COMMUNITY MEETING

March 27, 2019

CITY OF PALO ALTO · WRECO · TJKM · alta PLANNING + DESIGN · apex STRATEGIES · AECOM

Welcome & Summary Update from 3/18/19 Council Committee of the Whole

Ed Shikada

City Manager

CITY OF PALO ALTO

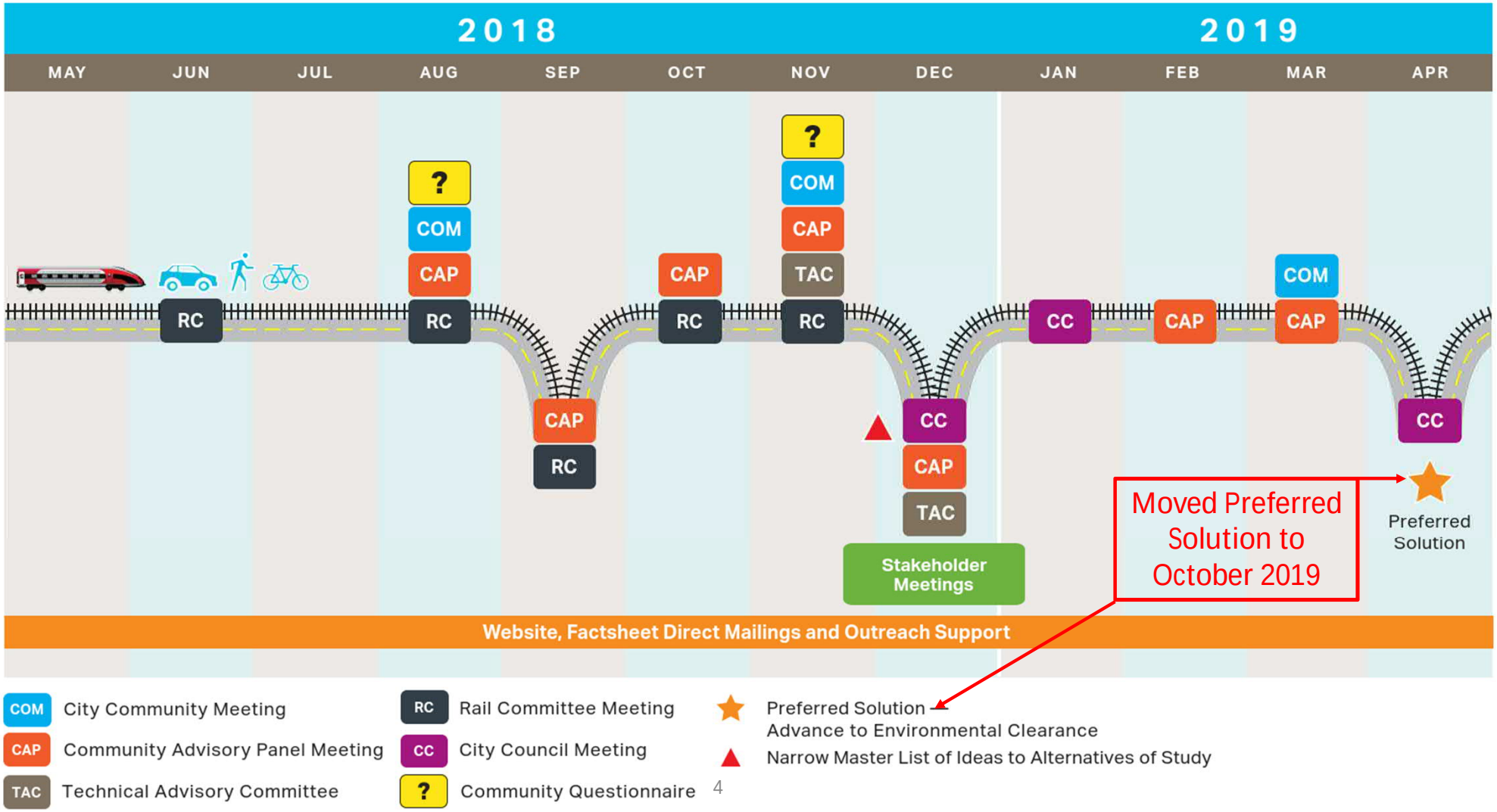
- Update timeline with a decision date in October 2019;
- Create a dynamic model that orders the alternatives based on the criteria;
- Develop plan for a community working group which reports to Council;
- Compile a list of ongoing questions and answers from the Council Committee of the Whole; and
- Amend AECOM contract to continue work to assist the City with the selection of a preferred solution for environmental review.

Link to March 18, 2019 Agenda and Minutes:
https://cityofpaloalto.org/gov/agendas/council/default.asp

Agenda

- Welcome & Update from 3/18/19 Meeting
- Project Background & Purpose
- Overview of Citywide Tunnel & Churchill Ave Closure
- Financing and Funding
- Q & A
- Stations
  - Citywide Tunnel
  - Churchill Ave Ped/Bike Undercrossing
  - Evaluation Impacts & Engineering Impacts
  - City Staff & Other Crossings
  - Traffic
  - Finance
- Station Report Out
- Next Steps

Community Engagement Schedule



Community Meeting Topics

Community Meeting – August 23, 2018

- Why separate the road from the tracks?
- Review current design alternatives

Community Meeting – November 28, 2018

- Feedback on the Charleston / Meadow alternatives
- 3D visuals
- Begin funding conversation

Community Meeting – March 27, 2019

- Feedback on Churchill Avenue and Citywide Tunnel alternatives
- 3D visuals
- Continue Funding Conversation
- Next Steps

Comments from each Community Meeting are summarized and posted on the project web page for review along with the materials and PowerPoints used at the meetings for those who cannot attend or for people who do attend to be able to refer back to the materials.

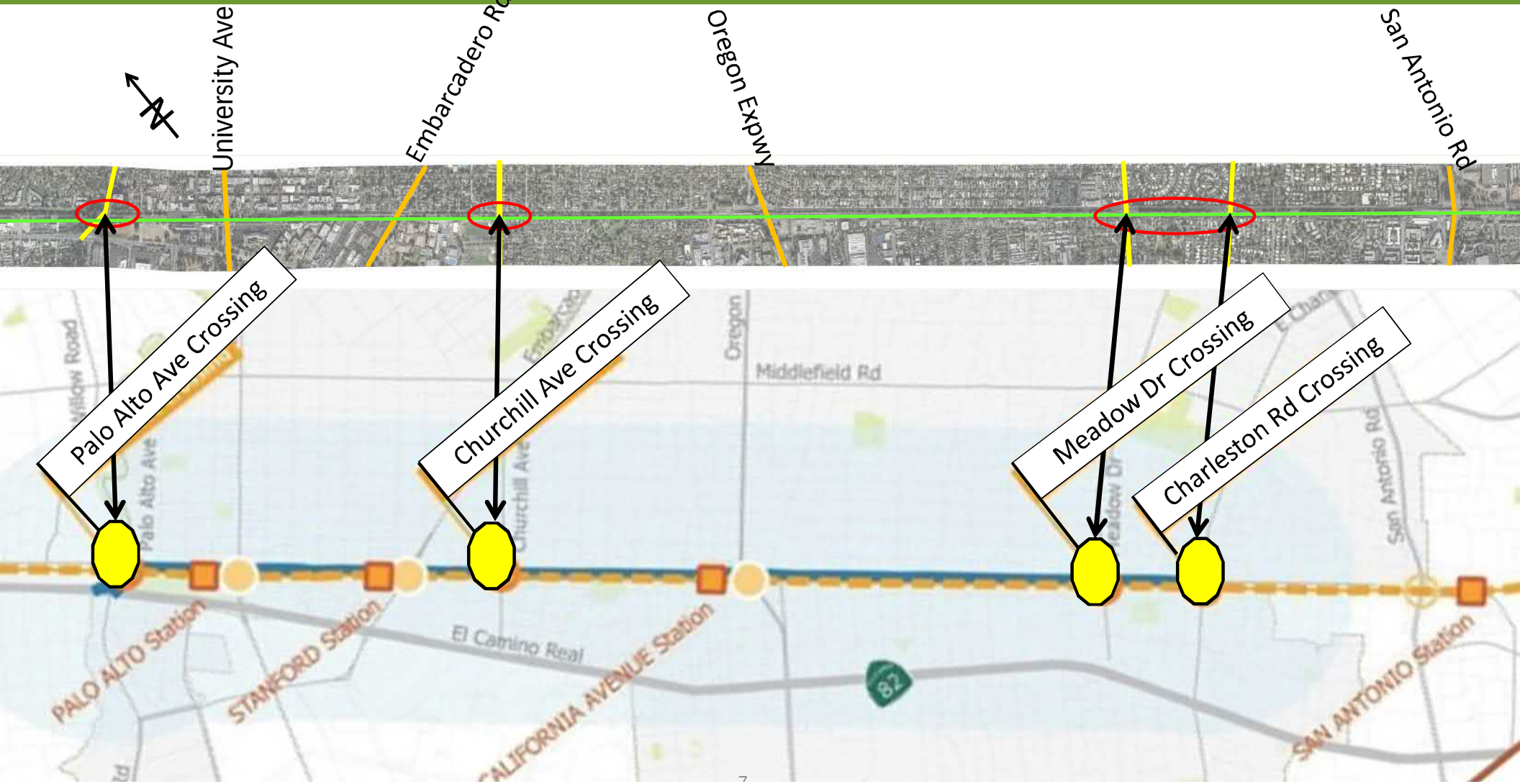
Background: What is an at-grade crossing?

Also known as a “railroad crossing”... a location where a roadway and sidewalk cross railroad tracks at grade (same level as the street).

Drop-down gates and red flashing lights are used to stop traffic when a train approaches.

At-Grade Crossing
Meadow Drive and Caltrain Tracks

Palo Alto Existing At-Grade Crossings



Near Miss: Vehicle Stopped on Tracks

Why is the City undertaking this effort?

Improve Traffic Circulation/Mobility

- Reduce traffic delays caused by gate down times
- Improve traffic flow across railroad crossing

Increase Public Safety (vehicular, bicycle, and pedestrian)

- Eliminate pedestrian, bicyclist and motor vehicle conflicts with the railroad... this eliminates the potential for accidents
- Improve pedestrian and bicycle access

Safer Facility + Less Congestion = Higher Quality of Life

Weekday Train Traffic

Total Number of Trains (per Weekday)

	Northbound (NB)	Southbound (SB)	Total
Caltrain (2018)	AM: 20 PM: 26 Total: 46	AM: 20 PM: 26 Total: 46	AM: 40 PM: 52 Total: 92
Caltrain (2022 Projection #)	57	57	114
High Speed Rail * (2029 Projection +)	128 trains per day to/from San Francisco with an additional 24 trains starting at San Jose		
Union Pacific	3	3	6

2022 Projected Values based on Completion of the Peninsula Corridor Electrification Project (from FEIR, December 2014) (Prototypical Schedule)
+ 2029 Projected Values based on Blended Service and Completion of the High Speed Rail Project and 2014 CHSRA Business Plan

*HSR projections subject to change due to Gov. Newsom's change in direction early in 2019 for HSR service in the Caltrain corridor.

Ten Year Collison History

At-Grade Crossing Intersection	Total Collisions	Fatality & Injuries	Involving Pedestrians
Charleston Road	7	4	5
Meadow Drive	5	2	1
Churchill Avenue	5	0	0

Source: Federal Railroad Administration

Current List of Grade Separation Alternatives

Citywide Tunnel

- Lower the railroad below the roadways in a tunnel

Churchill Ave. Closure

- At-grade crossing to be fully closed at Churchill Ave with a grade separation for Bike/Ped connectivity

South Palo Alto Tunnel

- Tunnel south of Oregon Expressway under Meadow and Charleston

Meadow / Charleston Trench

- Lower the railroad below the roadways at Meadow and Charleston

Meadow / Charleston Hybrid

- Partially lower the roads and partially elevate the tracks at Meadow and Charleston

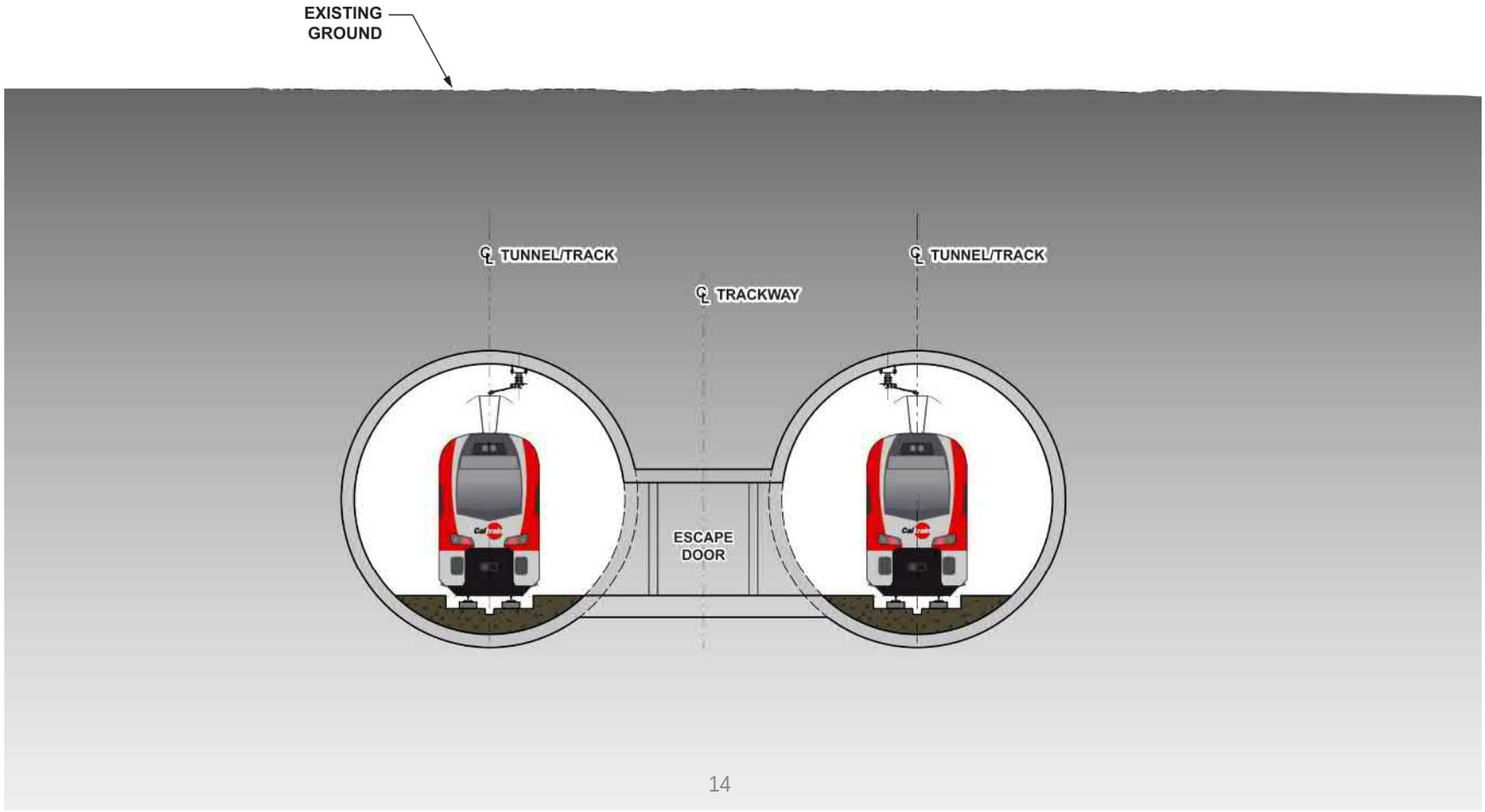
Meadow / Charleston Viaduct

- Raise the railroad above the roadways at Meadow and Charleston on structure

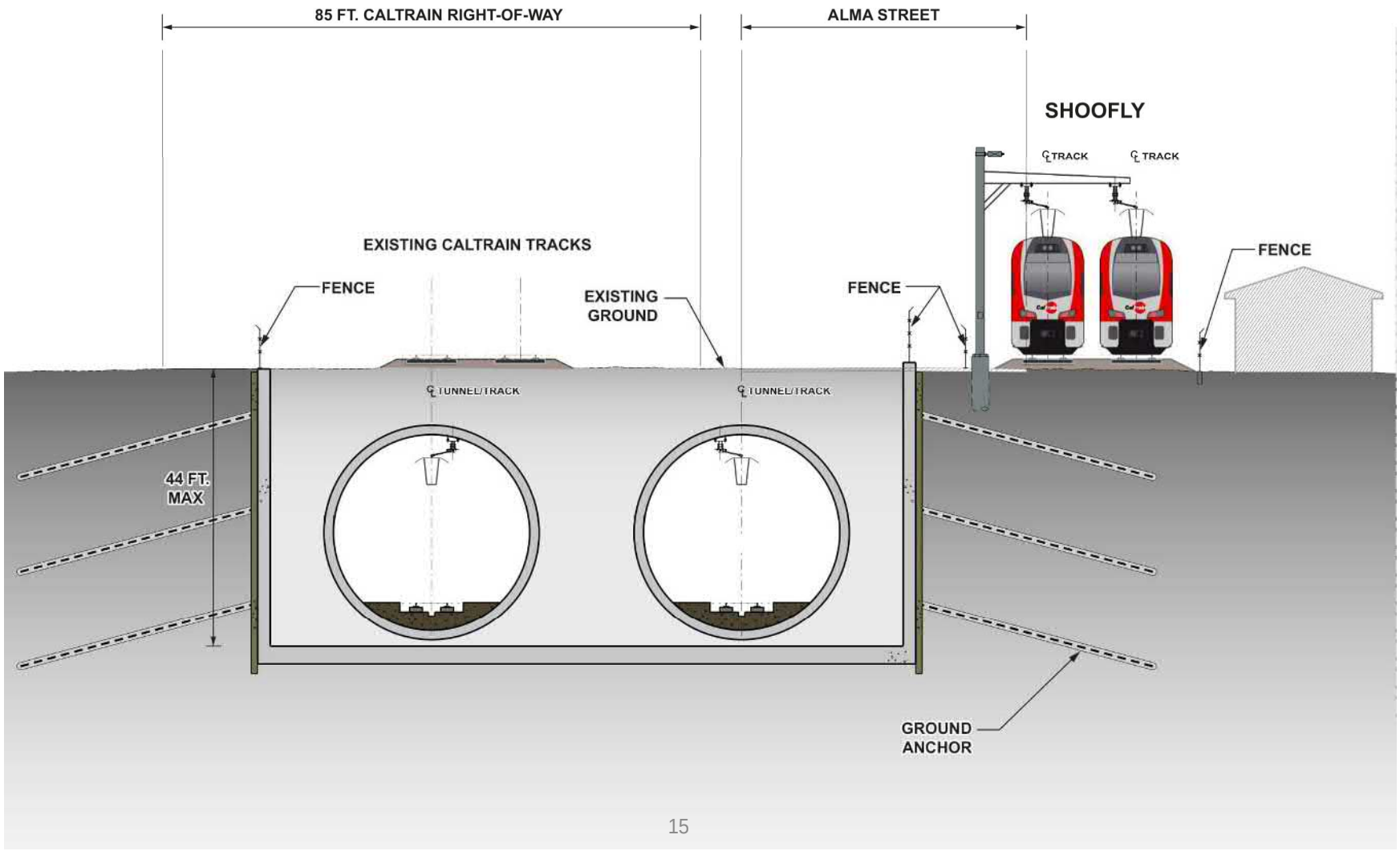
List as of January 22, 2019 City Council Meeting

Citywide Tunnel

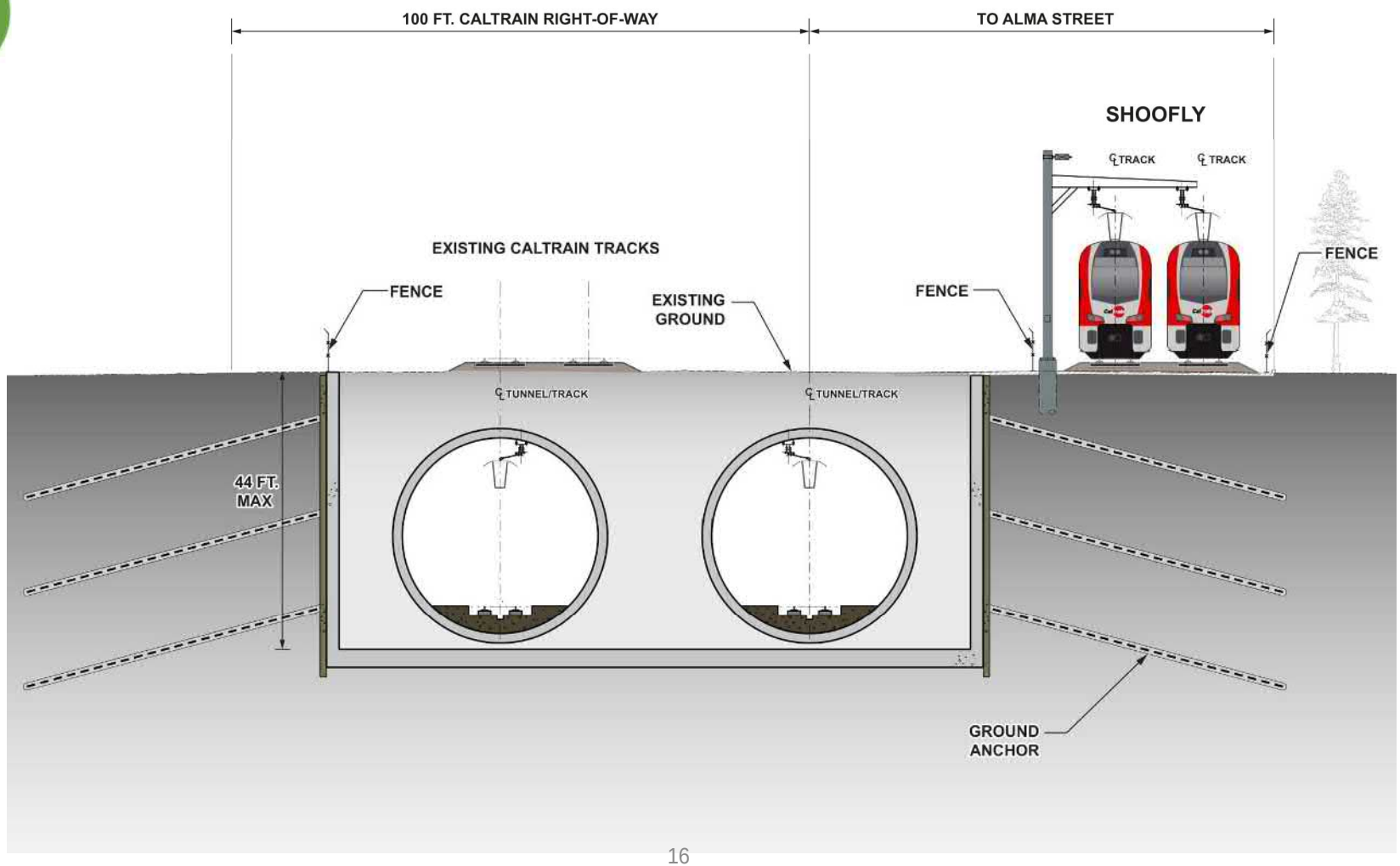
Tunnel Example Section – Twin Bore Tunnel



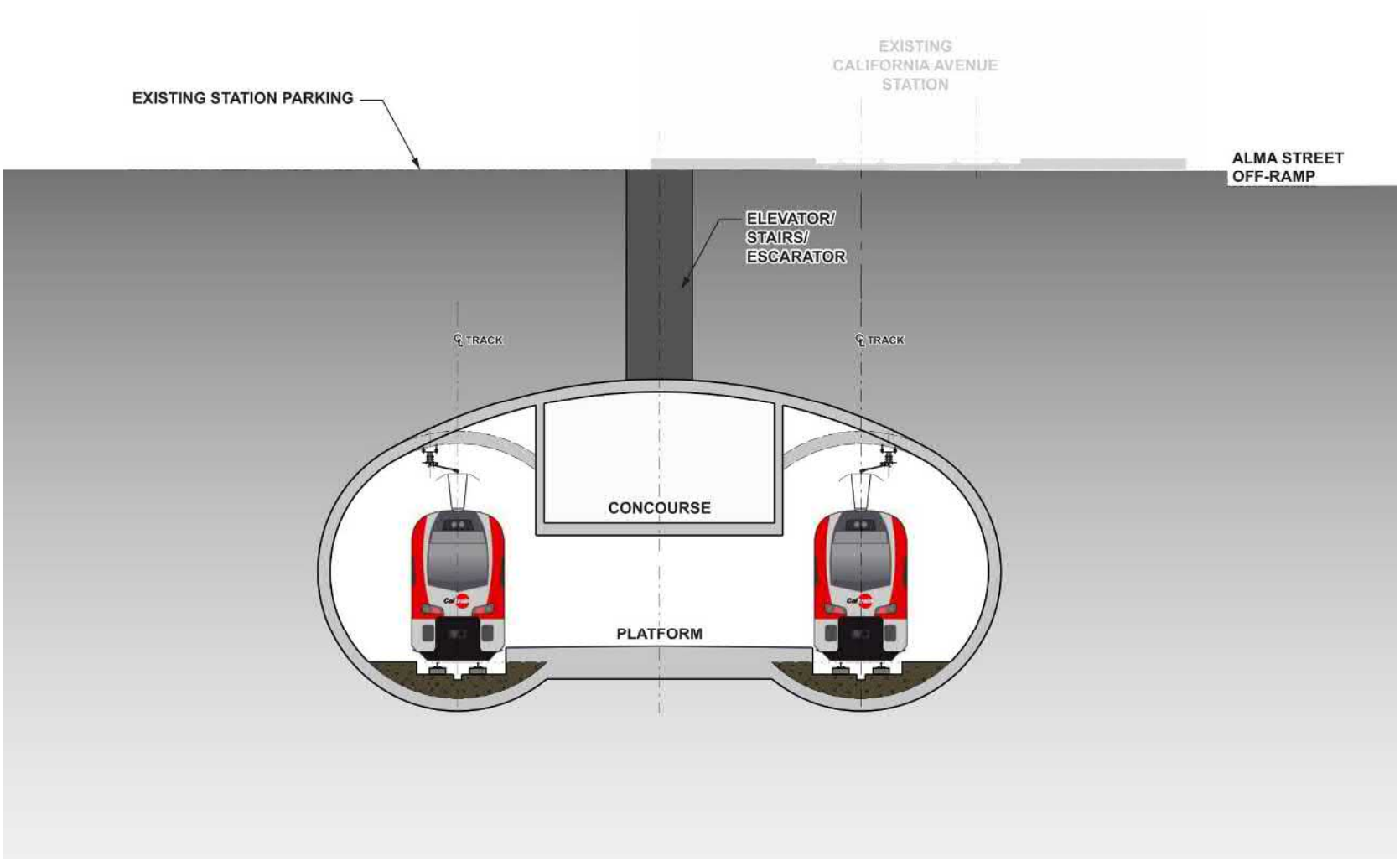
Tunnel Example Section – North Portal Launch Pit (looking North)



Tunnel Example Section – South Portal Launch Pit (Looking North)



Tunnel Example Section – California Avenue Station (Looking North)



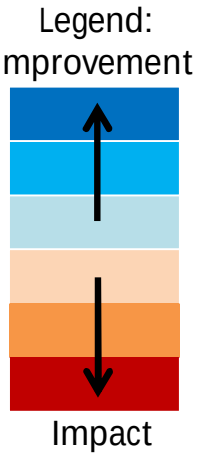
Tunnel Animation

18

Rendering/Example of Churchill Ave with Train in Tunnel

Citywide Tunnel Evaluation Matrix

	Criteria	Citywide Tunnel	Comments
A	Improve East-West Connectivity		❑ All at-grade crossings fully separated (Meadow, Charleston, Churchill)
B	Reduce traffic congestion and delays		❑ All at-grade crossings fully separated (Meadow, Charleston, Churchill) ❑ Alma St permanently narrowed from 4 to 2 lanes in the areas of the north portal. For the south portal area, Alma St will be permanently narrowed from 5 to 3 lanes.
C	Provide clear, safe routes for pedestrians and bikes		❑ Reduced conflicts for bikes/peds with railroad ❑ Reduced lanes on Alma Street near north and south portal
D	Support continued rail operations		❑ A temporary railroad track (shoofly) required near the north and south portals. ❑ Tunnel will have high maintenance costs and risks to train operations
E	Finance with feasible funding sources		❑ Based on estimated range of construction costs (K)
F	Minimize right-of-way acquisition		❑ Tunnel requires subsurface acquisition for structural elements ❑ Significant right-of-way impacts for construction of the temporary track near the north and south portals.
G	Reduce rail noise and vibration		❑ Tunnel eliminates train horn noise and warning bells ❑ Potential noise impact related to ventilation system, pump station, and generators.
H	Maintain or improve local access		❑ Stanford Station game day service eliminated ❑ Embarcadero undercrossing will need to be re-built
I	Minimize visual changes along the corridor		❑ Tunnel has train below grade – landscaping option limited to bushes or plants with shallow root systems
J	Minimize disruption and duration of construction	7+ years	❑ Embarcadero must be rebuilt and Adobe creek reconfigured before construction of the tunnel begins ❑ Tunnel has extended road closures for Alma Street during construction ❑ Duration assumes construction with one tunnel boring machine.
K	Order of Magnitude Cost	$2,500M to 3,800M*	❑ Does not include costs associated with rebuilding Embarcadero and reconfiguring Adobe Creek. * Total Preliminary Construction Costs in 2018 dollars (Subject to Change)



Tunnel Engineering Impacts

Engineering Impacts		Citywide Tunnel
L	Creek/Drainage/ Groundwater Impacts	❑ Requires diversion of Adobe creeks resulting in the need for pump stations ❑ Numerous regulatory agency approvals required for creek diversion ❑ Groundwater impacts include disruption to natural flow and potential to disperse existing contamination ❑ Pump stations also required to dewater the tunnel ❑ Increased risk of flooding due to pump stations
M	Long Term Maintenance	❑ Increased maintenance costs due to: •Pump stations for creek diversions •Pump stations for tunnel dewatering •Below ground railroad alignment
N	Utility Relocations	❑ Major utility relocations for Alma Street
O	Railroad Operations Impacts during Construction	❑ Temporary track (shoofly) is required at north and south portals
p	Local Street Circulation Impacts during Construction	❑ Alma St closed near north and south portals
Q	Caltrain Design Exceptions Needed	2% grade on track required. Caltrain standard maximum allowed is 1%.

Churchill Ave Alternatives

The only alternatives under consideration at Churchill now are a closure with a ped/bike undercrossing and no project. At the June 19, 2018 City Council meeting, the Council voted to reduce the alternatives under construction at Churchill Ave due to the proximity of homes to the rail corridor. The two alternatives removed that day were:

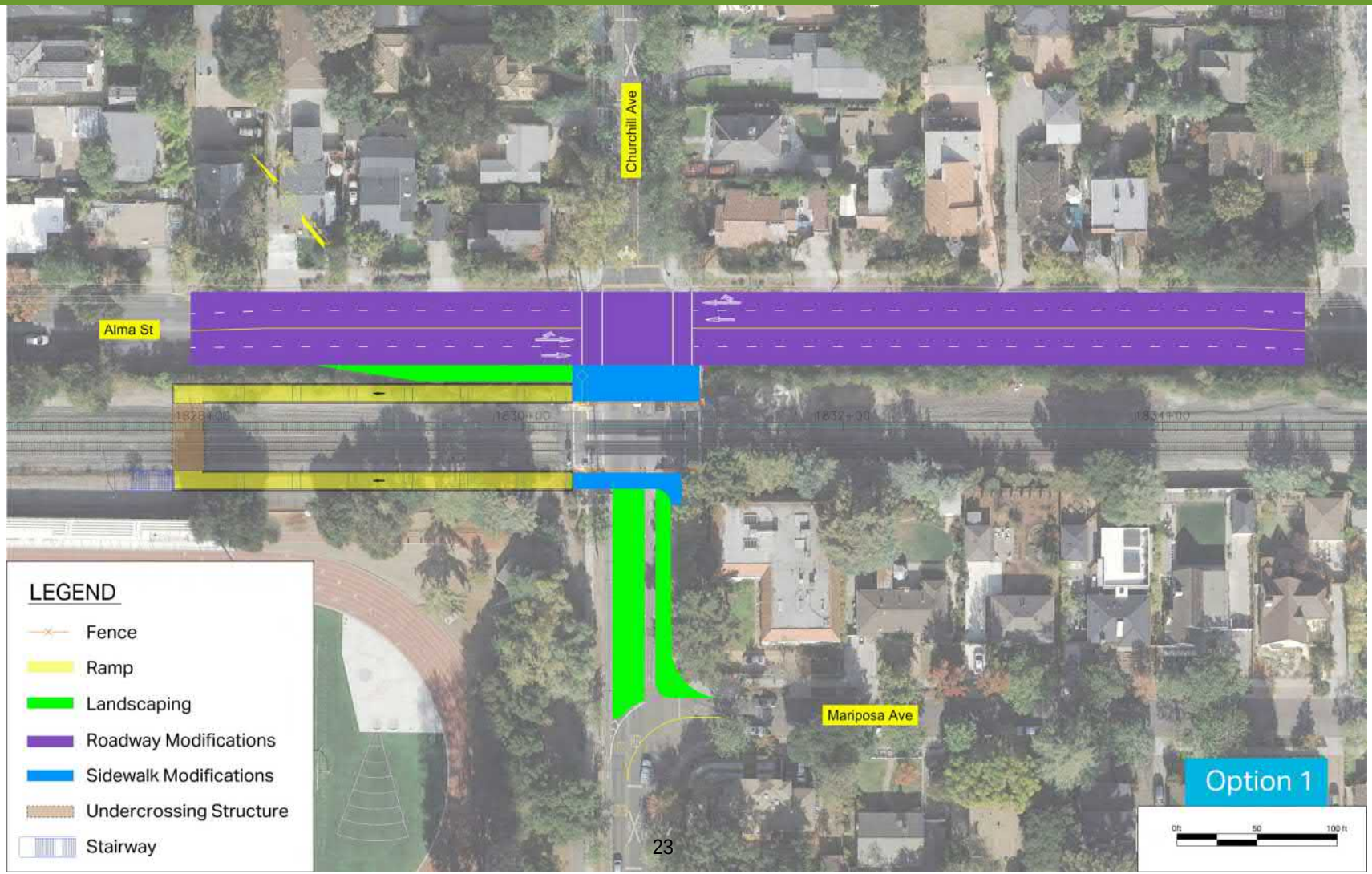
Churchill Ave Hybrid

- Partially lowers the road and partially elevates the track at Churchill

Churchill Ave Reverse Hybrid

- Partially elevates the road and partially lowers the track at Churchill

Churchill Ave Ped/Bike Undercrossing – Option 1

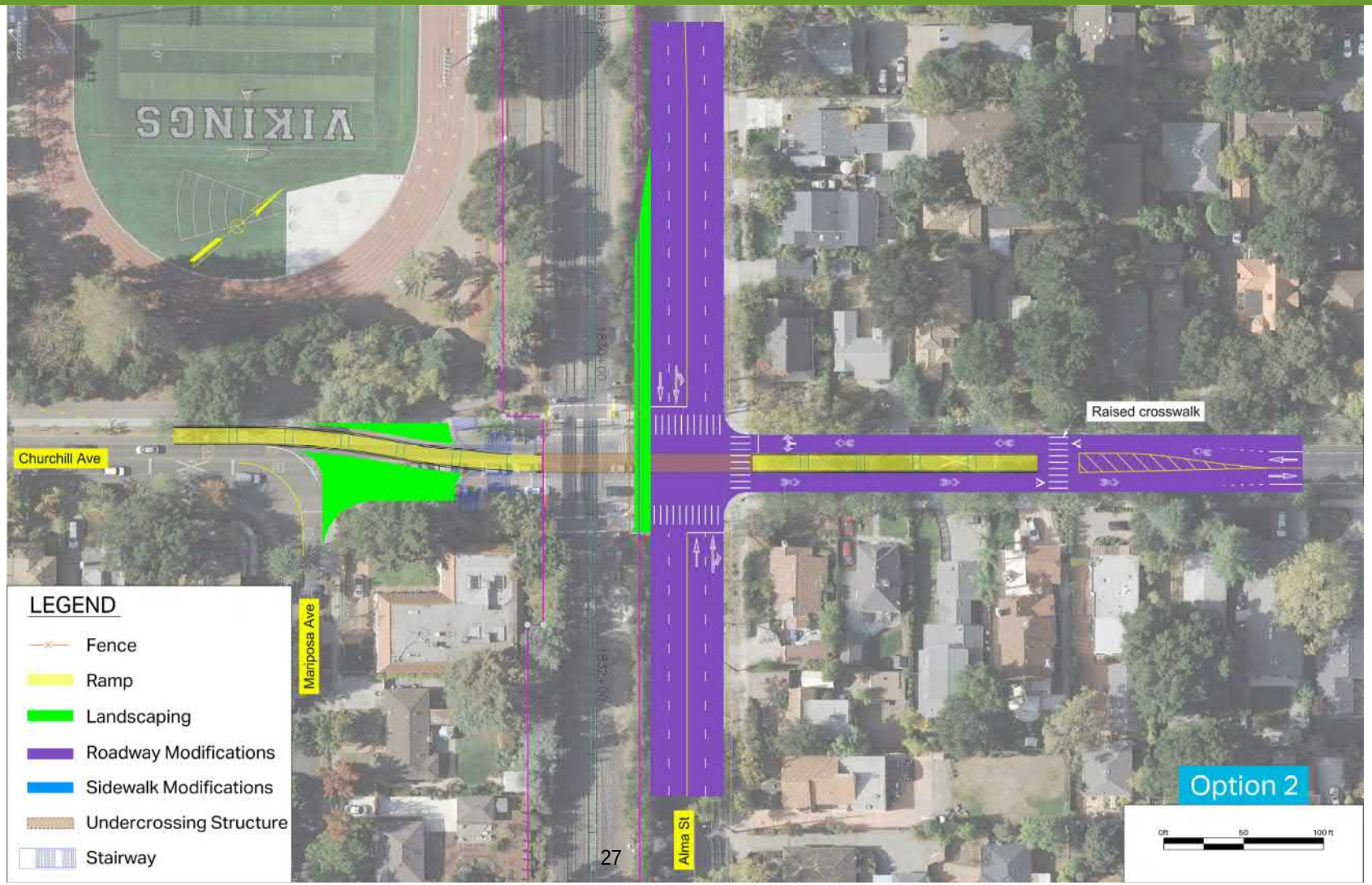


Churchill Ave Ped/Bike Undercrossing – Option 1

Churchill Ave Ped/Bike Undercrossing – Option 1

Churchill Ave Ped/Bike Undercrossing – Option 1

Churchill Ave Ped/Bike Undercrossing – Option 2



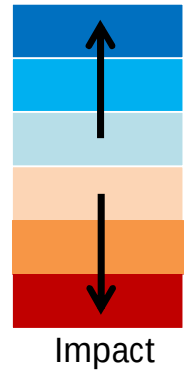
Churchill Ave Ped/Bike Undercrossing – Option 2

Churchill Ave Ped/Bike Undercrossing – Option 2

Churchill Ave Ped/Bike Undercrossing – Option 2

Churchill Ped/Bike Undercrossing Evaluation Matrix

	Criteria	Option 1	Option 2	Comments
A	Improve East-West Connectivity			❑ Both options close Churchill to through traffic ❑ Option 1 ped/bikes crosses underneath the railroad tracks only ❑ Option 2 ped/bikes crosses underneath the railroad tracks and Alma St
B	Reduce traffic congestion and delays			❑ Both options close Churchill to through traffic; however, impacted intersections can be mitigated. ❑ Pedestrian phase for traffic signal no longer needed at Alma Street for Option 2.
C	Provide clear, safe routes for pedestrians and bikes			❑ Option 1 reduces conflicts for ped/bikes at railroad ❑ Option 2 reduces conflicts for ped/bikes at railroad and Alma St ❑ Option 1 will have shorter ramps, stairs, and undercrossing than Option 2
D	Support continued rail operations			❑ Option 1 and 2 can be built with similar construction staging with limited single track operations at night and on weekends.
E	Finance with feasible funding sources			❑ Based on estimated range of construction costs (K)
F	Minimize right-of-way acquisition			❑ Option 1 may impact High School property and ramp proposed within Caltrain right-of-way ❑ Option 2 has no right-of-way impacts; however, there will be some loss of parking on the east side of Churchill
G	Reduce rail noise and vibration			❑ Both options eliminate train horn noise and warning bells with closure of Churchill
H	Maintain or improve local access			❑ Both options close Churchill to through traffic ❑ Option 1 ped/bikes crosses underneath the railroad tracks only ❑ Option 2 ped/bikes crosses underneath the railroad tracks and Alma St
I	Minimize visual changes along the corridor			❑ Both options have opportunities for additional landscaping areas
J	Minimize disruption and duration of construction	1 year	2 years	❑ Construction period is relatively short
K	Order of Magnitude Cost	$12M to $15M*	$16M to $20M*	* Total Preliminary Construction Costs in 2018 dollars (Subject to Change)



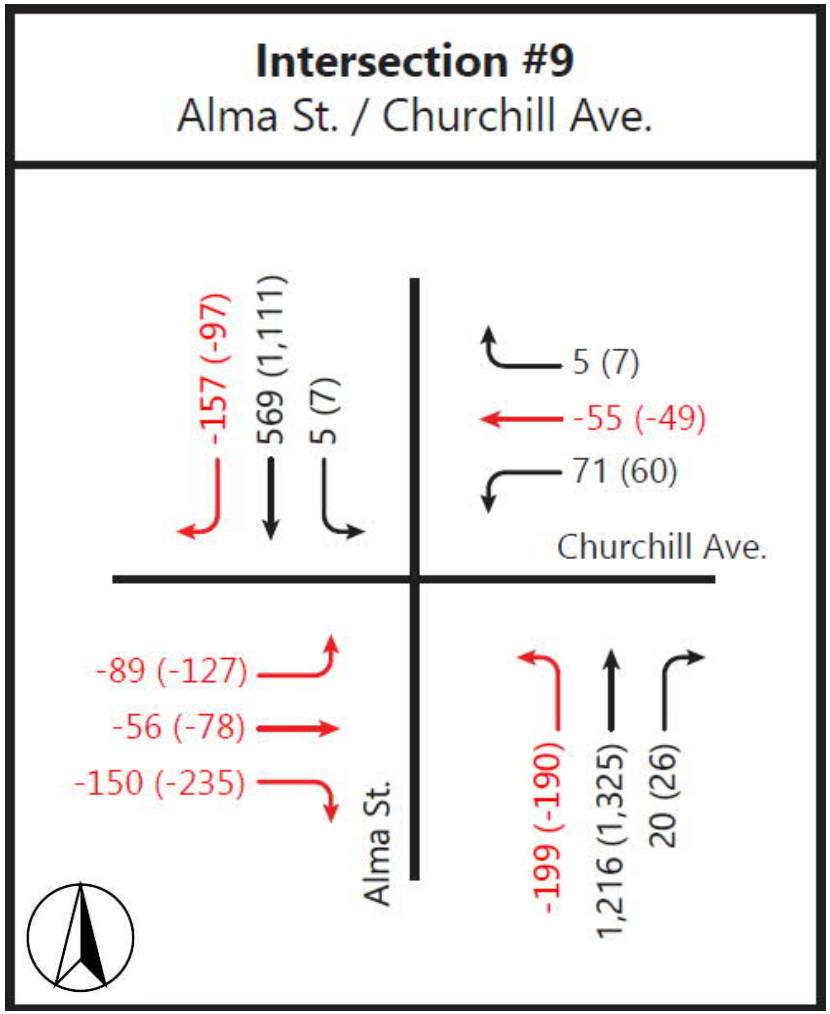
Churchill Ped/Bike Undercrossing Engineering Impacts

Engineering Impacts		Option 1	Option 2
L	Creek/Drainage Impacts	❑ Pump station required for lowered pedestrian/bike way. ❑ Increased risk of flooding due to pump stations	❑ Pump stations required for lowered pedestrian/bike way. ❑ Increased risk of flooding due to pump stations.
M	Long Term Maintenance	❑ Increased maintenance costs due to: •Pump stations for undercrossing dewatering	❑ Increased maintenance costs due to: •Pump stations for undercrossing dewatering
N	Utility Relocations	❑ Minimal impacts to utilities	❑ Potential utility relocations in Alma St and Churchill
O	Railroad Operations Impacts during Construction	❑ No shoofly required, only single tracking during nights and weekends	❑ No shoofly required, only single tracking during nights and weekends
P	Local Street Circulation Impacts during Construction	❑ Path along High School will impacted temporarily during construction	❑ Temporary night and weekend closures of lanes on Alma St and Churchill
Q	Caltrain Design Exceptions Needed	None required.	None required.

Churchill Ave Closure Traffic Study Review

- Data Collection
- Evaluation of Existing Traffic Conditions
- Evaluation of Year 2030 Traffic Conditions with Churchill Closure
- Some Mitigations for Impacted Intersections

Diverted trips due to Closure of Churchill Avenue

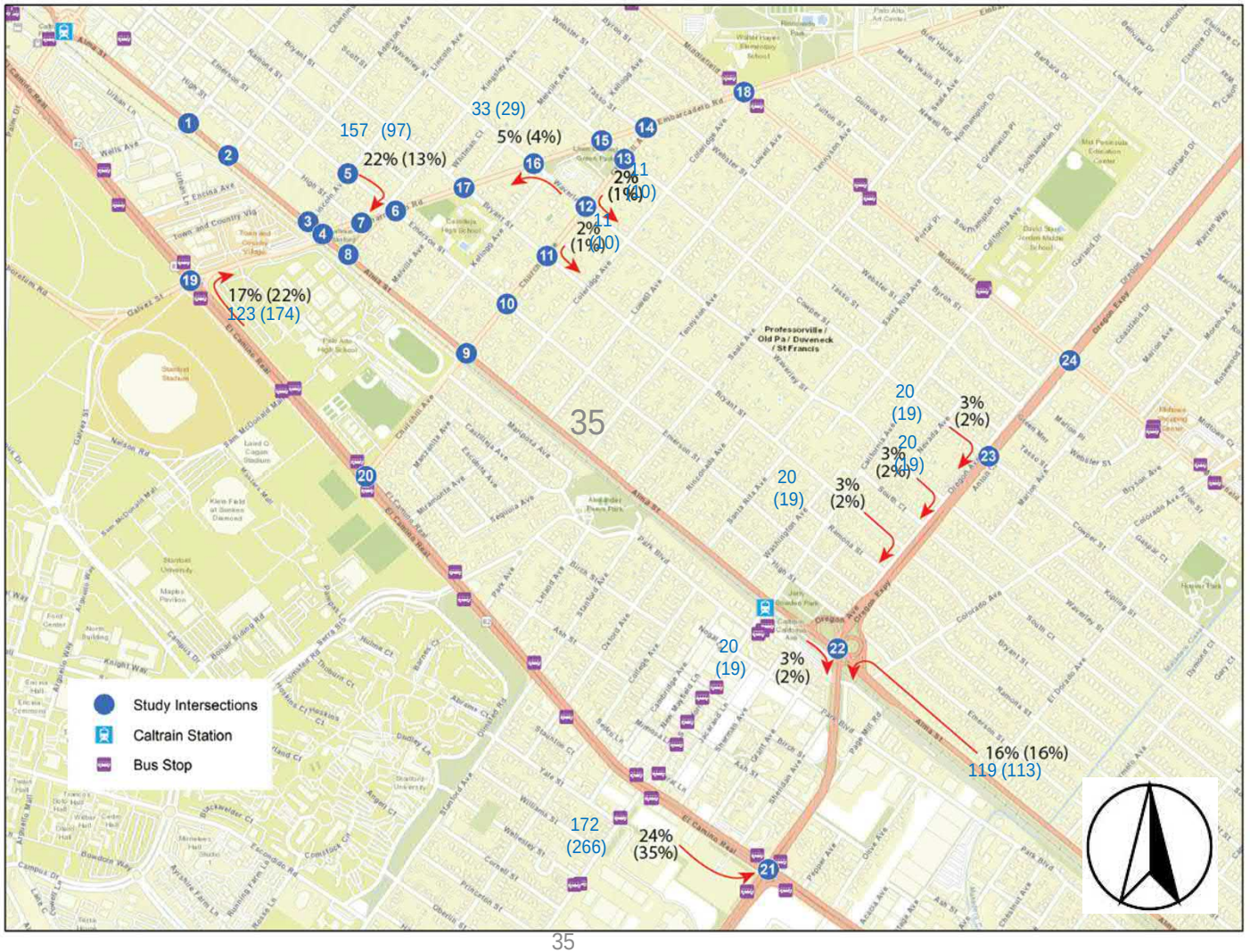


Total Trips Diverted due to Churchill Ave Closure

- AM Peak (8:00 a.m. – 9:00 a.m.) = 706 vehicles
- PM Peak (5:15 p.m. – 6:15 p.m.) = 776 vehicles

Trip Distribution

Based on City's Travel Demand Model and Origin and Destination Study



LEGEND:

1. XX% - AM Trip Distribution
2. (XX%) - PM Trip Distribution
3. XX – AM Trip Volume
4. (XX) – PM Trip Volume

Intersections at Unacceptable Level of Service (LOS)

Intersections Mitigated as a Group

- #3 - Alma Street/Lincoln Avenue
- #4 - Alma Street/Embarcadero Road
- #8 - Alma Street/Kingsley Avenue

CMP Intersections

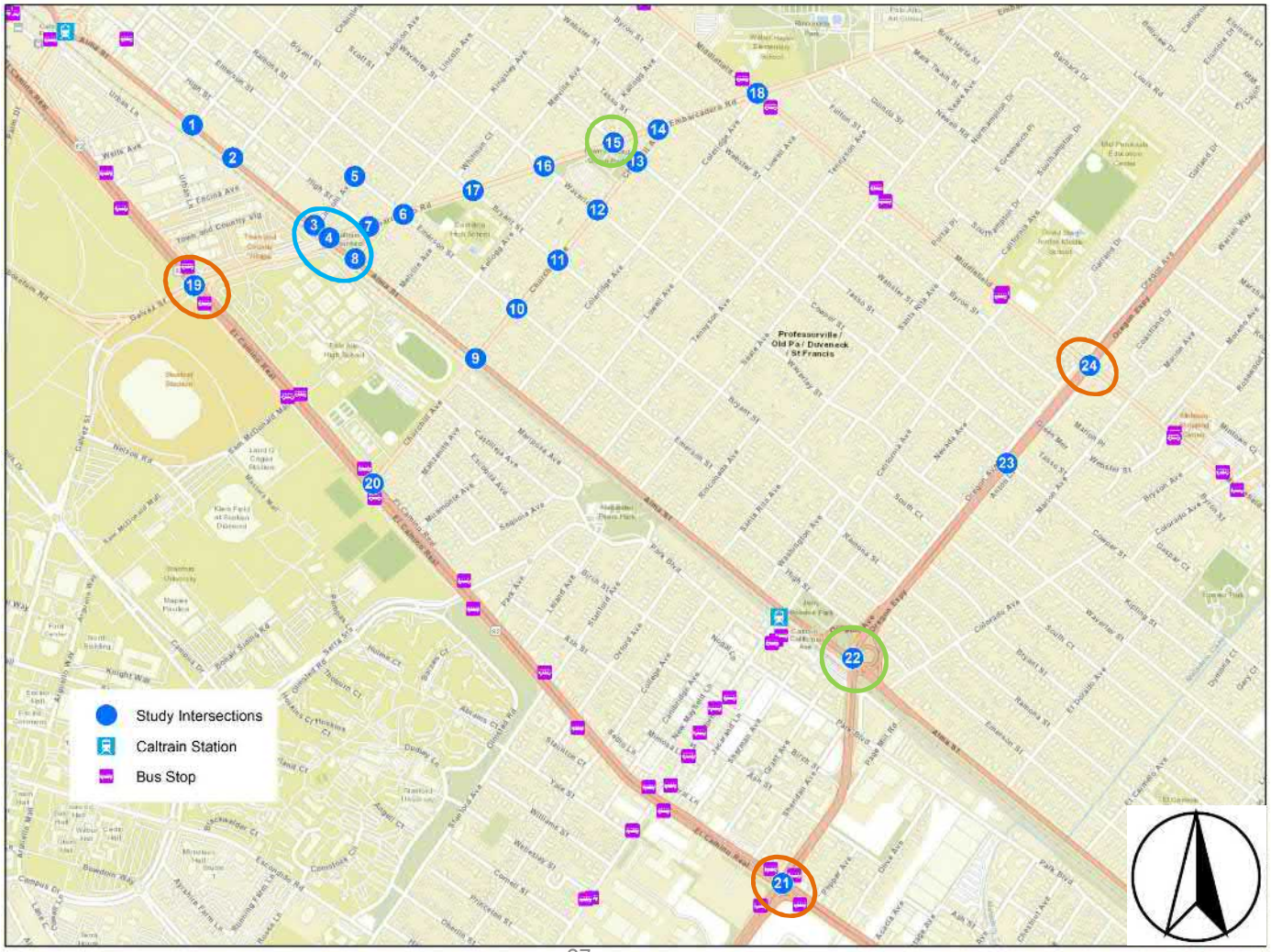
- #19 - El Camino Real/Embarcadero Road
- #24 - Oregon Expressway/Middlefield Road
- #21 - El Camino Real/Oregon Expressway-Page Mill Road

Intersections Mitigated Individually

- #22a/#22b - Alma Street/Oregon Expressway
- #15 - Embarcadero Road/Cowper Street

Intersections impacted by Churchill Ave Closure

Map of Unacceptable LOS Intersections



Summary of Potential Level of Service (LOS) Mitigations

Intersection Number and Name	Mitigation
#3 - Alma Street/Lincoln Avenue	• Restrict left turn and provide right turn only for Lincoln Ave
#4 - Alma Street/Embarcadero Road	• Add left turn lane and signalize
#8 - Alma Street/Kingsley Avenue	• Signalize intersection
#19 - El Camino Real/Embarcadero Road	• Add additional westbound left turn and northbound right turn lane • Optimize signal timings
#24 - Oregon Expressway/Middlefield Road	• Convert southbound right thru lane to exclusive southbound right turn lane • Convert northbound right turn lane to shared northbound thru and right turn lane • Modify signal phasing to include eastbound right and southbound right turn overlaps
#21 - El Camino Real/Oregon Expressway-Page Mill Road	• Install westbound right turn lane • Optimize signal timing

Summary of Potential Level of Service (LOS) Mitigations

Intersection Number and Name	Mitigation
#22a/#22b - Alma Street/Oregon Expressway	• Signalize intersections
#15 - Embarcadero Road/Cowper Street	• Restrict left turn and through movements for northbound and southbound at Cowper, reroute trips to Embarcadero/Waverly

Neighborhood Street Impact (TIRE Analysis)

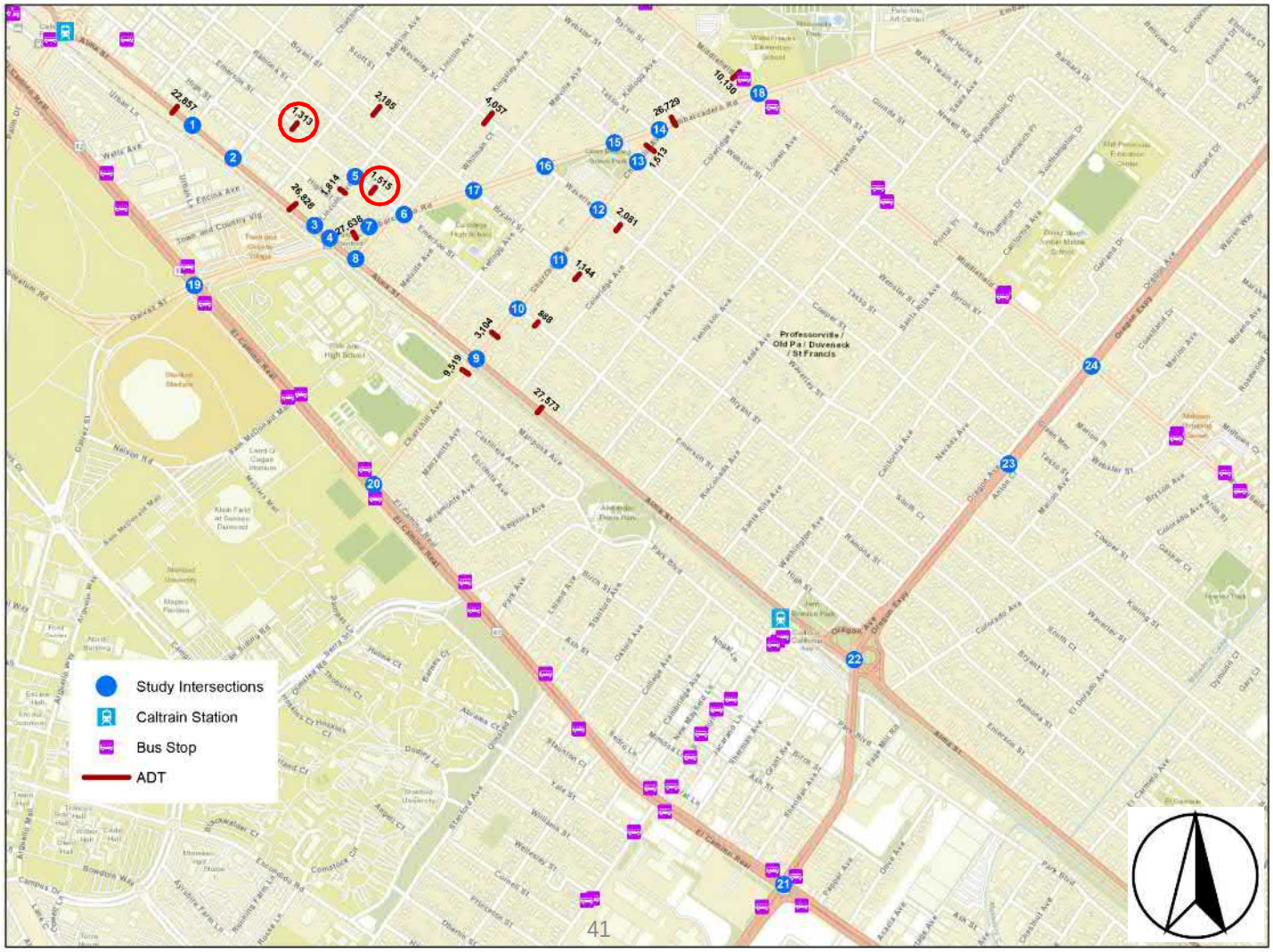
Traffic Intrusion on Residential Environment (TIRE)

- Measure of traffic impact on residents along a roadway
- Based on daily average conditions and uses average daily traffic (ADT) volumes to determine amount of daily traffic that could be added to a roadway before residents would perceive the increase in traffic

Two Segments Impacted Due to the Closure of Churchill Avenue

- Emerson Street, from Channing Avenue to Addison Avenue
- Emerson Street, from Lincoln Avenue to Kingsley Avenue

Neighborhood Street Impact (TIRE Analysis)



TIRE Analysis Mitigation

Implementation of Neighborhood Traffic Calming Measures

- Evaluation of the conditions
- Engaging the community to select the measures to mitigate the impact
  - Roadway improvements (widening, turn lanes, access control)
  - Intersection control (traffic signal, signal phasing, all-way stop, roundabout)
  - Operational improvements (signal timing, Intelligent Transportation System, signal systems)
  - Traffic Calming (speed humps and tables, chokers, bulb outs, diverters, etc.)
  - Pedestrian/Bicycle (crosswalks, ped signals, bike lanes)
  - Signalization of Embarcadero/Kingsley intersection

Finance and Funding

Outline

- Comparable Grade Separation Projects in Nearby Cities
- Finance and Funding Opportunities

Comparable Grade Separation Projects in Nearby Cities

San Bruno funding sources obtained

Project Summary:

- Elevate Caltrain tracks above three crossings; three pedestrian underpasses; new elevated Caltrain station
- Project cost of $155 million
- Completed in 2014

Funding Summary:

- Regional funds - $92.4 million
  - San Mateo County Transportation Authority (Measure A)
- State funds - $55.9 million
  - High Speed Rail / Proposition 1B / Statewide Transportation Improvement Program / Caltrans+CPUC Section 190
- Federal funds - $6.6 million
  - Federal Transit Administration

Comparable Grade Separation Projects in Nearby Cities

San Mateo funding sources obtained or proposed

Project Summary:

- Hybrid approach: Raise tracks; lowering of the road grade; allow for east-west street connections; new elevated Caltrain station
- Project cost of $180 million
- Estimated completion date of 2020

Funding Summary:

- Local Funds - $12 million
  - City of San Mateo Transportation Impact Fees
- Regional funds - $74 million
  - San Mateo County Transportation Authority (Measure A)
- State funds - $94 million
  - High Speed Rail Proposition 1A ($84 million)
  - Caltrans/CPUC Section 190 ($10 million)

Comparable Grade Separation Projects in Nearby Cities

Other general funding strategies proposed

Burlingame

- Estimated project alternative costs range from $250 to $910 million
- Preferred alternative was $250 million
- Preliminary design expected to be complete by end of 2019

Mountain View

- Estimated project cost of $120 million (in 2014)
- Entering preliminary environmental review and engineering phase

Menlo Park

- Estimate project cost for three crossings is $390 million while single crossing was estimated at $200 million, former preferred by City
- Draft project study report released at end of 2018

Across projects similar funding concepts:

- Regional funds: San Mateo County Measure A / Santa Clara County Measure B
- State funds: Caltrans/CPUC Section 190
- Local funds: Transportation impact fees and value capture approaches

Comparable Grade Separation Projects in Nearby Cities

Summary findings of funding strategies

- Federal funds have been limited for projects completed or under construction
- High speed rail funds have been critical for projects completed or under construction, but this will likely be an unreliable source of future funds
- Regional transportation measure funds have been and will continue to be a critical funding source for projects
- Local funding sources such as transportation impact fees have been used / are proposed for use, but have yet to be a large contributor comparative to total project costs
- Total project costs for similar projects were $250 million or less

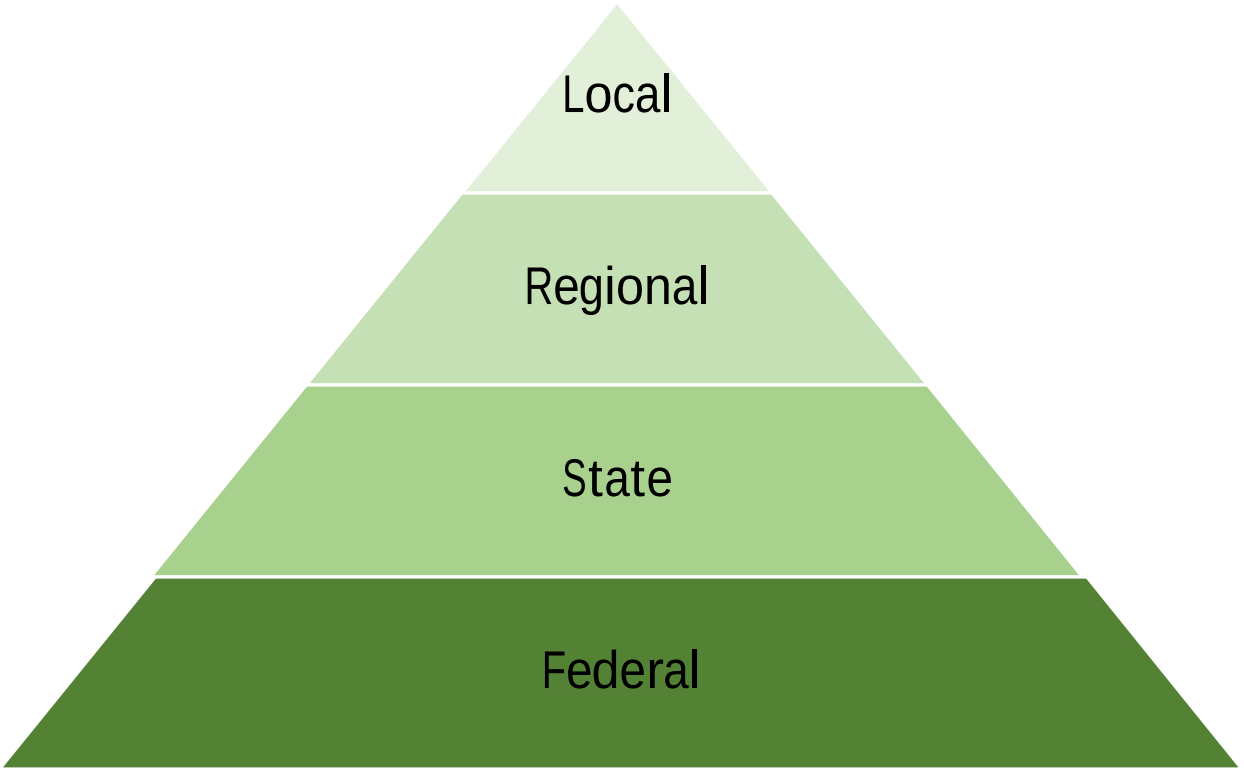
Financing and Funding

Financing

Financing refers to money that must be repaid. For example, municipal bond financing or public or private loans.

Funding

Funding refers to money that is available on hand or that will be collected over time that does not need to be repaid. For example, private or public grants would be a form of funding.



Financing and Funding

Funding Source	Funding/Financing Program	Description
Federal	Transportation Finance and Innovation Act (TIFIA) Program Loans	Direct loans, loan guarantees, and standby lines of credit provided to public and private transit, highway, rail, and port projects. (Must be repaid.)
Federal	BUILD Transportation Discretionary Grants	$1.5 billion for the overall program is available for infrastructure improvement projects.
State	Highway Railroad Crossing Safety Account (HRCSA)	The HRCSA provides $150 million annually for grade separation projects throughout the State.
Regional	Measure B	Current sales tax increment that will allocate $700 million to fund 8 grade separation projects for Sunnyvale, Mountain View, and Palo Alto.
Local	Public Private Partnerships	Public-private partnerships between a government agency and private-sector company can be used to finance, build and operate projects, such as public transportation networks, parks and convention centers.
Local	Mello-Roos Community Facilities District (CFD)	A special tax could be applied to property owners within two blocks of the Caltrain corridor.
Local	Property Taxes	A City could increase property taxes for city residents by 0.05%-0.25%
Local	Business Tax	A City could adopt a business tax in a variety of different ways and use some of such funding for many projects, including grade separations.

50

Stations

- Citywide Tunnel
- Churchill Ave Ped/Bike Undercrossing
- Evaluation Matrix and Engineering Impacts
- City Staff and Other Crossings
- Traffic
- Finance

Stay Engaged

Visit our website at: www.cityofpaloalto.org/ConnectingPaloAlto

Contact us at:
transportation@cityofpaloalto.org
(650) 329-2520


Thank you