

# Caltrain Grade Separation Feasibility Study

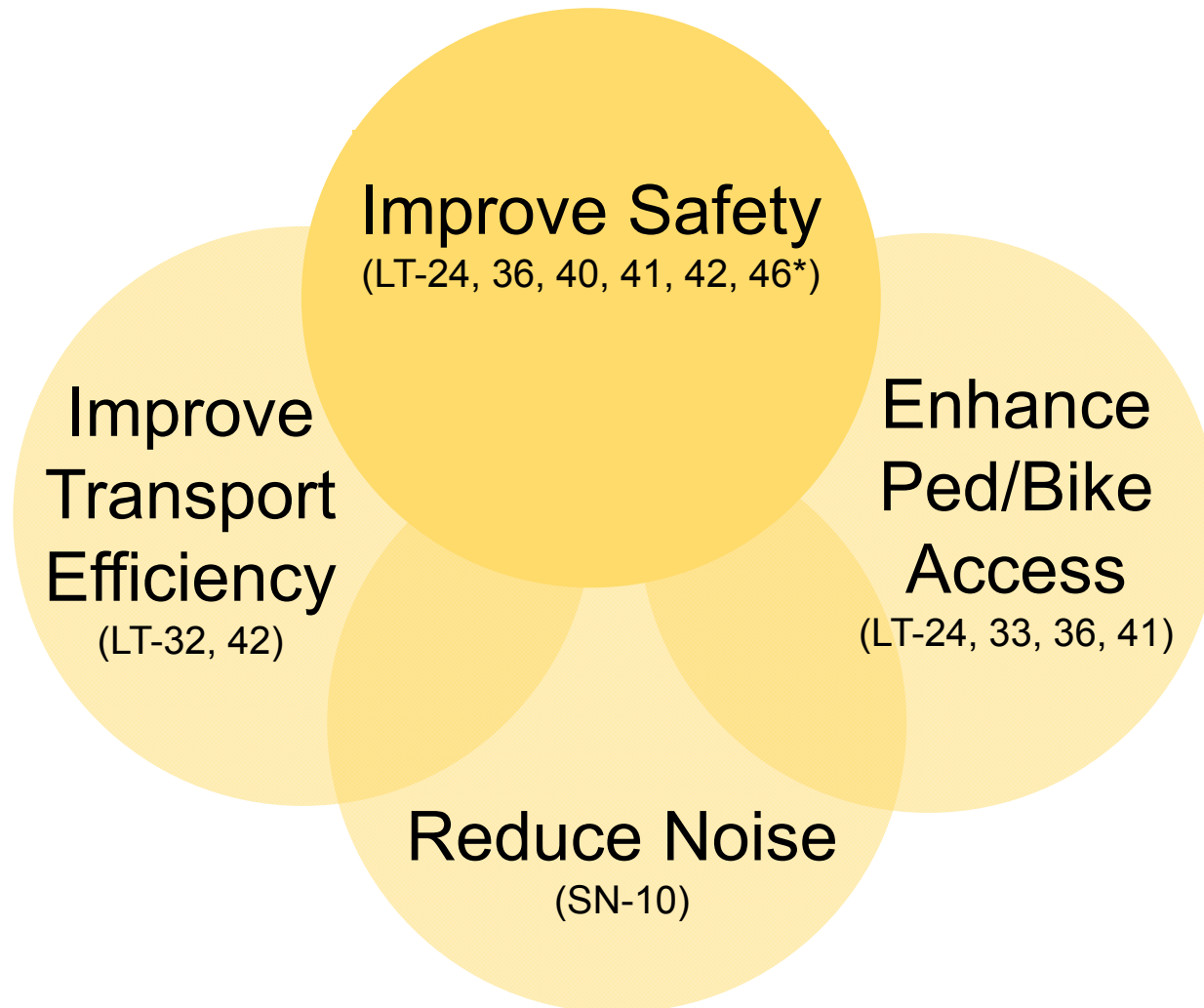
Joint City Council / BPAC Study Session  
October 17, 2017



Sunnyvale

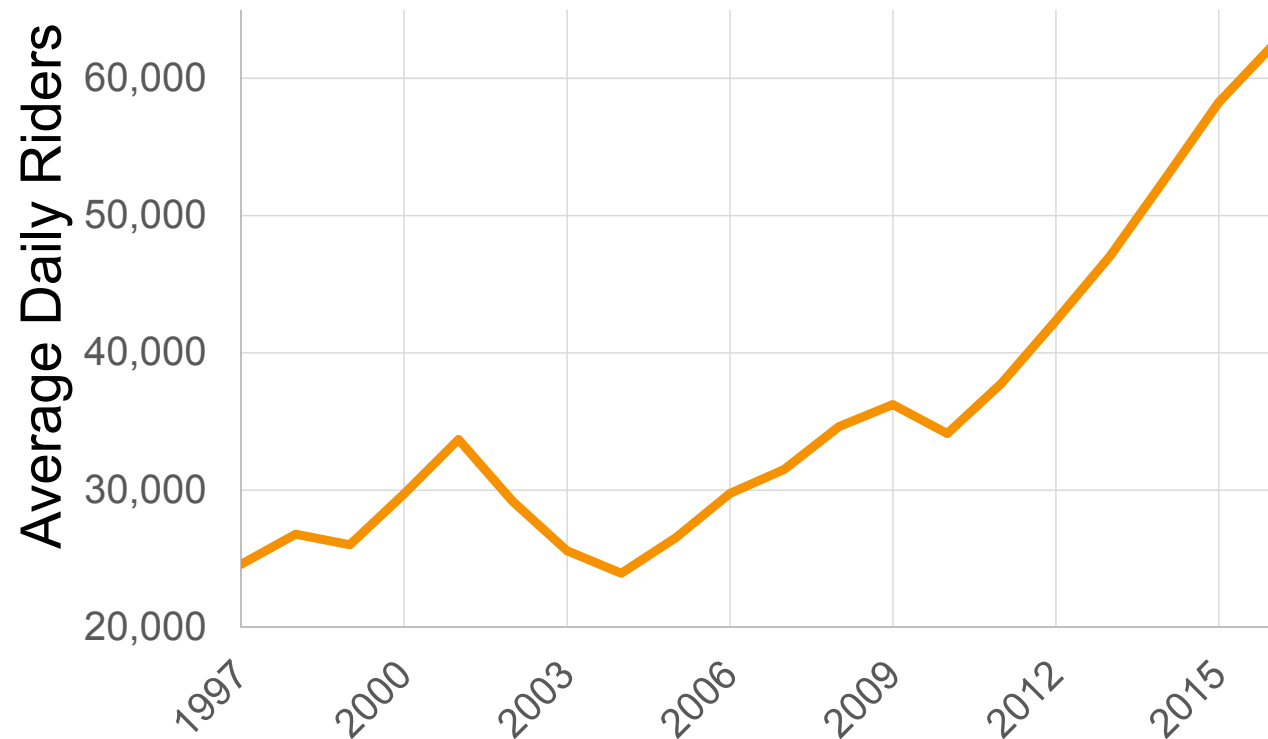
# Project Goals

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\* General Plan Policies refer to  
2017 Land Use and Transportation Element (LUTE) and  
2011 Consolidated General Plan Safety and Noise Element

# Project Context



76 trains  
(2003)

92 trains  
(2016)

114 trains  
+80-106 HSR  
(2040)



# Caltrain Grade Separation – VTA Program Description

- \$700 Million
- Projects in cities of:
  - Sunnyvale
  - Mountain View
  - Palo Alto
- Increase safety for
  - Drivers
  - Bicyclists
  - Pedestrians
- Reduce congestion at crossings intersections



*Solutions that move you*

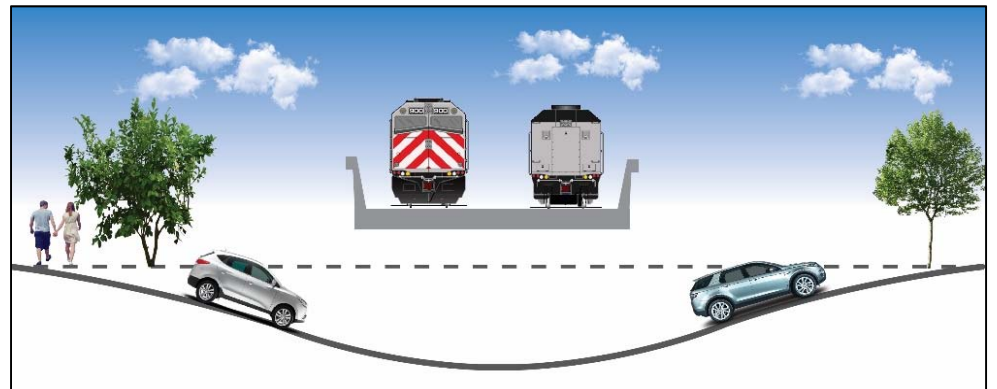
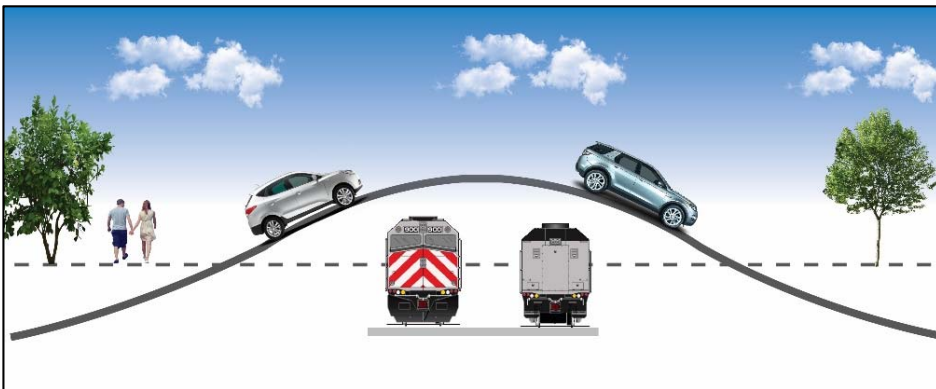
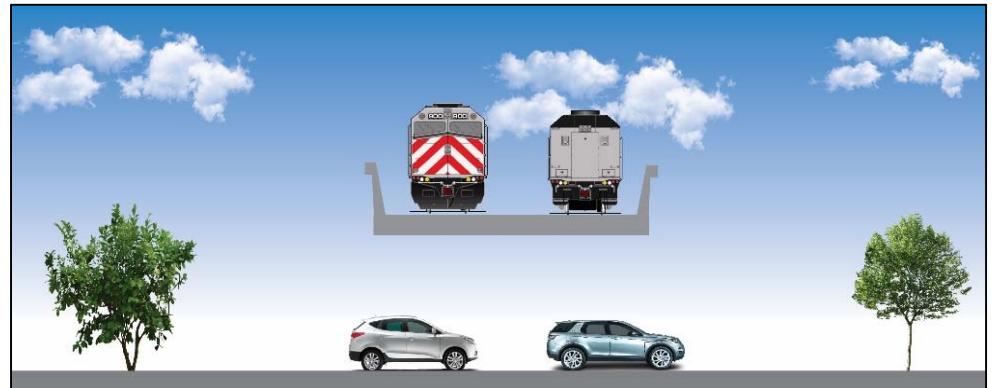
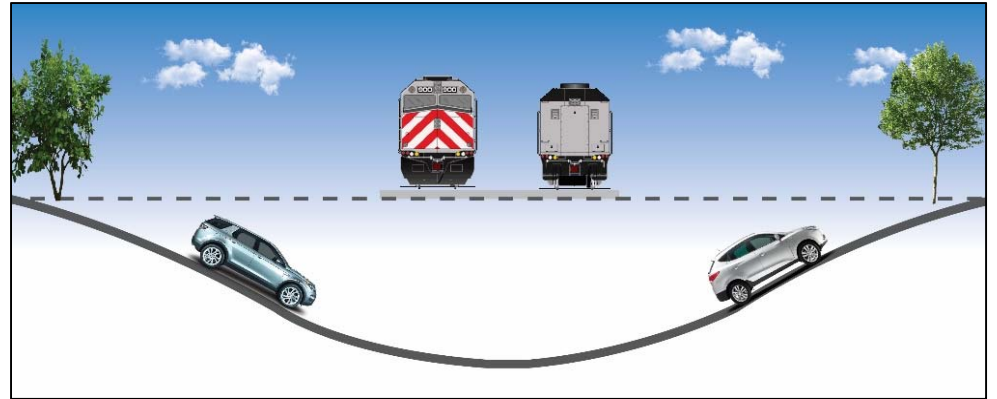
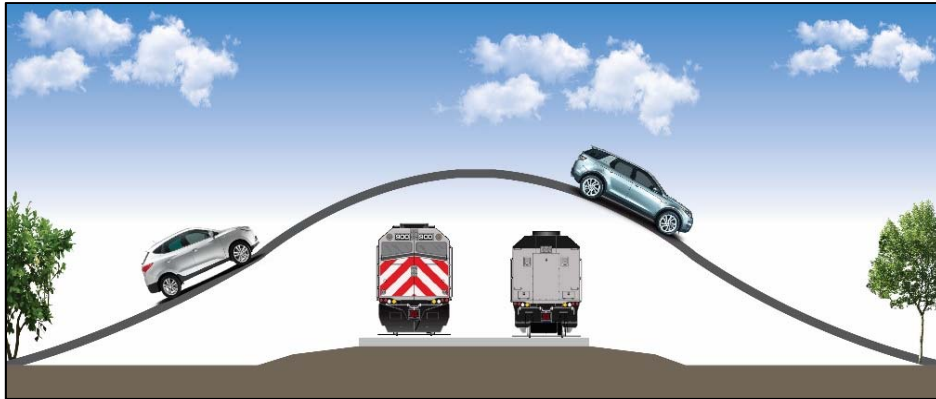
13

Sunnyvale has 2 of the 8 at grade crossings

VTA criteria include cost efficiency and Complete Streets



# Initial Screening Alternatives



# Road Overpass



Mathilda Avenue, Sunnyvale (Google Maps)



Tustin/Rose Overpass (BKF)



# Road Underpass

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Marina Bay Parkway, Richmond (BKF)



Jefferson Avenue, Redwood City (Google Maps)

# Split Road Underpass



Holly Street, San Carlos (Google Maps)



Harbor Blvd, Belmont (Google Maps)



# Depressed Rail



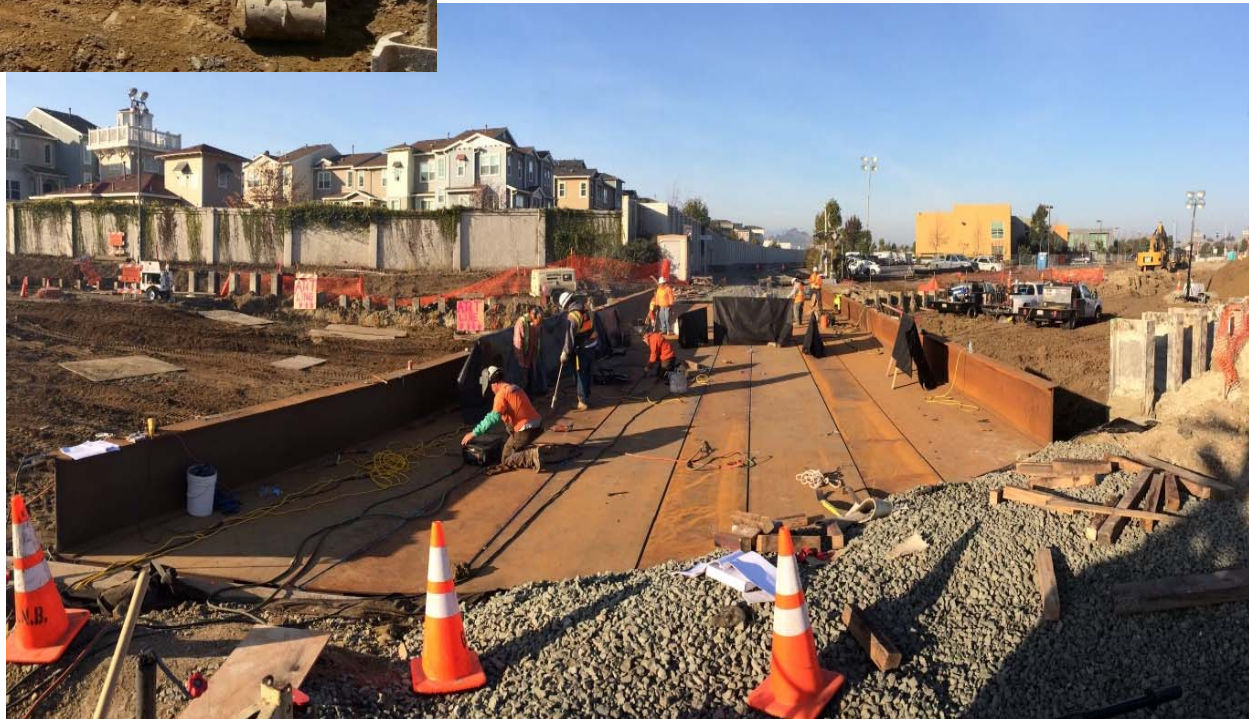
4<sup>th</sup> Street at Clay Street, Oakland (Flickr user Andy Tucker)



VTA Light Rail at Diridon Station

# Grade Separation Construction

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# Community Outreach

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## Project Webpage

Business Outreach Meeting 7/26

BPAC Meeting 8/17

Mary Ave Community Meeting 8/10\*  
(100 participants)

Sunnyvale Ave Community Mtg 8/24\*  
(65 participants)

Mary Ave Expressions Meeting 8/22

Sunnyvale Downtown Association 9/6

Mary Ave Online Survey 9/15  
(128 responses)

Sunnyvale Ave Online Survey 9/15  
(77 responses)

\* Outreach included: 8,934 postcards, NextDoor (62 groups), Yahoo! Group (126 members), eBlast, City website calendar, Council/Commission notices, FaceBook, Twitter.



# Mary Avenue





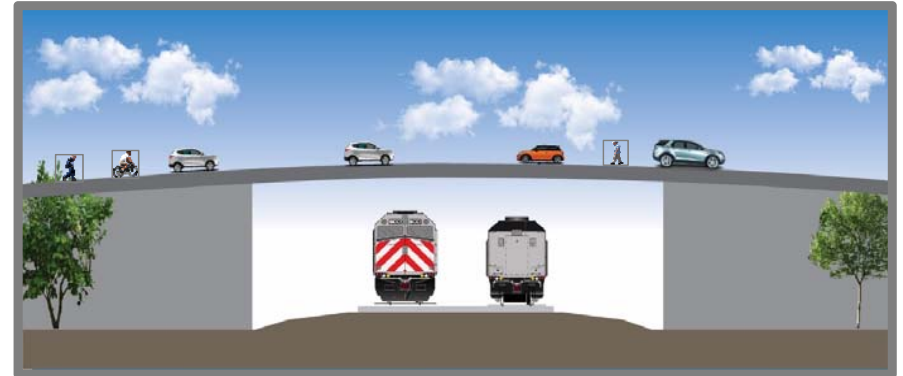
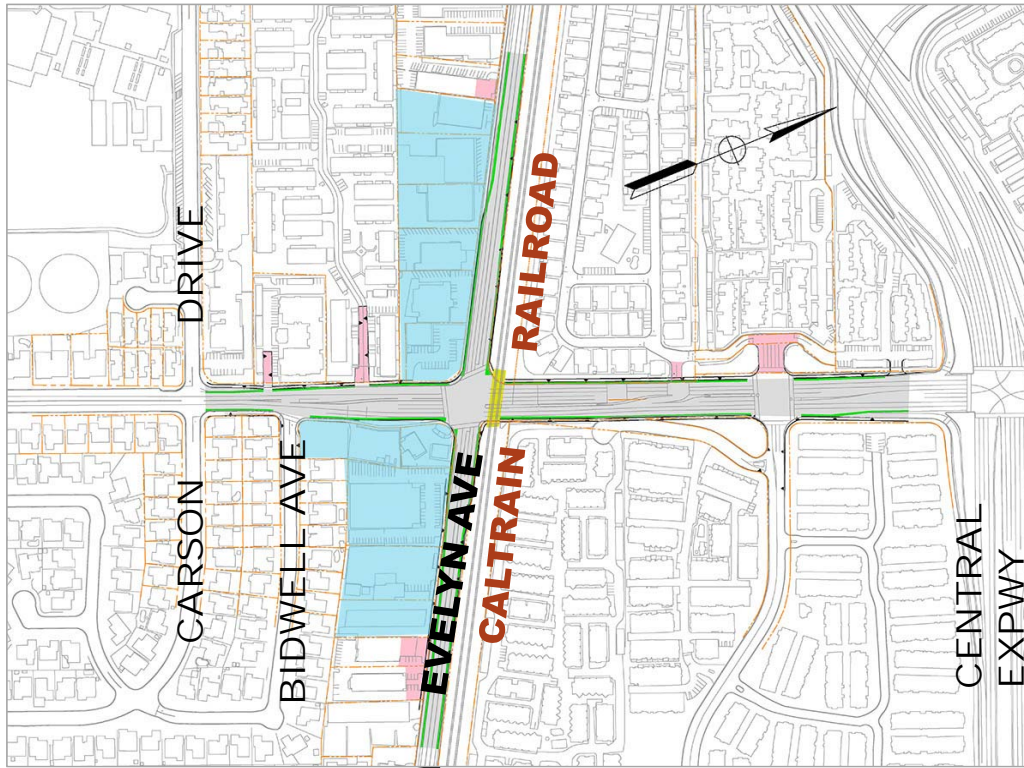
# Mary Avenue Elevated Rail



No grade change to Mary Ave	No grade change to Evelyn Ave	Railroad elevated
✗ Noise and visual impacts along residences	✗ Evelyn Ave reduced to one lane during construction	✗ Shoofly required
✗ Mathilda ramp bridge reconstructed	\$150M - \$250M*	✗ Rail disruption

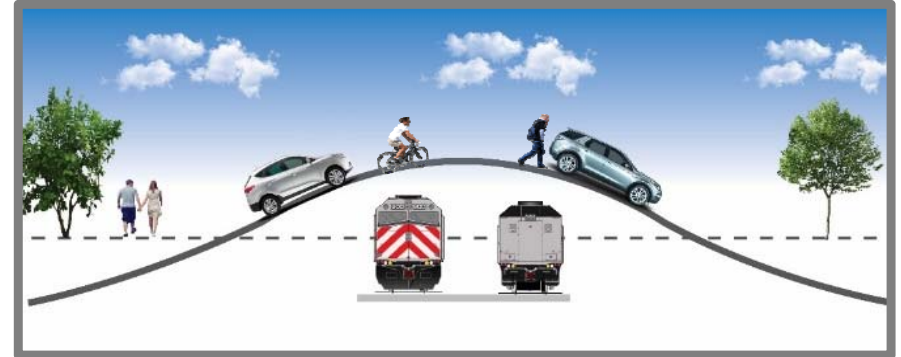
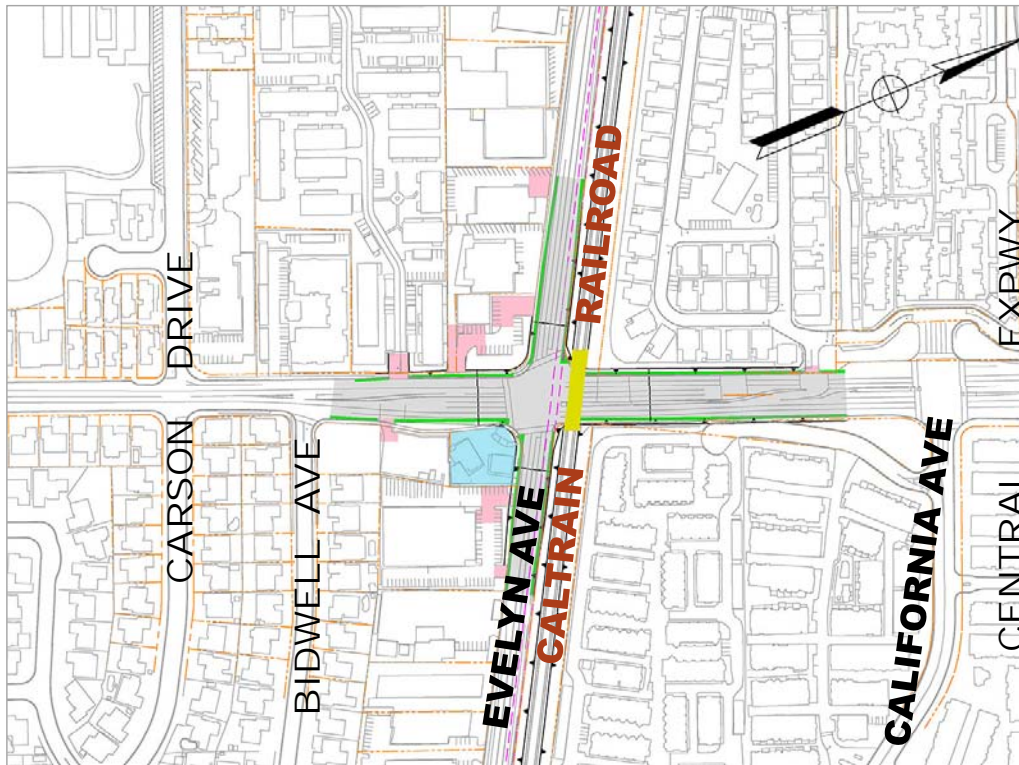
\* Costs within presentation include construction, utility relocation, right of way and admin costs

# Mary Avenue Overpass



Mary Ave elevated	Evelyn Ave elevated	Railroad at-grade
✗ Potential acquisition of 12+ parcels	✗ Noise and visual impacts along residences	✓ No rail disruption
✗ Modifications to 7+ driveways	\$200M - \$250M	

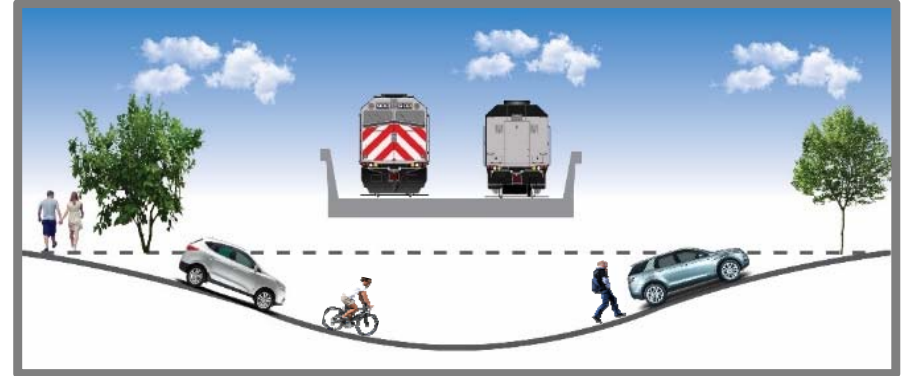
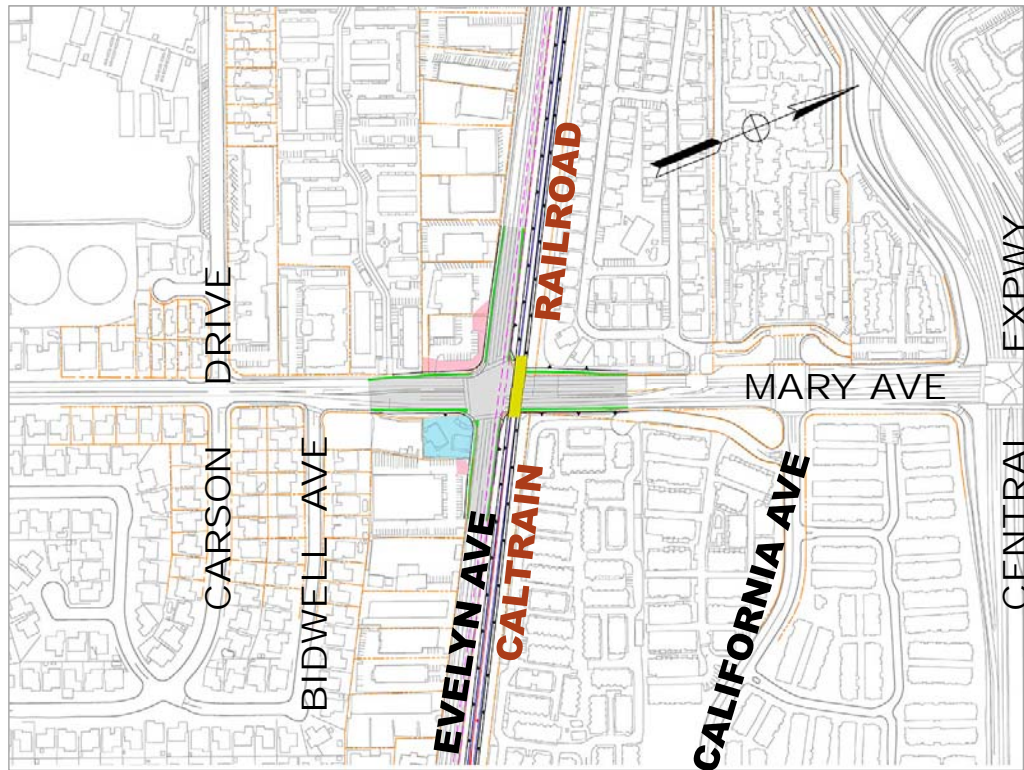
# Mary Avenue Split Overpass



Mary Ave partially elevated	Evelyn Ave partially elevated	Railroad partially depressed
✗ Potential acquisition of 1+ parcels	✗ Evelyn Ave reduced to one lane during construction	✗ Noise and visual impacts along residences
✗ Modifications to 7+ driveways	\$200M - \$250M	✗ Shoofly and rail disruption



# Mary Avenue Split Underpass

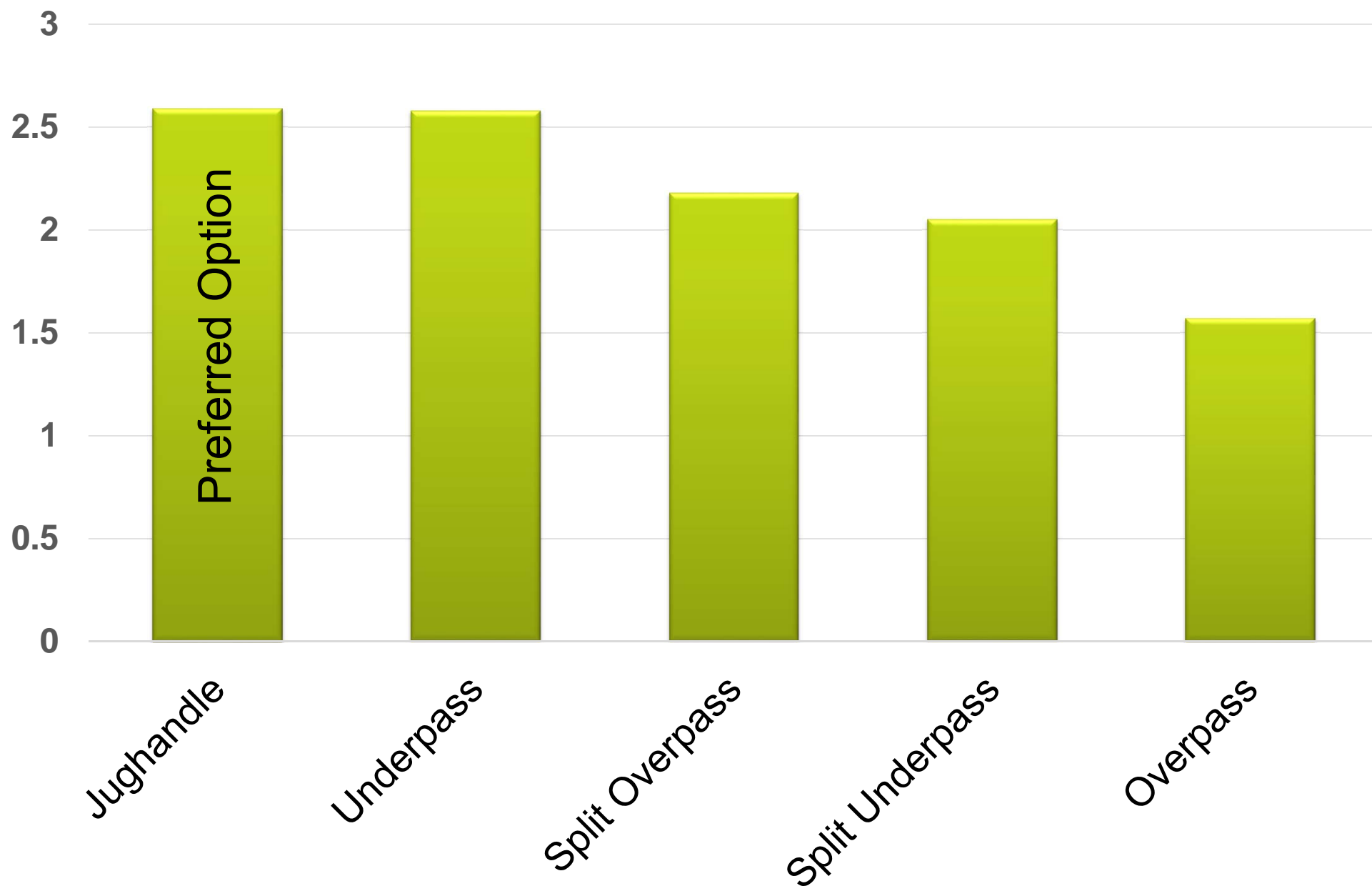


Mary Ave partially depressed	Evelyn Ave partially depressed	Railroad partially elevated
<p>✗ Potential acquisition of 1+ parcels</p>	<p>✗ Evelyn Ave reduced to one lane during construction</p>	<p>✗ Noise and visual impacts along residences</p>
<p>✗ Modifications to 3+ driveways</p>	<p>\$150M - \$250M</p>	<p>✗ Shoofly and rail disruption</p>



# Mary Avenue Online Survey

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# Mary Avenue Alternatives

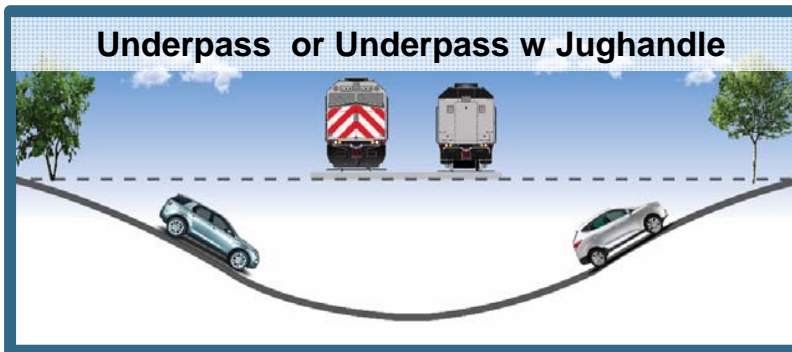
**Depressed Rail**



**X Overpass**



**Underpass or Underpass w Jughandle**



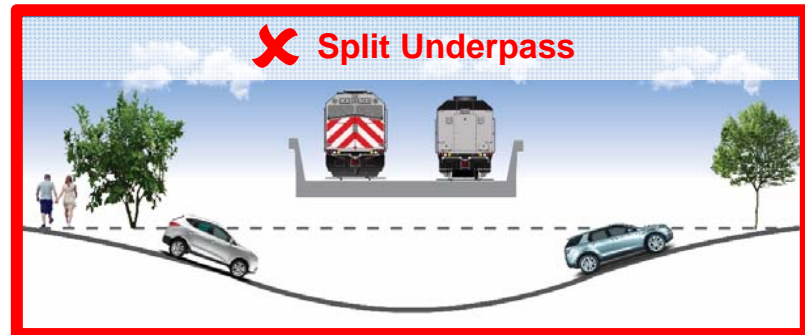
**X Elevated Rail**



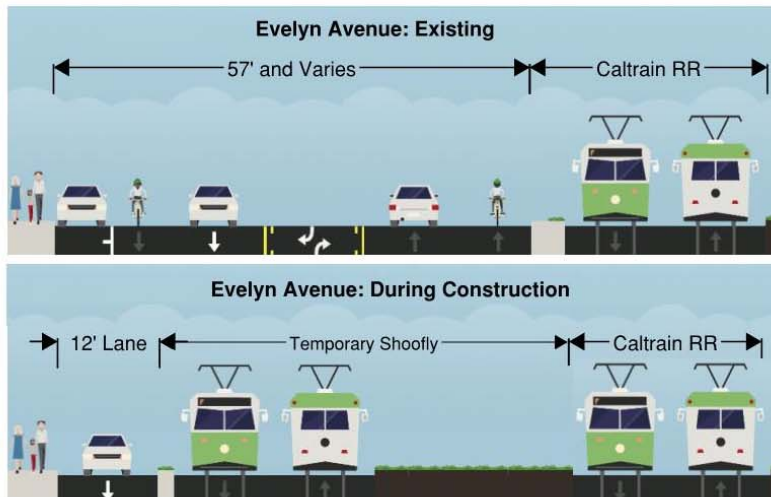
**X Split Overpass**



**X Split Underpass**



# Mary Avenue Depressed Rail



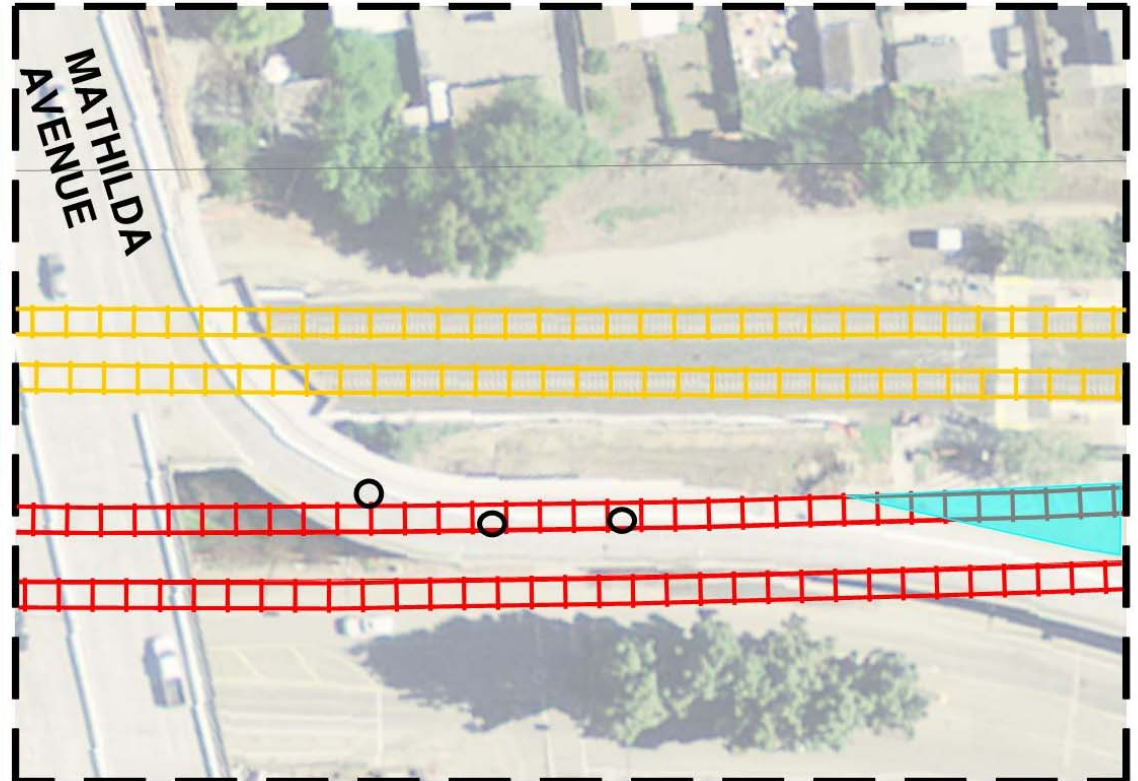
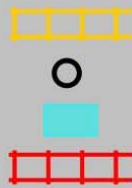
## LEGEND:

Existing Caltrain Railroad

Existing Ramp Columns

Proposed Right-of-Way Acquisition

Proposed Temporary Shoofly

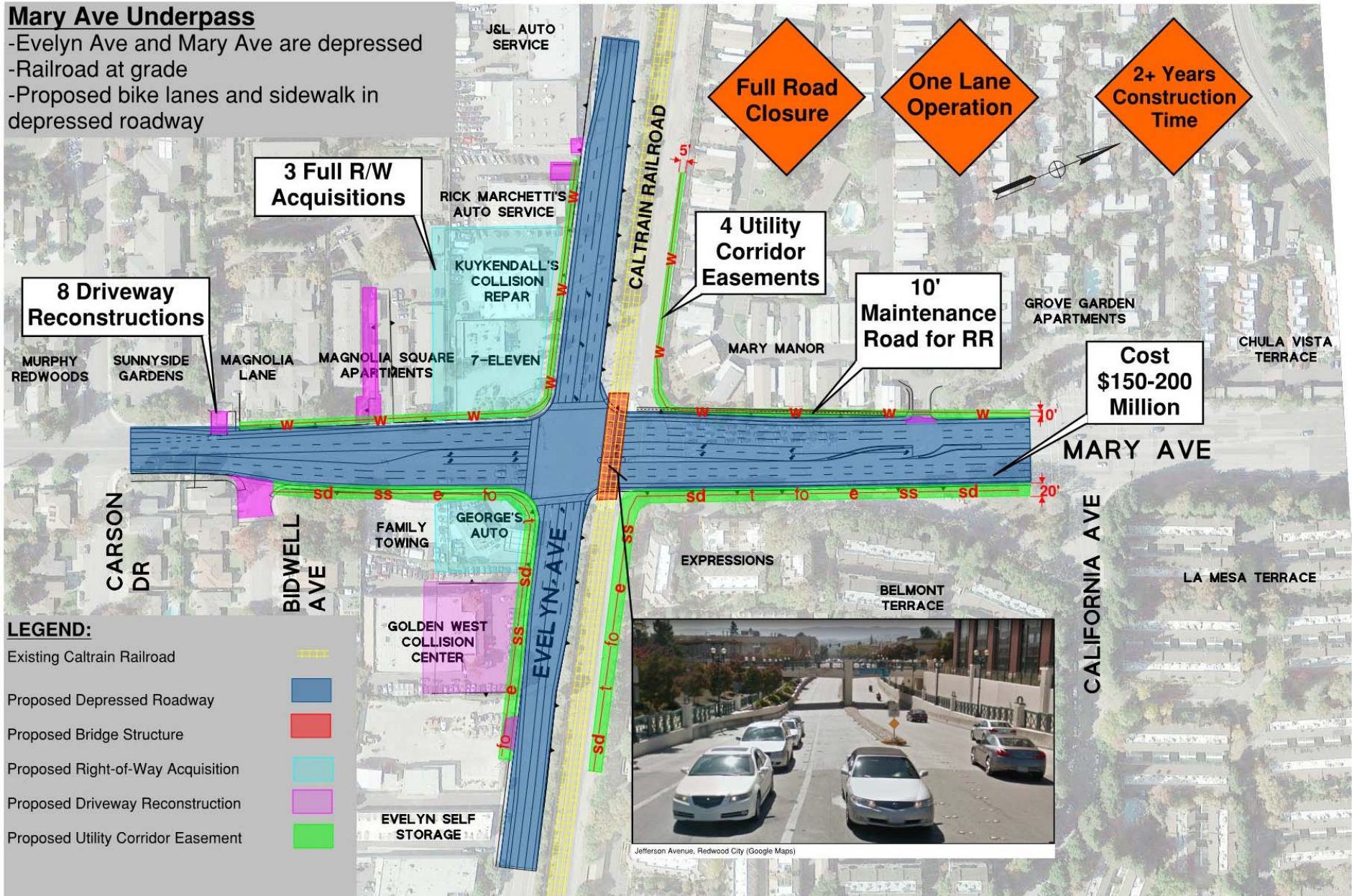




# Mary Avenue Underpass

## Mary Ave Underpass

- Evelyn Ave and Mary Ave are depressed
- Railroad at grade
- Proposed bike lanes and sidewalk in depressed roadway

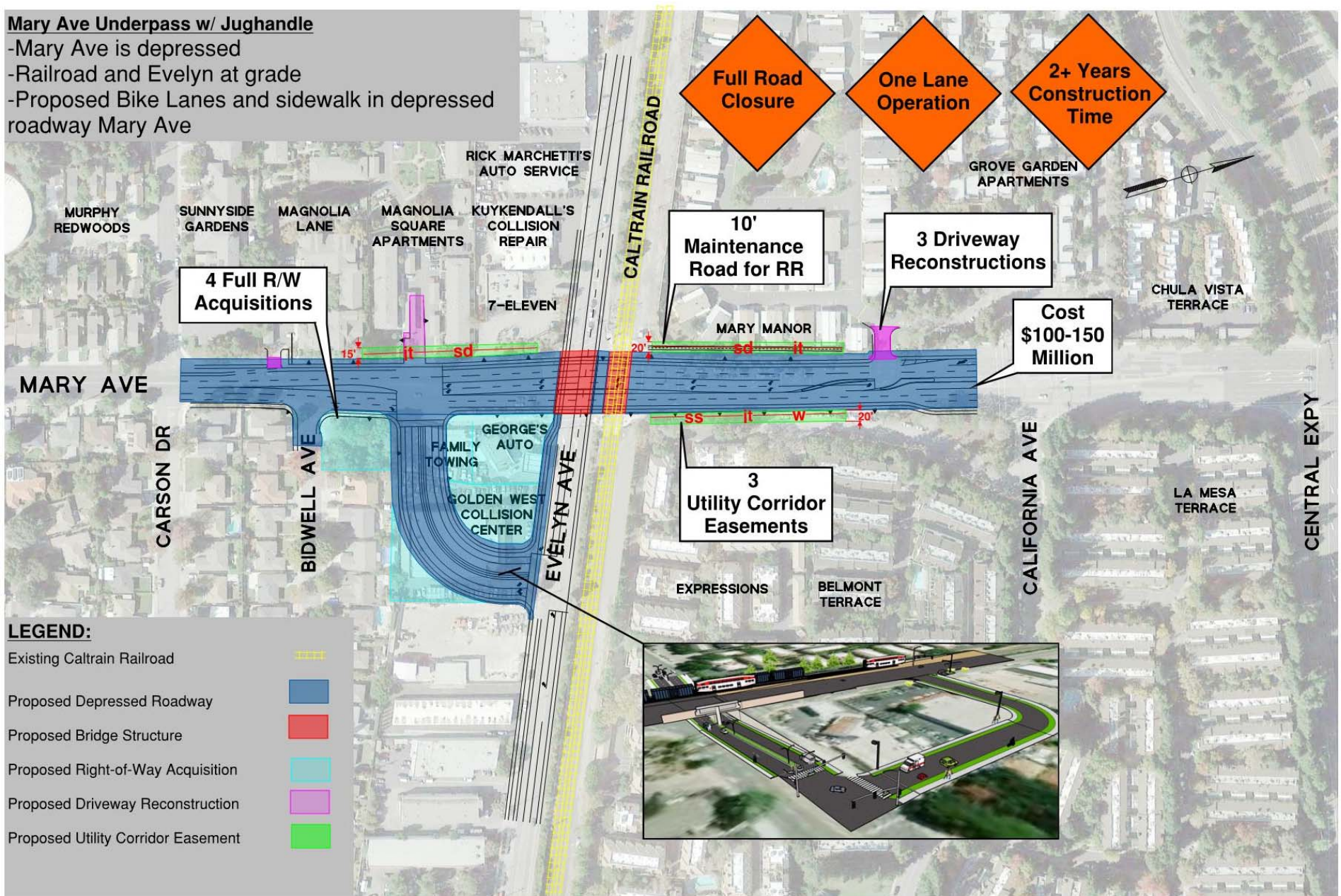




# Mary Avenue Underpass with Jughandle

## Mary Ave Underpass w/ Jughandle

- Mary Ave is depressed
- Railroad and Evelyn at grade
- Proposed Bike Lanes and sidewalk in depressed roadway Mary Ave





# Mary Avenue Underpass with Jughandle



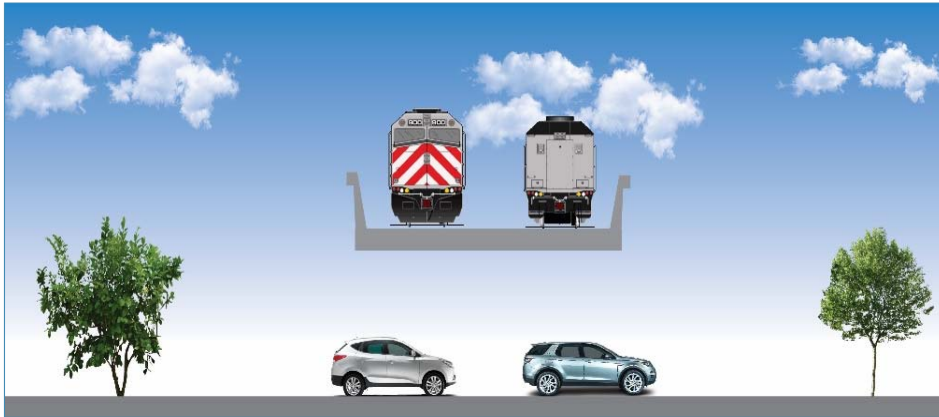


# Sunnyvale Avenue

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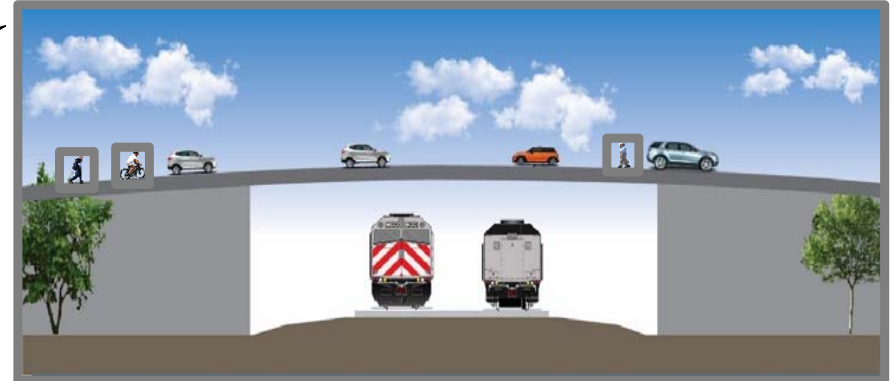
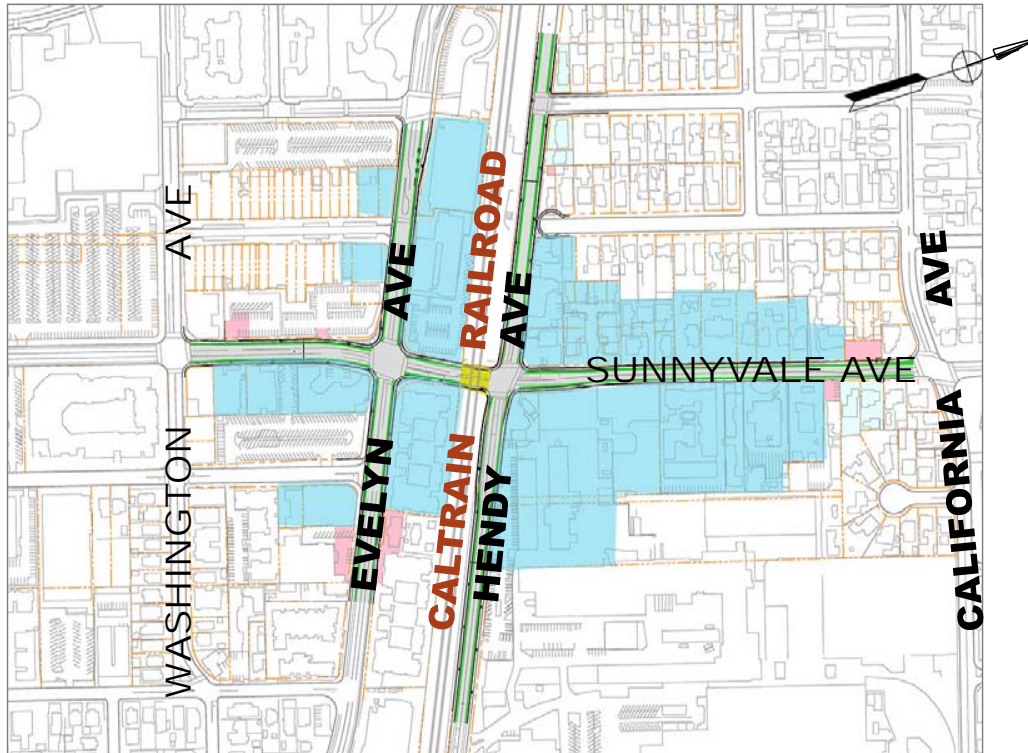
# Sunnyvale Avenue Elevated Rail



No grade change to Sunnyvale Avenue	No grade change to Evelyn Ave	No grade change to Hendy Ave
✗ Noise and visual impacts along residences	✗ Conflicts with Fair Oaks and Mathilda bridges	✗ Shoofly required
✗ No driveway access along Hendy Ave	\$150M - \$250M	✗ Rail and station disruption

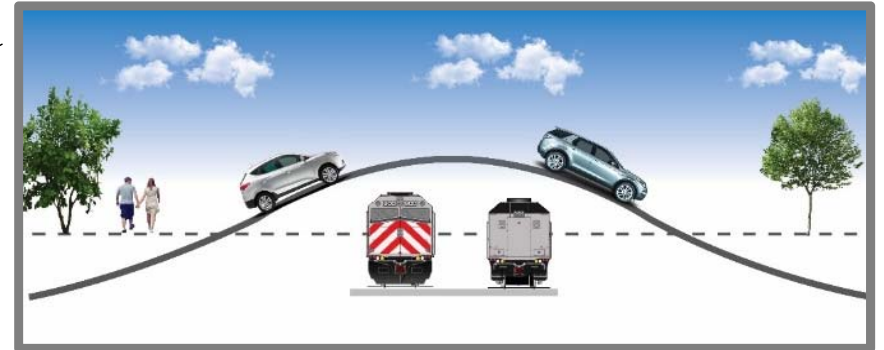
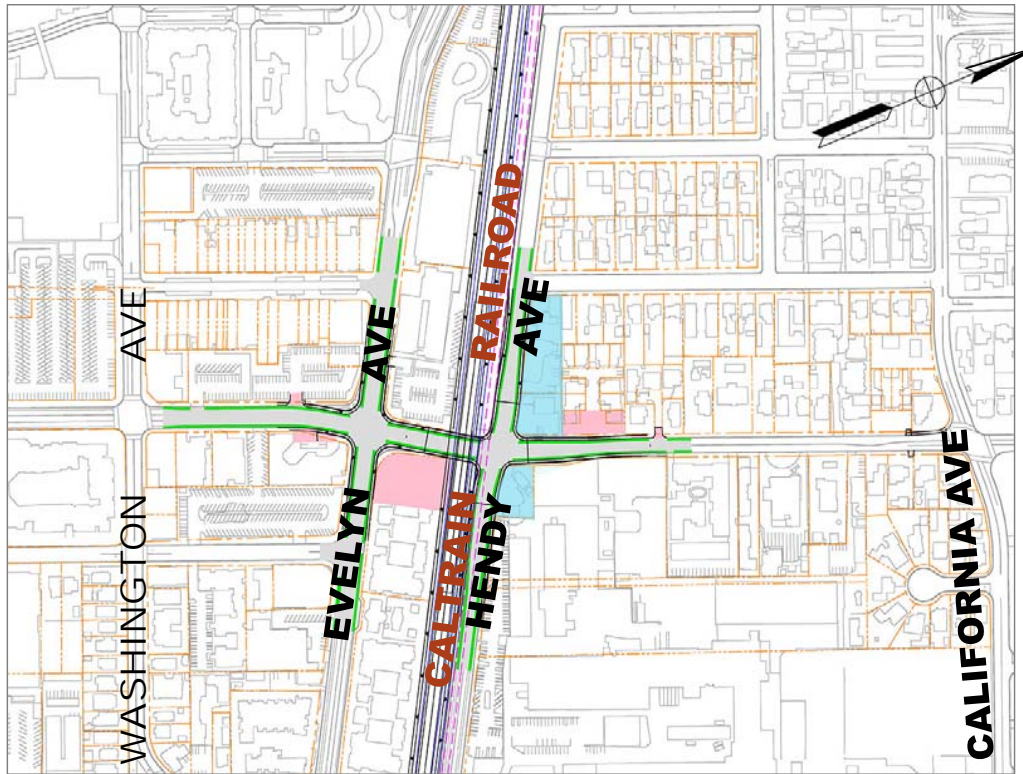


# Sunnyvale Avenue Overpass



Sunnyvale Ave elevated	Evelyn Ave elevated	Hendy Ave elevated
<div>✗</div> Potential acquisition of 44+ parcels	<div>✗</div> Noise and visual impacts along residences	<div>✓</div> No rail construction required
<div>✗</div> Modifications to 16+ driveways	\$300M - \$350M	<div>✓</div> No station reconstruction

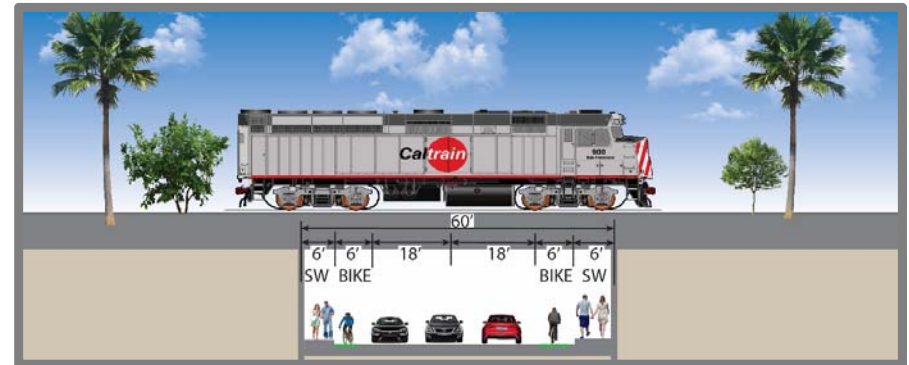
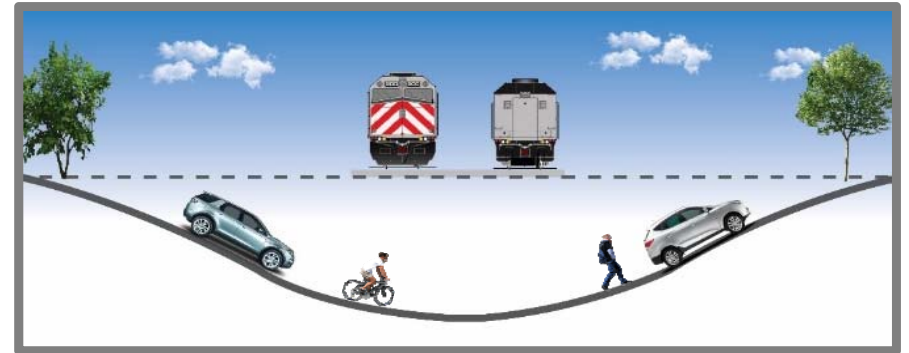
# Sunnyvale Avenue Split Overpass



Sunnyvale Ave partially elevated	Evelyn Ave partially elevated	Hendy Ave partially elevated
✗ Potential acquisition of 5+ parcels	✗ Noise and visual impacts along residences	✗ Shoofly and rail and station disruption
✗ Modifications to 4+ driveways	\$350M - \$450M	✗ No driveway access along Hendy Ave

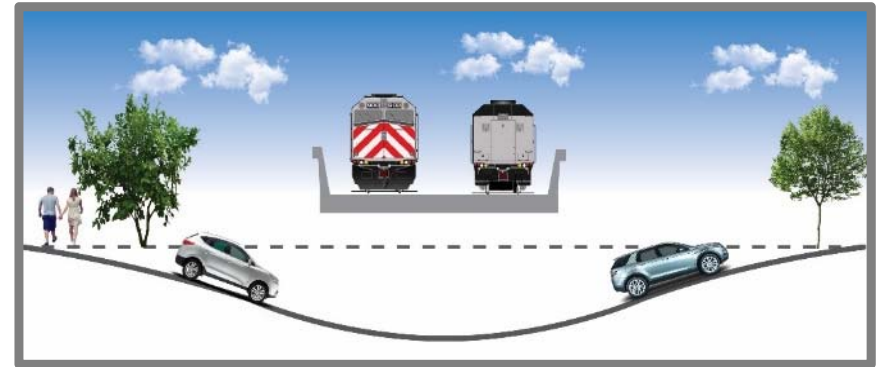


# Sunnyvale Avenue Underpass



Sunnyvale Ave depressed	Evelyn Ave depressed	Hendy Ave depressed
<div>✗</div> Potential acquisition of 14+ parcels	<div>✓</div> No permanent rail impact	<div>✓</div> No station reconstruction
<div>✗</div> Modifications to 5+ driveways	\$150M - \$200M	

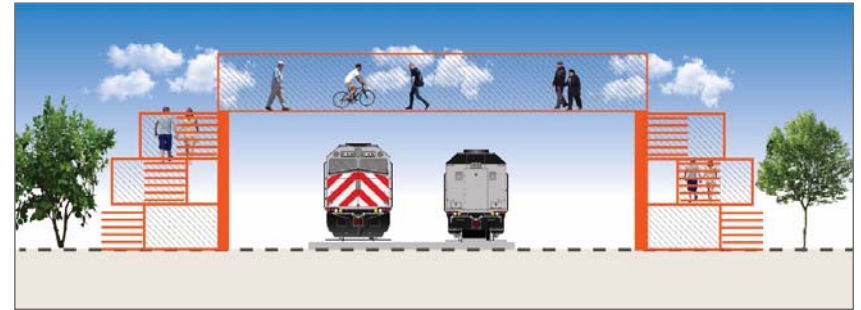
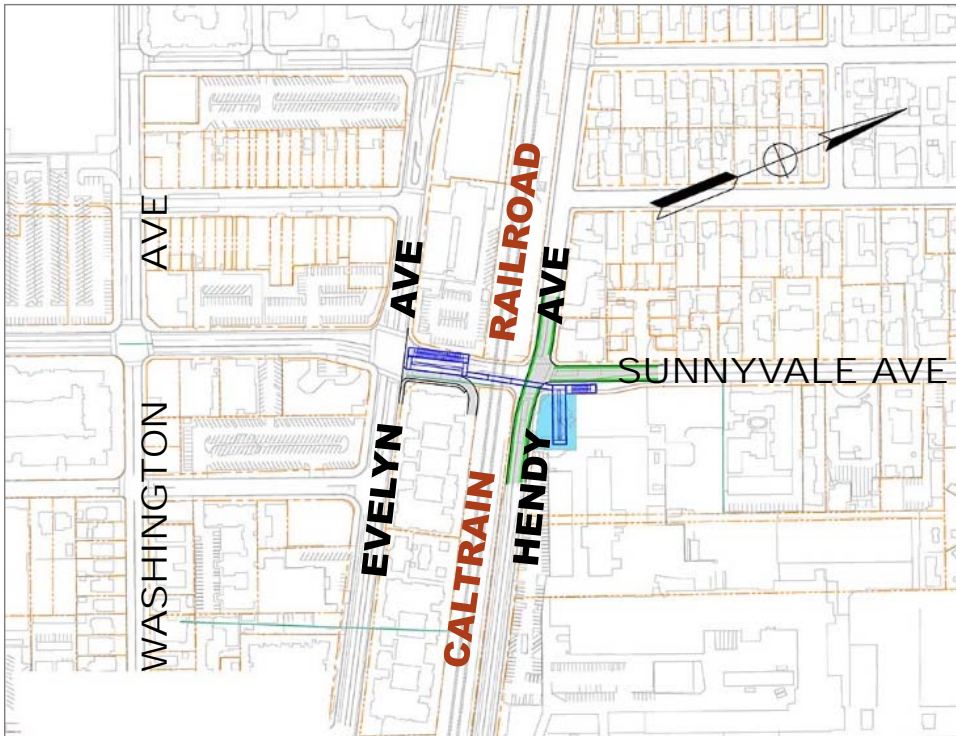
# Sunnyvale Avenue Split Underpass



Sunnyvale Ave partially depressed	Evelyn Ave partially depressed	Hendy Ave partially depressed
✗ Potential acquisition of 3+ parcels	✗ Noise and visual impacts along residences	✗ Shoofly and rail and station disruption
✗ Modifications to 5+ driveways	\$200M - \$250M	✗ No driveway access along Hendy Ave

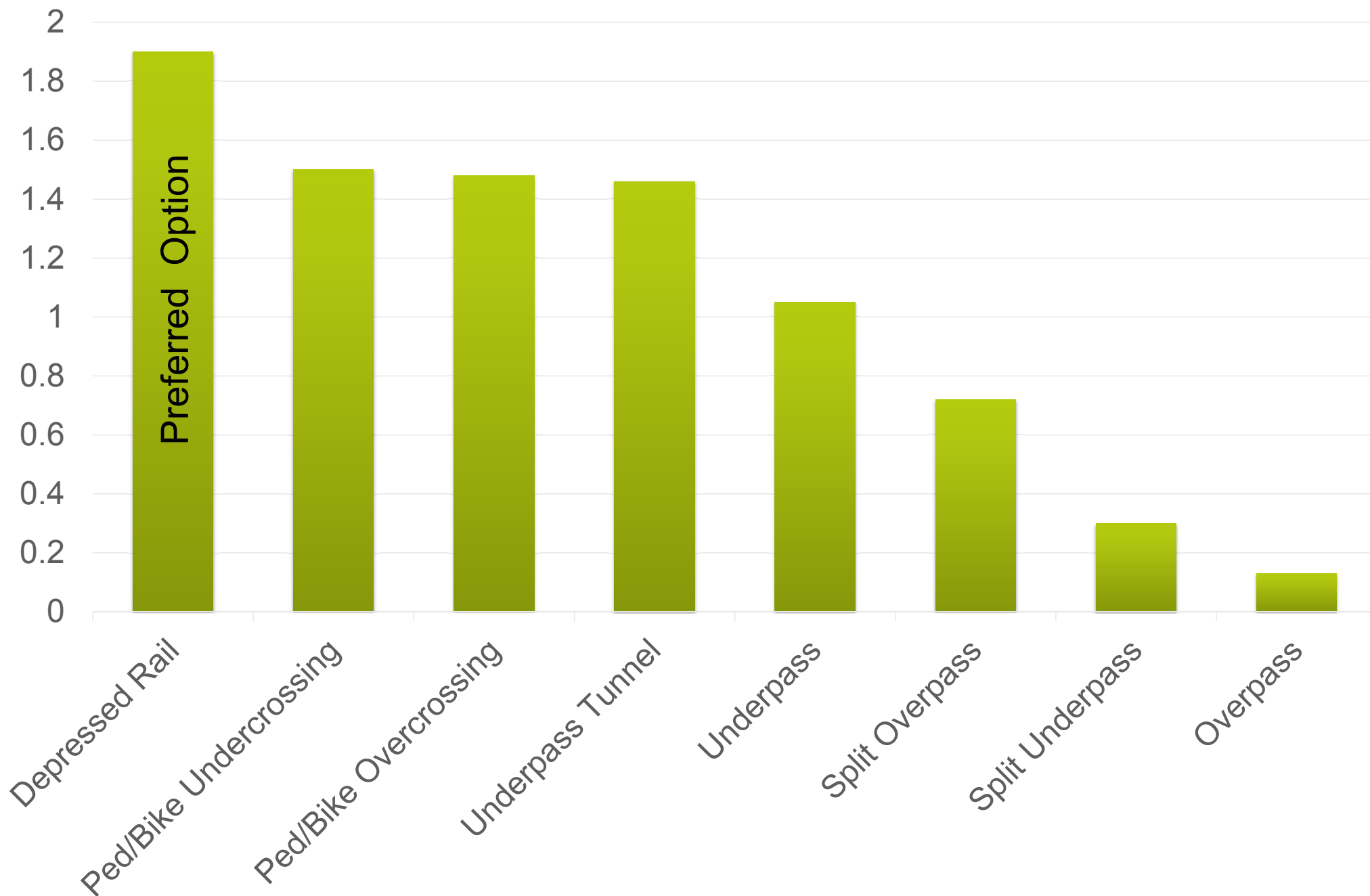


# Sunnyvale Avenue Bike/Pedestrian Overcrossing



Sunnyvale Ave at-grade	Evelyn Ave at-grade	Hendy Ave at-grade
✗ Sunnyvale closed at crossing	✗ Visual impacts along residences	✓ No rail construction required
✗ Potential acquisition of 1+ parcel	\$25M - \$35M	✓ No station reconstruction

# Sunnyvale Avenue Online Survey





# Sunnyvale Avenue Alternatives

**✗ Rail Elevated**



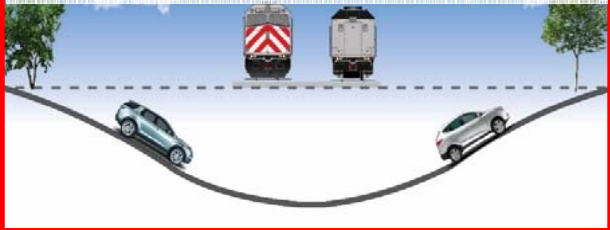
**✗ Overpass**



**Depressed Rail**



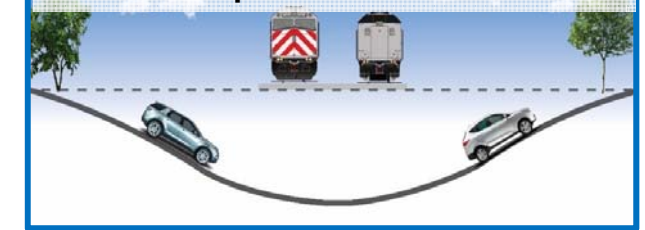
**✗ Underpass**



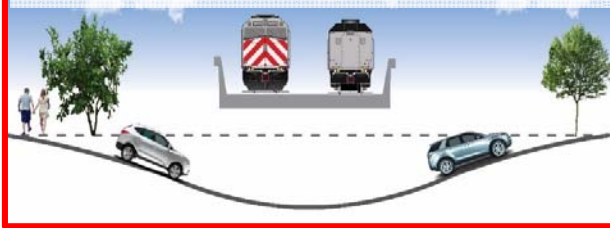
**✗ Split Overpass**



**Underpass Tunnel**



**✗ Split Underpass**



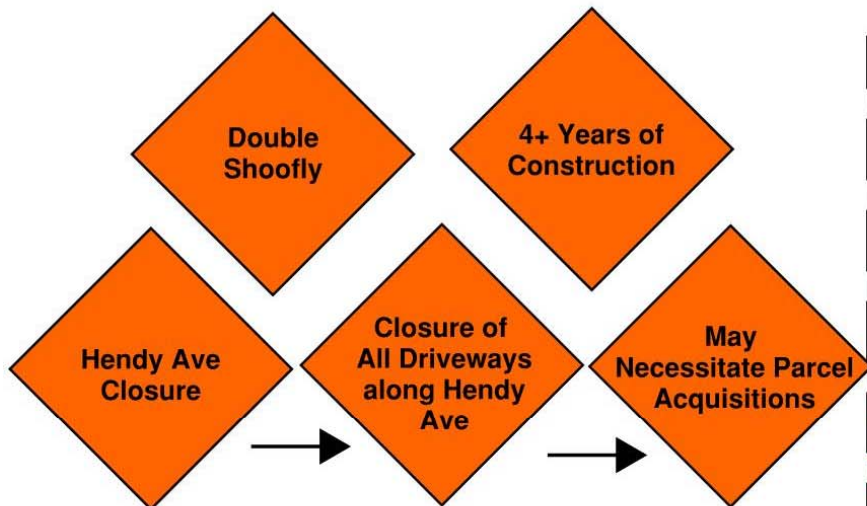
**✗ Ped/Bike Overcrossing**



**Ped/Bike Undercrossing**

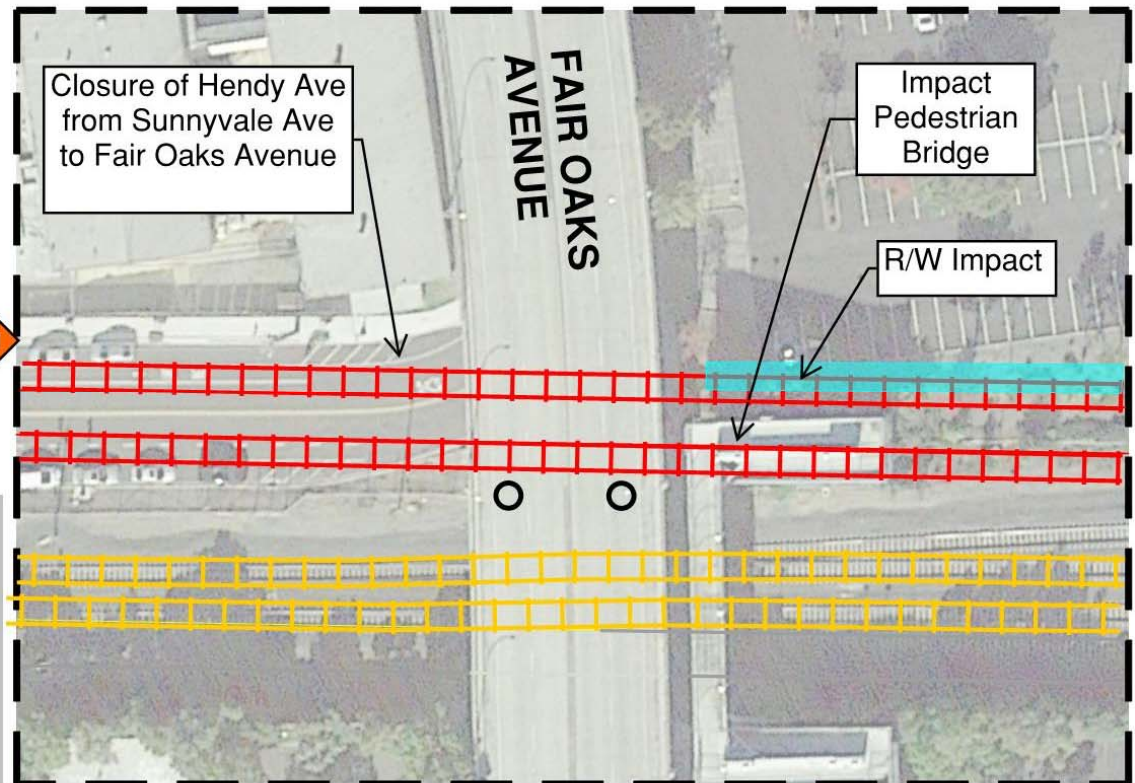


# Sunnyvale Avenue Depressed Rail



## LEGEND:

- Proposed Right-of-Way Acquisition
- Existing Caltrain Railroad
- Proposed Temporary Shoofly
- Existing Bridge Columns

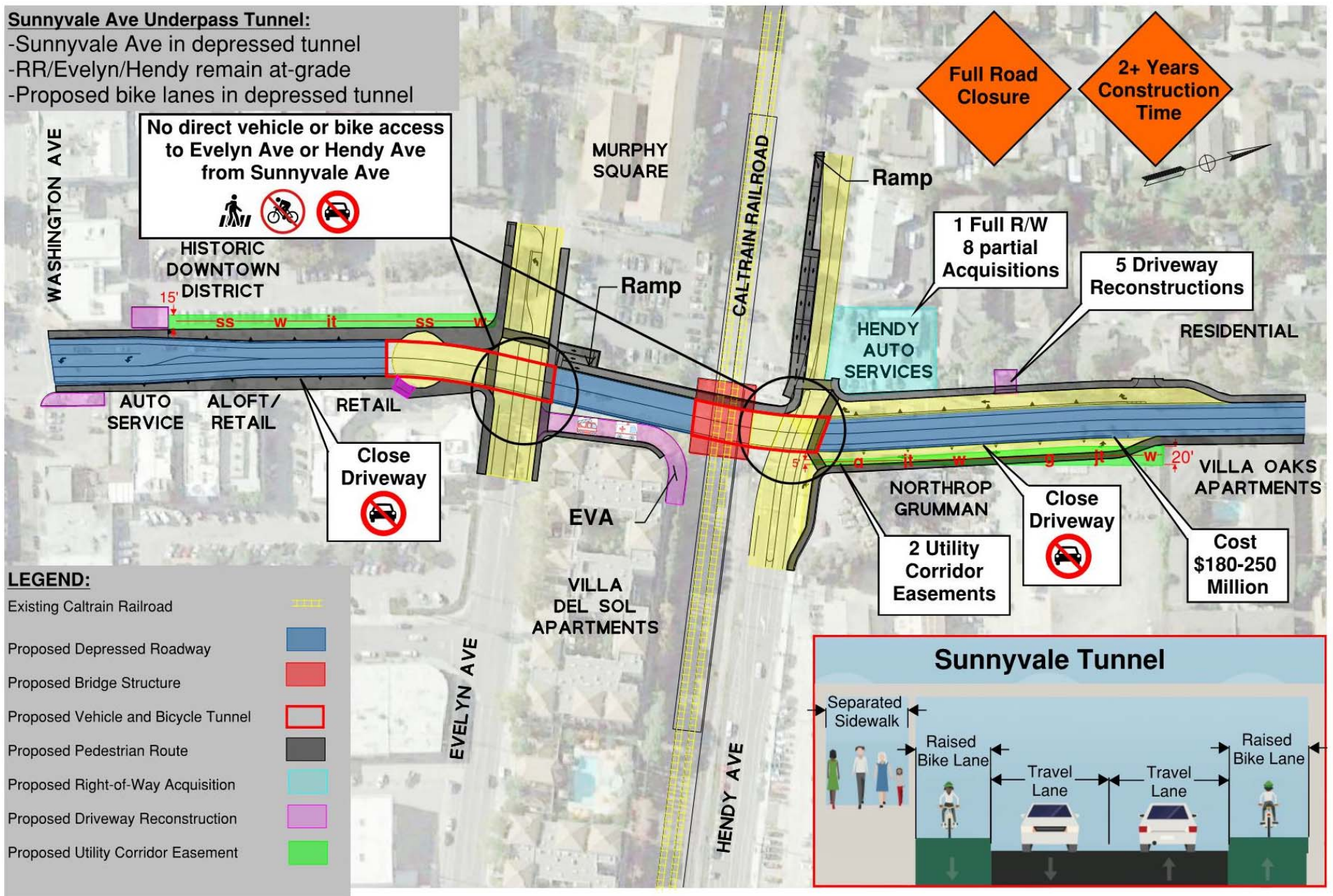




# Sunnyvale Avenue Underpass Tunnel

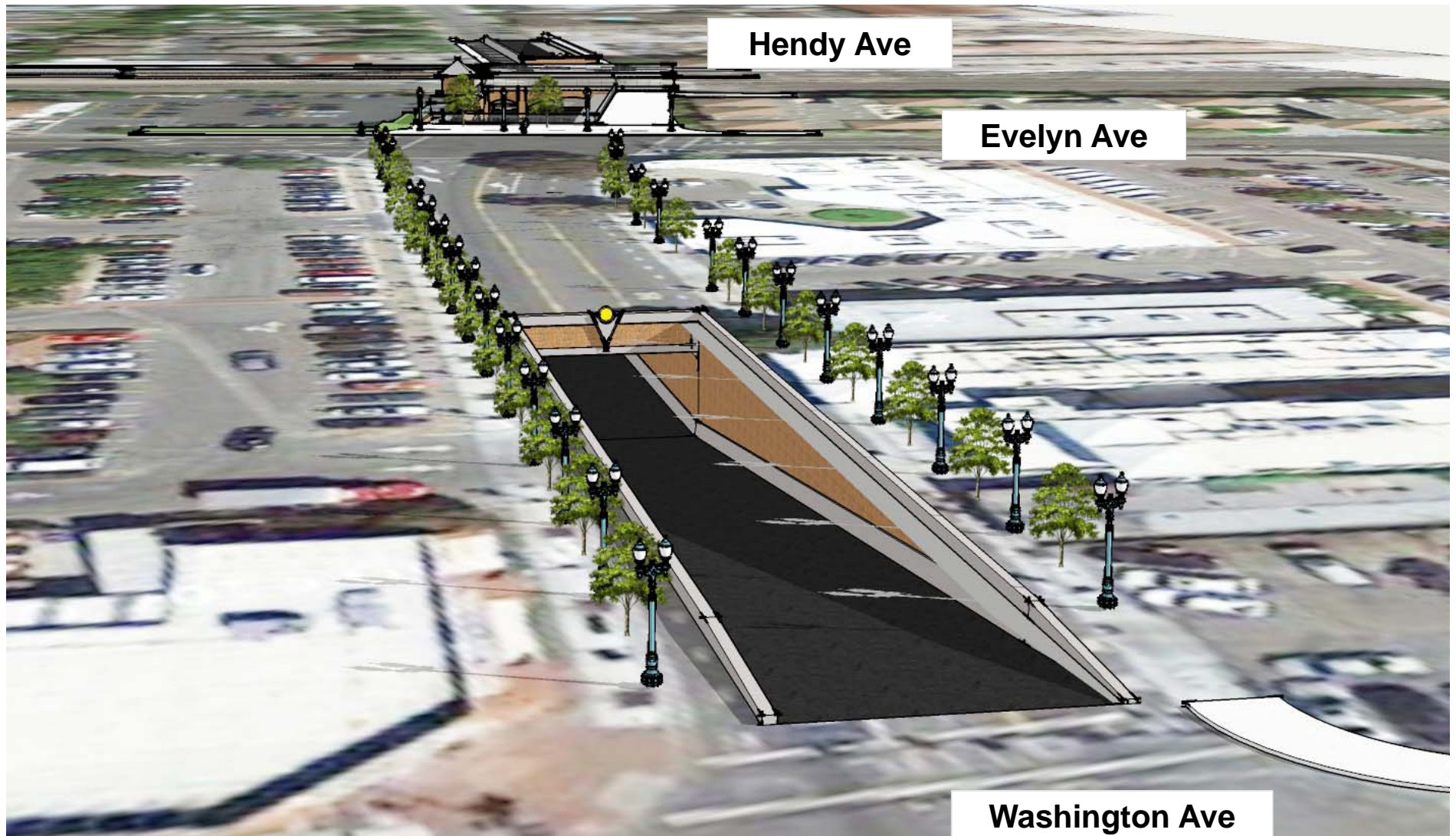
## Sunnyvale Ave Underpass Tunnel:

- Sunnyvale Ave in depressed tunnel
- RR/Evelyn/Hendy remain at-grade
- Proposed bike lanes in depressed tunnel





# Sunnyvale Avenue Underpass Tunnel





# Sunnyvale Avenue Underpass Tunnel

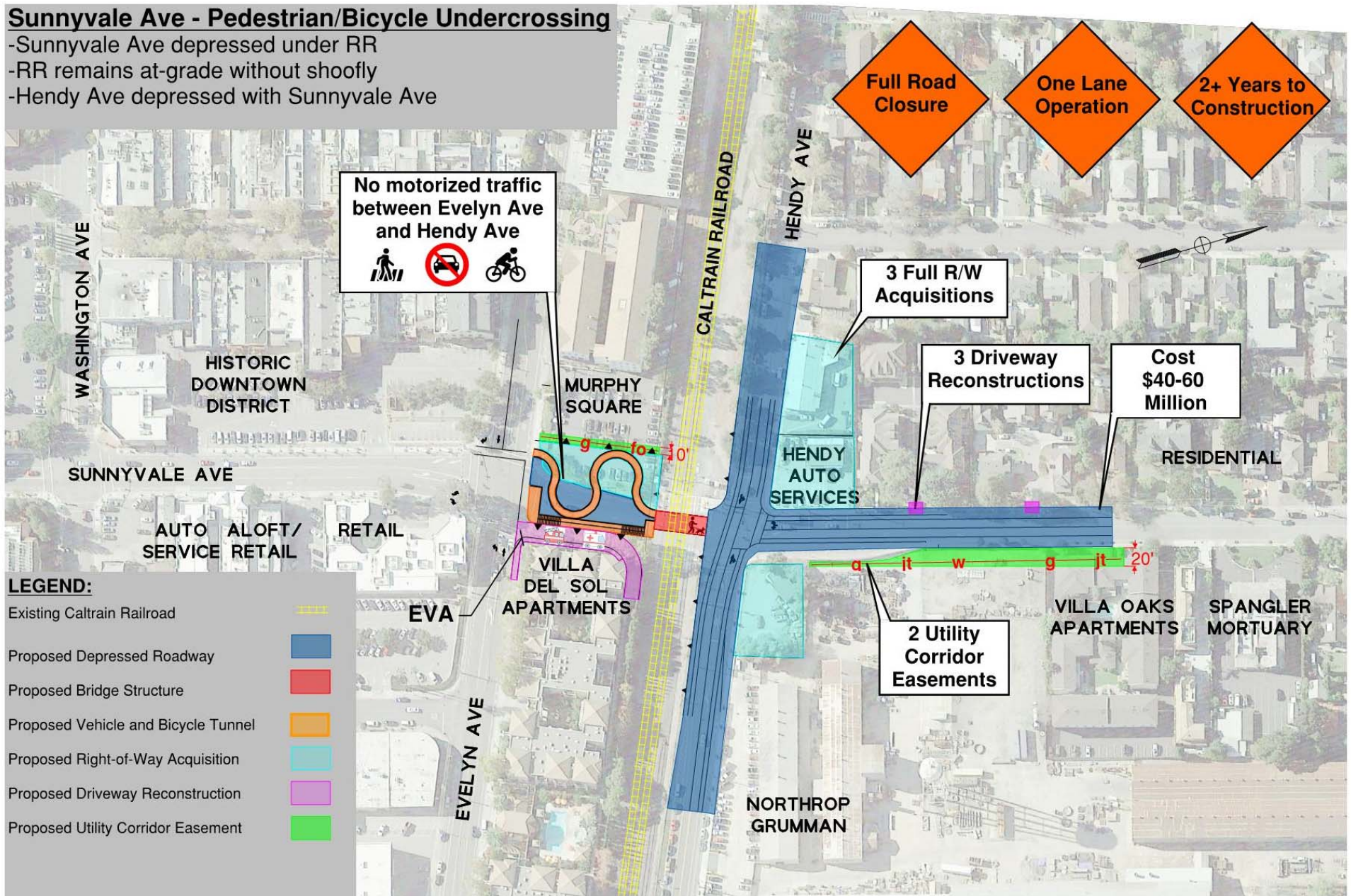




# Sunnyvale Avenue Pedestrian/Bicycle Undercrossing

## Sunnyvale Ave - Pedestrian/Bicycle Undercrossing

- Sunnyvale Ave depressed under RR
- RR remains at-grade without shoofly
- Hendy Ave depressed with Sunnyvale Ave





# Pedestrian/Bicycle Undercrossing



Palo Alto Homer Undercrossing



Santa Clara Ped Undercrossing

# Schedule and Process

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**Feasibility Study**

**Environmental  
Analysis &  
Concept Design**

**Detailed Design &  
Property  
Acquisition**

**Bid &  
Construction**

**1 year**

**1 1/2 years**

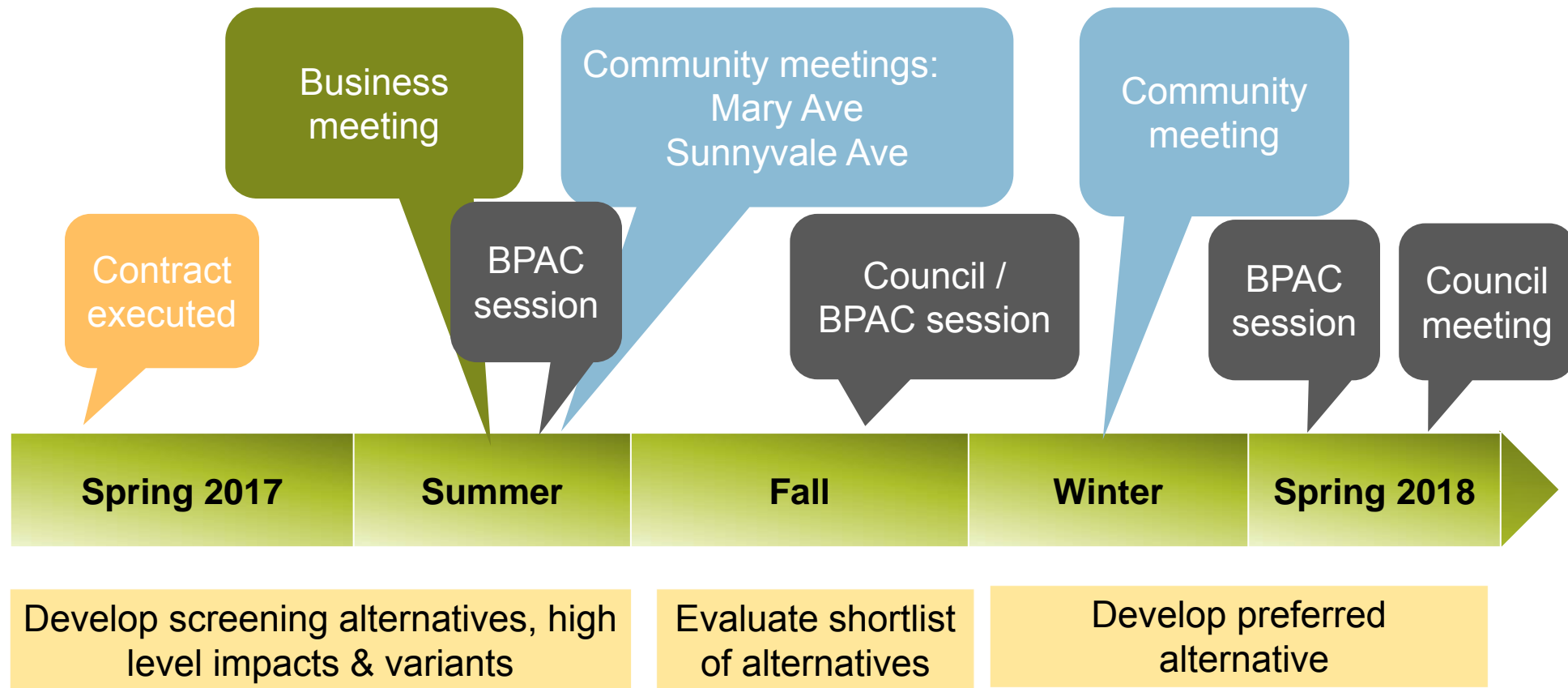
**2 years**

**2-5 years**



# Feasibility Study Process

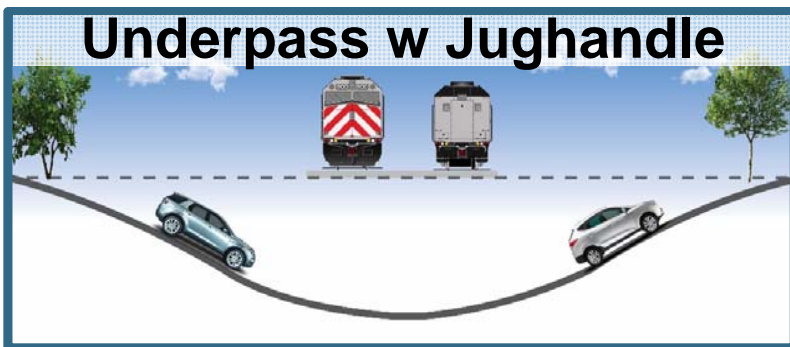
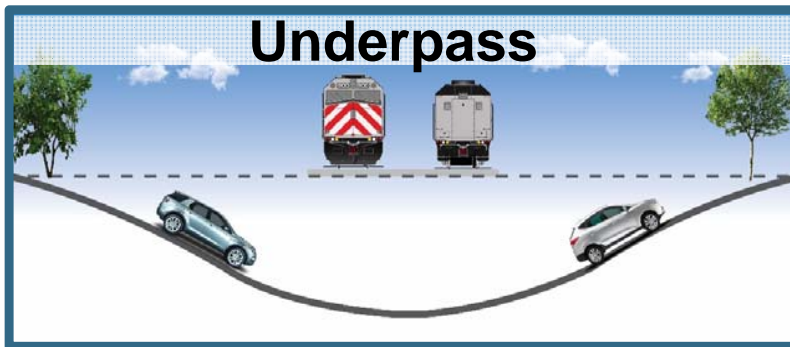
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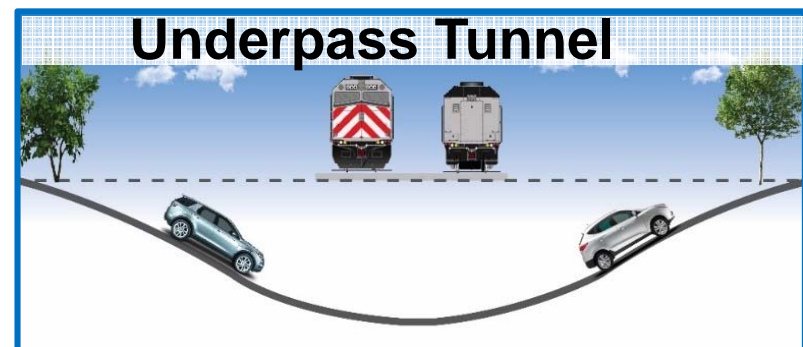
# Next Steps

- Move forward with further analysis and refinement:

## Mary Avenue



## Sunnyvale Avenue



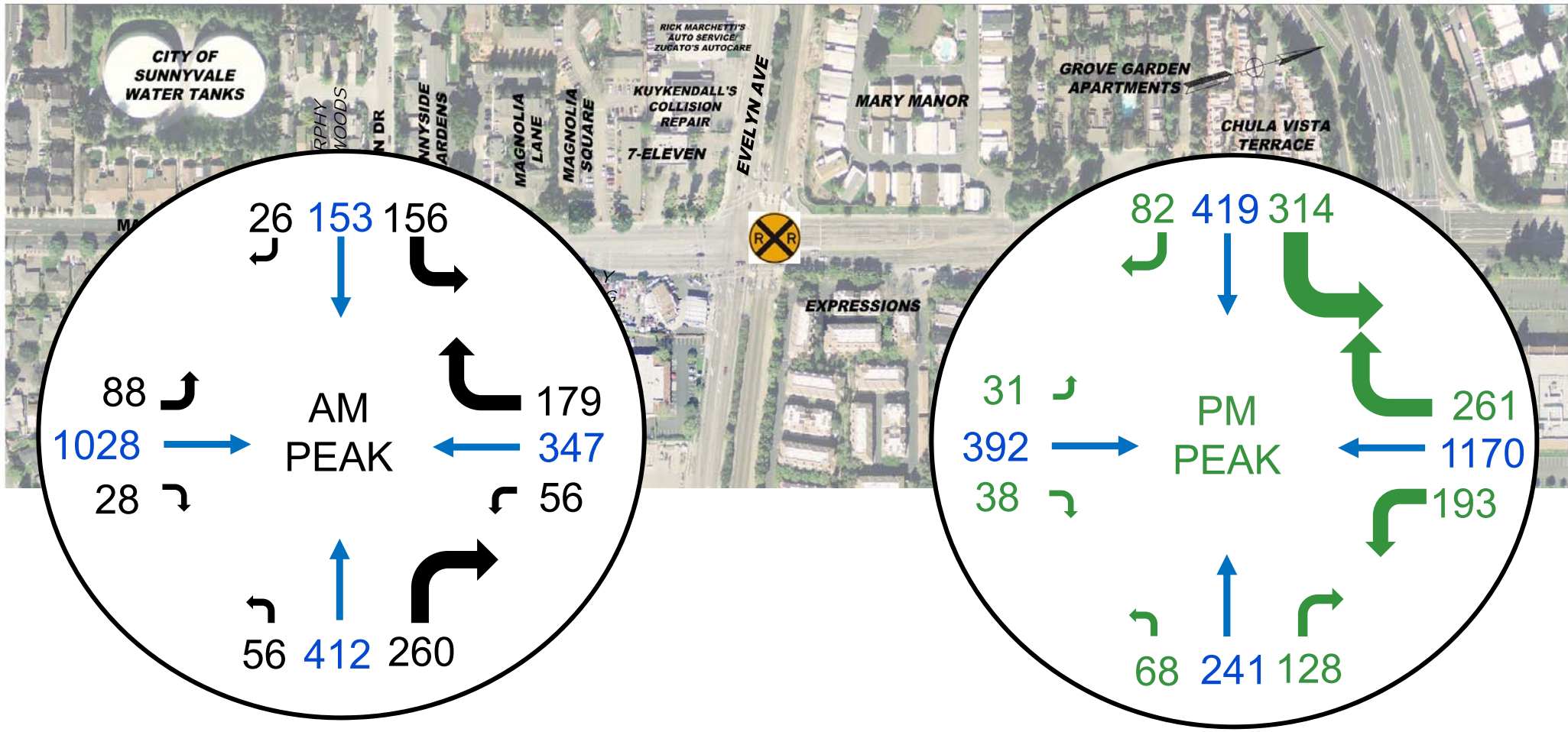


Thank You!



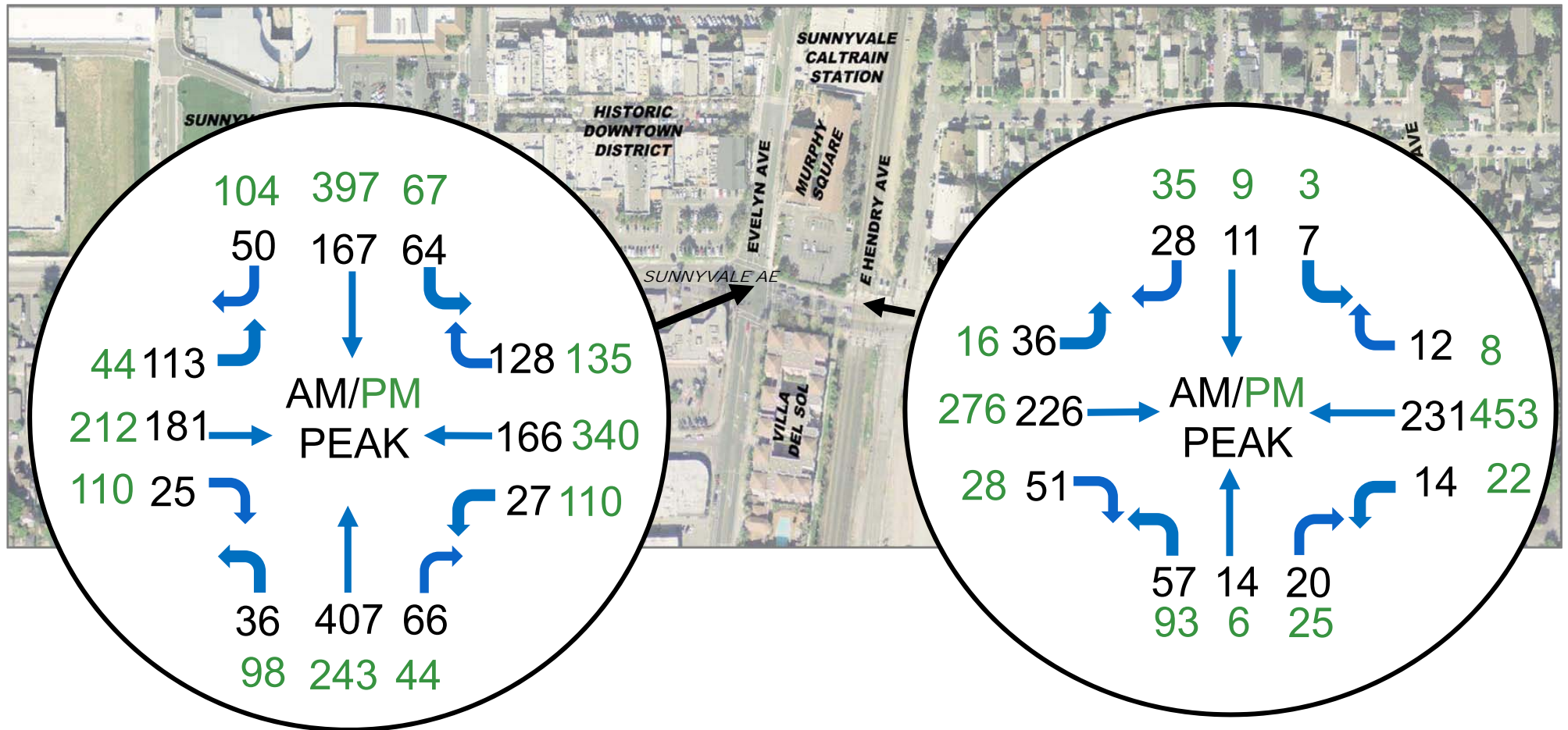
Sunnyvale

# Mary Avenue Traffic Counts





# Sunnyvale Avenue Traffic Counts



# Alternatives

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## Mary Avenue

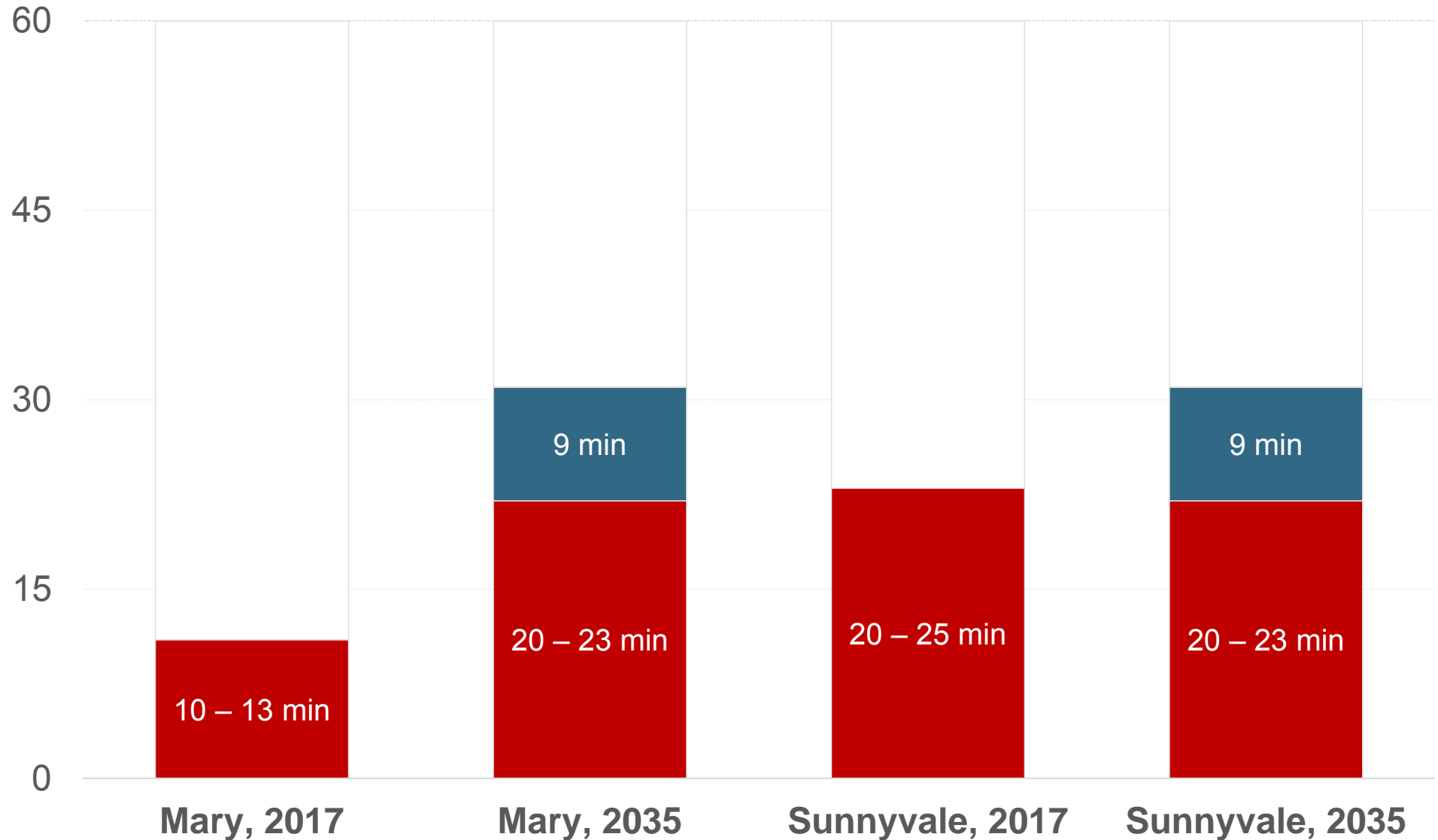
Alternative	Cost \$	Construction Duration	Parcel Acquisitions
<b>Underpass</b>	\$150-200M	2+ years	3 full
<b>Jughandle</b>	\$100-150M	2+ years	4 full
<b>Depressed Rail</b>	\$600-700M	4+ years	0

## Sunnyvale Avenue

Alternative	Cost \$	Construction Duration	Parcel Acquisitions
<b>Depressed Rail</b>	\$600-700M	4+ years	8 full, 4 partial
<b>Jughandle</b>	\$180-250M	2+ years	1 full. 8 partial
<b>Ped/Bike Undercrossing</b>	\$40-60M	2+ years	3 full



## Peak Hour Gate Down Time (City estimate\*)



\* Based on 70 second gate down time per event, 20 Caltrain services and 8 HSR services per peak hour in 2035