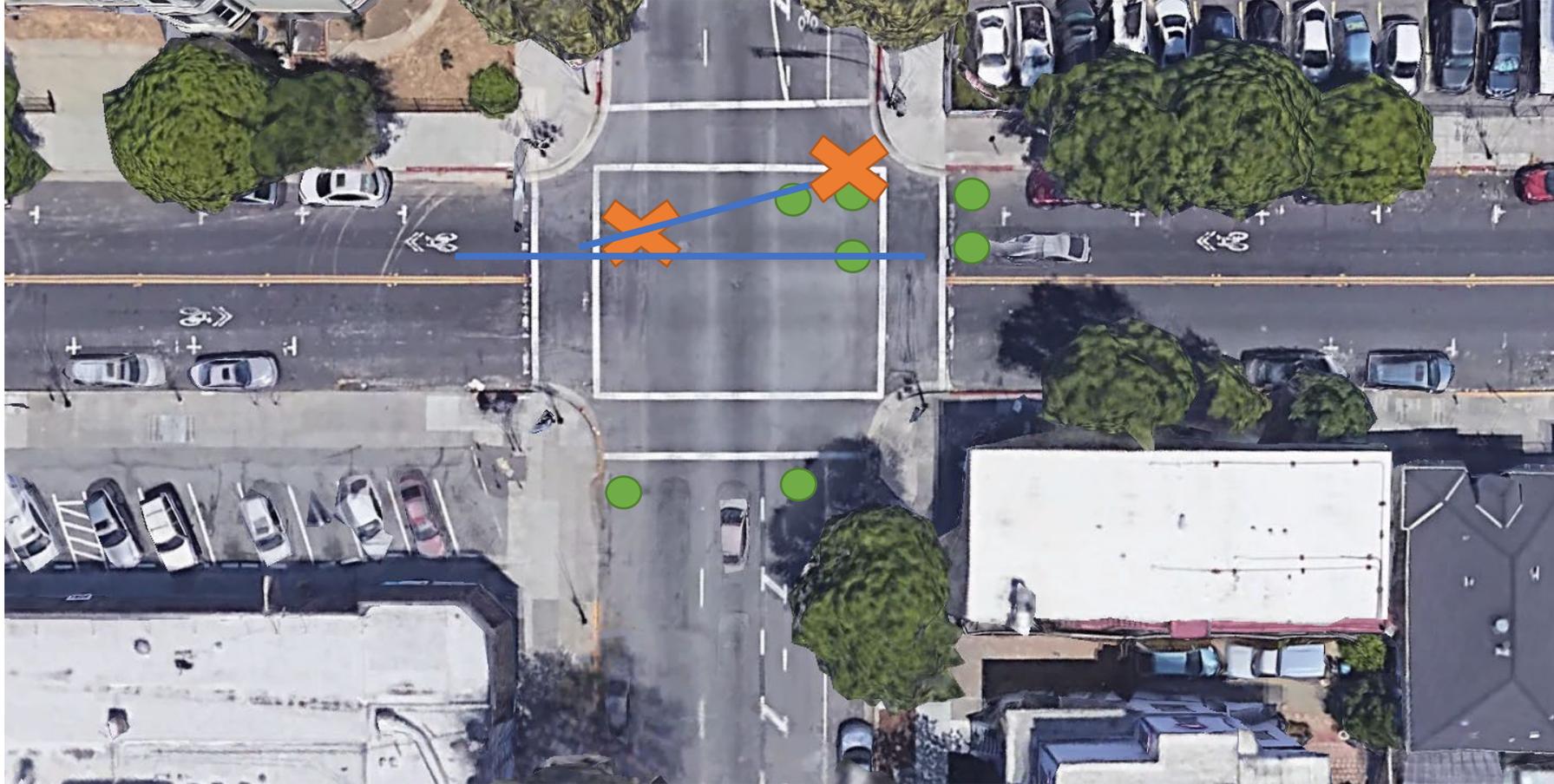
Protected Intersection Modified





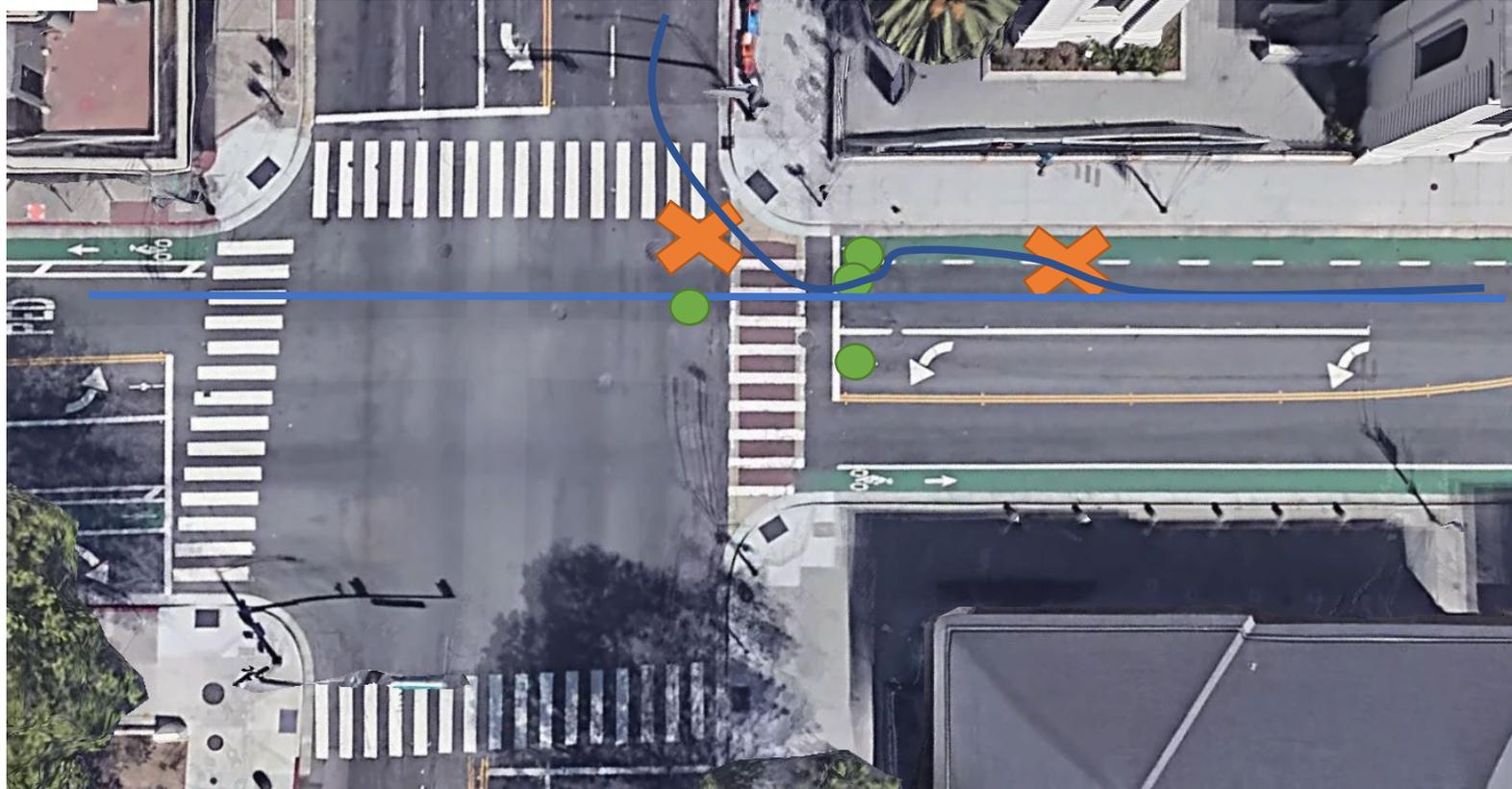
San Jose, CA

Bike Route Approach



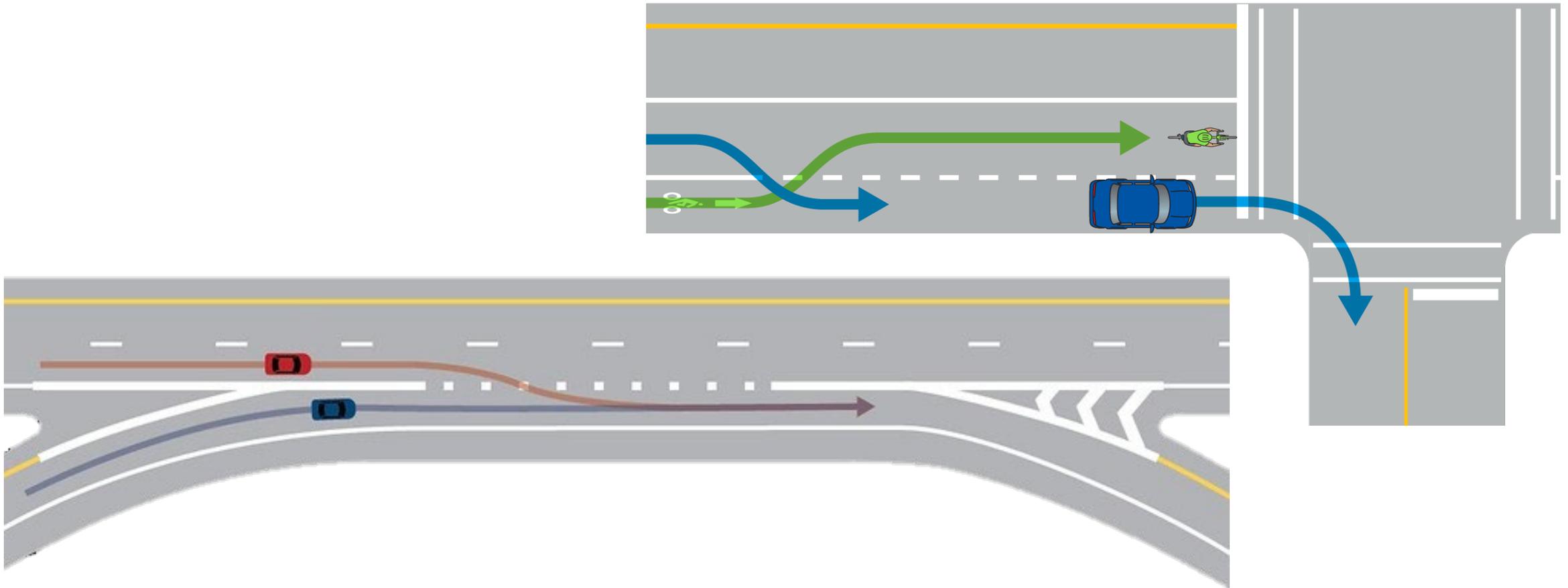
San Jose, CA

Bike Lane Approach

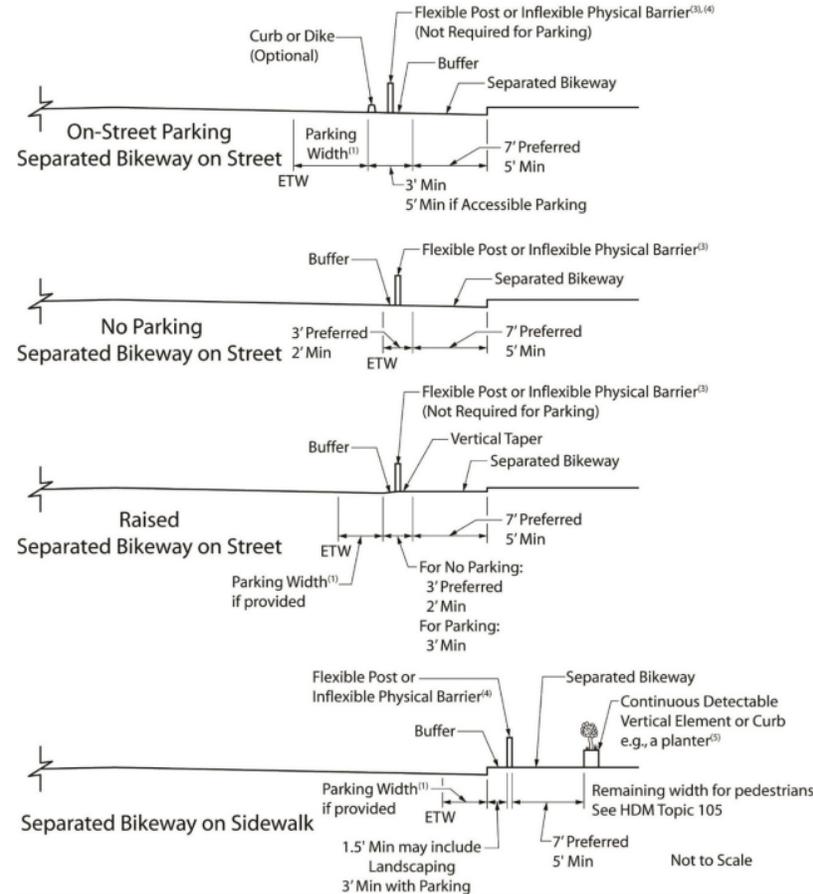


San Jose, CA

Intersection weaving and Speed Differential

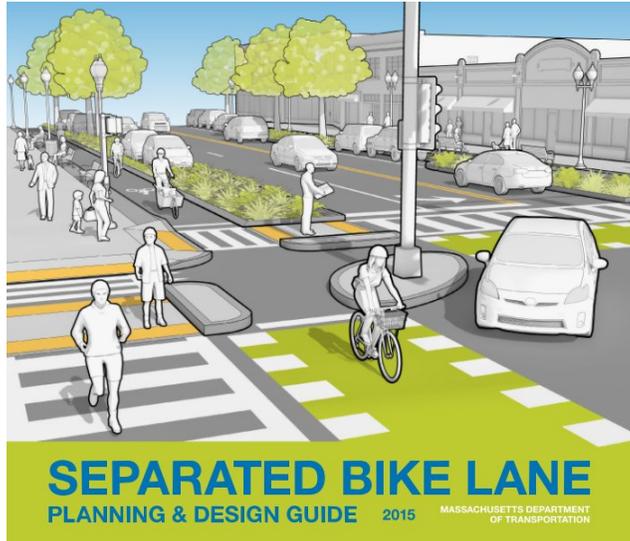


Typical Class IV Bikeway (Separated Bikeway) Cross Sections



NOTES:

- (1) See CA MUTCD Section 3B.19 for parking guidance.
- (2) For separated bikeway marking and signing guidance, see the CA MUTCD Part 9.
- (3) May be a raised island in lieu of flexible posts or inflexible physical barriers.
- (4) Flexible posts or inflexible physical barriers may be omitted.
- (5) Periodic openings should be provided for bicyclists to access buildings.





Incorporating On-Road Bicycle Networks into Resurfacing Projects




U.S. Department of Transportation
Federal Highway Administration

MARCH 2016



Don't Give Up at the Intersection

Designing All Ages and Abilities
Bicycle Crossings

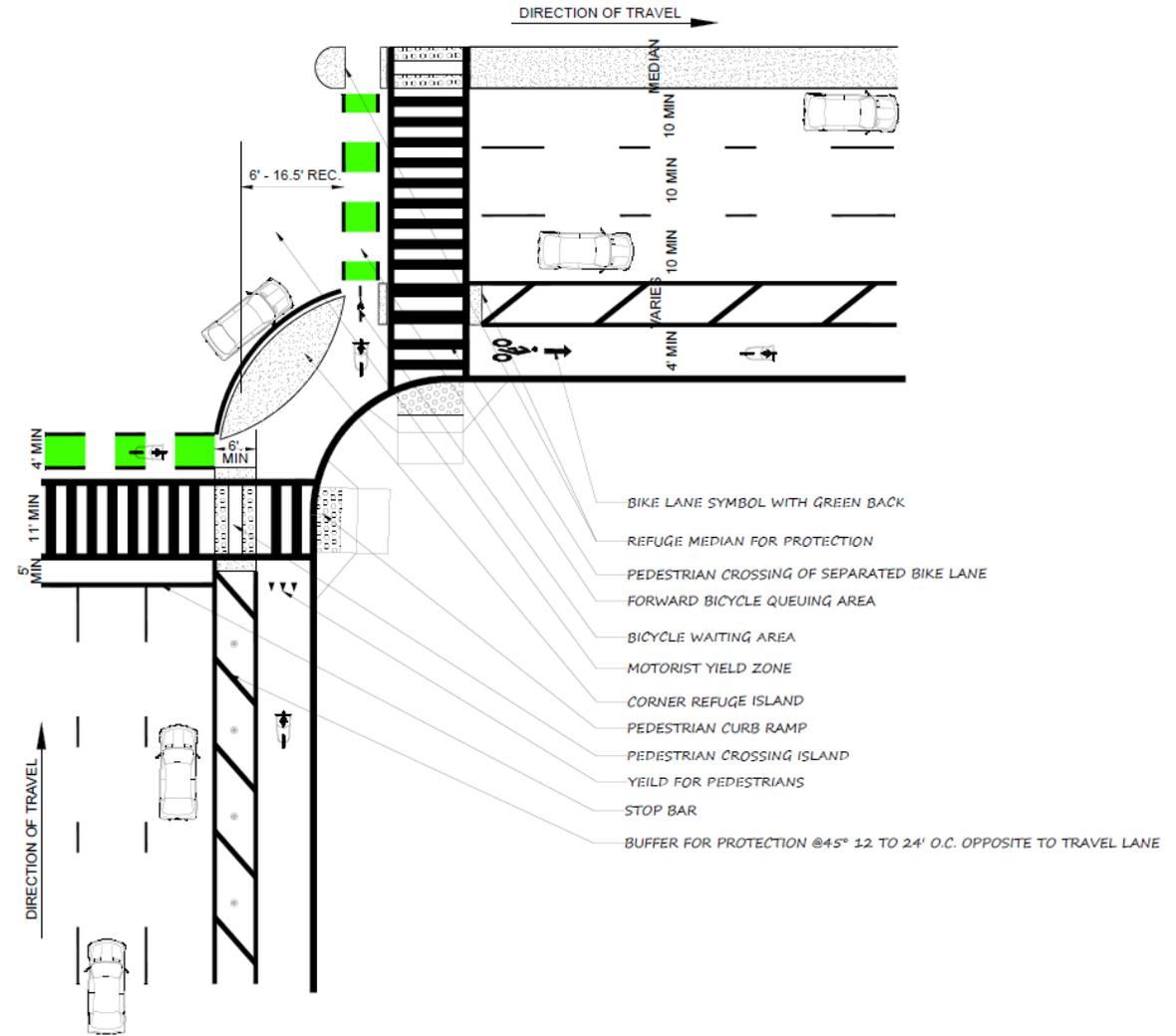
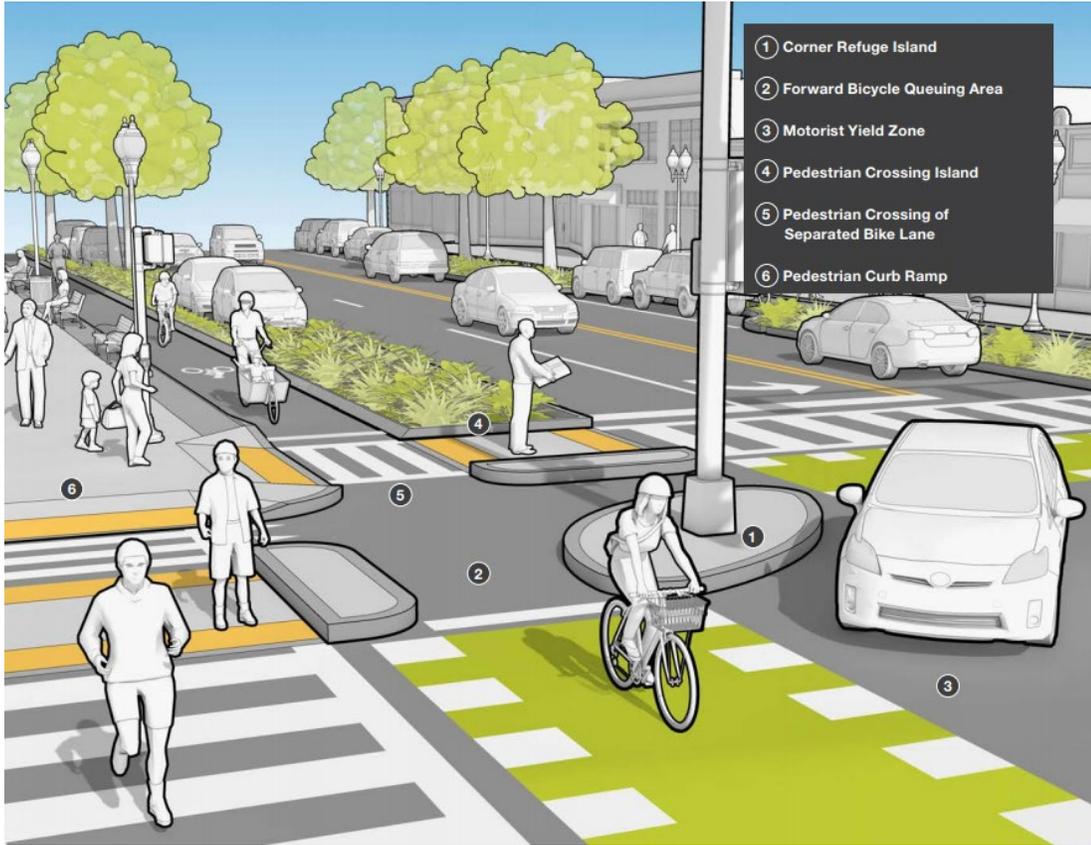


 **NACTO**
National Association of
City Transportation Officials

May 2019



Crossroad Lab



MASS DOT Separated Bikeway Guidance

Protected Intersections

No Stopping / No Standing Zone

Motor vehicle parking and stopping are prohibited on the approach to the intersection.

Pedestrian Islands

Islands reduce crossing distances and improve visibility by keeping the intersection clear. Wider islands support high volumes of people walking and biking, raising the capacity of the intersection. In some cases, islands can reduce the signal time needed for pedestrians.

Bikeway Setback

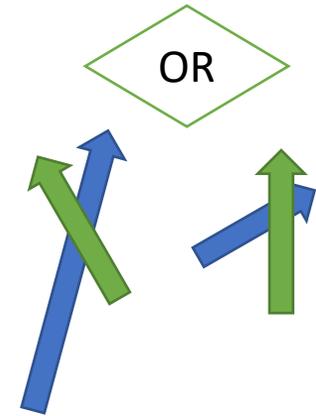
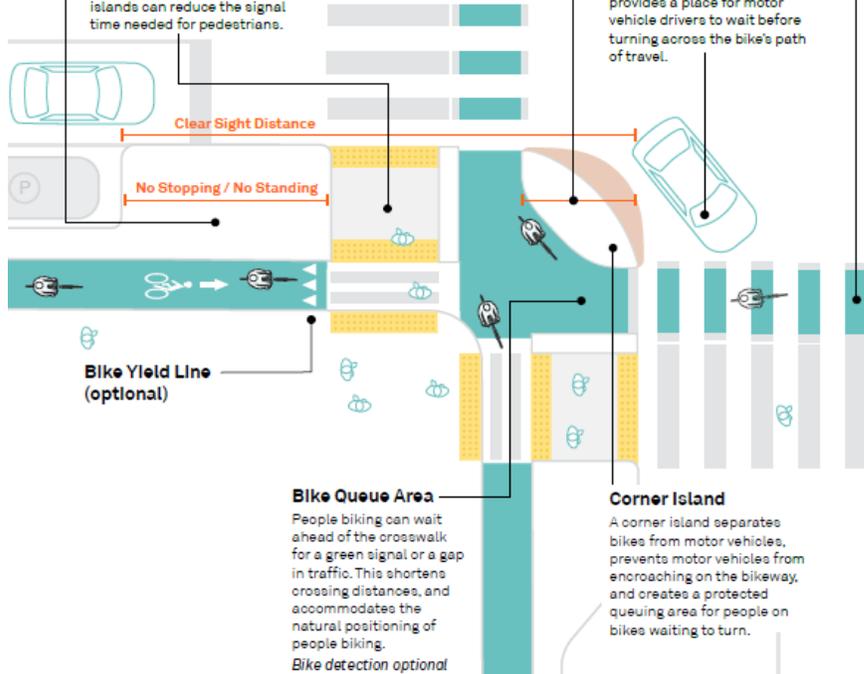
The setback determines how much room will be available for drivers to wait and yield, and the angle at which they cross the bikeway. Larger setbacks provide better visibility and give people bicycling more time to notice and react to turning vehicles.

Crossbikes / Intersection Crossing Markings

Markings provide conspicuity and directional guidance to bikes in the intersection. They are marked with dotted bicycle lane line extensions and may be supplemented with green color or bike symbols between these lines.¹¹

Motorist Waiting Zone

The space between the motor vehicle lane and the crossbike provides a place for motor vehicle drivers to wait before turning across the bike's path of travel.



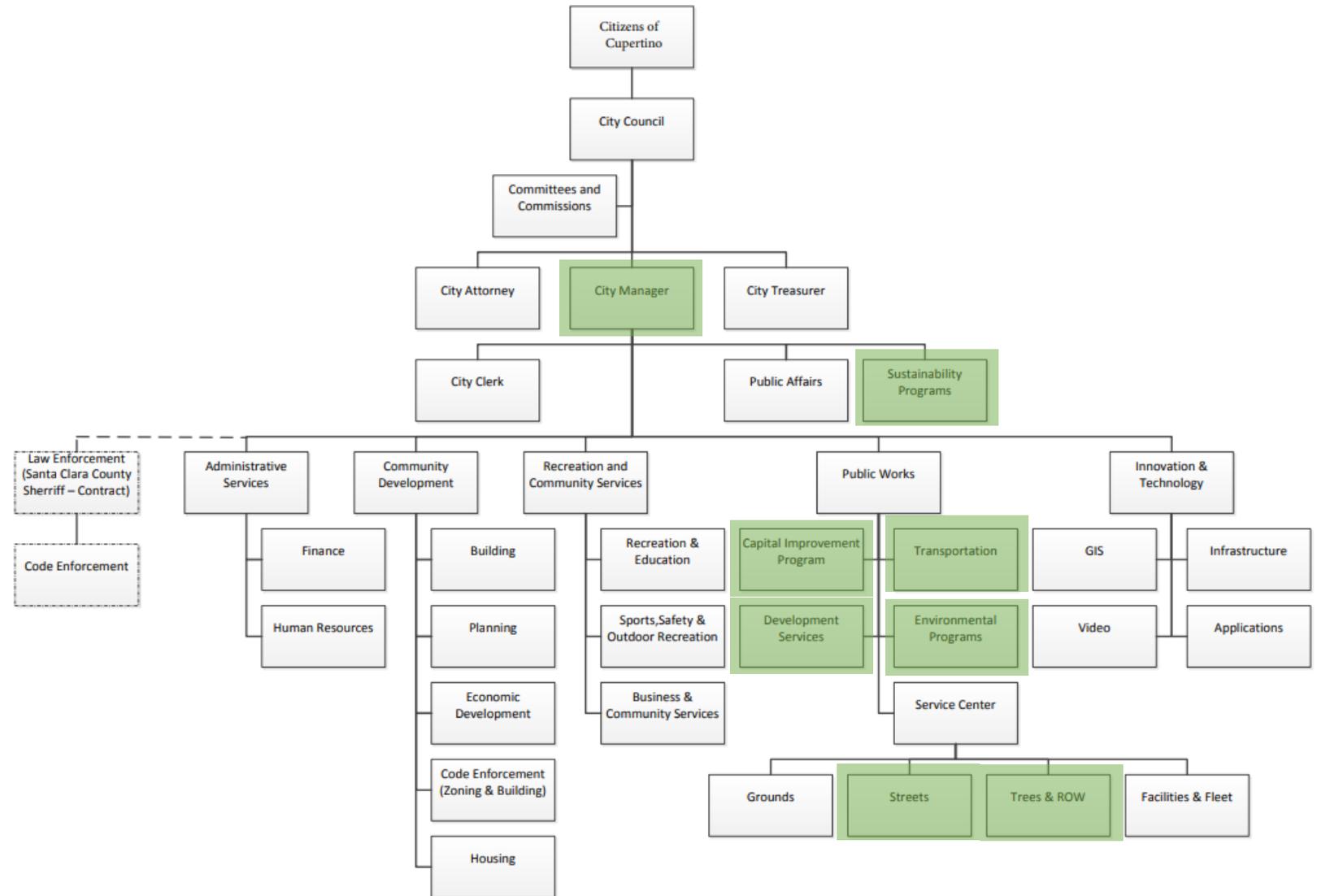
San Jose, CA



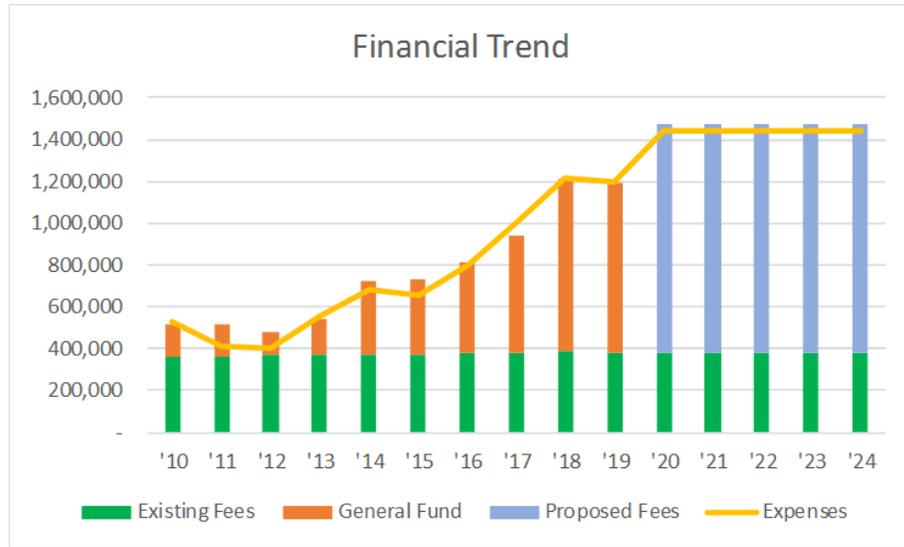
City Structure

Projects Stem From

- Grants-CIP
- Operations
- Development
- Maintenance
- Environmental
- Sustainability
- Private Sector
- Advocacy
- Work Order



Stormwater Fee – Current Best Practice



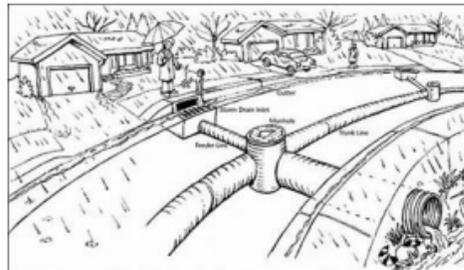
San Mateo County
Sustainable Green Streets and Parking Lots
Design Guidebook
First Edition | January 2009



City of Cupertino Stormwater Fees ~\$56 Annually

- Paving
- Street Sweeping
- Stormwater
 - ADA

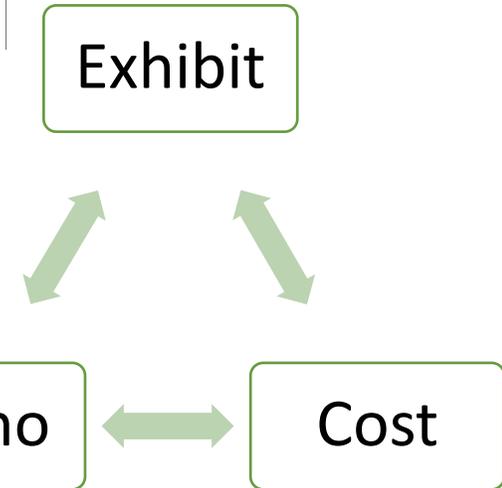
Storm Water Management Fee



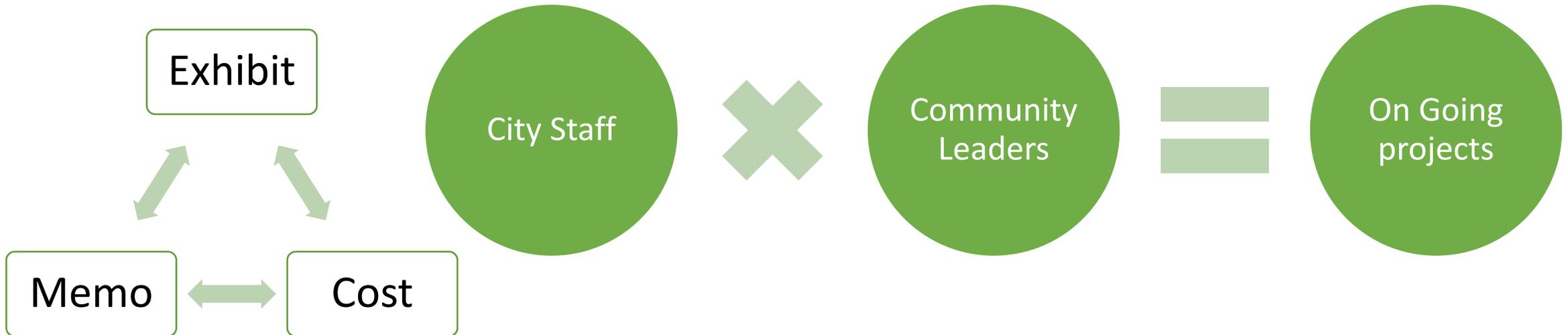
2017 Storm Water Management Fee Ballot Measure Passes

In April 2017, Palo Alto property owners voted to approve a new Storm Water Management fee that will replace the City's existing Storm Drainage fee. A typical homeowner will pay about \$13.65 per month, effective June 1, 2017.

The Storm Water Management fee will be included on the monthly utility bill and represents a 62 cent increase for a typical property. The fee was approved by approximately 64 percent of those submitted with 50 percent needed to pass.



Enable the Leaders and the Community



Enable the Leaders and the Community



Cupertino, CA



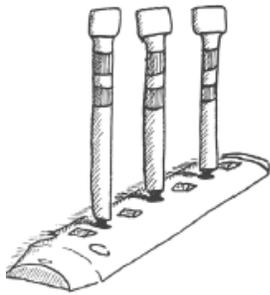
Oakland, CA



Fremont, CA



RAISED LANE SEPARATOR



Typical Dimensions: 40 in. long, 12 in. wide, 3 in. high (curb, not including posts, as shown at left).

Estimated Cost: Cost varies by retailer (Approx. \$105 - \$150 per segment + \$65 for 18 in. end cap).

Demo (1 day - 1 month) ▶ Pilot (1 month - 1 year) ▶ Interim (1 - 5 years)

Recommended Applications and Installation

- ▶ **Bikeways:** May be used to create a curb line or barrier along bikeway edge or centered within the buffer zone. Place curb segments end to end or space each 2 - 3 ft. apart. Requires minimum 12 in. horizontal width to install.
- ▶ **Roundabouts:** Place end to end in circular formation to create roundabout.
- ▶ **Parks/Trails:** If trail passes through roadway, may be used to create a curb line or barrier at edge to separate trail users from motor vehicles.

Tips and Considerations

- » Requires construction tools including rotary hammer, impact wrench, carbide tipped drill bit, and socket.
- » Section spacing can be customized for local conditions to maintain natural water drainage.
- » When used alongside bikeways, consider 27 in. posts to reduce the chances of interfering with bicycle handlebars.
- » Lightweight and easy to install, with only two connection points to the pavement, resulting in reduced labor and enhanced installation times.
- » May need to be removed seasonally to facilitate snow plowing.

Potential Sources

- » Purchase from traffic control or construction equipment suppliers.
- SOURCE:1) <http://tacticalurbanismguide.com/>
 2) <http://www.atlantaga.gov/Home/ShowDocument?id=15698>
 3) <https://www.jtitraffic.com/our-products/dura-curb/>

DURA-CURB



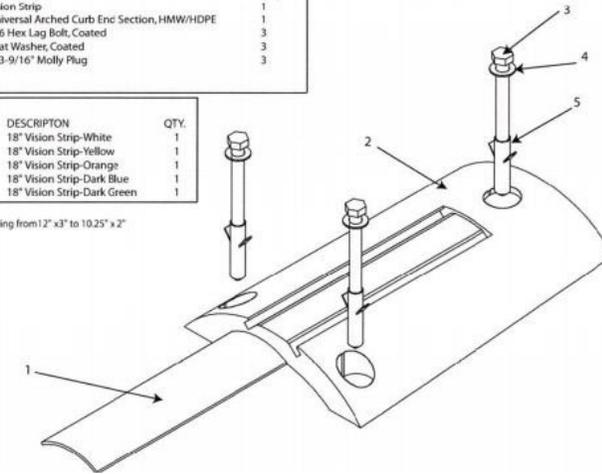
18" NOSE SECTION

Item	Part No.	Description	Req'd
1	See Table A	18" Vision Strip	1
2	352	18" Universal Arched Curb End Section, HMW/HDPE	1
3	367	5/8" x 6 Hex Lag Bolt, Coated	3
4	368	5/8" Flat Washer, Coated	3
5	369	3/4" x 3-9/16" Molly Plug	3

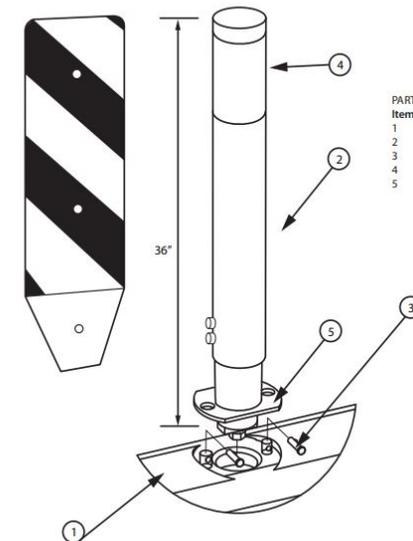
Table A	Part No.	Description	Qty.
ASSY. NO.	PART NO.	DESCRIPTION	QTY.
355-0	400	18" Vision Strip-White	1
355-1	401	18" Vision Strip-Yellow	1
355-2	402	18" Vision Strip-Orange	1
355-3	403	18" Vision Strip-Dark Blue	1
355-4	404	18" Vision Strip-Dark Green	1

Overall dimensions: 18" long, tapering from 12" x 3" to 10.25" x 2"

DRAWING NO. 2001-4737.DWG

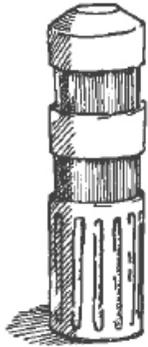


8" HAZARD MARKER DELINEATOR



Item	Qty	Description
1	1	40" Arched Dura-Curb Section
2	1	Dura-Post Assembly
3	2	Quick Pin
4	1	ReflectORIZED Material
5	1	Quick Mount Base

K-71 DELINEATOR POST



Typical Dimensions: 22 in. circumference, 33 in. high

Estimated Cost: \$91.25 / unit (including bolts). Price may decrease by ordering in bulk. Installation tools sold separately.

Overview: Large durable delineator posts that pop back up after being hit by vehicles up to 65 mph.

Demo (1 day - 1 month)

Pilot (1 month - 1 year)

► Interim (1 - 5 years)

Recommended Applications and Installation

- **Bikeways:** Center delineator within the buffer zone along the edge of the bikeway. Typical spacing is every 8 - 20 ft., depending on the thoroughfare's design speed / bikeway configuration. Allow a minimum of 2 ft. clear width for installation.
- **Median Islands:** Place approximately 2 - 3 ft. apart to demarcate median area. Provide a minimum 6 ft. break for crosswalk/pedestrian accessibility.
- **Curb Extensions:** Place along edge, approximately 1 post every 8 - 10 ft.
- **Plazas:** Place along edge of plaza area, approximately 1 post every 8 - 10 ft.
- **Roundabouts:** May be used to demarcate roundabout area, in conjunction with signs and other design elements.

Tips and Considerations

- » Requires drilling and adhesive. Materials for installation include: T-Bar; Metal Pavement Sleeves; metal reinforcement screen; adhesive; manual pump gun; and nozzles.
- » Request NTPEP certifications to ensure safety / durability.
- » May be combined with rubber curbing as barrier element.
- » Large size can help reinforce design intent and enhance cyclist comfort.
- » May need to be removed seasonal to facilitate snow plowing.
- » Available in a variety of colors;

Potential Sources

- » Purchase from traffic control or construction equipment suppliers.

SOURCE: <http://tacticalurbanismguide.com/>

Then cars, trucks, and finally, an LAFD fire truck ran over the barriers from multiple angles and speeds.

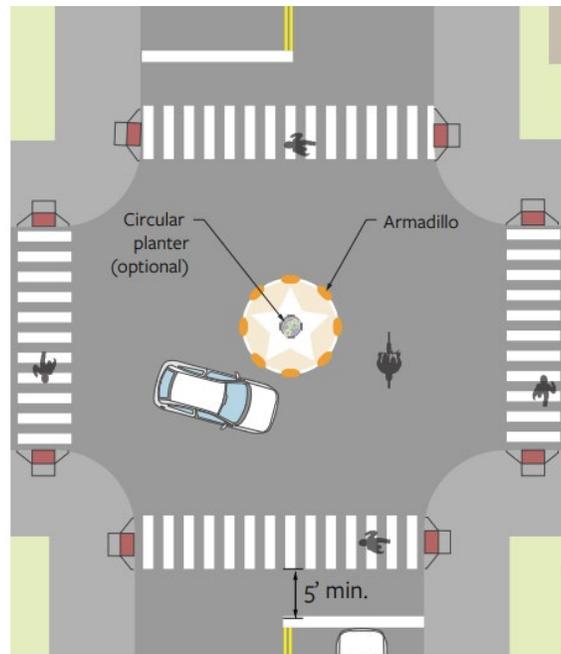
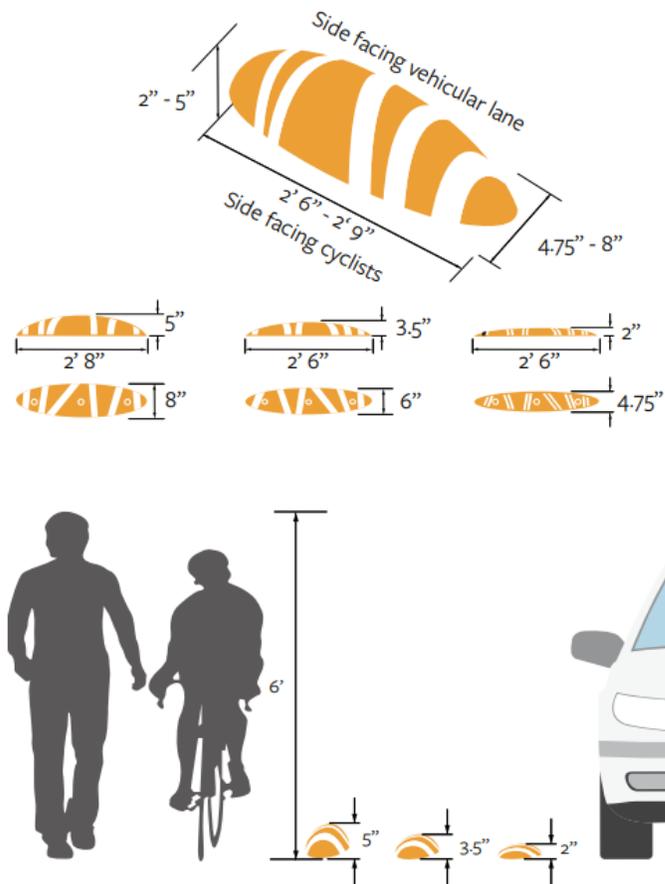


Bikeways engineer, Robert Sanchez, drives over the k71 bollards to test durability and how they withstand emergency vehicles entering and exiting the cycletrack



SOURCE: 1) <https://twitter.com/DaleMunroe/status/1134871593966981120/photo/1>
2) <https://twitter.com/srepetsk/status/1153765588348657664/photo/1>

ARMADILLO (ZICLA)



Estimated Cost: \$40 / 3" unit; \$50 / 5" unit, depending on size and quantity ordered.

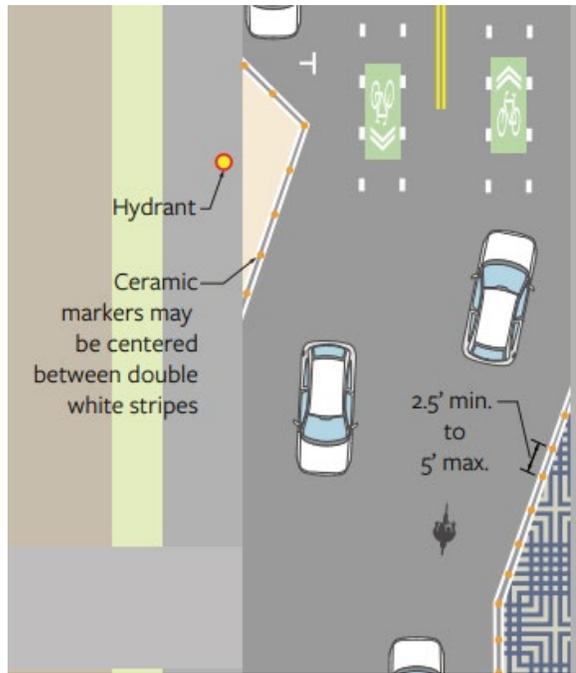
Product Details:

- Ensure placement does not obstruct accessibility.
- Mountable profile ensures emergency and city service vehicle access, and minimal / no stormwater obstruction.
- If necessary, remove for winter to facilitate snow plowing / removal; If intended for year-round use, pair with delineator posts to increase visibility for snowplow operators.
- Where aesthetics are a concern, Armadillos offer a less visually obtrusive option (compared to vertical delineator posts etc.).
- The Armadillo's low visual profile may lead to decreased safety perception for people walking or biking (compared to more vertical barrier elements like planters or delineator posts etc.).
- The reflective markings on each unit are asymmetrical; it is recommended that the side with the greater density of reflective bands face oncoming vehicular traffic.

Mini-Roundabout / Neighborhood Traffic Circles

- The Zicla Zebra system offers differing levels of mountability; Use lower profile armadillos where larger vehicles are expected to mount the center island more frequently
- Place end-to-end in a circular formation to create inner island, leaving small gaps to accommodate stormwater flow where necessary
- Accompany with appropriate MUTCD-compliant signs

CERAMIC MARKERS



Product Details:

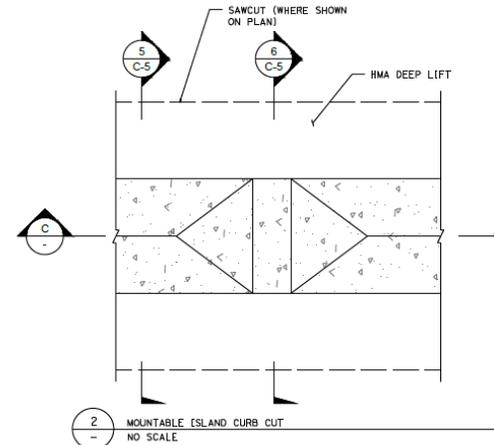
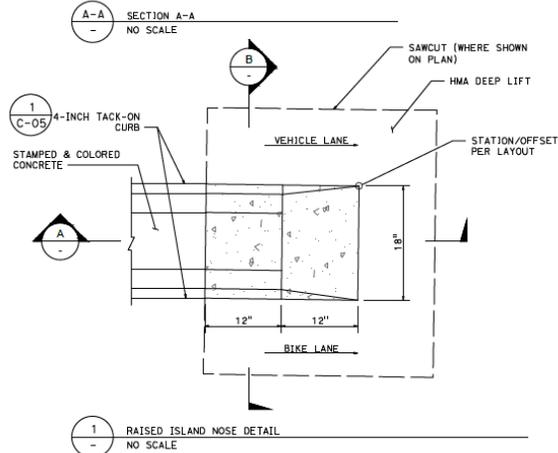
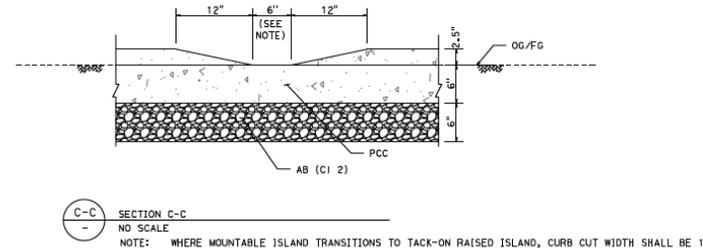
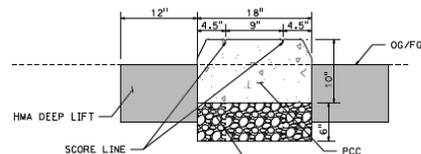
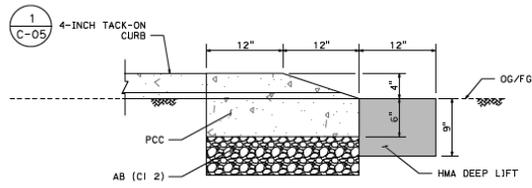
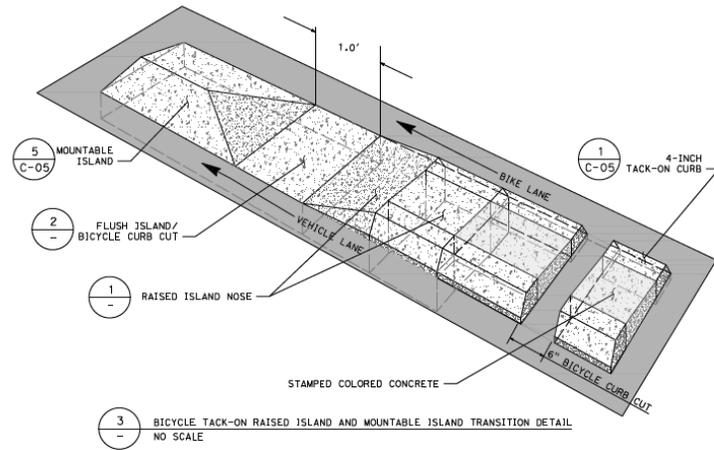
- Affix to pavement per manufacturer's specifications (see Apex or Ennis-Flint products) no more than 5' apart to discourage vehicular encroachment.
- Installation / adhesive set time will be impacted by weather and temperature.
- Markers should be allowed to fully set before sustaining any impact.
- Center or place ceramic markers along inside edge of retroreflective 4" double white stripe demarcating perimeter of the Quick Build project element (curb extension, pedestrian plaza etc.)
- Reflective and non-reflective ceramic markers are available; reflective ceramic markers are strongly encouraged.
- Ceramic markers are fully mountable and may especially appropriate where emergency vehicle need access, such as along curb extensions or pinch point.
- Ceramic markers should be used in conjunction with other vertical elements (such as circular or rectangular planters, delineator post, K-71 bollards etc.) where physical protection is required.
- For use only along low-volume streets only (3,000 ADT or less)

SOURCE:1) https://www.burlingtonvt.gov/sites/default/files/QUICK_BUILD%20GUIDE_0.pdf

2) <http://tacticalurbanismguide.com/>

3) https://safety.fhwa.dot.gov/speedmgt/ePrimer_modules/module3.cfm

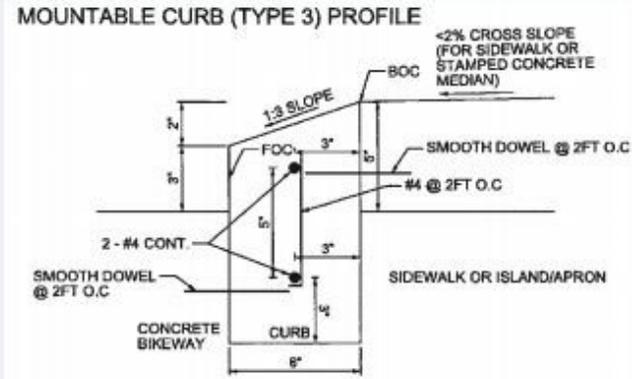
CONCRETE



FIRE TRUCK RELATED CONCERNS



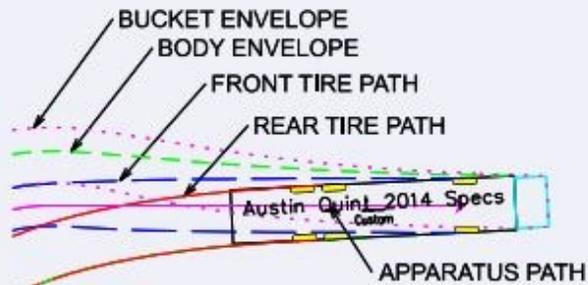
Austin Fire Department "Quint" testing a mountable curb profile. Photo: City of Austin.



The mountable curb features a 3 inch (75 mm) vertical rise followed by a further 2 inch (50 mm) over 6 inch (150 mm) run for a 1:3 slope. Image: City of Austin.



A more recent implementation of a protected intersection corner that is mountable only to fire trucks. The color helps distinguish this corner to other drivers so as not to hit it.



Design Variables

This section explores the various types of corner treatments that have been deployed around North America and classifies them by similar traits.

Type of Accommodation for Design and Control Vehicle

SINGLE RADIUS WITH MOUNTABLE ZONE

This group features a single curb line that is intended to be usable for the vast majority of vehicles (design and managed). Only very infrequent control vehicles (such as fire trucks) are expected to mount the curbs, which are designed to allow mounting by larger vehicles while strongly deterring smaller vehicles. There is no secondary curbline or path defined for the control vehicle. City experience has shown that the mountable zone must be tall enough to deter most drivers from using it. Corners built lower have not been effective at minimizing unnecessary vehicle encroachment.



Examples of a mountable zone include:



Atlanta, GA



Austin, TX



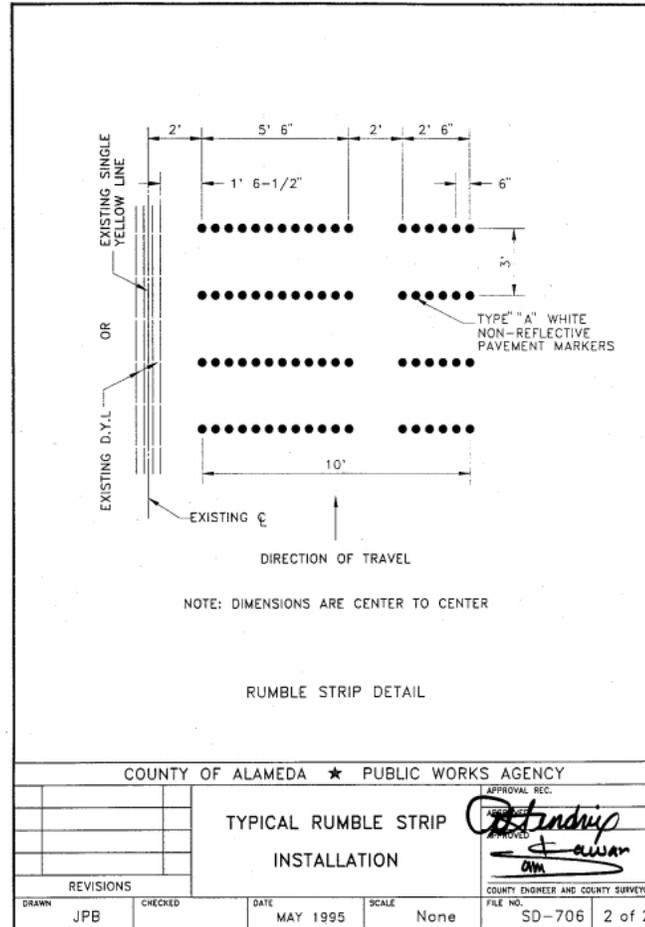
Salt Lake City, UT

Vertical separation

RUBY LAKE GLASS (\$17 SF)



ALAMEDA RUMBLE (\$80)



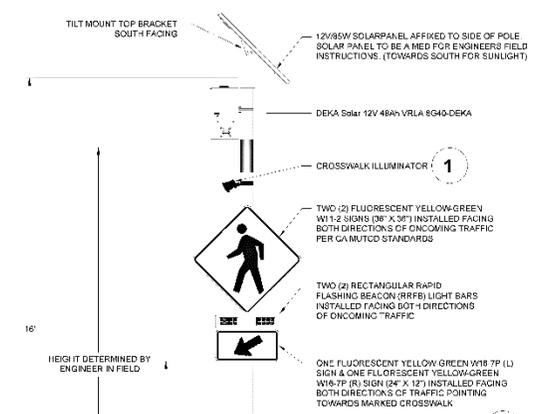
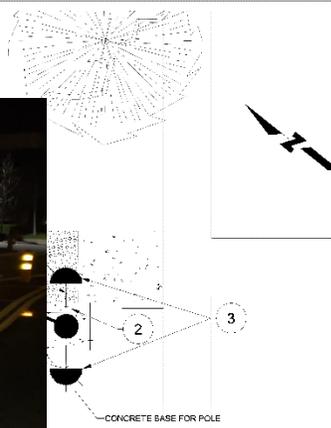
3M ROADWAY TAPE (\$1.5/LF)

THERMOPLASTIC (\$14 SF)



WATER BARRIERS \$350

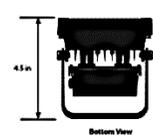
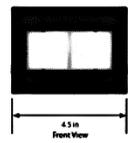




FEATURES AND BENEFITS

Increase pedestrian visibility at poorly lit, two-lane crossings with the SafeWalk™ Crosswalk Illuminator – a simple safety enhancement to TAPCO Pedestrian Crosswalk Systems.

- Flood light illuminates the approach area of the crosswalk
- Beam light projects outward, illuminating the middle of the crosswalk
- Activates concurrently with LED-enhanced warning alerts
- Adjustable brackets allow for precise light focus at most crossings
- Rugged enclosure to withstand weather and surrounding environment



2 APS PUSH BU NOT TO SCALE



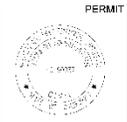
SPECIFICATIONS

POWER INPUT	12VDC
POWER CONSUMPTION	700mA to 1.4A
LIGHT DISTANCE	6 by 15 feet per illuminator
INSTALLATION HEIGHT	12 to 15 feet
HOUSING	Aluminum and weather resistant polycarbonate
OPERATING TEMPERATURE RANGE	-40°F to 176°F (-40°C to 80°C)

1 CROSSWALK ILLUMINATOR NOT TO SCALE



No.	DATE	REVISION	BY	APPD	VIGNESH SWAMINATHAN P.E.
					Vignesh@crosroadlab.com
					10496 RYRNF AVE CUPERTINO, CA 95014 www.CrosroadLab.com Cell US: +415-827-8948 info@crosroadlab.com



APPROVED – PRINCIPAL ENGINEER

UNCONTROLLED CROSS WALK
RRFB INSTALLATION & POLE DETAILS
Not for Construction
PUBLIC WORKS DEPARTMENT

DATE: MM/DD/YYYY RECOMMENDED – PROJECT MANAGER

CITY PROJECT: SCALE: AS SHOWN DRAWING:

FEDERAL PROJECT:

DESIGNED BY: VIGNESH S. CHECKED BY: VIGNESH S.

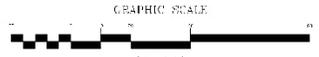
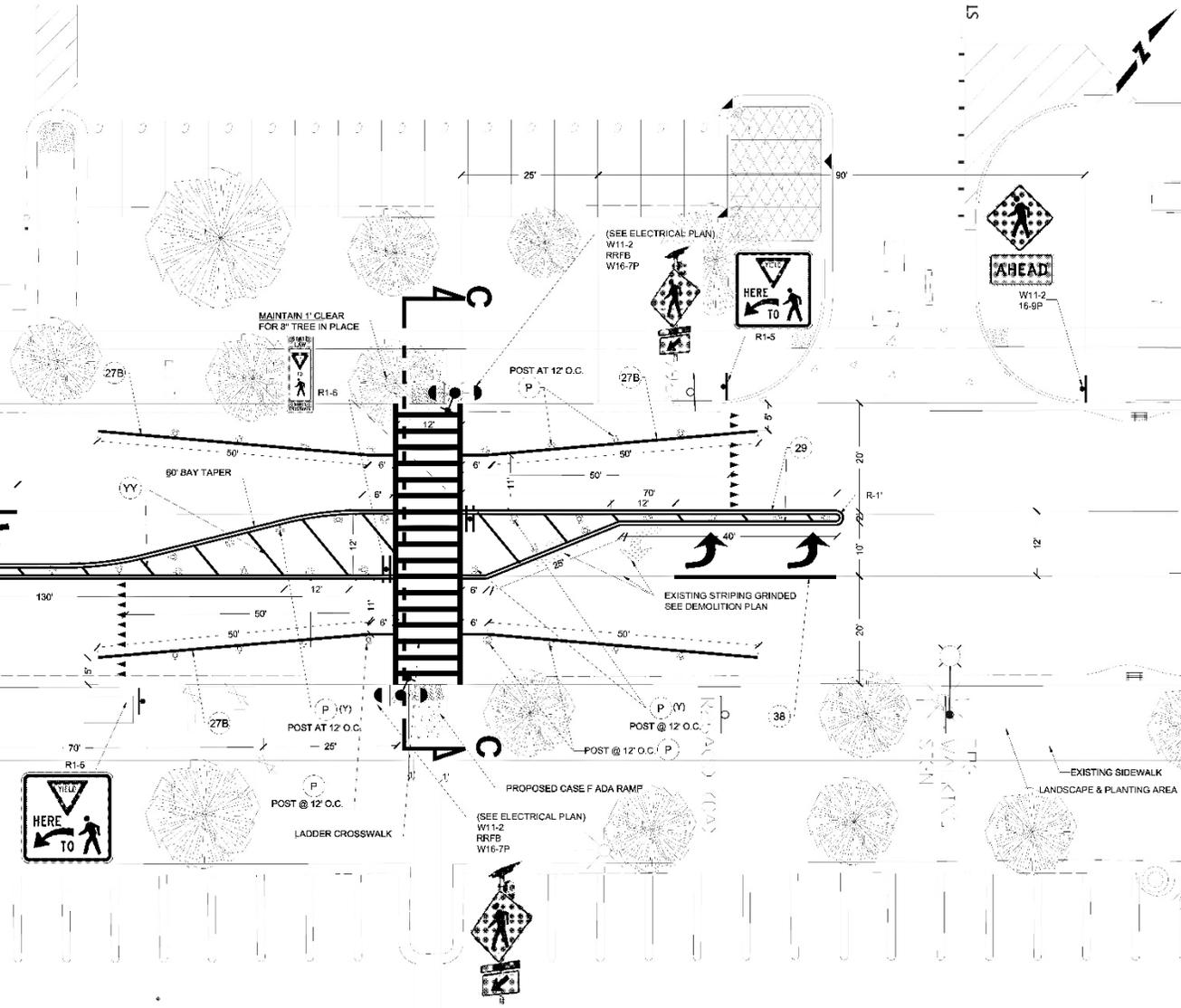
DRAWN BY: A.SIDDIQUE DATE: 03 FEB 2020

NOTE: VERIFY SCALE. BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES ACCORDINGLY IF BAR IS NOT ONE INCH.

EL-01

SHEET 06 OF 06

Fremont, CA



No.	DATE	REVISION	BY: APPD VIGNESH SWAMINATHAN P.E. Vignesh@crosroadlab.com	PERMIT 	UNCONTROLLED CROSSWALK STRIPING & SIGNAGE PLAN Not for Construction PUBLIC WORKS DEPARTMENT	CITY PROJECT:	SCALE: AS SHOWN	DRAWING	
									10496 BYRNE AVE CUPERTINO, CA 95014 www.CrosroadLab.com Call Us: +08-827-6440 info@crosroadlab.com Crosroad Lab



Crossroad Lab

Quick-Build Questions?

Vignesh@crossroadlab.com

Vignesh Swaminathan

Crossroadlab.com