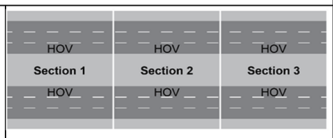
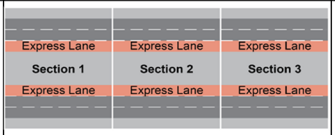
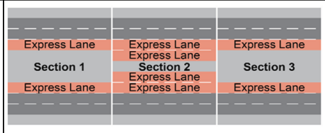
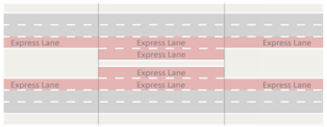
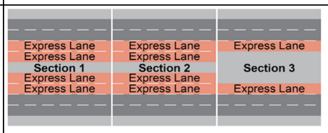
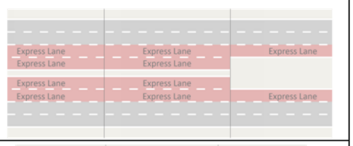
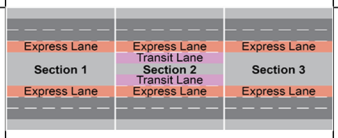
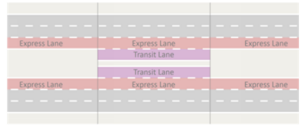
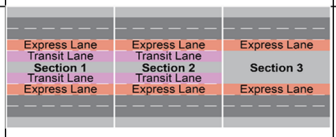
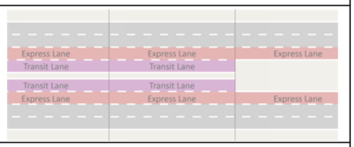
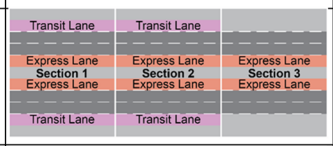
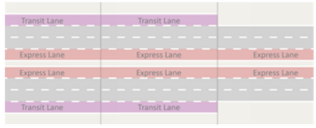
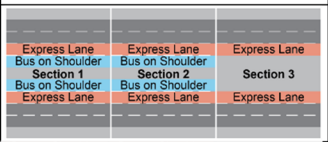
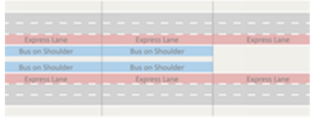
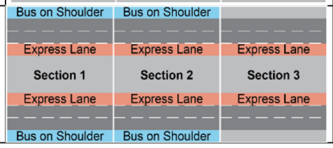
APPENDIX C

CONSTRUCTION COSTS

Appendix C – Construction Costs

For Appendix C please use the following equivalency table to compare the alternatives in this report and the alternatives in the three Parsons reports.

SR 85 Transit Alternatives Matrix							
Overall Alternative					Parsons Report Alternative		
Existing	1-1	No Change		equals	1-1	No Build	
Express Lanes	2-1	HOV to Express Lane		equals	1-2	HOV to Express Lane	
	2-2	Short Dual Express Lane		equals	2-1	Express Lane	
	2-3	Long Dual Express Lane		equals	2-2	Long Express Lane	
Transit Lanes	3-1	Short Median Transit Lane		equals	3-4	Short Transit Lane	
	3-2	Long Median Transit Lane		equals	3-1	Long Transit Lane (Median Adjacent Lane)	
	3-3	Right Side Transit Lane		equals	3-2	Long Transit Lane (Right-side Lane)	
Bus On Shoulder	4-1	Median Bus On Shoulder		equals	3-5	Long Shoulder (Median)	
	4-2	Right Side Bus On Shoulder		equals	3.6	Long Shoulder (Right-side)	

Basis of Design Report

STATE ROUTE 85 TRANSIT GUIDEWAY STUDY

Part 1: Proposed Engineering Features

October 9, 2019
November 8, 2019

PARSONS
100 West San Fernando Street, Suite 375
San Jose, CA 95113-2233

Valley Transportation Authority
Solutions that move you

MEASURE B

Revision History

Revision	Date	Description
1.0	October 9, 2019	Initial Draft Submission
2.0	November 8, 2019	Revised Draft Submission

Table of Contents

Introduction

The Santa Clara Valley Transportation Authority (VTA), in cooperation with the California Department of Transportation (Caltrans), proposes transit and managed lane improvements along 24 miles of State Route (SR) 85 between U.S. 101 in south San Jose and U.S. 101 in Mountain View, California (see Figure 1). These improvements are intended to enhance trip reliability, increase person throughput, encourage mode shift to transit and carpools, and provide long-term congestion management of the corridor.

Within the project limits, SR 85 is generally a six-lane, divided, controlled-access freeway with two general-purpose lanes in each direction plus one high-occupancy vehicle (HOV) lane in each direction. At the southern end of the route, from postmile (PM) 1.33 to PM 5.27, VTA additionally provides a light rail transit (LRT) line with two tracks and stations in the median of the divided freeway. Some parts of SR 85 also have auxiliary lanes that extend from on-ramps to off-ramps.

The existing travel lane width is generally 12 feet throughout the corridor. The inside shoulder has a standard width of 10 feet throughout the corridor with the exception of one overcrossing (northbound at Homestead Road). The outside shoulder has the standard width of 10 feet in the portion of the corridor from its southern junction with U.S. 101 to the separation with I-280, 18.4 miles to the north. From I-280 to the northern junction with U.S. 101, the outside shoulders range in width from 4 feet to 10 feet.

The width of the median varies considerably from end to end. Table 1 lists the approximate width of the median from inside edge of travelway to inside edge of travelway. This measurement includes paved shoulders, barriers, columns supporting overhead structures, and the width between bridges. South of Santa Teresa Boulevard, the listed median width does not include VTA's LRT trackway.

The pavement is generally in excellent condition. From U.S. 101 at the south end of SR 85 to the Guadalupe River Bridge (PM 5.59), the mainline lanes are full depth asphalt concrete (AC). From that point north, the mainline pavement is Portland cement concrete (PCC). Shoulders, both inside and outside, are partial depth AC. Heavy trucks, those in excess of 4.5 tons, are prohibited from utilizing SR 85 between I-280 and U.S. 101 in southern San Jose.

The freeway generally lies on level original ground, but alternates between segments on embankments and in depressed sections. The northbound and southbound roadbeds are typically at the same elevation and separated by a median concrete barrier(s) south of Almaden Expressway (PM 6.00) and north of McClellan Road (PM 17.17). Between these points, a thrie metal beam barrier separates the roadbeds.

For the purpose of defining managed lane investments, the corridor is segmented into three parts:

- Segment 1 from U.S. 101 in South San Jose to SR 87. This segment includes a VTA light rail line in the median of SR 85.
- Segment 2 from SR 87 to I-280. This segment for the most part includes a wide unpaved median.
- Segment 3 from I-280 to U.S. 101 in Mountain View. This segment includes a narrow median.

In all three segments, SR 85 passes through predominately residential neighborhoods. Sound walls line both sides of the freeway. The PCC pavement is grooved and microplaned. A SR 85 Noise Reduction Study is underway and five locations have been identified to test alternative noise reduction strategies. Balancing the noise concerns of residents and the mobility aspirations of commuters is an important aspect of VTA's Route 85 Transit Guideway Study.

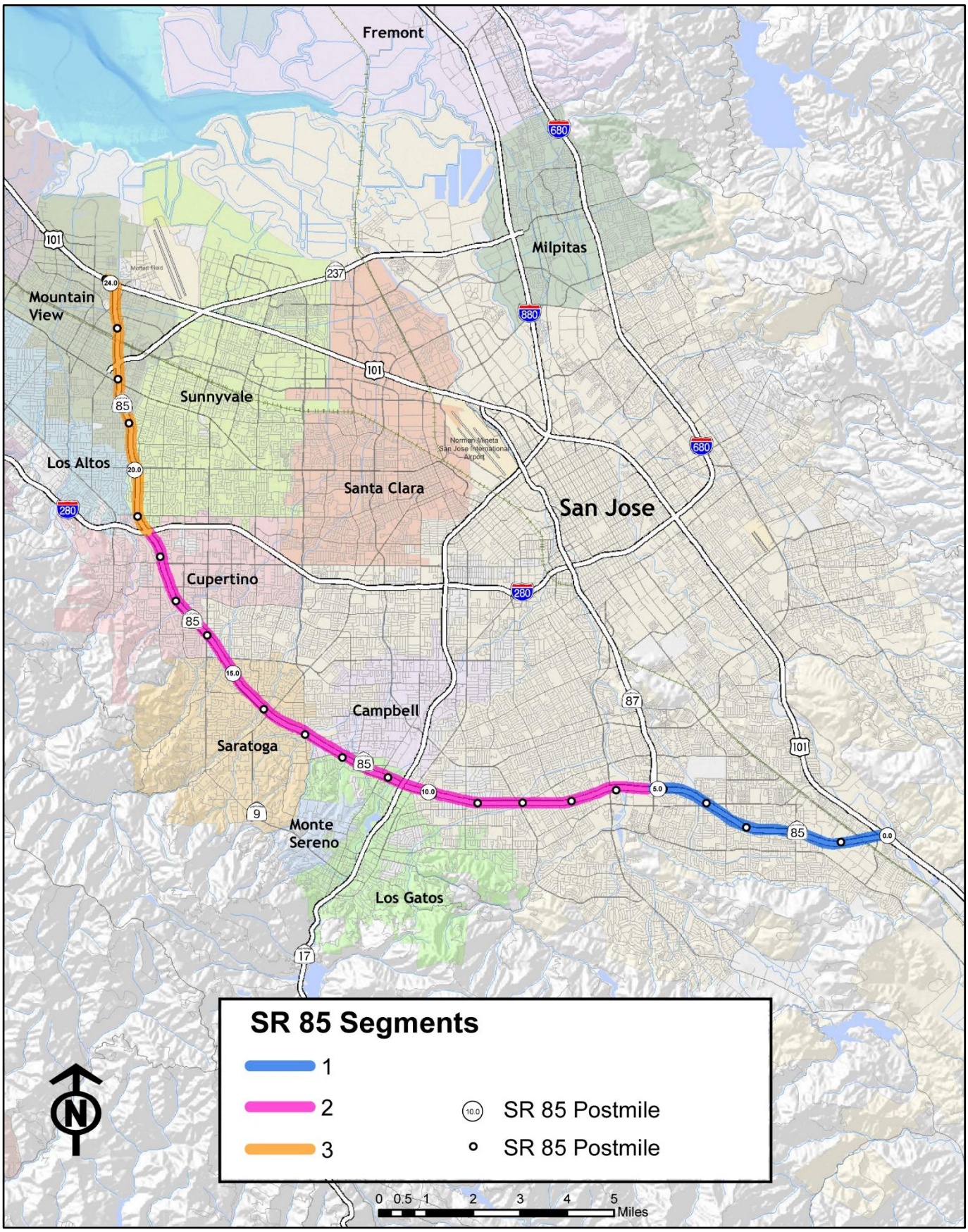


Figure 1 Vicinity Map

Table 1 Median Width along State Route 85

Structure No.	Postmile	Structure Name	Type*	Median Width (feet)
1	0.20	Bernal Road	Undercrossing	33
2	0.29	Monterey Road/Union Pacific/Great Oaks Boulevard	Undercrossing/overpass	46
3	1.22	Via Del Oro	Undercrossing	60
4	1.33	VTA Light Rail	Overpass	68
5	1.97	Cottle Road	Overcrossing	20
6	2.73	Lean Avenue	Overcrossing	18
7	3.48	Snell Avenue	Overcrossing	18
8	3.93	Blossom Hill Road	Overcrossing	16
9	4.28	Canoas Creek	Bridge	18
10	4.50	Cahalan Avenue	Pedestrian undercrossing	20
11	4.84	Southbound SR 87 to southbound SR 85	Separation	19
12	5.20	Santa Teresa Boulevard	Undercrossing	68
13	5.27	VTA Light Rail	Overpass	18
14	5.31	Southbound SR 85 to northbound SR 87	Separation	68
15	5.59	Winfred Blvd/Guadalupe River/Sanchez Drive	Bridge	68
16	6.00	Almaden Expressway	Undercrossing	70
17	6.46	Russo Drive	Pedestrian overcrossing	48
18	7.30	Meridian Avenue	Overcrossing	48
19	7.50	Dent Avenue	Pedestrian overcrossing	48
20	8.11	Camden Avenue	Undercrossing	66
21	8.77	Leigh Avenue	Overcrossing	48
22	9.28	Union Avenue	Overcrossing	68
23	9.93	Samaritan Place	Pedestrian overcrossing	50
24	10.23	Bascom Avenue	Overcrossing	66
25	10.40	Southbound SR 17 to southbound SR 85	Separation	56
26	10.48	SR 17	Separation	50
27	10.60	Oka Road	Undercrossing	50
28	10.80	Los Gatos Creek	Bridge	48
29	10.90	Winchester Boulevard	Underpass	48
30	11.00	Winchester Boulevard	Overcrossing	48
31	11.97	Pollard Road	Undercrossing	44
32	12.45	More Avenue	Pedestrian overcrossing	44
33	12.68	San Tomas Aquino Creek	Bridge	44
34	12.91	Quito Road	Overcrossing	44
35	13.73	Saratoga Avenue	Undercrossing	44
36	13.91	Saratoga Creek	Bridge	44
37	14.28	Cox Avenue	Overcrossing	44
38	14.31	Cox Avenue utility	Overcrossing	44
39	14.73	Scully Avenue utility	Overcrossing	44
40	14.84	Blue Hills	Pedestrian overcrossing	44
41	15.27	Prospect Road	Overcrossing	45
42	15.40	Calabazas Creek	Bridge	44
43	15.87	South De Anza Boulevard	Overcrossing	44
44	16.61	South Stelling Road	Overcrossing	44
45	17.17	McClellan Road	Overcrossing	30
46	17.70	Stevens Creek Boulevard	Overcrossing	24
47	18.35	Southbound/eastbound I-280	Separation	20
48	18.41	SR 85/I-280	Separation	20
49	18.43	Northbound/westbound I-280	Separation	20
50	18.86	Homestead Road	Overcrossing	18
51	19.39	The Dalles	Pedestrian overcrossing	22

Table 1 Median Width along State Route 85

Structure No.	Postmile	Structure Name	Type*	Median Width (feet)
52	19.86	Fremont Avenue	Undercrossing	20
53	20.02	Stevens Creek	Bridge	20
54	20.37	Hawkins Drive	Right-of-way	20
55	20.69	Permanente Creek Diversion Channel	Culvert	20
56	21.10	Stevens Creek Trail/Dale Avenue	Pedestrian overcrossing	22
57	21.75	SR 82/SR 85/El Camino Real	Separation	20
58	22.13	SR 85/SR 237	Separation	22
59	22.43	Dana Street	Overcrossing	20
60	22.63	Evelyn Avenue/Caltrain/Light Rail/Central Expressway	Undercrossing/overpass	20
61	22.95	Stevens Creek	Bridge	22
62	23.19	Middlefield Road	Overcrossing	22
63	23.44	Moffett Boulevard	Undercrossing	22

*Type:
- Undercrossing = local road under State highway
- Overcrossing = local road over State highway
- Pedestrian overcrossing = Pedestrian crossing over State highway
- Separation = State highway crossing
- Underpass = State highway under railroad
- Overpass = State highway over railroad
- Right-of-way = right-of-way required

Basis of Design

To enhance trip reliability, increase person throughput, encourage mode shift to transit and carpools, and provide long-term congestion management of the corridor, VTA and its State Route 85 Policy Advisory Board (PAB) are considering the installation of express lanes and/or transit lanes along SR 85. Earlier phases of this study considered, but eventually ruled out other investment options such as light rail transit, or reversible lanes using movable barriers.

The purpose of this document is to provide a physical definition of the alternatives advanced for further study, based on conceptual engineering considerations. As such, this documentation of "Proposed Engineering Features" provides scoping information for subsequent capital cost estimating, preliminary environmental assessment, and stakeholder/community outreach.

As SR 85 is owned and maintained by the State of California, alterations or expansions of the facility must be approved by Caltrans, no matter the source of funding. Documents which guide and govern the design of the proposed investments include:

- Caltrans Transportation Planning Manual
- Caltrans Project Development Procedures Manual
- Caltrans Highway Design Manual
- Manual on Uniform Traffic Control Devices (MUTCD) and the California Supplement to the MUTCD
- Caltrans Traffic Operations Policy Directives.

As the installation of express lanes and/or transit lanes are frequently retrofits of existing facilities, Caltrans has also published *High-Occupancy Vehicle Guidelines for Planning, Design and Operations.* The guidelines acknowledge, "For most situations, retrofitting an HOV [high occupancy vehicle] lane [includes express and transit lanes] on an existing freeway requires some compromises in design standards." The guidelines go on to emphasize the following:

> "The Guidelines are advisory in nature and are to be used only when every effort to conform to established standards has been exhausted. When conformance is not possible, the deviation must be documented by a sound and defensible analysis and an approved design exception fact sheet."

Collectively, the guidance covering the alteration of State Route 85 covers literally hundreds, if not thousands, of topics. For the purpose of this physical definition and conceptual design investigation, select guidance covering the geometric cross section of the proposed investments are summarized in Table 2.

Guidance provided in Caltrans Highway Design Manual is extremely important. Deviations from this guidance typically requires approval of a Design Standards Decision Document by the Chief, Division of Design. Caltrans recognizes that retrofitting state facilities to include managed lane elements will typically require design exceptions and they have issued *High Occupancy Vehicle Guidelines* to indicate the department's priorities for the reduction of lane widths. Neither of these resources address part-time use of shoulders for bus use. The Federal Highway Administration (FHWA) recognizes this option as a valuable resource potential and has issued planning and design guidelines to advise State and local transportation agencies such as Caltrans. Lastly, Table 2 presents SR 85 project specific guidelines the design team has followed, in addition to those provided by Caltrans and FHWA.

Table 2 SR 85 Transit Corridor Design Guidance

Source	Topic	Horizontal Geometric Standard/Guidance Applicable to SR 85
Caltrans Highway Design Manual	108.3—Commuter and Light Rail Facilities within State Right of Way (3) Parallel Rail Facilities	As necessary, rail facilities may be located within the median upon approval from the District Director.
	108.5—Bus Rapid Transit	Bus rapid transit (BRT) is to be considered the same as commuter and light rail facilities with regard to approvals and design guidance.

Table 2 SR 85 Transit Corridor Design Guidance

Source	Topic	Horizontal Geometric Standard/Guidance Applicable to SR 85
		BRT located on freeways should be designed in accordance with the HOV Guidelines and per standards contained in the HDM (Highway Design Manual).
	108.6—High-occupancy Toll and Express Lanes	High-occupancy vehicle guidelines are to be consulted. High-occupancy toll (HOT) and express toll lane facilities are to comply with HDM design standards.
	301.1—Lane Width	12 feet
	302.1—Highway Shoulder Width	On freeways with six or more lanes, 10 feet left and 10 feet right paved shoulders. Ramps—4 feet left and 8 feet right. For single or two-lane branch connections, 5 feet left and 10 feet right.
	305.1—Median Width for (3) Facilities under Restrictive Conditions	22 feet minimum
	305.5—Paved Medians	On freeways of six or more lanes, medians 30 feet wide or less should be paved. Where medians are paved, each half should be paved in the same plane as the adjacent traveled way.
	307.5—Multilane All Paved Cross Sections with Special (Narrow) Median Widths	May be used for widening of existing facilities.
	309.1—Horizontal Clearances	
	(3) a. Minimum to objects	Equal to standard shoulder width, but not less than 4 feet.
	b. Minimum to walls (including noise barriers)	10 feet
	(5) Parallel BRT facilities on freeways	4-foot separation between (mainline) lanes—see HOV Guidelines
High-occupancy Vehicle Guidelines[1]	3.10—Relative Priority of Cross-Sectional Elements	
	(0) General	A reduction in standards for cross-sectional elements may be necessary for most retrofit HOV projects and will require approved Design Standards Decision Documents.
	(3) Buffer-Separated HOV Facilities	First, reduce the median shoulder from 14 feet (the width to accommodate continuous enforcement areas) to 10 feet. Any reduction of the median shoulders should be accompanied by the addition of California Highway Patrol (CHP) enforcement areas. Second, reduce the buffer to 2 feet. Third, reduce the median shoulders to a minimum of 8 feet. Fourth, reduce the HOV lane to 11 feet. Fifth, reduce the number one general purpose lane to 11 feet. Sixth, reduce the remaining general-purpose lanes to 11 feet, starting with the number two lane and moving to the right as needed. The outside general-purpose lane should remain at 12 feet unless truck volume is less than 3 percent. Seventh, reduce the median shoulders to a minimum of 2 feet. Shoulders less than 8 feet, but greater than 5 feet, are not recommended. Any excess width resulting from a reduction of median shoulder width from 8 feet to 5 feet or less should be used to restore the general-purpose lane widths to 12 feet starting from the outside and moving left. The reduction of median shoulders from 14 feet to either 8 feet or 2 feet should be combined with the construction of enforcement areas.
	(4) Contiguous HOV Facilities	First, reduce the median shoulders from 14 feet (the width to accommodate continuous enforcement areas) to 10 feet. Any reduction of the median shoulders should be accompanied by the addition of CHP enforcement areas. Second, reduce the median shoulders to a minimum of 8 feet. Third, reduce the HOV lane to 11 feet. Fourth, reduce the general-purpose lanes to 11 feet, starting with the left lane and moving to the right as needed. The outside general-purpose lane should remain at 12 feet unless truck volumes are less than 3 percent.

[1] January 2018

Table 2 SR 85 Transit Corridor Design Guidance

Source	Topic	Horizontal Geometric Standard/Guidance Applicable to SR 85
		Fifth, reduce the median shoulders to a minimum of 2 feet. Shoulders less than 8 feet, but greater than 5 feet are not recommended. Any excess width from 8 feet to 5 feet or less should be used to restore the general-purpose lane widths to 12 feet starting from the outside and moving to the left.
FHWA[2]	Part-time Shoulder Use	Used for travel only during those times of day when the adjoining lanes are likely to be heavily congested. When not needed as an additional travel lane, the shoulder is restored to its original purpose.
	Bus-only Use of Shoulders (Bus on Shoulder—BOS)	To improve bus travel time and reliability.
	Lane Width	12 feet or more preferred.
	Shoulder Width	"Several" feet beyond BOS lane.
	Bridge Width	The minimum shoulder width on bridges is 11.5 feet (10 foot BOS lane plus 1.5 foot lateral offset to obstruction).
	Signage	Typically static, ground mounted.
	Pavement Markings	Solid edge line typically used between the shoulder and the adjacent travel lane remains in place. A second solid line is used on the outside of the shoulder beside the edge of pavement. The two solid lines should be the same color: white for part-time use of the right shoulder and yellow for part-time use of the left (median) shoulder.
Parsons	Preliminary Pavement Widths	Vary at interchange ramps, lane/shoulder transition areas, bridge columns and other roadway elements. Widths also vary where additional shoulder width is needed to improve stopping sight distance to obstructions (e.g., left shoulder along outside of horizontal curve with a median concrete barrier or right shoulder along outside of horizontal curves adjacent to a soundwall).
	Existing Bridges and Overcrossing Structures	Avoid replacement wherever possible.
	Restrictive Right of Way (R/W)	The R/W is particularly narrow in the northern/western segment of the project between I-280 and US 101. The surrounding area is fully developed with residential and commercial land uses. Reduced cross sections will be necessary where significant R/W acquisition and community impacts would otherwise be required.
	Existing Soundwalls	Reduced cross sections will be necessary to avoid reconstruction of soundwalls which would result in significant R/W acquisitions, park land and community impacts.
	Heavy Truck Volumes	Trucks in excess of 4.5 tons are prohibited from utilizing SR 85 south of I-280. Outside lanes may be reduced from 12 feet to 11 feet where necessary. A Design Standards Decision Document (DSDD) will need to be prepared for approval by the Chief, Division of Design.
	Proposed Lane Widths	Should be reasonably consistent throughout each segment of the corridor, without excessive variations (narrowing or widening) within short distances. The standard lane width of 12 feet may be reduced to 11 feet per Caltrans High-occupancy Vehicle Guidelines Topic 3.10. A design exception will need to be prepared for approval by the Chief, Division of Design.
	Buffer	No buffer is proposed between express lanes and general-purpose lanes as contiguous lane striping is assumed. A buffer width of 2 feet is proposed to separate transit lanes from adjacent HOV, express lane, and/or general-purpose lanes.
	Right Shoulder Width	The standard right shoulder width of 10 feet should be provided throughout the corridor. In restrictive conditions (e.g., existing bridges, overcrossings, soundwalls), the right shoulder may be reduced to below 10 feet, but no less than 8 feet. The transit lane buffer may need to be

[2] Use of Freeway Shoulders for Travel—Guide for Planning, Evaluating, and Designing Part-time Shoulder Use as a Traffic Management Strategy, Federal Highway Administration (FHWA), February 2016.

Table 2 SR 85 Transit Corridor Design Guidance

Source	Topic	Horizontal Geometric Standard/Guidance Applicable to SR 85
		removed to achieve the 8-foot right shoulder width minimum. An approved DSDD will be required.
	Left Shoulder Width	The standard left shoulder width of 10 feet may be reduced per Caltrans High-occupancy Vehicle Guidelines Topic 3.10. An approved DSDD will be required.
	Median Width	The standard median width of 22 feet may be reduced to 10 feet between structures to accommodate a concrete Type 60 median barrier with left shoulder widths of 4 feet or left shoulder widths of 2 feet at locations with overhead signs or bridge columns. An approved DSDD will be required.

A Concept of Operations Report, prepared by CDM Smith, will additionally set forth proposals for tolling the express lanes and managing the use of the transit lanes where provided. This Concept of Operations Report will additionally match the types of transit services which are compatible with the physical design options which are presented in this Proposed Engineering Features document.

Alternatives

ALTERNATIVES CONSIDERED

Ten alternatives are being considered. These are briefly described below and are illustrated on Figure 2.

Alternative 1-1: No Build

This alternative would not make any changes to SR 85. Metrics for this alternative can serve as a point of comparison for other alternatives.

Alternative 1-2: HOV to Express Lane Conversion

In this alternative, the existing HOV lane on SR 85 would be converted to an express lane, but the unused space in the median between I-280 and SR 87 would not be changed, leaving it available for a future transportation investment.

Alternative 2-1: Express Lanes Project

This alternative would convert the existing HOV lane on SR 85 to an express lane and would construct a new express lane between I-280 and SR 87 in accordance with the design in VTA's Silicon Valley Express Lane Program.

Alternative 2-2: Long Express Lanes

This alternative would convert the existing HOV lanes into express lanes and construct a new express lane between U.S. 101 in Mountain View and SR 87.

Alternative 3-1: Long Transit Lane (Median Adjacent Lane)

This alternative would construct a new, median-adjacent transit lane between U.S. 101 in Mountain View and SR 87 in San Jose. Access to the lane would be limited to large, space-efficient vehicles like public transit and private shuttles.

Stations would be located at El Camino Real, Stevens Creek Boulevard, Saratoga Avenue, Bascom Avenue, and the Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard. Except for the Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard, which already exists, buses would serve stations located in the median of SR 85.

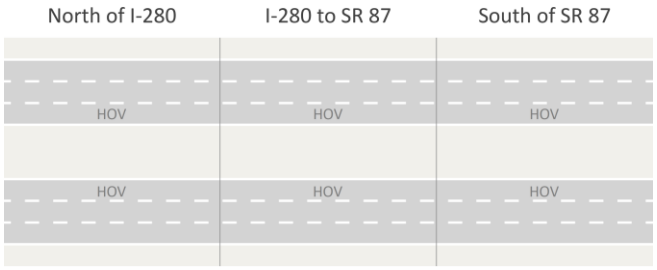
In this alternative, VTA transit buses would travel in a direct path along the corridor, serving median stations. This would permit the fastest, most reliable travel time for the transit lane since the buses would not need to leave the freeway to pick up and drop off riders nor interact with other vehicles.

Alternative 3-2: Long Transit Lane (Right-side Lane)

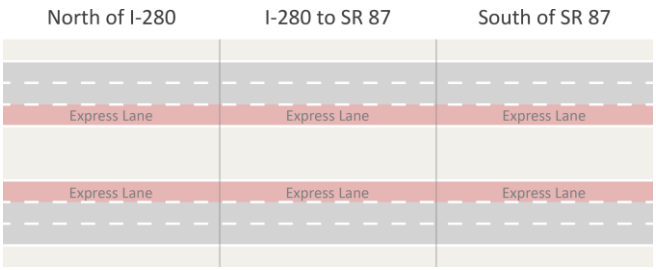
This alternative would install a transit lane between U.S. 101 in Mountain View and SR 87 that would be located along the right side of the roadway. Access to the lane would be limited to large, space-efficient vehicles like public transit buses and private shuttles and vehicles merging across the lane to enter/exit the freeway at on-ramps/off-ramps.

Stations would be located at on-ramps and off-ramps at El Camino Real, Stevens Creek Boulevard, Saratoga Avenue, Bascom Avenue and the existing Oholone-Chynoweth Light Rail Station at Santa Teresa Boulevard. Routing deviations from the corridor to access high-demand locations or transit connections would be easily made since the buses are traveling in the right lane.

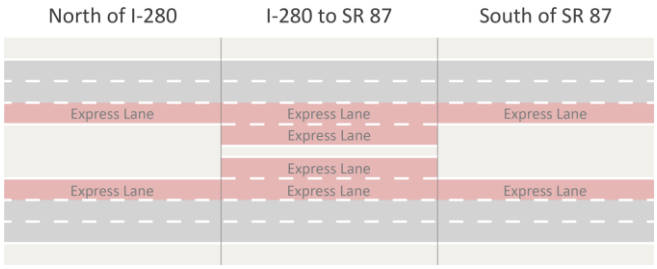
Alternative 1-1: No Build



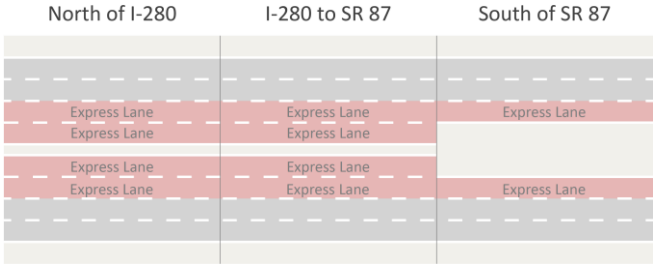
Alternative 1-2: HOV to Express Lane Conversion



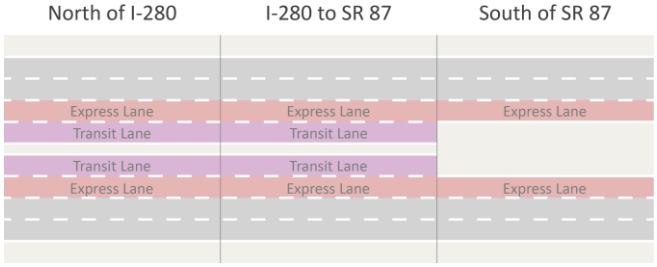
Alternative 2-1: Express Lanes Project



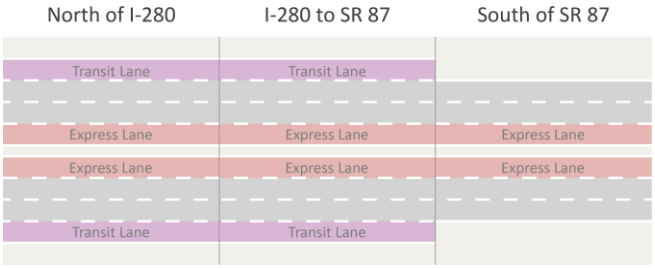
Alternative 2-2: Long Express Lanes Project



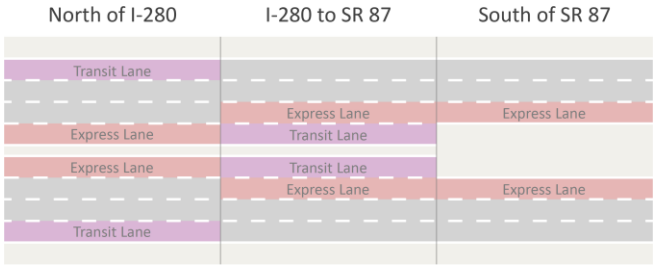
Alternative 3-1: Long Transit Lane (Median Adjacent Lane)



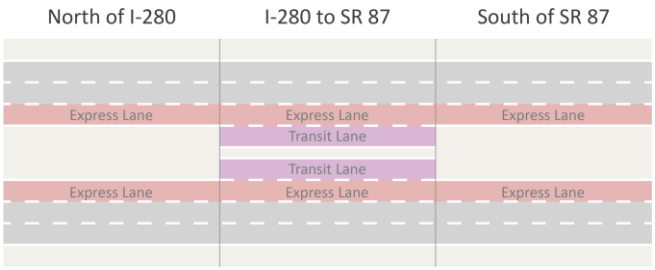
Alternative 3-2: Long Transit Lane (Right-side Lane)



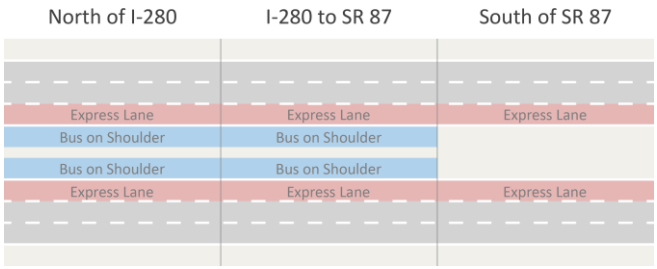
Alternative 3-3: Long Transit Lane (Hybrid)



Alternative 3-4: Short Transit Lane



Alternative 3-5: Long Shoulder (Median)



Alternative 3-6: Long Shoulder (Right-side)

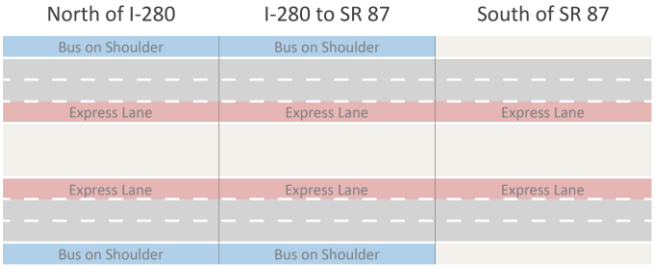


Figure 2 State Route 85 Transit Guideway Study Alternatives

Alternative 3-3: Long Transit Lane (Hybrid Median and Right-side Lanes)

This alternative is a combination of Alternatives 3-1 and 3-2, 3-1 and 3-5, or 3-2 and 3-6. Where the transit lane is median-adjacent, stations would be in the median. Where the transit lane is on the right side, stations would be on on-ramps or off-ramps. Among the Long Transit Lane alternatives, this alternative would strike a balance between capital cost, travel speeds and access. (Note: This alternative will be defined once the other alternatives are evaluated insofar as traffic and transit operations.)

Alternative 3-4: Short Transit Lane

This alternative would build a new transit lane in the unused space adjacent to the SR 85 median between I-280 and SR 87. Median stations would be located at Stevens Creek Boulevard, Saratoga Avenue and Bascom Avenue. An on-ramp/off-ramp station would be located at El Camino Real. Public transit buses are also envisioned to serve the existing Ohlone-Chynoweth Light Rail Station.

Alternative 3-5: Long Shoulder (Median)

This alternative would widen the median shoulder to provide enough space to accommodate bus operations. Physical changes would include building a more durable shoulder to support the increased use and weight of buses and restriping lanes.

Stations would be located at El Camino Real, Stevens Creek Boulevard, Saratoga Avenue, Bascom Avenue, and the existing Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard.

Alternative 3-6: Long Shoulder (Right-side)

This alternative would widen the right-side shoulder to provide enough space to accommodate bus operations. Physical changes would include building a more durable shoulder to support the increased use and weight of buses and restriping lanes.

On-ramp/off-ramp stations would be located at El Camino Real, Stevens Creek Boulevard, Saratoga Avenue and Bascom Avenue. Public transit buses are also envisioned to serve the existing Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard.

ALTERNATIVES REMOVED FROM FURTHER CONSIDERATION

During the course of this SR 85 Transit Guideway Study and presentations to the State Route 85 Corridor Policy Advisory Board, which preceded the current study, several additional alternatives were considered, but ultimately removed from further consideration. These included:

- Adding one new transit lane (in each direction) in the median without stations and retaining the HOV lanes.
- Adding one new transit lane (in each direction) in the median without stations and replacing the HOV lane with one express lane in each direction.
- Adding one new transit lane in the median (in each direction) with stations and park-and-ride lots and retaining the HOV lanes.
- Adding a new LRT line in the median and retaining the HOV lanes.
- Adding a new LRT line in the median and replacing the HOV lane with one express lane (in each direction).
- Constructing reversible lanes in the median of SR 85 using movable barriers to separate the directional traffic or retractable gates to regulate how vehicles enter and exit a dedicated reversible roadway.

Physical Construction Scenarios

From an engineering design perspective, the 10 alternatives can be grouped into four physical construction scenarios.

- Scenario A—Limited Physical Change
  - Alternative 1-1: No Build
  - Alternative 1-2: HOV to Express Lane Conversion

No freeway widening occurs with either alternative. Investment is limited to the addition of tolling infrastructure including toll gantries with transponder readers and high-speed digital cameras, directional and informational signage, dynamic message signs, closed circuit television coverage of the entire corridor, and duct bank installation for power supply and fiber optic communications.

- Scenario B—Freeway Widening without Transit Stations
  - Alternative 2-1: Express Lane Project
  - Alternative 2-2: Long Express Lanes

Alternative 2-1, Dual Express Lanes, between I-280 and SR 87 is a subset of Alternative 2-2. Tolling infrastructure identified for Alternative 1-2 applies to both Scenario B alternatives.

- Scenario C—Freeway Widening with Transit Stations
  - Alternative 3-1: Long Transit Lane (Median Adjacent Lane)
  - Alternative 3-2: Long Transit Lane (Right-side Lane)
  - Alternative 3-4: Short Transit Lane

The footprint of the freeway widening is similar to Scenario B. With median stations, the freeway mainline is bowed to create space for the stations depending on station design. For right-side running, stations can be constructed on line, or along off- or on-ramps. Commuter buses which do not stop at the stations are provided with a bypass lane. Alternative 3-4 is a subset of Alternative 3-1 or 3-2.

- Scenario D—Part-time Shoulder Use (Bus on Shoulder)
  - Alternative 3-5: Long Shoulder (Median)
  - Alternative 3-6: Long Shoulder (Right-side)

These alternatives include the installation of HOV to Express Lane Conversion (Alternative 1-2) tolling infrastructure plus the reconstruction and widening of the median shoulder or the right-side shoulder with full depth PCC or AC pavement. Stations, similar to those considered under the Transit Lane Alternatives, would also be included.

Alternative 3-3, Long Transit Lane Hybrid, is a mix and match by freeway segment option of Scenarios C and D elements. This alternative will be further defined once the other alternatives are evaluated insofar as traffic and transit operations.

SCENARIO A—LIMITED PHYSICAL CHANGE

Alternative 1-2: HOV to Express Lane Conversion

Mainline Improvements

- Convert existing HOV lane in each direction from Bernal Road, near U.S. 101 in south San Jose to Moffett Boulevard, near U.S. 101 in Mountain View, a distance of 23.2 miles.
- Provide continuous access to express lane from the adjacent general-purpose lanes.
- Install toll infrastructure in median to support express lanes.
- Reconstruct concrete median barrier south of Santa Teresa Boulevard and north of Stelling Road to accommodate toll gantries and dynamic message signs.
- Widen paved median shoulder to 14 feet in both directions from Santa Teresa Boulevard to South Stelling Road (excepting structures) to provide continuous CHP enforcement area.

- Widen right-side shoulders to meet Highway Design Manual standards (10 feet). Relocate drainage inlets as needed to the outside edge of shoulder.
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing (optional improvement).

Interchange Improvements

No ramp improvements are required to implement this alternative. Conversion of the SR 85 interchange at SR 82/El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration is an optional improvement for consideration.

Local Street Improvements

No streets crossing under or over SR 85 would be reconstructed to accommodate the HOV to express lane conversion. Conversion of the SR 85 interchange at SR 82/El Camino Real from a Type L-10 to a Type L-2, as an optional improvement, would require reconstruction of the ramp terminal intersections, installation of traffic signals, removal of a portion of the raised median and landscaping, and pavement signing and striping to accommodate dual left-turn lanes to the northbound and southbound on-ramps. No widening of El Camino Real would be required.

Conversion of the HOV lane to an express lane would allow for improved enforcement, a reduction in the proportion of HOV2+ "cheaters," and improved managed use to achieve speeds of 45 mph or higher in the express lane.

The HOV to Express Lane Conversion alternative would not yield additional vehicle throughput, however. The HOV and general-purpose lanes each accommodate roughly 1,500 vehicles per hour per lane (vphpl) during peak hours in the peak direction. The capacity of the express lane at level of service (LOS) C is 1,600 vphpl. While the volume of vehicles will likely remain unchanged, the speed of the vehicles using the express lane will likely increase, encouraging more single occupant vehicle (SOV) drivers to carpool and/or utilize commuter buses, if available.

With mainline traffic volumes expected to remain unchanged from no build conditions, no impacts to local streets would be expected.

Railroad Involvement

Six (6) railroad crossings over or under SR 85 occur within the project limits.

1. VTA light rail tracks (Guadalupe Corridor) under southbound SR 85 at PM 1.33.
2. VTA light rail tracks (Guadalupe Corridor) under northbound SR 85 at PM 5.27, just west of Santa Teresa Boulevard.
3. VTA light rail track under SR 85 adjacent to Winfred Boulevard at PM 5.59.
4. Union Pacific track over SR 85 adjacent to Winchester Boulevard at PM 10.98.
5. Caltrain Peninsula Commuter tracks under SR 85 adjacent to Evelyn Avenue at PM 22.63.
6. VTA light rail tracks under SR 85 adjacent to Central Expressway at PM 22.63.

None of these crossings would require bridge work to accommodate the proposed HOV to Express Lane Conversion.

Structure Improvements

Including the Bernal Road and Moffett Boulevard undercrossings at the two ends of the corridor, there are 63 structures which could be affected by the build alternatives. None of these structures would require widening or replacing as a result of implementing the HOV to Express Lane Conversion alternative.

Drainage Improvements

Storm runoff is collected by inlets located along the outside edge of the right-side shoulders and in the center of the median. North of I-280, the right side-shoulders range in width from 4 to 10 feet. To meet the HDM standards for shoulder width, the AC paved shoulders would need to be widened, generally to 10 feet, and drainage inlets relocated to the outside edge of the shoulder.

Utilities

The project area contains overhead electric and communications lines and underground electric, gas, sanitary sewer, water, reclaimed water, communications, and fiber optic lines. Utility providers in the project area are listed below by category.

- Gas and electric—PG&E
- Communications—AT&T, Comcast, Level 3, Verizon, Nextlink, and MCI
- Water—San Jose Water Company, Santa Clara Valley Water District, California Water Service Company, Great Oaks Water Company, City of Sunnyvale Water Division, and City of Mountain View Water Division
- Sanitary—City of San Jose, West Valley Sanitation District, City of Cupertino, and City of Mountain View.

The project would not require utility relocations. Utility impacts would be limited to the extension of casings (protective pipes or channels) for existing underground facilities whose casings do not extend through the right-of-way. All other existing utilities would be protected in place.

Express Lane Begin/End Transitions

The SR 85 express lanes would extend from U.S. 101 in south San Jose to U.S. 101 in Mountain View. The existing HOV direct-connector ramps at both ends of SR 85 would be converted to express lane connectors.

Express Lane Buffer

No buffer is proposed between the express lane and the adjacent general-purpose lanes. A single, white-striped lane line would separate the lanes and continuous access between the lanes would be permitted.

California Highway Patrol Observation/Enforcement Areas and Emergency Refuge Areas

State-of-the-art toll infrastructure will be installed to reduce the need for CHP observation areas given the right-of-way constraints north of South Stelling Road.

Pending future agreements, it is anticipated that the CHP will be contracted to provide toll enforcement including express lane eligibility violations.

Inside median shoulders will be widened south of Stelling Road to Santa Teresa Boulevard to 14 feet in both directions to provide a continuous CHP enforcement area. At structures such as bridges and undercrossings, existing shoulders will be maintained and structures will not be widened for this purpose.

Emergency refuge areas (pullouts for stopped vehicles) along the outside shoulders would be unaffected by the HOV to express lane conversion alternatives.

Toll Infrastructure

The express lane facility would incorporate various toll infrastructure including toll gantries with transponder readers and high-speed digital cameras (49), directional and informational signage, dynamic message signs to communicate real-time toll rates to drivers (25), complete closed circuit television coverage of the entire express lanes corridor, and fiber optics linking the infrastructure to a centralized toll operations office. Toll equipment would meet Title 21 specification and national protocol, as well as interoperability with other toll facilities in California.

The Metropolitan Transportation Commission has prepared a simple fact sheet to further explain toll infrastructure components. This fact sheet is reproduced in whole as Exhibit 1 along with photographs of express lane construction work along I-680 in Walnut Creek and Concord.

The Operations Center mentioned in Exhibit 1 is assumed to be funded by a separate project and not a component of cost for the Route 85 Transit Guideway Project.

3. System Technology and Elements

MTC Express Lanes are implemented by overlaying communications equipment on new and existing freeway infrastructure. Express lanes implementation requires four discrete elements that are integrated through design, construction and operations, including:

Civil Infrastructure (Highway Modifications)

For lane conversions, the civil infrastructure consists of sign structures, sign panels, lane striping, and conduit work for power and communications. For gap closure and extension projects, the civil infrastructure includes highway widening to add lanes as well as the signage and communications equipment required for conversions.

The civil contractor will put in place the foundations and structures upon which the toll systems contractor will install the toll equipment. In addition, the civil contractor will construct the infrastructure necessary to provide power and communications to the toll system.

Toll System

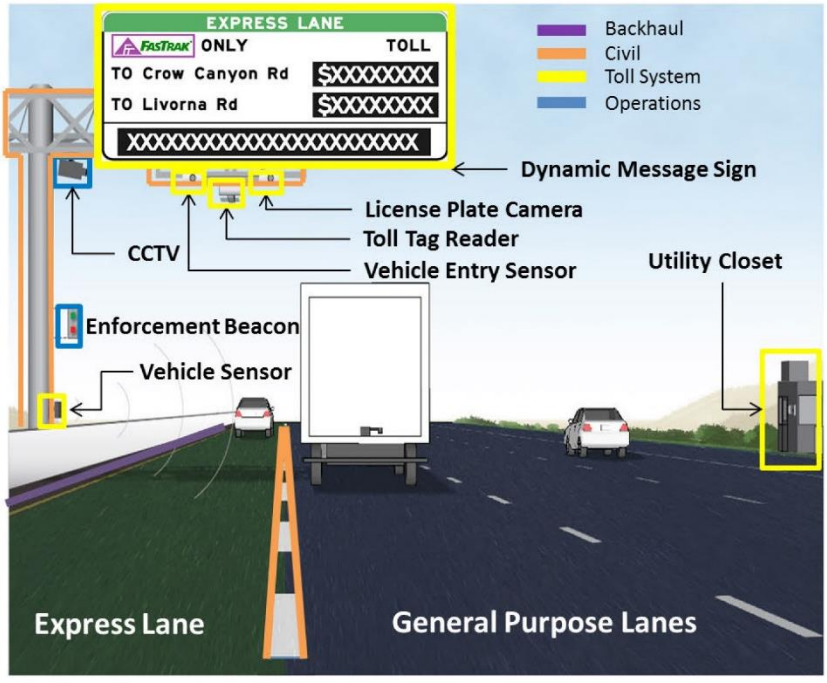
The toll system consists of two components, the in-lane system and the back-end "host" system. The lane system consists of all the equipment on the highway needed to operate the toll system including toll tag readers, cameras and vehicle detection. The host system serves as the brain of the toll system, which collects and processes all the data from the highway and sends it to the regional customer service center for billing.

Backhaul Communications Network

The backhaul network is the communication line along which data collected in the lanes is sent to the toll host system, operations center and regional customer service center. The backhaul contractor will install new conduit and communications fiber as well as utilize existing Caltrans, BART and other infrastructure to build the network. The backhaul network is being designed with the expectation that it will become part of a broader regional communications network.

Operations

The operations element consists of everything that is needed to successfully operate the express lanes including: an operations center, the regional customer service center, enforcement, public outreach, performance monitoring and ongoing maintenance. An express lanes Regional Operations Center will be established in the Bay Area Metrocenter building in San Francisco where operators will actively monitor the condition of the lanes and coordinate with Caltrans and the California Highway Patrol to ensure that the lanes operate efficiently.



For illustrative purposes only

Source: MTC Express Lanes Program Quarterly Report/1st Quarter 2019

Exhibit 1B

Installing drainage on I-680 in Walnut Creek

Drilling an overhead sign foundation on I-680 in Concord

Extending PG&E service connections on I-680 in Concord

Source: MTC Express Lanes Program Quarterly Report/1st Quarter 2019

Tolling Policies

A *Concept of Operations Report* will be prepared to address various tolling policies under which the express lanes will be operated. This report will provide preliminary information regarding the type of tolling, toll exemption or rate reduction for HOVs, maximum target volume to maintain speed and minimize congestion in the express lanes, method for determining toll amount, methods for toll collection and toll enforcement, penalty rates for toll violations, and provision of supplemental service patrol. The items listed below represent key policies which have been assumed for the SR 85 express lanes; however, they are subject to change pending further studies.

- The express lanes are anticipated to operate part-time during peak hours, Monday through Friday.
- It is anticipated that HOVs with two or more occupants (HOV2+) will be allowed to use the express lanes toll-free. Single-occupancy vehicles will be allowed to use the express lanes for a toll.
- Motorcycles will be allowed to travel in the express lanes toll-free and are not required to have a transponder.
- Exempted vehicles including emergency response vehicles, highway maintenance vehicles serving the express lanes facility, and CHP vehicles assigned to patrol the express lane facility will have toll-free access to the express lanes, by registering these vehicles as toll exempt in the License Plate Recognition system.
- Clean air vehicles with valid clean air vehicle decals will be able to use the express lanes for a toll discount, assumed to 15 percent.
- Tolling is anticipated to be dynamic pricing based on real-time traffic levels to ensure peak period speed of no less than 45 mph.

Additional studies will be performed to establish the operating policies and business rules and determine pricing structures and toll violation rates.

Toll Operations and Maintenance

The institutional arrangements for operation and maintenance of the express lanes will be consistent with those implemented by VTA for the express lane system in Santa Clara County.

Express Lanes Incident Responses

At this time, it is anticipated that Freeway Service Patrol will be contracted to provide incident response for the express lanes similar to the current arrangement in the HOV and general-purpose lanes. It is currently planned to have dedicated roving Freeway Service Patrol patrolling the express lanes during hours of peak congestion, to respond to incidents that might affect the express lanes including clearing of debris, towing disabled vehicles, and minor auto repairs.

Conceptual Engineering Plans

Geometric cross sections for mainline segments and alignment plans **have not been developed** for this alternative. Physical changes include installing toll infrastructure in the median barrier south of Santa Teresa Boulevard and north of Stelling Road to accommodate toll gantries and dynamic message signs and widening the paved median shoulder to 14 feet in both directions from Santa Teresa Boulevard to South Stelling Road.

Right-of-Way Requirements

The HOV to Express Lane conversion project would be constructed entirely within the existing right-of-way.

SCENARIO B—FREEWAY WIDENING WITHOUT TRANSIT STATIONS

Alternative 2-1 and 2-2: Dual Express Lanes

Mainline Improvements

- Add one express lane in each direction from Almaden Expressway to Moffett Boulevard to operate jointly with existing HOV lanes as two express lanes in each direction.
- Convert existing HOV lane in each direction from U.S. 101 (southern end of SR 85) to Almaden Expressway to operate as one express lane in each direction.
- Provide continuous access to the express lane(s) from the adjacent general-purpose lanes.

- Extend existing auxiliary lane on northbound SR 85 from the South De Anza Boulevard northbound on-ramp to 0.2 mile south of the Stevens Creek Boulevard off-ramp.
- Provide CHP enforcement/observation areas in the median at selected locations along the corridor.
- Install double-luminaire mast arm lighting at 250- to 400-foot intervals from PM 6.00 (Almaden Expressway) to PM 17.70 (Stevens Creek Boulevard) and from PM 18.86 (Homestead Road) to PM 23.44 (Moffett Boulevard) as an optional improvement.
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing as an optional improvement.

Interchange Improvements

Ramp improvements are required to implement this alternative. Conversion of the SR 85 interchange at SR 82/El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration is an optional improvement for consideration.

Partial realignment of ramps is proposed at the interchanges listed in Table 3. A diagram showing the relative location of the ramps is attached to this document as Attachment 1.

Local Street Improvements

No streets crossing under or over SR 85 would be reconstructed to accommodate the dual express lanes alternative. Conversion of the SR 85 interchange at SR 82/El Camino Real from a Type L-10 to a Type L-2, as an optional improvement, would require reconstruction of the ramp terminal intersections, installation of traffic signals, removal of a portion of the raised median and landscaping, and pavement signing and striping to accommodate dual left-turn lanes to the northbound and southbound on-ramps. No widening would be required along El Camino Real.

Table 3 Alternative 2-1 Ramp Improvements

Interchange Name	Ramp No.	Description	Ramp Improvement		
			Partial	Full	None
South De Anza Boulevard	51	South De Anza Boulevard northbound on-ramp	X		
Stevens Creek Boulevard	54	Stevens Creek Boulevard northbound off-ramp			X
	55	Stevens Creek Boulevard southbound on-ramp	X		
	56	Stevens Creek Boulevard southbound off-ramp			X
I-280	57	I-280 northbound off-ramp			X
	58	I-280 northbound loop on-ramp	X		
	59	I-280 northbound on-ramp	X		
	60	I-280 southbound on-ramp			X
	61	I-280 southbound loop on-ramp	X		
	62	I-280 southbound off-ramp	X		
Homestead Road	63	Homestead Road northbound on-ramp	X		
	64	Homestead Road southbound off-ramp	X		
Fremont Avenue	65	Fremont Avenue northbound off-ramp			X
	66	Fremont Avenue northbound on-ramp	X		
	67	Fremont Avenue southbound on-ramp	X		
	68	Fremont Avenue southbound off-ramp	X		
SR 82/El Camino Real	69	SR 82/El Camino Real northbound off-ramp	X		
	70	SR 82/El Camino Real northbound loop on-ramp	X		
	71	SR 82/El Camino Real northbound loop off-ramp	X		
	72	SR 82/El Camino Real northbound on-ramp	X		
	73	SR 82/El Camino Real southbound on-ramp	X		
	74	SR 82/El Camino Real southbound loop off-ramp	X		
	75	SR 82/El Camino Real southbound on-ramp	X		
SR 237	76	SR 237 northbound off-ramp	X		
	77	SR 237 northbound on-ramp	X		
	78	SR 237 southbound on-ramp	X		
	79	SR 237 southbound off-ramp			X
Evelyn Avenue	80	Evelyn Avenue northbound off-ramp	X		
	81	Evelyn Avenue southbound on-ramp	X		

Table 3 Alternative 2-1 Ramp Improvements

Interchange Name	Ramp No.	Description	Ramp Improvement		
			Partial	Full	None
Central Expressway	82	Central Expressway northbound on-ramp	X		
	83	Central Expressway southbound off-ramp	X		
Moffett Boulevard	84	Moffett Boulevard northbound off-ramp	X		
	85	Moffett Boulevard southbound on-ramp	X		

The dual express lane alternative would accommodate additional throughput on the mainline and additional traffic volumes on the off-ramps and on-ramps. An environmental document for express lanes on SR 85, similar in definition to this alternative, was prepared and circulated for public comment from December 30, 2013 until February 28, 2014. The document was an Initial Study (IS) with Negative Declaration/Environmental Assessment (EA) with Finding of No Significant Impact. The Draft IS/EA did not include an analysis of local roadways and arterials.

In response to comments from the City of Saratoga and City of Cupertino, a supplemental assessment of project-related traffic impacts on the local roadways was conducted for 19 intersections in Saratoga and Cupertino, including the intersections of local roadways with SR 85 ramps. Saratoga and Cupertino staff reviewed and provided comments on the assessment materials, and their comments were incorporated into the final IS/EA. The assessment showed that none of the studied intersections would be significantly impacted by the proposed project.

Should this alternative advance to a new environmental assessment of project impacts, the topic of local street improvements, particularly at ramp terminal and adjacent intersections, will need to be revisited.

Railroad Involvement

Six (6) railroad crossings over or under SR 85 occur within the project limits.

1. VTA light rail tracks (Guadalupe Corridor) under southbound SR 85 at PM 1.33.
2. VTA light rail tracks (Guadalupe Corridor) under northbound SR 85 at PM 5.27, just west of Santa Teresa Boulevard.
3. VTA light rail track under SR 85 adjacent to Winfred Boulevard at PM 5.59.
4. Union Pacific track over SR 85 adjacent to Winchester Boulevard at PM 10.98.
5. Caltrain Peninsula Commuter tracks under SR 85 adjacent to Evelyn Avenue at PM 22.63.
6. VTA light rail tracks under SR 85 adjacent to Central Expressway at PM 22.63.

None of these crossings would require bridge work to accommodate the proposed freeway widening for the addition of one express lane in each direction.

Structure Improvements

The dual express lane alternative would necessitate the widening of nine bridge or undercrossing structures, the replacement of embankments with retaining walls at two overcrossings, and the replacement of one pedestrian overcrossing. Table 4 summarizes the proposed structure improvements under Alternative 2-2.

Table 4 Alternative 2-2 Structure Improvements

Structure No.	Postmile	Structure Name	Type*	Structure Improvement		
				No Work	Widen	Replace
1	0.20	Bernal Road	Undercrossing	X		
2	0.29	Monterey Road/Union Pacific/Great Oaks Boulevard	Undercrossing/overpass	X		
3	1.22	Via Del Oro	Undercrossing	X		
4	1.33	VTA Light Rail	Overpass	X		
5	1.97	Cottle Road	Overcrossing	X		
6	2.73	Lean Avenue	Overcrossing	X		
7	3.48	Snell Avenue	Overcrossing	X		
8	3.93	Blossom Hill Road	Overcrossing	X		
9	4.28	Canoas Creek	Bridge	X		
10	4.50	Cahalan Avenue	Pedestrian undercrossing	X		
11	4.84	Southbound SR 87 to southbound SR 85	Overcrossing	X		

Table 4 Alternative 2-2 Structure Improvements

Structure No.	Postmile	Structure Name	Type*	Structure Improvement		
				No Work	Widen	Replace
12	5.20	Santa Teresa Boulevard	Undercrossing	X		
13	5.27	VTA Light Rail	Overpass	X		
14	5.31	Southbound SR 85 to northbound SR 87	Overcrossing	X		
15	5.59	Winfred Blvd/Guadalupe River/Sanchez Drive	Bridge	X		
16	6.00	Almaden Expressway	Undercrossing		X	
17	6.46	Russo Drive	Pedestrian overcrossing	X		
18	7.30	Meridian Avenue	Overcrossing	X		
19	7.50	Dent Avenue	Pedestrian overcrossing	X		
20	8.11	Camden Avenue	Undercrossing		X	
21	8.77	Leigh Avenue	Overcrossing	X		
22	9.28	Union Avenue	Overcrossing	X		
23	9.93	Samaritan Place	Pedestrian overcrossing	X		
24	10.23	Bascom Avenue	Overcrossing	X		
25	10.40	Southbound SR 17 to southbound SR 85	Undercrossing	X		
26	10.48	SR 17	Separation	X		
27	10.60	Oka Road	Undercrossing		X	
28	10.80	Los Gatos Creek	Bridge		X	
29	10.90	Winchester Boulevard	Underpass	X		
30	11.00	Winchester Boulevard	Overcrossing	X		
31	11.97	Pollard Road	Undercrossing		X	
32	12.45	More Avenue	Pedestrian overcrossing	X		
33	12.68	San Tomas Aquino Creek	Bridge		X	
34	12.91	Quito Road	Overcrossing	X		
35	13.73	Saratoga Avenue	Undercrossing		X	
36	13.91	Saratoga Creek	Bridge		X	
37	14.28	Cox Avenue	Overcrossing	X		
38	14.31	Cox Avenue utility	Overcrossing	X		
39	14.73	Scully Avenue utility	Overcrossing	X		
40	14.84	Blue Hills	Pedestrian overcrossing	X		
41	15.27	Prospect Road	Overcrossing	X		
42	15.40	Calabazas Creek	Bridge		X	
43	15.87	South De Anza Boulevard	Overcrossing	X		
44	16.61	South Stelling Road	Overcrossing		X	
45	17.17	McClellan Road	Overcrossing		X	
46	17.70	Stevens Creek Boulevard	Overcrossing	X		
47	18.35	Southbound/eastbound I-280	Undercrossing	X		
48	18.41	SR 85/I-280	Separation	X		
49	18.43	Northbound/westbound I-280	Undercrossing	X		
50	18.86	Homestead Road	Overcrossing	X		
51	19.39	The Dalles	Pedestrian overcrossing			X
52	19.86	Fremont Avenue	Undercrossing	X		
53	20.02	Stevens Creek	Bridge	X		
54	20.37	Hawkins Drive	Right-of-way	X		
55	20.69	Permanente Creek Diversion Channel	Culvert	X		
56	21.10	Stevens Creek Trail/Dale Avenue	Pedestrian overcrossing	X		
57	21.75	SR 82/SR 85/El Camino Real	Separation	X		
58	22.13	SR 85/SR 237	Separation	X		
59	22.43	Dana Street	Overcrossing	X		
60	22.63	Evelyn Avenue/Caltrain/Light Rail/Central Expressway	Undercrossing/overpass	X		
61	22.95	Stevens Creek	Bridge	X		
62	23.19	Middlefield Road	Overcrossing	X		
63	23.44	Moffett Boulevard	Undercrossing	X		

*Type:
- Undercrossing = local road under State highway
- Overcrossing = local road over State highway
- Pedestrian overcrossing = Pedestrian crossing over State highway
- Separation = State highway crossing
- Underpass = State highway under railroad
- Overpass = State highway over railroad
- Right-of-way = right-of-way required

The bridge and undercrossing widening would close the existing spaces between the separate northbound and southbound structures by installing new bridge decking in the median. At each location, the bridge decks would be extended using precast, prestressed concrete beams supported by new abutments and columns. Bridge crossings of creeks are assumed to be free span between the abutments at each end of the bridge, except for the Los Gatos Creek bridge which has two spans. **Table 5** provides more specific information regarding the nine bridge and undercrossing structures that would be widened.

An existing auxiliary lane would be extended along a 1.1-mile segment of northbound SR 85 between the existing South De Anza Boulevard northbound on-ramp and 0.2 mile south of the Stevens Creek Boulevard northbound off-ramp where the auxiliary lane currently begins. The existing pavement would be widened by up to 14 feet to the outside (northeast). To accommodate the auxiliary lane, sections of the existing abutments at South Stelling Road and McClellan Road overcrossings adjacent to northbound SR 85 would be removed and replaced by new retaining walls to support the embankments behind them.

Table 5 Alternative 2-2 Structure Improvements

Structure No.	Postmile	Name	Type	Length (feet)	Spans (existing)	Minimum Vertical Clearances (feet)	Widening (feet)
16	6.0	Almaden Expressway	Undercrossing	238	2	19.16	50
20	8.11	Camden Avenue	Undercrossing	210	2	15.49	45
27	10.60	Oka Road	Undercrossing	102	1	16.31	33
28	10.80	Los Gatos Creek	Bridge	178	2	—	29
31	11.97	Pollard Road	Undercrossing	196	1	16.47	23
33	12.68	San Tomas Aquino Creek	Bridge	105	1	—	23
35	13.73	Saratoga Avenue	Undercrossing	192	2	16.67	23
36	13.91	Saratoga Creek	Bridge	100	1	—	23
42	15.40	Calabazas Creek	Bridge	156	2	—	22

The segment of northbound SR 85 where the extended auxiliary lane is proposed is up to 25 feet lower in elevation than surrounding development. In the majority of this segment, retaining walls extend along the toe of the slope by approximately 14 feet beyond the northbound shoulder, and sound walls exist at the top of the slope along the edge of the right-of-way. Widening for the proposed auxiliary lane would occur in the area between the northbound shoulder and the retaining walls or toe of the slope. The new retaining walls at the South Stelling Road and McClellan Road overcrossings would replace existing slope areas adjacent to northbound SR 85.

Drainage Improvements

Storm runoff is collected by inlets located along the outside edge of the right-side shoulders and in the center of the median. The dual express lane alternative will widen the travelway by adding one lane in each direction in the median. The elevation of the inlets located in the median may need to be adjusted (raised) to meet the plane of the widened travelway.

North of I-280, the right-side shoulders range in width from 4 to 10 feet. To meet the HDM standards for shoulder width, the AC paved shoulders would need to be widened, generally to 10 feet, and drainage inlets relocated to the outside edge of the shoulder.

Utilities

The project area contains overhead electric and communications lines and underground electric, gas, sanitary sewer, water, reclaimed water, communications, and fiber optic lines. Utility providers in the project area are listed below by category.

- Gas and electric—PG&E
- Communications—AT&T, Comcast, Level 3, Verizon, Nextlink, and MCI

- Water—San Jose Water Company, Santa Clara Valley Water District, California Water Service Company, Great Oaks Water Company, City of Sunnyvale Water Division, and City of Mountain View Water Division
- Sanitary—City of San Jose, West Valley Sanitation District, City of Cupertino, and City of Mountain View.

The project would not require utility relocations. Utility impacts would be limited to the extension of casings (protective pipes or channels) for existing underground facilities whose casings do not extend through the right-of-way. All other existing utilities would be protected in place.

Express Lane Begin/End Transitions

The SR 85 express lanes would extend from U.S. 101 in south San Jose to U.S. 101 in Mountain View. The existing HOV direct-connector ramps at both ends of SR 85 would be converted to express lane connectors. North of the northbound and southbound mainline bridges spanning Winfred Boulevard, Guadalupe River, and Sanchez Drive, a second express lane would be added in the median traveling northbound and dropped traveling southbound.

At the north end of SR 85, the second express lane would be added in the median immediately south of the southbound U.S. 101 to southbound SR 85 express lane (converted HOV lane) direct-connector ramp. Northbound, the inside express lane would connect directly with the northbound SR 85 to northbound U.S. 101 express lane (converted HOV lane) direct-connector ramp. The remaining express lane would continue as a general-purpose lane.

Express Lane Buffer

No buffer is proposed between the dual express lanes and the adjacent general-purpose lanes. A single, white striped lane line would separate the lanes and continuous access between the lanes would be permitted.

California Highway Patrol Observation/Enforcement Areas and Emergency Refuge Areas

State-of-the-art toll infrastructure will be installed to reduce the need for CHP observation areas given the right-of-way constraints north of South Stelling Road.

Pending future agreements, it is anticipated that the CHP will be contracted to provide toll enforcement including express lane eligibility violations.

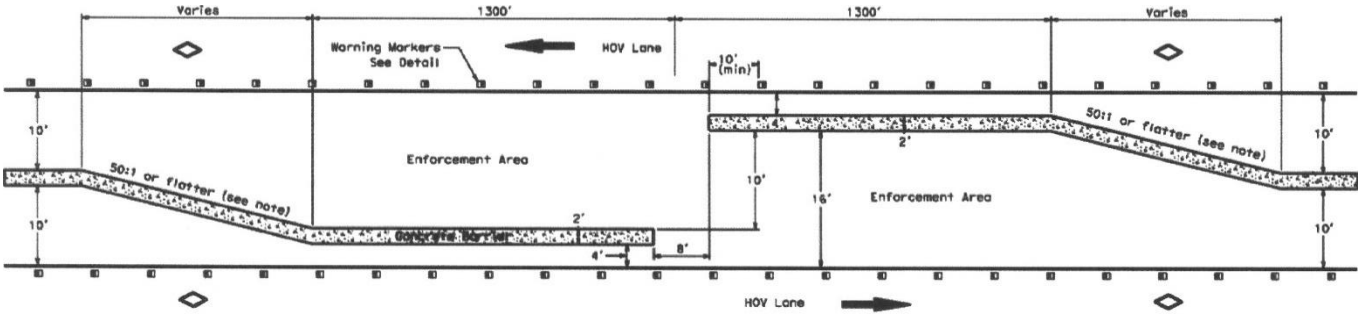
Existing emergency refuge areas (ERA) and proposed CHP observation/enforcement areas are listed in Table 6.

Table 6 Existing Emergency Refuge Areas and Proposed CHP Observation/Enforcement Areas

Northbound		Southbound	
1. Cottle Road	PM 1.97	1. Cottle Road	PM 1.97
2. Blossom Hill Road	PM 3.93	2. Blossom Hill Road	PM 3.93
3. Santa Teresa Boulevard	PM 5.20	*Rimwood Drive CHP*	*PM 6.72*
4. Almaden Expressway	PM 5.98	3. North of Russo Drive	PM 6.78
5. Almaden Expressway	PM 6.02	4. North of Leigh Avenue	PM 8.80
Rimwood Drive CHP	*PM 6.72*	5. North of Union Avenue	PM 9.66
6. North of Dent Avenue	PM 7.65	*Mulberry Drive CHP*	*PM 11.60*
7. North of Union Avenue	PM 9.34	6. South of Pollard Road	PM 11.71
8. North of Union Avenue	PM 9.50	7. More Avenue pedestrian overcrossing	PM 12.45
9. South of SR 17	PM 10.38	8. San Tomas Aquino Creek	PM 12.69
10. North of SR 17	PM 10.57	9. North of Saratoga Creek	PM 14.05
Mulberry Drive CHP	*PM 11.60*	10. Cox Avenue utility	PM 14.31
11. More Avenue pedestrian overcrossing	PM 12.45	*Hollanderry Place CHP*	*PM 16.23*
12. San Tomas Aquino Creek	PM 12.67	11. South of El Camino Real	PM 21.68
13. North of Saratoga Creek	PM 14.05	12. North of El Camino Real	PM 21.80
14. Cox Avenue utility	PM 14.31	13. North of El Camino Real	PM 21.84
Hollanderry Place CHP	*PM 16.23*		
15. South of Homestead Road	PM 18.80		
16. South of El Camino Real	PM 21.66		

Exhibit 2 illustrates a suggested layout for the proposed CHP observation/enforcement areas.

Exhibit 2. Bidirectional Enforcement Areas for Wide Medians



Toll Infrastructure

The express lane facility would incorporate various toll infrastructure including toll gantries with transponder readers and high-speed digital cameras (49), directional and informational signage, dynamic message signs to communicate real-time toll rates to drivers (25), complete closed circuit television coverage of the entire express lanes corridor, and fiber optics linking the infrastructure to a centralized toll operations office. Toll equipment would meet Title 21 specification and national protocol, as well as interoperability with other toll facilities in California.

Trenching would be conducted along the outside edge of pavement for installation of conduits. The depth of trenching would be 3 to 5 feet below the roadway surface. Conduits would be jacked across the freeway to the median where needed to provide power and communication feeds to the new overhead signs and toll structures.

The project would install new overhead and barrier-mounted signs, including dynamic message signs. The overhead signs would be installed in the median on cantilever structures supported on piles.

In some locations the express lane signs would replace existing signs or be added to existing sign structures, but most would be at new locations along SR 85. The exact number and locations of these features will be determined during the project design phase in coordination with the toll system design.

Please see Exhibit 1A, which further clarifies toll infrastructure components.

Tolling Policies

A *Concept of Operations Report* will be prepared to address various tolling policies under which the express lanes will be operated. This report will provide preliminary information regarding the type of tolling, toll exemption or rate reduction for HOVs, maximum target volume to maintain speed and minimize congestion in the express lanes, method for determining toll amount, methods for toll collection and toll enforcement, penalty rates for toll violations, and provision of supplemental service patrol. The items listed below represent key policies which have been assumed for the SR 85 express lanes; however, they are subject to change pending further studies.

- The express lanes are anticipated to operate part-time during peak hours, Monday through Friday.
- It is anticipated that HOVs with two or more occupants (HOV2+) will be allowed to use the express lanes toll-free. Single-occupancy vehicles will be allowed to use the express lanes for a toll.
- Motorcycles will be allowed to travel in the express lanes toll-free and are not required to have a transponder.
- Exempted vehicles including emergency response vehicles, highway maintenance vehicles serving the express lanes facility, and CHP vehicles assigned to patrol the express lane facility will have toll-free access to the express lanes, by registering these vehicles as toll exempt in the License Plate Recognition system.
- Clean air vehicles with valid clean air vehicle decals will be able to use the express lanes for a toll discount, assumed to 15 percent.
- Tolling is anticipated to be dynamic pricing based on real-time traffic levels to ensure peak period speed of no less than 45 mph.

Additional studies will be performed to establish the operating policies and business rules and determine pricing structures and toll violation rates.

Toll Operations and Maintenance

The institutional arrangements for operation and maintenance of the express lanes will be consistent with those implemented by VTA for the express lane system in Santa Clara County.

Express Lanes Incident Responses

At this time, it is anticipated that Freeway Service Patrol will be contracted to provide incident response for the express lanes similar to the current arrangement in the HOV and general-purpose lanes. It is currently planned to have dedicated roving Freeway Service Patrol patrolling the express lanes during hours of peak congestion, to respond to incidents that might affect the express lanes including clearing of debris, towing disabled vehicles, and minor auto repairs.

Conceptual Engineering Plans

Geometric cross sections for mainline segments and segments passing structures with restrictive widths are provided in Attachment 2.

Alignment plans for the dual express lane alternative are provided in Attachment 3 for the mainline segment from Prospect Road (PM 15.27) to just south of U.S. 101 in Mountain View (PM 23.70). Plan sheets are also provided for the segment from Almaden Boulevard to Santa Teresa Boulevard where the express lanes transition from one to two lanes in each direction.

Right-of-Way Requirements

South of I-280, in segments 1 and 2 of the corridor, the project would be constructed entirely within the existing right-of-way.

North of I-280, in segment 3 of the corridor, the alignment plans provided in Attachment 3 indicate that the pedestrian overcrossing at The Dalles (PM 19.39), illustrated on Sheet 17, will need to be relocated. This relocation will likely require new right-of-way to the east of SR 85 if the pedestrian overcrossing is reconstructed at this location.

A potential right-of-way impact is illustrated on Sheet 14 in Attachment 3 at PM 20.37 where the right-side shoulder narrows to six feet. A Design Standards Decision Document will need to be prepared and approved by Caltrans Division of Design Chief to avoid acquiring right-of-way and relocating the adjacent sound wall at this location.

SCENARIO C—FREEWAY WIDENING WITH TRANSIT STATIONS

Alternative 3-1 (Median) and Alternative 3-2 (Right-side)

Mainline Improvements

- Convert existing HOV lane in each direction from U.S. 101 (southern end of SR 85) to U.S. 101 in Mountain View to operate as a single express lane in each direction.
- Add one lane in each direction from Almaden Expressway to Evelynn Avenue or Moffett Boulevard. The added lane would be positioned in the existing median as the number 1 (inside) lane.
- With Alternative 3-1, the transit lane would occupy the number 1 lane position. With Alternative 3-2, the transit lane would occupy the number 4 (outside) lane position.
- Provide a buffer to separate the transit lane from the adjacent express lane (Alternative 3-1) or general-purpose lane (Alternative 3-2).
- Provide continuous access to the express lane(s) from the adjacent general-purpose lanes.
- Extend existing auxiliary lane on northbound SR 85 from the South De Anza Boulevard northbound on-ramp to 0.2 mile south of the Stevens Creek Boulevard off-ramp.
- Provide CHP enforcement/observation areas in the median at selected locations along the corridor.

- Install double-luminaire mast arm lighting at 250- to 400-foot intervals from postmile (PM) 6.00 (Almaden expressway) to PM 17.70 (Stevens Creek Boulevard) and from PM 18.86 (Homestead Road) to PM 23.44 (Moffett Boulevard) as an optional improvement.
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing lighting as an optional improvement.

Interchange Improvements

Ramp improvements are required to implement this alternative. Conversion of the SR 85 interchange at SR 82/El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration is required to enable the provision of a transit station at this location.

Partial realignment of ramps is proposed at the interchanges listed in Table 7. A diagram showing the relative location of the ramps is attached to this document as Attachment 1.

Table 7 Alternative 3-2 Structure Improvements

			Ramp Improvement			
Interchange Name	Ramp No.	Description	Partial	Full	Remove	None
South De Anza Boulevard	51	South De Anza Boulevard northbound on-ramp	X			
Stevens Creek Boulevard	54	Stevens Creek Boulevard northbound off-ramp	X			
	55	Stevens Creek Boulevard southbound on-ramp	X			
	56	Stevens Creek Boulevard southbound off-ramp	X			
I-280	57	I-280 northbound off-ramp	X			
	58	I-280 northbound loop on-ramp				X
	59	I-280 northbound on-ramp	X			
	60	I-280 southbound on-ramp				X
	61	I-280 southbound loop on-ramp				X
	62	I-280 southbound off-ramp	X			
Homestead Road	63	Homestead Road northbound on-ramp	X			
	64	Homestead Road southbound off-ramp	X			
Fremont Avenue	65	Fremont Avenue northbound off-ramp				X
	66	Fremont Avenue northbound on-ramp	X			
	67	Fremont Avenue southbound on-ramp	X			
	68	Fremont Avenue southbound off-ramp	X			
SR 82/El Camino Real	69	SR 82/El Camino Real northbound off-ramp		X		
	70	SR 82/El Camino Real northbound loop on-ramp			X	
	71	SR 82/El Camino Real northbound loop off-ramp			X	
	72	SR 82/El Camino Real northbound on-ramp		X		
	73	SR 82/El Camino Real southbound on-ramp	X			
	74	SR 82/El Camino Real southbound loop off-ramp			X	
	75	SR 82/El Camino Real southbound on-ramp			X	
SR 237	76	SR 237 northbound off-ramp	X			
	77	SR 237 northbound on-ramp	X			
	78	SR 237 southbound on-ramp	X			
	79	SR 237 southbound off-ramp				X
Evelyn Avenue	80	Evelyn Avenue northbound off-ramp	X			
	81	Evelyn Avenue southbound on-ramp	X			
Central Expressway	82	Central Expressway northbound on-ramp	X			
	83	Central Expressway southbound off-ramp	X			
Moffett Boulevard	84	Moffett Boulevard northbound off-ramp	X			
	85	Moffett Boulevard southbound on-ramp	X			

The “Mainline Improvements” listed above indicated that the one lane added in each direction would extend from Almaden Expressway to Evelyn Avenue or Moffett Boulevard. As an option, Alternative 3-1 (Median) Long Transit Lane could include a drop ramp from the median of SR 85 to Evelyn Avenue in lieu of continuing the transit lanes to Moffett Boulevard.

Figure 3 illustrates a conceptual alignment plan for this option. The median direct connector ramp is facilitated by the freeway mainline rising by 16 feet between Dana Street and Evelyn Avenue, while the median transit lanes drop in elevation by 12 feet to meet the grade of Evelyn Avenue (see Figure 4). To construct the drop ramp, a tunnel could be "jacked" under the northbound travel lanes without the need to temporarily close the freeway (see Exhibit 3). Commuter buses not using the median drop lane could continue north to Moffett Boulevard and U.S. 101 using the adjacent express lane. Alternative 3-2 (Right-side) Long Transit Lane would allow VTA buses to utilize the right-side off-ramp and on-ramp to and from Evelyn Avenue while also allowing the transit lane to continue north to Moffett Boulevard for use by commuter buses.

Local Street Improvements

No streets crossing under or over SR 85 would be reconstructed to accommodate the transit lanes alternatives. Conversion of the SR 85 interchange at SR 82/El Camino Real from a Type L-10 cloverleaf layout to a Type L-2 spread diamond layout would require reconstruction of the ramp terminal intersections, installation of traffic signals, removal of a portion of the raised median and landscaping, and pavement signing and striping to accommodate dual left-turn lanes to the northbound and southbound on-ramps. No widening of El Camino Real would be required.

Conversion of the HOV lane to an express lane would allow for improved enforcement, a reduction in the proportion of HOV2+ "cheaters," and improved managed use to achieve speeds of 45 mph or higher in the express lane.

The HOV to Express Lane Conversion aspect of this alternative would not yield additional vehicle throughput, however. The HOV and general-purpose lanes each accommodate roughly 1,500 vehicles per hour per lane (vphpl) during peak hours in the peak direction. The capacity of the express lane at LOS C is 1,600 vphpl. While the volume of vehicles will likely remain unchanged, the speed of the vehicles using the express lane will likely increase, encouraging more SOV drivers to carpool and/or utilize commuter buses, if available.

With mainline traffic volumes expected to remain unchanged from no build conditions, no impacts to local streets would be expected.

Railroad Involvement

Six (6) railroad crossings over or under SR 85 occur within the project limits.

1. VTA light rail tracks (Guadalupe Corridor) under southbound SR 85 at PM 1.33.
2. VTA light rail tracks (Guadalupe Corridor) under northbound SR 85 at PM 5.27, just west of Santa Teresa Boulevard.
3. VTA light rail track under SR 85 adjacent to Winfred Boulevard at PM 5.59.
4. Union Pacific track over SR 85 adjacent to Winchester Boulevard at PM 10.98.
5. Caltrain Peninsula Commuter tracks under SR 85 adjacent to Evelyn Avenue at PM 22.63.
6. VTA light rail tracks under SR 85 adjacent to Central Expressway at PM 22.63.

None of these crossings would require bridge work to accommodate the proposed freeway widening for the addition of one transit lane in each direction.

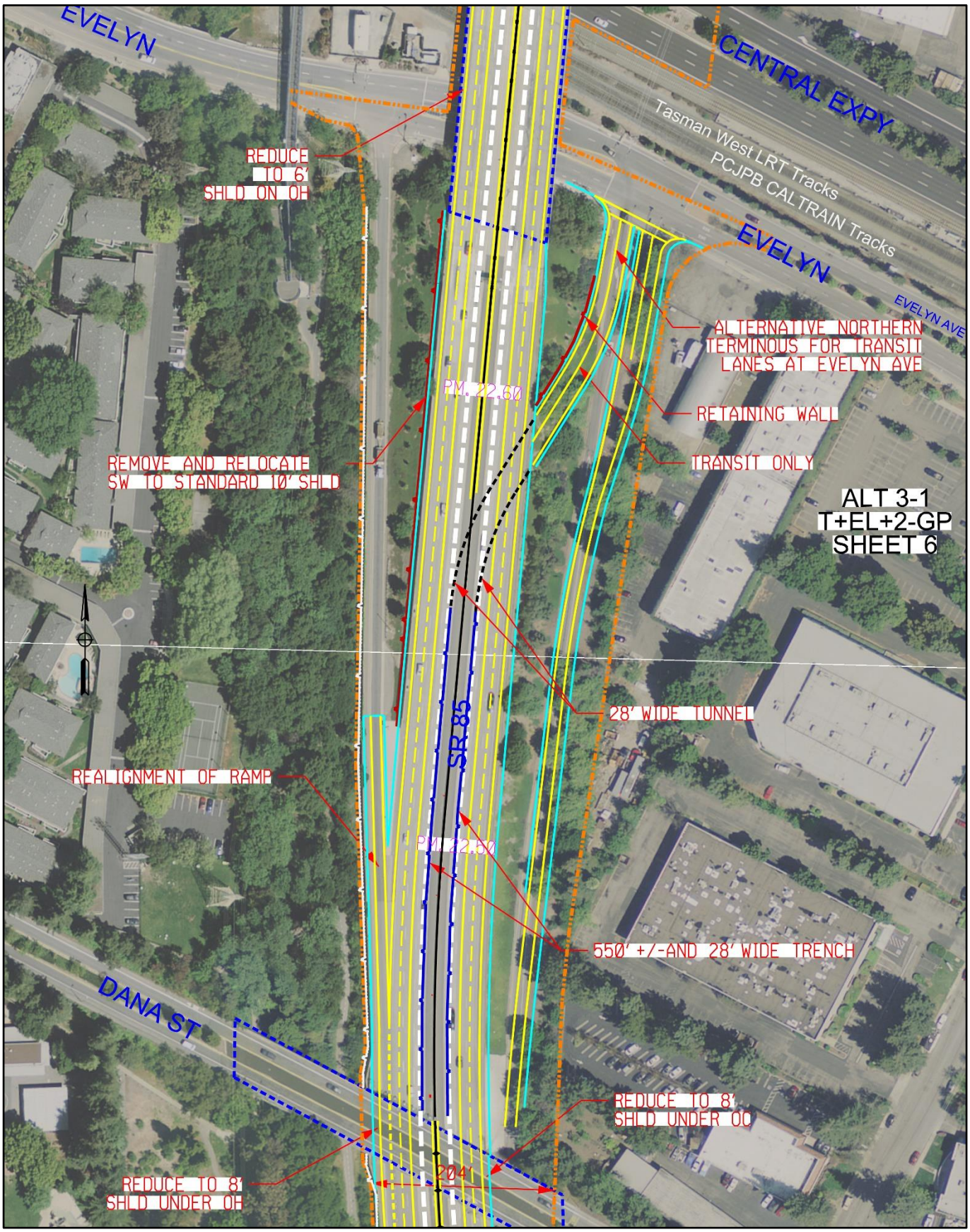


Figure 3 Alternative 3-1 Conceptual Alignment Plan for Direct Connector Drop Ramp to Evelyn Avenue

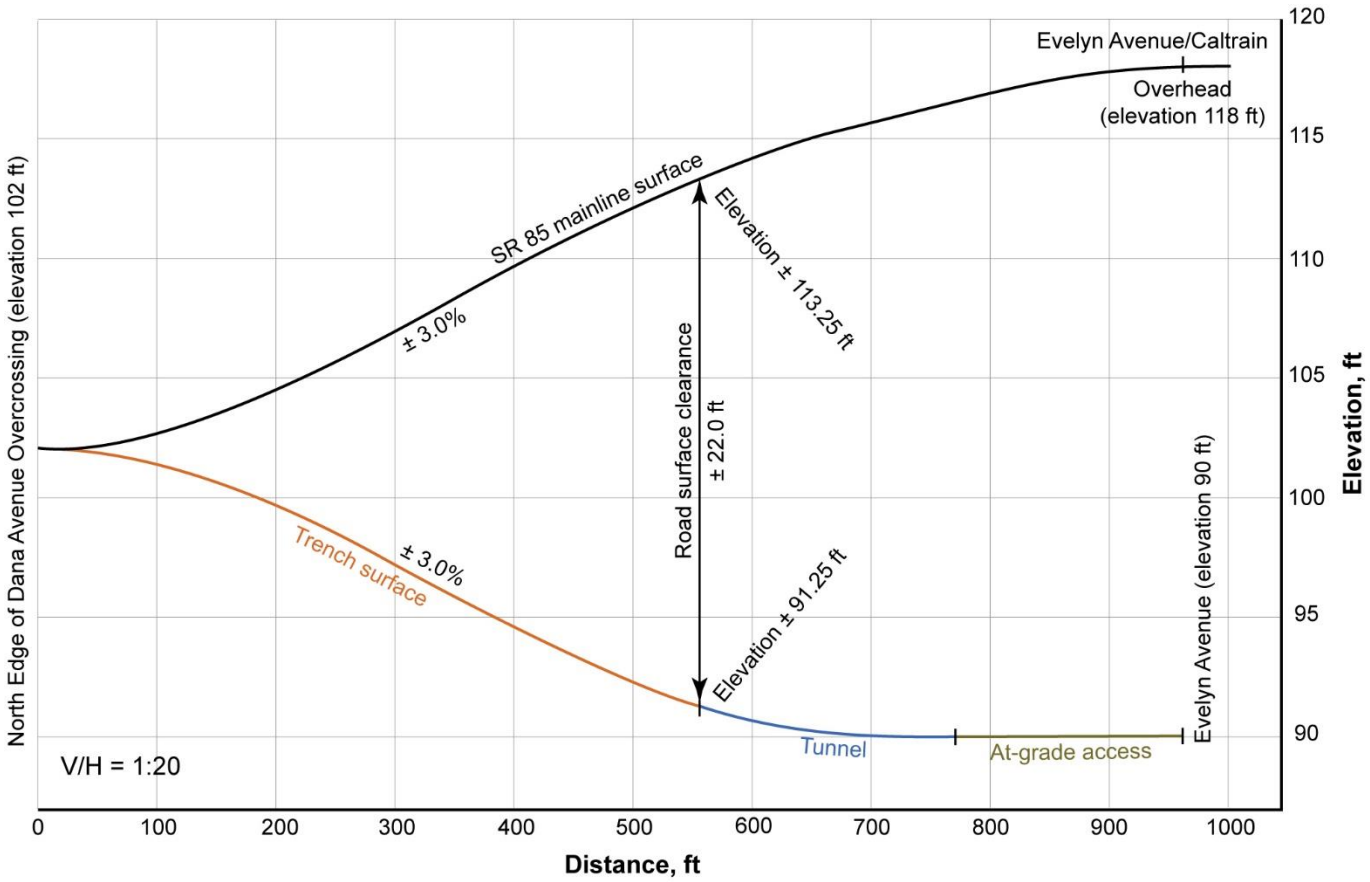
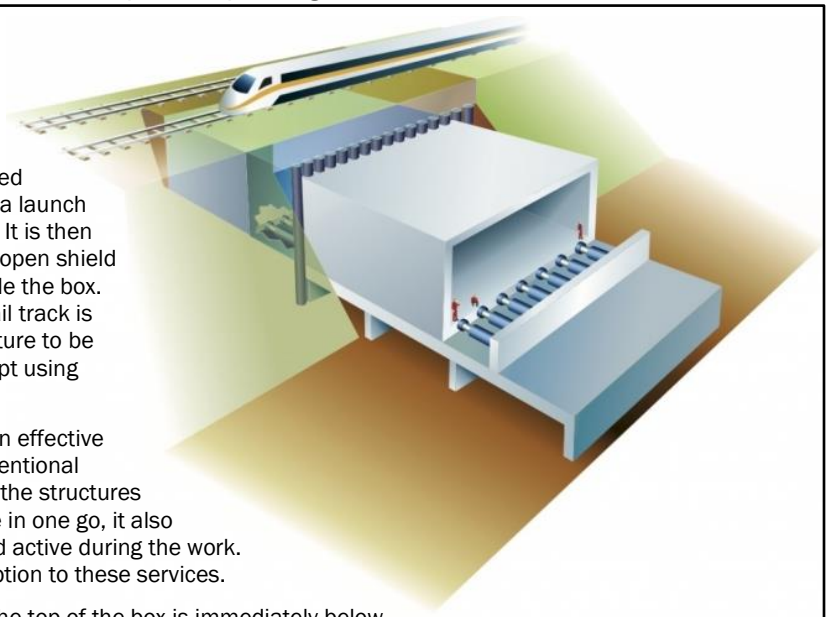


Figure 4 Conceptual Vertical Profile for Direct Connector Drop Ramp to Evelyn Avenue

Exhibit 3. Box (or Tunnel) Jacking

BOX JACKING



Box jacking, also known as Tunnel Jacking, involves the advancement of a site cast rectangular or other shaped sections using high capacity hydraulic jacks. The structure to be installed is constructed, normally in reinforced concrete, on a launch pad at site adjacent to where it has to be installed. It is then thrust forward horizontally using advance support, open shield and jacking technology with taking place from inside the box. This is frequently used where an existing road or rail track is on an embankment and space exists for the structure to be cast at the side. There are variations on this concept using short pre-cast units to form the box.

The main benefit of this approach is that it offers an effective alternative to disruptive open cut techniques, conventional tunneling methods being inappropriate so close to the structures above. Tunnel jacking can install the final structure in one go, it also allows the above infrastructure to remain "live" and active during the work. This obviously significantly reduces potential disruption to these services.

A number of installations have been made where the top of the box is immediately below the track. The system is designed for the track loads to be picked up by the box roof as it advances.

Source: Jacked Structures, Cheshire, United Kingdom

Structure Improvements

The transit lane alternatives would necessitate the widening of nine bridge or undercrossing structures, the replacement of embankments with retaining walls at three overcrossings, and the replacement of one pedestrian overcrossing. Table 8 summarizes the proposed structure improvements under Alternatives 3-1 and 3-2.

Table 8 Long Transit Lane Alternatives Structure Improvements

Structure No.	Postmile	Structure Name	Type*	Structure Improvement		
				No Work	Widen	Replace
1	0.20	Bernal Road	Undercrossing	X		
2	0.29	Monterey Road/Union Pacific/Great Oaks Boulevard	Undercrossing/overpass	X		
3	1.22	Via Del Oro	Undercrossing	X		
4	1.33	VTA Light Rail	Overpass	X		
5	1.97	Cottle Road	Overcrossing	X		
6	2.73	Lean Avenue	Overcrossing	X		
7	3.48	Snell Avenue	Overcrossing	X		
8	3.93	Blossom Hill Road	Overcrossing	X		
9	4.28	Canoas Creek	Bridge	X		
10	4.50	Cahalan Avenue	Pedestrian undercrossing	X		
11	4.84	Southbound SR 87 to southbound SR 85	Separation	X		
12	5.20	Santa Teresa Boulevard	Undercrossing	X		
13	5.27	VTA Light Rail	Overpass	X		
14	5.31	Southbound SR 85 to northbound SR 87	Separation	X		
15	5.59	Winfred Blvd/Guadalupe River/Sanchez Drive	Bridge	X		
16	6.00	Almaden Expressway	Undercrossing		X	
17	6.46	Russo Drive	Pedestrian overcrossing	X		
18	7.30	Meridian Avenue	Overcrossing	X		
19	7.50	Dent Avenue	Pedestrian overcrossing	X		
20	8.11	Camden Avenue	Undercrossing	X	X	
21	8.77	Leigh Avenue	Overcrossing	X		
22	9.28	Union Avenue	Overcrossing	X		
23	9.93	Samaritan Place	Pedestrian overcrossing	X		
24	10.23	Bascom Avenue	Overcrossing	X		
25	10.40	Southbound SR 17 to southbound SR 85	Separation	X		
26	10.48	SR 17	Separation	X		
27	10.60	Oka Road	Undercrossing		X	
28	10.80	Los Gatos Creek	Bridge		X	
29	10.90	Winchester Boulevard	Underpass	X		
30	11.00	Winchester Boulevard	Overcrossing	X		
31	11.97	Pollard Road	Undercrossing		X	
32	12.45	More Avenue	Pedestrian overcrossing	X		
33	12.68	San Tomas Aquino Creek	Bridge		X	
34	12.91	Quito Road	Overcrossing	X		
35	13.73	Saratoga Avenue	Undercrossing		X	
36	13.91	Saratoga Creek	Bridge		X	
37	14.28	Cox Avenue	Overcrossing	X		
38	14.31	Cox Avenue utility	Overcrossing	X		
39	14.73	Scully Avenue utility	Overcrossing	X		
40	14.84	Blue Hills	Pedestrian overcrossing	X		
41	15.27	Prospect Road	Overcrossing	X		
42	15.40	Calabazas Creek	Bridge		X	
43	15.87	South De Anza Boulevard	Overcrossing	X		
44	16.61	South Stelling Road	Overcrossing		X	
45	17.17	McClellan Road	Overcrossing		X	
46	17.70	Stevens Creek Boulevard	Overcrossing		X	
47	18.35	Southbound/eastbound I-280	Separation	X		
48	18.41	SR 85/I-280	Separation	X		
49	18.43	Northbound/westbound I-280	Separation	X		
50	18.86	Homestead Road	Overcrossing	X		
51	19.39	The Dalles	Pedestrian overcrossing			X

Table 8 Long Transit Lane Alternatives Structure Improvements

Structure No.	Postmile	Structure Name	Type*	Structure Improvement		
				No Work	Widen	Replace
52	19.86	Fremont Avenue	Undercrossing	X		
53	20.02	Stevens Creek	Bridge	X		
54	20.37	Hawkins Drive	Right-of-way	X		
55	20.69	Permanente Creek Diversion Channel	Culvert	X		
56	21.10	Stevens Creek Trail/Dale Avenue	Pedestrian overcrossing	X		
57	21.75	SR 82/SR 85/El Camino Real	Separation	X		
58	22.13	SR 85/SR 237	Separation	X		
59	22.43	Dana Street	Overcrossing	X		
60	22.63	Evelyn Avenue/Caltrain/Light Rail/Central Expressway	Undercrossing/overpass	X		
61	22.95	Stevens Creek	Bridge	X		
62	23.19	Middlefield Road	Overcrossing	X		
63	23.44	Moffett Boulevard	Undercrossing	X		

*Type:
- Undercrossing = local road under State highway
- Overcrossing = local road over State highway
- Pedestrian overcrossing = Pedestrian crossing over State highway
- Separation = State highway crossing
- Underpass = State highway under railroad
- Overpass = State highway over railroad
- Right-of-way = right-of-way required

The bridge and undercrossing widening would close the existing spaces between the separate northbound and southbound structures by installing new bridge decking in the median. At each location, the bridge decks would be extended using precast, prestressed concrete beams supported by new abutments and columns. Bridge crossings of creeks are assumed to be free span between the abutments at each end of the bridge, except for the Los Gatos Creek bridge which has two spans. **Table 5**, reported earlier, provides more specific information regarding the nine bridge and undercrossing structures that would be widened.

An existing auxiliary lane would be extended along a 1.1-mile segment of northbound SR 85 between the existing South De Anza Boulevard northbound on-ramp and 0.2 mile south of the Stevens Creek Boulevard northbound off-ramp where the auxiliary lane currently begins. The existing pavement would be widened by up to 14 feet to the outside (northeast). To accommodate the auxiliary lane, sections of the existing abutments at South Stelling Road and McClellan Road overcrossings adjacent to northbound SR 85 would be removed and replaced by new retaining walls to support the embankments behind them.

The segment of northbound SR 85 where the extended auxiliary lane is proposed is up to 25 feet lower in elevation than surrounding development. In the majority of this segment, retaining walls extend along the toe of the slope by approximately 14 feet beyond the northbound shoulder, and sound walls exist at the top of the slope along the edge of the right-of-way. Widening for the proposed auxiliary lane would occur in the area between the northbound shoulder and the retaining walls or toe of the slope. The new retaining walls at the South Stelling Road and McClellan Road overcrossings would replace existing slope areas adjacent to northbound SR 85.

Drainage Improvements

Storm runoff is collected by inlets located along the outside edge of the right-side shoulders and in the center of the median. The transit lane alternatives will widen the travelway by adding one lane in each direction in the median. The elevation of the inlets located in the median may need to be adjusted (raised) to meet the plane of the widened travelway.

North of I-280, the right-side shoulders range in width from 4 to 10 feet. To meet the HDM standards for shoulder width, the AC paved shoulders would need to be widened, generally to 10 feet, and drainage inlets relocated to the outside edge of the shoulder.

Utilities

The project area contains overhead electric and communications lines and underground electric, gas, sanitary sewer, water, reclaimed water, communications, and fiber optic lines. Utility providers in the project area are listed below by category.

- Gas and electric—PG&E
- Communications—AT&T, Comcast, Level 3, Verizon, Nextlink, and MCI
- Water—San Jose Water Company, Santa Clara Valley Water District, California Water Service Company, Great Oaks Water Company, City of Sunnyvale Water Division, and City of Mountain View Water Division
- Sanitary—City of San Jose, West Valley Sanitation District, City of Cupertino, and City of Mountain View.

The project would not require utility relocations. Utility impacts would be limited to the extension of casings (protective pipes or channels) for existing underground facilities whose casings do not extend through the right-of-way. All other existing utilities would be protected in place.

Transit and Express Lane Begin/End Transitions

The SR 85 express lanes would extend from U.S. 101 in south San Jose to U.S. 101 in Mountain View. The existing direct-connector ramps at both ends of SR 85 would be converted to express lane connectors. North of Santa Teresa Boulevard, the northbound and southbound mainline bridges spanning Winfred Boulevard, Guadalupe River, and Sanchez Drive, a second lane would be added in the median traveling northbound and dropped traveling southbound.

At the north end of SR 85, the second lane would be added in the median immediately south of the southbound U.S. 101 to southbound SR 85 express lane (converted HOV lane) direct-connector ramp. Northbound, the inside lane would connect directly with the northbound SR 85 to northbound U.S. 101 express lane (converted HOV lane) direct-connector ramp. The remaining lanes would continue as general-purpose lanes.

With Alternative 3-1, the number 1 one lane will be designated and signed for transit use plus qualifying first responder and CHP use. With Alternative 3-2, the number 4 lane will be designated for these uses along with users of the general-purpose lanes who are exiting or entering the freeway to off-ramps and on-ramps, respectively.

Express Lane Buffer

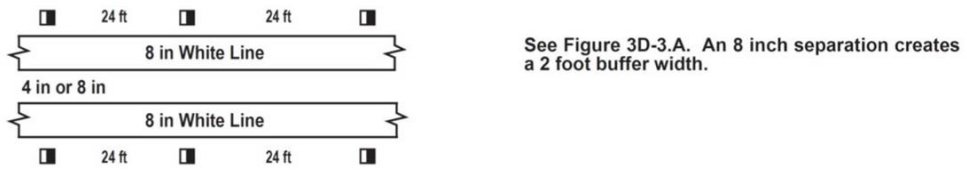
No buffer is proposed between the express lane and the adjacent general-purpose lanes. A single, white striped lane line would separate the lanes and continuous access between the lanes would be permitted.

Transit Lane Buffer

The proposed transit lanes would be located in lane 1 nearest the median or lane 4 nearest the right-side shoulder of the widened SR 85 freeway. The transit lanes are proposed to be buffer-separated from the adjacent express lane or general-purpose lanes.

A minimum buffer width of two feet is proposed. The diagram below presents the anticipated striping detail for the 2-foot buffer, which is Detail 44 with an 8-inch separation per the 2014 California MUTCD Revision 4, effective March 29, 2019.

Figure 3A-113 (CA). Examples of Preferential Lane Lines

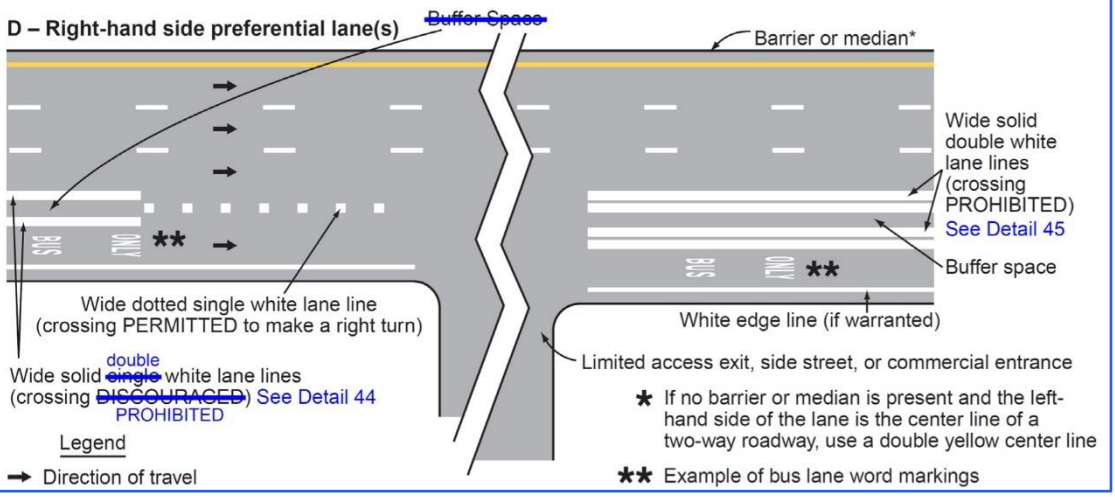


Source: California Manual on Uniform Traffic Control Devices, 2014 Edition, Revision 4 (March 29, 2019), California State Transportation Agency, 2019

Transit Lane Intermediate Access Points

Intermediate access points for the transit lanes will be identified once transit routing plans are refined during the PA/ED phase of project development. In the case of Alternative 3-2, access through the striped buffer to off-ramps and from on-ramps will be as defined by the CA MUTCD in Figure 3D-2D, Right-hand Side Preferential Lane(s), shown below.

Figure 3D-2D. Right-hand side Preferential Lane(s)



Source: California Manual on Uniform Traffic Control Devices, 2014 Edition, Revision 4 (March 29, 2019), California State Transportation Agency, 2019

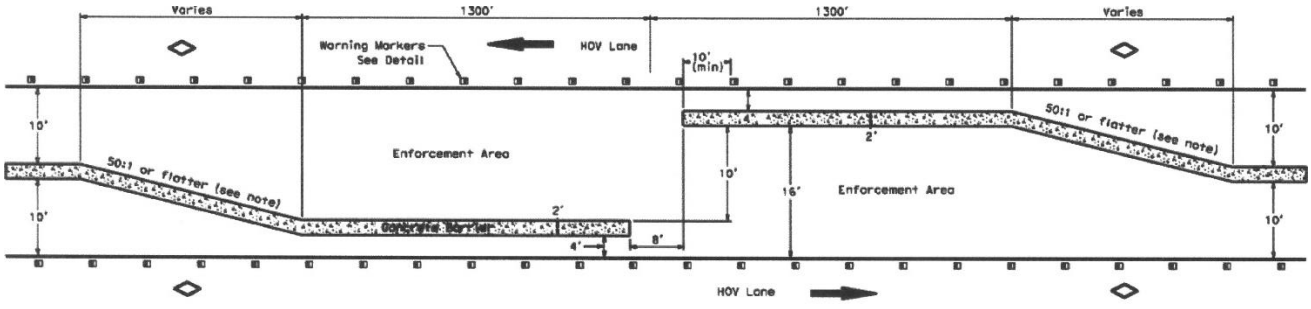
California Highway Patrol Observation/Enforcement and Emergency Refuge Areas

State-of-the-art toll infrastructure will be installed to reduce the need for CHP observation areas given the right-of-way constraints north of South Stelling Road.

Pending future agreements, it is anticipated that the CHP will be contracted to provide toll enforcement including express lane eligibility violations.

California Highway Patrol observation/enforcement areas are proposed at locations where the width of the median and separation between upstream and downstream structures will permit the design guidance illustrated as Figure 6.1 of Caltrans' High-Occupancy Vehicle Guidelines dated January 2018 to be implemented. Figure 6.1 is illustrated below for reference.

Figure 6.1 Bi-directional Enforcement Areas for Wide Medians
NOT TO SCALE



Source: High-Occupancy Vehicle Guidelines for Planning, Design and Operations, California State Transportation Agency, January 2018

The locations which permit the installation of these bi-directional CHP enforcement areas are:

- Rimwood Drive (north of Almaden Expressway at PM 6.72)
- Mulberry Drive (north of Winchester Boulevard at PM 11.60)
- Hollanderry Place (north of De Anza Boulevard at PM 16.23).

The CHP is anticipated to be contracted to conduct routine and supplemental enforcement services on SR 85 express lanes.

The locations of emergency refuge areas were listed previously on Table 6. All of the emergency refuge areas would be retained with this alternative.

Toll Infrastructure

The express lane facility would incorporate various toll infrastructure including toll gantries with transponder readers and high-speed digital cameras (49), directional and informational signage, dynamic message signs to communicate real-time toll rates to drivers (25), complete closed circuit television coverage of the entire express lanes corridor, and fiber optics linking the infrastructure to a centralized toll operations office. Toll equipment would meet Title 21 specification and national protocol, as well as interoperability with other toll facilities in California. Please see Exhibit 1A, displayed previously, for an illustration of the tolling infrastructure.

Trenching would be conducted along the outside edge of pavement for installation of conduits. The depth of trenching would be 3 to 5 feet below the roadway surface. Conduits would be jacked across the freeway to the median where needed to provide power and communication feeds to the new overhead signs and toll structures.

The project would install new overhead and barrier-mounted signs, including dynamic message signs. The overhead signs would be installed in the median on cantilever structures supported on piles.

In some locations the express lane signs would replace existing signs or be added to existing sign structures, but most would be at new locations along SR 85. The exact number and locations of these features will be determined during the project design phase in coordination with the toll system design.

Tolling Policies

A *Concept of Operations Report* will be prepared to address various tolling policies under which the express lanes will be operated. This report will provide preliminary information regarding the type of tolling, toll exemption or rate reduction for HOVs, maximum target volume to maintain speed and minimize congestion in the express lanes, method for determining toll amount, methods for toll collection and toll enforcement, penalty rates for toll violations, and provision of supplemental service patrol. The items listed below represent key policies which have been assumed for the SR 85 express lanes; however, they are subject to change pending further studies.

- The express lanes are anticipated to operate part-time during peak hours, Monday through Friday.
- It is anticipated that HOVs with two or more occupants (HOV2+) will be allowed to use the express lanes toll-free. Single-occupancy vehicles will be allowed to use the express lanes for a toll.
- Motorcycles will be allowed to travel in the express lanes toll-free and are not required to have a transponder.
- Exempted vehicles including emergency response vehicles, highway maintenance vehicles serving the express lanes facility, and CHP vehicles assigned to patrol the express lane facility will have toll-free access to the express lanes, by registering these vehicles as toll exempt in the License Plate Recognition system.
- Clean air vehicles with valid clean air vehicle decals will be able to use the express lanes for a toll discount, assumed to 15 percent.
- Tolling is anticipated to be dynamic pricing based on real-time traffic levels to ensure peak period speed of no less than 45 mph.

Additional studies will be performed to establish the operating policies and business rules and determine pricing structures and toll violation rates.

Toll Operations and Maintenance

The institutional arrangements for operation and maintenance of the express lanes will be consistent with those implemented by VTA for the express lane system in Santa Clara County.

Express Lanes Incident Responses

At this time, it is anticipated that Freeway Service Patrol will be contracted to provide incident response for the express lanes similar to the current arrangement in the HOV and general-purpose lanes. It is currently planned to have dedicated roving Freeway Service Patrol patrolling the express lanes during hours of peak congestion, to respond to incidents that might affect the express lanes including clearing of debris, towing disabled vehicles, and minor auto repairs.

Conceptual Engineering Plans

Conceptual cross sections for mainline segments and segments passing structures with restrictive widths are provided in Attachment 2.

Alignment plans for the transit lane alternatives are provided in Attachment 3 for the mainline segment from Prospect Road (PM 15.27) to just south of U.S. 101 in Mountain View (PM 23.70). Plan sheets are also provided for segments including transit stations at El Camino Real, Stevens Creek Boulevard, Saratoga Avenue and Bascom Avenue.

Right-of-Way Requirements

South of I-280, in segments 1 and 2 of the corridor, the project would be constructed entirely within the existing right-of-way.

North of I-280, in segment 3 of the corridor, the alignment plans provided in Attachment 3 indicate that the pedestrian overcrossing at The Dalles (PM 19.39) illustrated on Sheet 17, will need to be relocated. This relocation will likely require new right-of-way to the east of SR 85 if the pedestrian overcrossing is reconstructed at this location.

A potential right-of-way impact is illustrated on Sheet 14 in Attachment 3 at PM 20.37 where the right-side shoulder narrows to six feet. A Design Standards Decision Document will need to be prepared and approved by Caltrans Division of Design Chief to avoid acquiring right-of-way and relocating the adjacent sound wall at this location.

Transit Lane Stations

Stations are proposed along the Route 85 Transit Guideway at the following locations.

- Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard
- Bascom Avenue
- Saratoga Avenue
- Stevens Creek Boulevard
- SR 82/El Camino Real

These station locations are preliminary and representative of different right-of-way availability, mainline and median conditions, and interchange configurations. The locations of the stations proposed for proof of concept evaluation are illustrated on Figure 5.

The conceptual design options for these stations are presented later in this document following the discussion of engineering features for Scenario D, Part-time Shoulder Use.

SCENARIO D—PART-TIME SHOULDER USE (BUS ON SHOULDER)

Alternative 3-5 (Long Shoulder—Median) and Alternative 3-6 (Long Shoulder—Right Side)

These alternatives include utilizing the median shoulder (Alternative 3-5) or the right-side shoulder (Alternative 3-6) for bus on shoulder transit operations.

The Federal Highway Administration defines part-time shoulder use as a transportation system management and operation strategy for addressing congestion and reliability issues within the transportation system. There are many forms of part-time shoulder use or "shoulder running"; however, they all involve use of the left or right shoulders of an existing roadway for temporary travel during certain hours of the day. Part-time shoulder use has primarily been used in locations where there is recurring congestion due to lack of peak period capacity through the corridor.

Part-time shoulder use is primarily used on freeways. There are multiple examples of how highway agencies have used the shoulders of roadways to address congestion and reliability needs and to improve overall system performance. These options vary in terms of the location of the shoulder (left/right shoulder options) used, vehicle-use options [e.g., bus only, HOV only, all vehicles except trucks], operating schedule, and special speed controls. In all of these options, the use is "temporary" for part of the day, and the lane continues to operate as a refuge shoulder when not being used for these travel purposes.

Traffic Considerations

Peak period traffic volumes for three representative locations are reported in Table 9. The table indicates that traffic demand accommodated by the existing facility is highly directional, northbound in the morning and southbound in the afternoon/evening. Segment travel speed data further emphasizes the directional nature of peak period traffic.

Figure 6 illustrates a five-minute slice of traffic speeds along SR 85 at 7:30 a.m. The top portion of the graphic illustrates northbound speeds in the two general-purpose lanes and the adjacent HOV lane. In segment 2 of the corridor, from SR 87 to I-280, speeds drop below 35 mph, which indicates "significant congestion." Southbound during the same 5-minute slice of time, motorists travel at or above the speed limit of 65 mph.

Similar speed profiles exist for the afternoon peak hours. Figure 7 illustrates speeds during the 5:30 p.m. 5-minute slice of time.

More extensive analysis of existing traffic conditions and congestion is presented in the Traffic Study Report prepared for this SR 85 Transit Guideway Study.

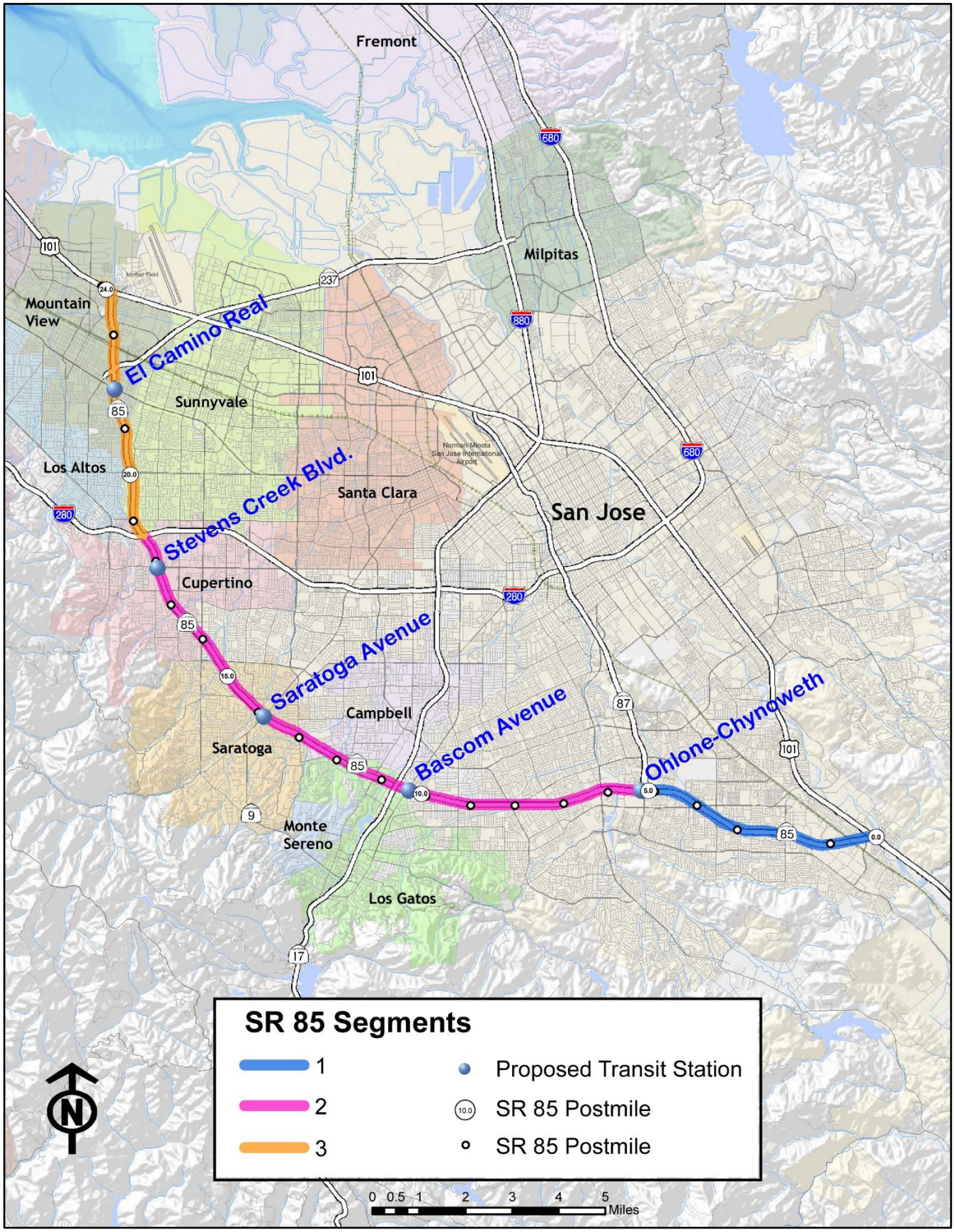


Figure 5 Transit Lane Station Locations

Table 9 State Route 85 Peak Period Hourly Traffic Volumes

	Northbound Throughput (vehicles/hour) at Location		
AM Peak Hour	❶	❷	❸
0600	1,871	2,824	5,309
0700	3,098	3,535	5,849
0800	4,612	3,961	5,162
0900	3,995	3,711	4,760
1000	4,154	3,638	4,542
PM Peak Hour	❶	❷	❸
1400	4,930	3,536	3,300
1500	4,737	3,553	3,634
1600	5,024	3,673	3,571
1700	5,634	4,101	3,868
1800	5,154	3,702	3,741
1900	4,043	2,860	2,933
Daily Total	**71,841**	**58,934**	**71,641**

	Southbound Throughput (vehicles/hour) at Location		
AM Peak Hour	❶	❷	❸
0600	963	936	1,170
0700	2,600	2,329	2,736
0800	3,445	2,824	3,077
0900	2,970	2,453	2,686
1000	2,597	2,182	2,427
PM Peak Hour	❶	❷	❸
1400	4,367	4,086	4,968
1500	5,985	4,504	4,476
1600	6,357	4,726	4,630
1700	6,177	4,710	4,749
1800	5,677	4,448	4,619
1900	4,405	3,992	4,735
Daily Total	**63,356**	**53,925**	**59,823**

Locations:

❶ Camden Avenue to Union Avenue

❷ Saratoga Avenue to De Anza Boulevard

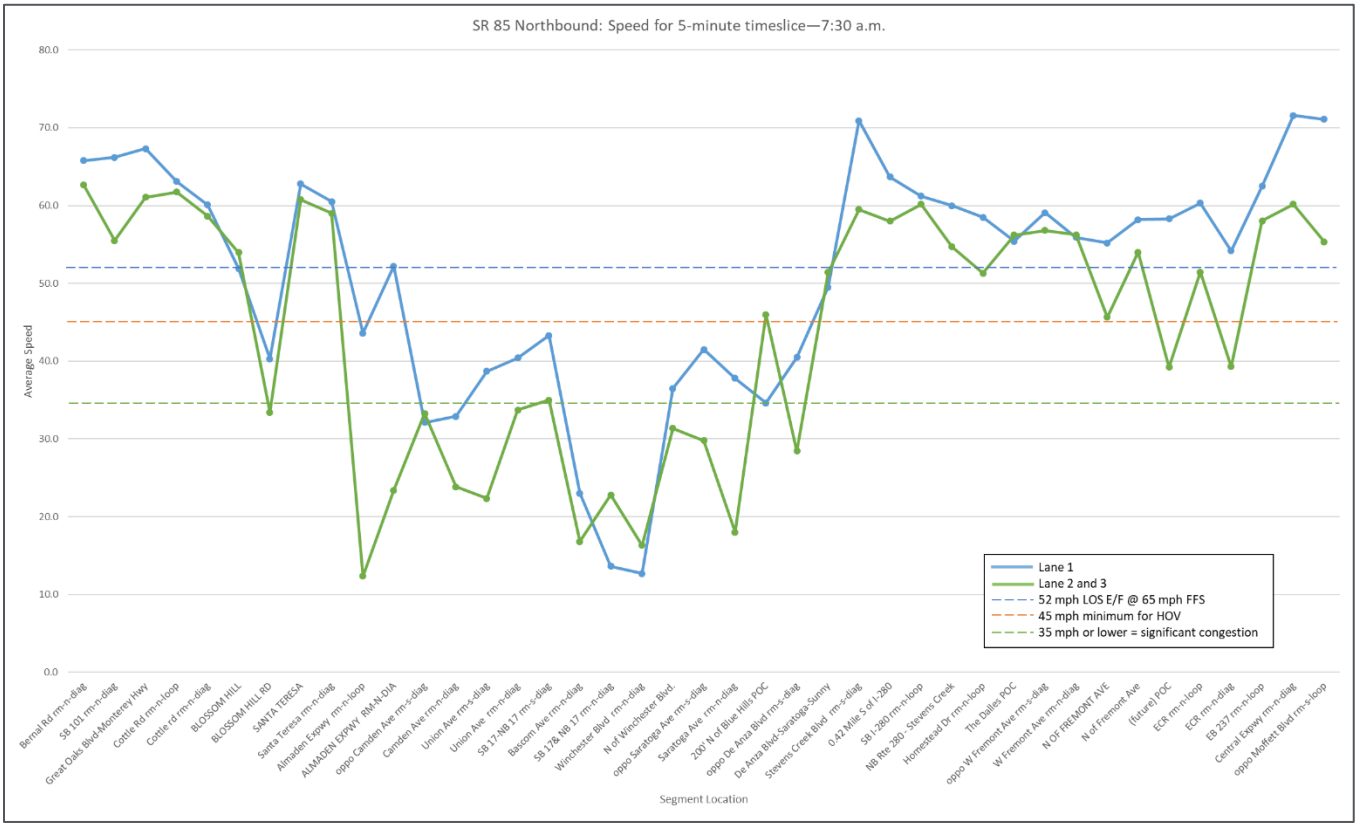
❸ Fremont Avenue to El Camino Real

Mainline Improvements

- Includes all elements of Alternative 1-2, HOV to Express Lane Conversion
  - Convert existing HOV lane in each direction from Bernal Road, near U.S. 101 in south San Jose to Moffett Boulevard, near U.S. 101 in Mountain View, a distance of 23.2 miles.
  - Provide continuous access to express lane from the adjacent general-purpose lanes.
  - Install toll infrastructure in median to support express lanes.
  - Reconstruct concrete median barrier south of Santa Teresa Boulevard and north of Stelling Road to accommodate toll gantries and dynamic message signs.
  - Widen paved median shoulder to 14 feet in both directions from Santa Teresa Boulevard to South Stelling Road (excepting structures) to provide continuous CHP enforcement area.
  - Widen right-side shoulders to meet Highway Design Manual standards (10 feet). Relocate drainage inlets as needed to the outside edge of shoulder.
  - Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing (optional improvement).
- For Alternative 3-5, the median shoulder is assumed to be paved with full depth AC or PCC to provide a 12-foot-wide part-time travel lane and a total shoulder width of 14 feet where space permits (from Santa Teresa Boulevard to South Stelling Road, excepting structures).
- For Alternative 3-6, the right-side shoulder is assumed to be paved with full depth AC or PCC to provide a 12-foot-wide part-time travel lane and a total width of 14 feet where space permits. In many to most cases, widening the right-side shoulders will involve widening the median shoulder with full depth PCC and relocating the lane markings and delineators. This will avoid the need for retaining the side slopes, reconstructing existing retaining walls and/or soundwalls.
- At structures, shoulders used by buses will be a minimum of 11.5 feet wide.

Interchange Improvements

Conversion of the SR 85 interchange at SR 82/El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration is a required improvement for these alternatives.



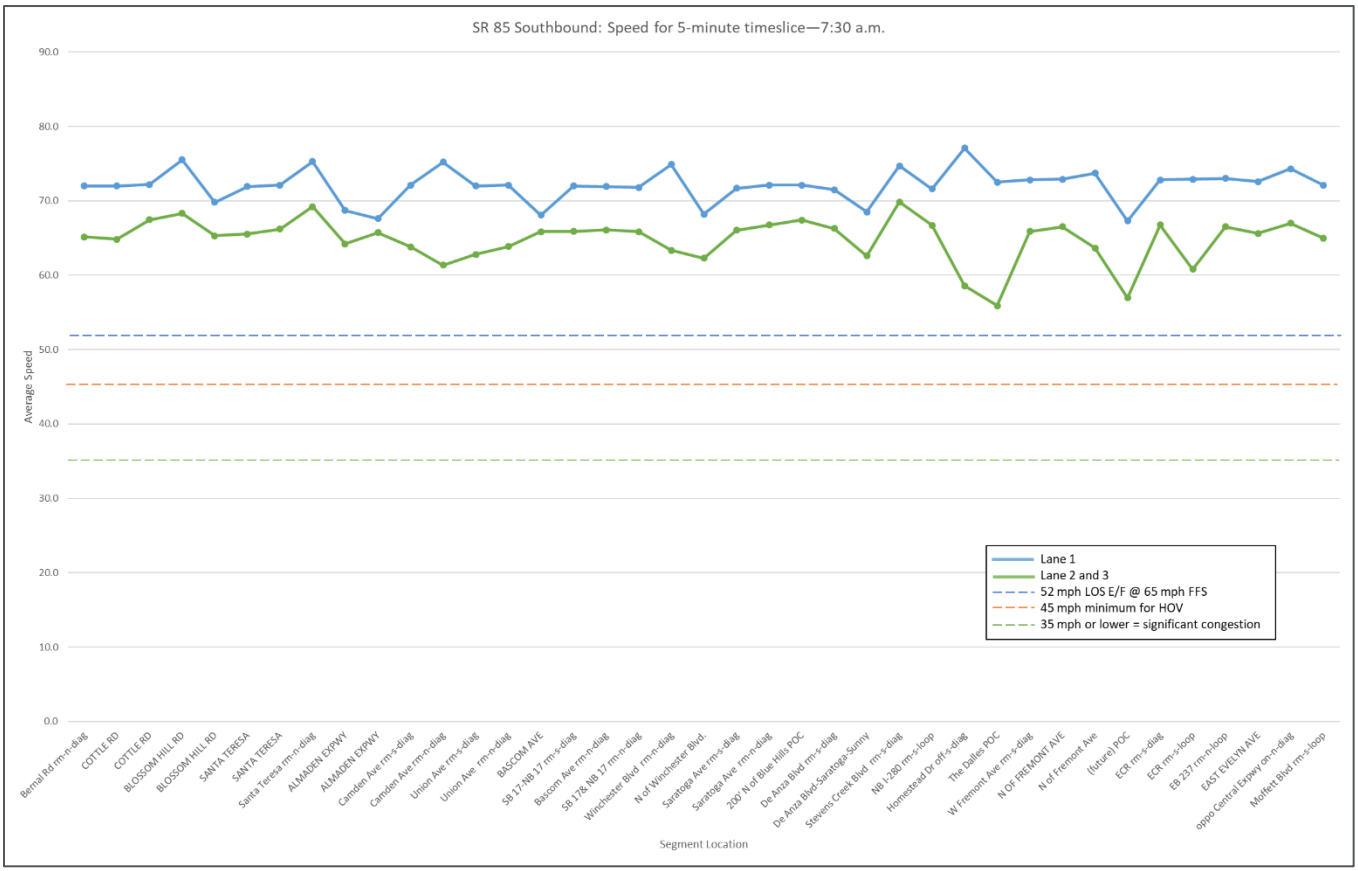
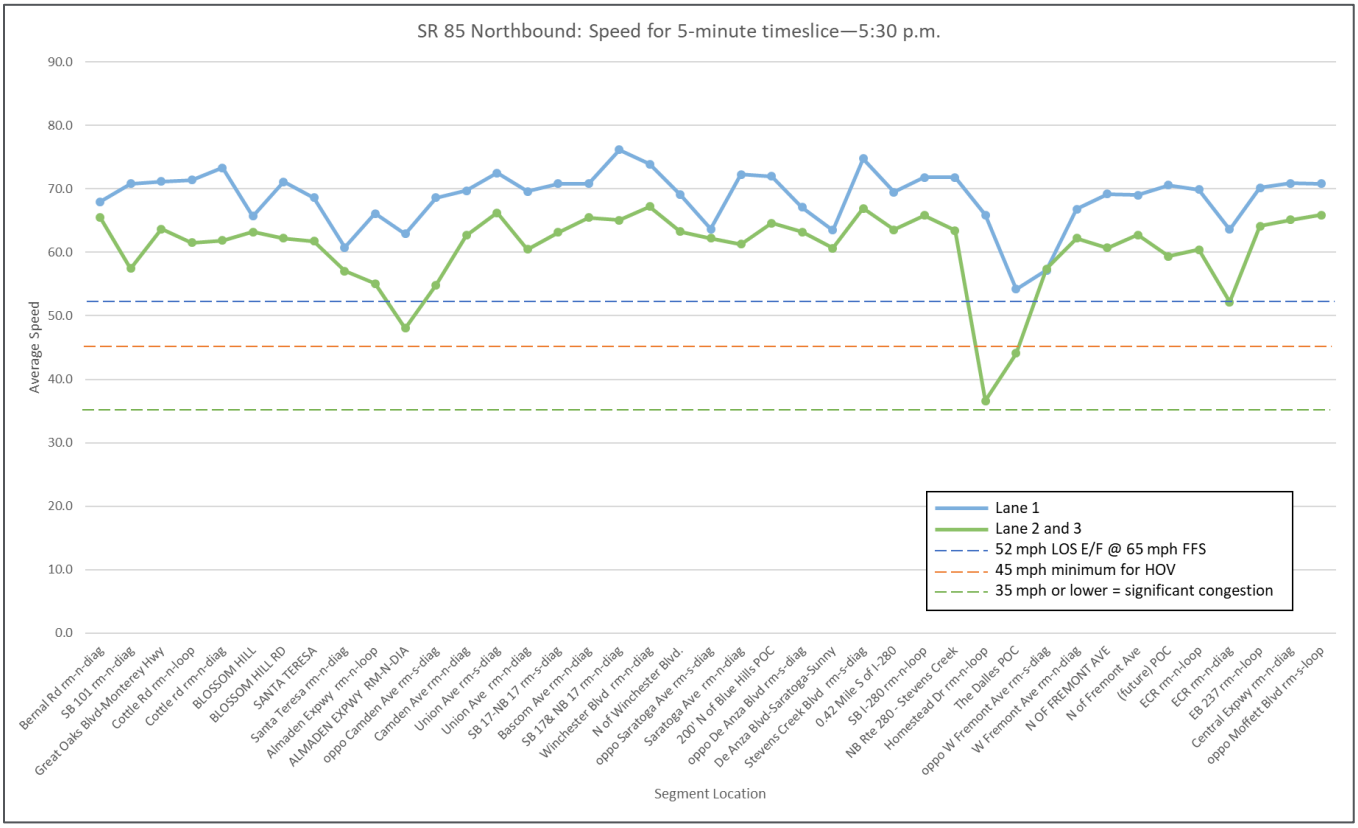


Figure 6 State Route 85 AM Peak Period 5-minute Timeslice



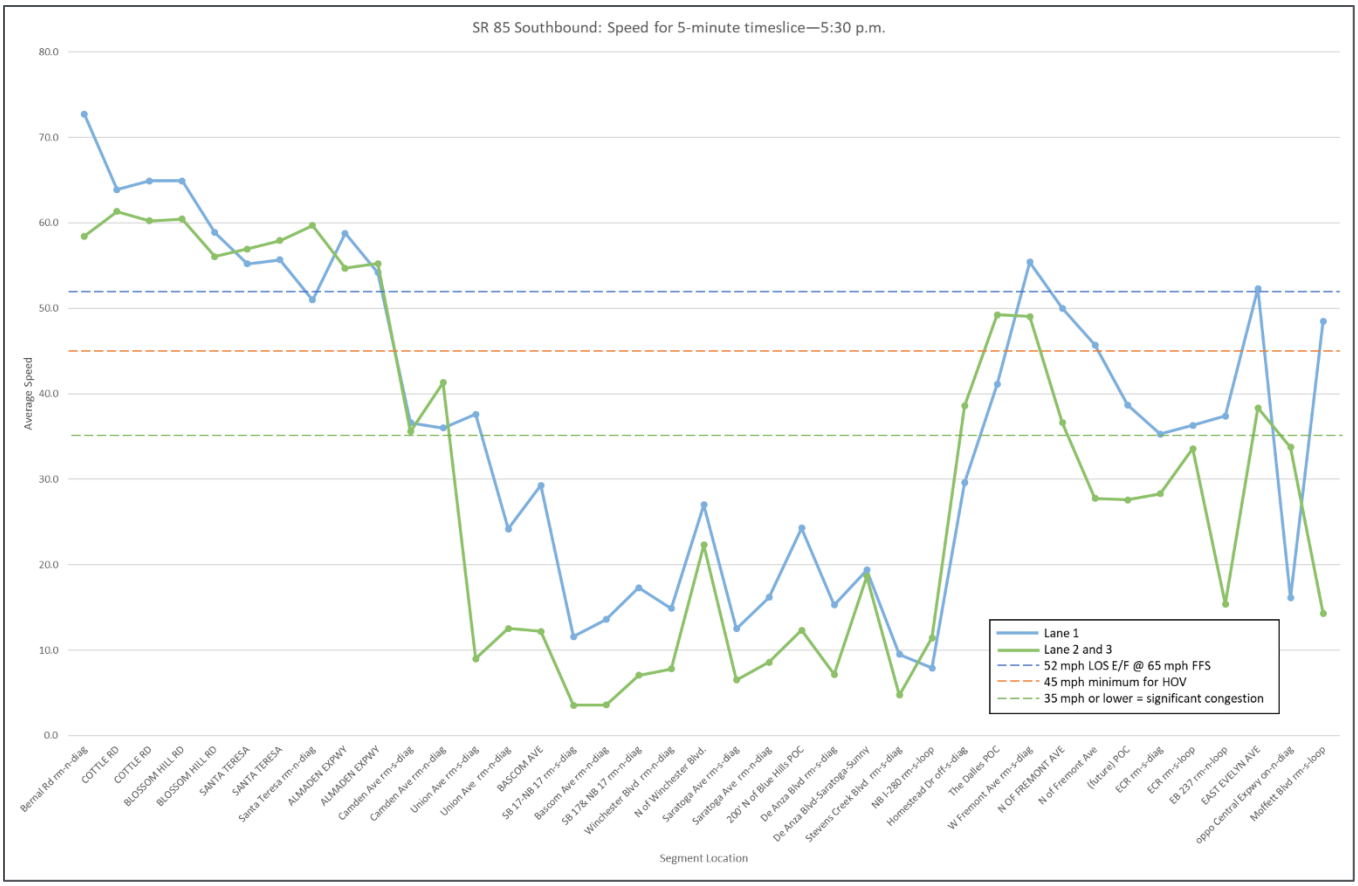


Figure 7 State Route 85 PM Peak Period 5-minute Timeslice

Local Street Improvements

No streets crossing under or over SR 85 would be reconstructed to accommodate the HOV to express lane conversion or bus on shoulder operations. Conversion of the SR 85 interchange at SR 82/El Camino Real from a Type L-10 to a Type L-2 will require reconstruction of the ramp terminal intersections, installation of traffic signals, removal of a portion of the raised median and landscaping, and pavement signing and striping to accommodate dual left-turn lanes to the northbound and southbound on-ramps. No widening of El Camino Real will be required.

Conversion of the HOV lane to an express lane would allow for improved enforcement, a reduction in the proportion of HOV2+ "cheaters," and improved managed use to achieve speeds of 45 mph or higher in the express lane.

The HOV to Express Lane Conversion element of these alternatives would not yield additional vehicle throughput, however. The HOV and general-purpose lanes each accommodate roughly 1,500 vehicles per hour per lane (vphpl) during peak hours in the peak direction. The capacity of the express lane at LOS C is 1,600 vphpl. While the volume of vehicles will likely remain unchanged, the speed of the vehicles using the express lane will likely increase, encouraging more SOV drivers to carpool and/or utilize commuter buses, if available.

With mainline traffic volumes expected to remain unchanged from no build conditions, no impacts to local streets would be expected.

Railroad Involvement

Six (6) railroad crossings over or under SR 85 occur within the project limits.

1. VTA light rail tracks (Guadalupe Corridor) under southbound SR 85 at PM 1.33.
2. VTA light rail tracks (Guadalupe Corridor) under northbound SR 85 at PM 5.27, just west of Santa Teresa Boulevard.
3. VTA light rail track under SR 85 adjacent to Winfred Boulevard at PM 5.59.
4. Union Pacific track over SR 85 adjacent to Winchester Boulevard at PM 10.98.
5. Caltrain Peninsula Commuter tracks under SR 85 adjacent to Evelyn Avenue at PM 22.63.
6. VTA light rail tracks under SR 85 adjacent to Central Expressway at PM 22.63.

None of these crossings would require bridge work to accommodate the proposed HOV to express lane conversion or bus on shoulder operations.

Structure Improvements

Including the Bernal Road and Moffett Boulevard undercrossings at the two ends of the corridor, there are 63 structures which could be affected by the build alternatives. One of these structures at Saratoga Avenue would require widening to accommodate a median station as a result of implementing bus on shoulder operations with Alternative 3-5. The replacement of embankments with retaining walls to accommodate a median station at Stevens Creek Boulevard would also be required for Alternative 3-5.

Drainage Improvements

Storm runoff is collected by inlets located along the outside edge of the right-side shoulders and in the center of the median. North of I-280, the right side-shoulders range in width from 4 to 10 feet. To meet the HDM standards for shoulder width, the AC paved shoulders would need to be widened, generally to 10 feet, and drainage inlets relocated to the outside edge of the shoulder. In the case of Alternative 3-6, the right-side shoulder will need to be repaved with full depth AC or PCC and widened to 14 feet, except at structures.

Utilities

The project area contains overhead electric and communications lines and underground electric, gas, sanitary sewer, water, reclaimed water, communications, and fiber optic lines. Utility providers in the project area are listed below by category.

- Gas and electric—PG&E
- Communications—AT&T, Comcast, Level 3, Verizon, Nextlink, and MCI
- Water—San Jose Water Company, Santa Clara Valley Water District, California Water Service Company, Great Oaks Water Company, City of Sunnyvale Water Division, and City of Mountain View Water Division
- Sanitary—City of San Jose, West Valley Sanitation District, City of Cupertino, and City of Mountain View.

The project would not require utility relocations. Utility impacts would be limited to the extension of casings (protective pipes or channels) for existing underground facilities whose casings do not extend through the right-of-way. All other existing utilities would be protected in place.

Express Lane Begin/End Transitions

The SR 85 express lanes would extend from U.S. 101 in south San Jose to U.S. 101 in Mountain View. The existing HOV direct-connector ramps at both ends of SR 85 would be converted to express lane connectors.

Bus on Shoulder Limits of Operation

Bus on shoulder operations will extend from Almaden Expressway to Moffett Boulevard.

Bus on Shoulder Access

Continuous access between the adjacent travel lanes and the shoulder is assumed.

Express Lane Buffer

No buffer is proposed between the express lane and the adjacent general-purpose lanes. A single, white-striped lane line would separate the lanes and continuous access between the lanes would be permitted.

California Highway Patrol Observation/Enforcement Areas and Emergency Refuge Areas

State-of-the-art toll infrastructure will be installed to reduce the need for CHP observation areas given the right-of-way constraints north of South Stelling Road.

Pending future agreements, it is anticipated that the CHP will be contracted to provide toll enforcement including express lane eligibility violations.

Inside median shoulders will be widened south of Stelling Road to Santa Teresa Boulevard to 14 feet in both directions to provide a continuous CHP enforcement area. In the case of Alternative 3-5, the median shoulder will need to be repaved with full depth AC or PCC. At structures such as bridges and undercrossings, existing shoulders will be maintained and structures will not be widened for this purpose.

Emergency refuge areas along the outside shoulders would be unaffected by the part-time shoulder operations.

Toll Infrastructure

The express lane facility would incorporate various toll infrastructure including toll gantries with transponder readers and high-speed digital cameras (49), directional and informational signage, dynamic message signs to communicate real-time toll rates to drivers (25), complete closed circuit television coverage of the entire express lanes corridor, and fiber optics linking the infrastructure to a centralized toll operations office. Toll equipment would meet Title 21 specification and national protocol, as well as interoperability with other toll facilities in California.

The Metropolitan Transportation Commission has prepared a simple fact sheet to further explain toll infrastructure components. This fact sheet is reproduced in whole as Exhibit 1A along with photographs of express lane construction work along I-680 in Walnut Creek and Concord.

The Operations Center mentioned in Exhibit 1A is assumed to be funded by a separate project and not a component of cost for the Route 85 Transit Guideway Project.

Tolling Policies

A *Concept of Operations Report* will be prepared to address various tolling policies under which the express lanes will be operated. This report will provide preliminary information regarding the type of tolling, toll exemption or rate reduction for HOVs, maximum target volume to maintain speed and minimize congestion in the express lanes, method for determining toll amount, methods for toll collection and toll enforcement, penalty rates for toll violations, and provision of supplemental service patrol. The items listed below represent key policies which have been assumed for the SR 85 express lanes; however, they are subject to change pending further studies.

- The express lanes are anticipated to operate part-time during peak hours, Monday through Friday.
- It is anticipated that HOVs with two or more occupants (HOV2+) will be allowed to use the express lanes toll-free. Single-occupancy vehicles will be allowed to use the express lanes for a toll.
- Motorcycles will be allowed to travel in the express lanes toll-free and are not required to have a transponder.
- Exempted vehicles including emergency response vehicles, highway maintenance vehicles serving the express lanes facility, and CHP vehicles assigned to patrol the express lane facility will have toll-free access to the express lanes, by registering these vehicles as toll exempt in the License Plate Recognition system.
- Clean air vehicles with valid clean air vehicle decals will be able to use the express lanes for a toll discount, assumed to 15 percent.
- Tolling is anticipated to be dynamic pricing based on real-time traffic levels to ensure peak period speed of no less than 45 mph.

Additional studies will be performed to establish the operating policies and business rules and determine pricing structures and toll violation rates.

Toll Operations and Maintenance

The institutional arrangements for operation and maintenance of the express lanes will be consistent with those implemented by VTA for the express lane system in Santa Clara County.

Express Lanes Incident Responses

At this time, it is anticipated that Freeway Service Patrol will be contracted to provide incident response for the express lanes similar to the current arrangement in the HOV and general-purpose lanes. It is currently planned to have dedicated roving Freeway Service Patrol patrolling the express lanes during hours of peak congestion, to respond to incidents that might affect the express lanes including clearing of debris, towing disabled vehicles, and minor auto repairs.

Conceptual Engineering Plans

Geometric cross sections for mainline segments and segments passing structures with restrictive widths are provided in Attachment 2.

Alignment plans for bus-on-shoulder alternatives are not provided in Attachment 3, except for the median crossover station option at El Camino Real for Alternative 3-5.

Right-of-Way Requirements

South of I-280, in segments 1 and 2 of the corridor, the project would be constructed entirely within the existing right-of-way.

North of I-280, in segment 3 of the corridor, the project would also be constructed within the existing right-of-way and the pedestrian overcrossing at The Dalles (PM 19.39), would not need to be relocated.

Bus on Shoulder Stations

Stations are proposed along the Route 85 Transit Guideway at the following locations.

- Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard

- Bascom Avenue
- Saratoga Avenue
- Stevens Creek Boulevard
- SR 82/El Camino Real

These station locations are preliminary and representative of different right-of-way availability, mainline and median conditions, and interchange configurations. The locations of the stations proposed for proof of concept evaluation were previously illustrated on Figure 5.

The conceptual design options for these stations are the same or similar to those proposed for the Scenario C, Freeway Widening with Transit Stations alternatives and are presented in the following section of this document.

Stations

Transit stations are proposed for the transit lane alternatives (3-1, 3-2, 3-3, and 3-4) and the bus on shoulder alternatives (3-3, 3-5, and 3-6). Alternative 3-3 is a hybrid alternative which could include dedicated transit lanes south of I-280 and bus on shoulder use north of I-280.

In all cases, the stations are proposed for the following locations for the purpose of this alternatives analysis investigation.

- Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard
- Bascom Avenue
- Saratoga Avenue
- Stevens Creek Boulevard
- El Camino Real

Alternatives featuring left-side running in Lane 1 or the shoulder adjacent to lane 1 situate the station platform(s) in the median. Alternatives featuring right-side running in lane 4 or the shoulder adjacent to lane 3 situate the station platforms to the right of the transit lane or shoulder.

Right-side running alternatives could additionally or alternatively provide bus stops along on-ramps or off-ramps near the ramp terminal intersections with cross streets. The flexible routing capabilities of bus service also allow these transit vehicles to deviate from the freeway corridor altogether, to access nearby (but off-line) transit centers.

Design options are presented below for each of the five stations proposed to support the SR 85 Transit Guideway service.

The Concept of Operations Report, prepared by CDM Smith, provides additional insights regarding which types of transit services are most compatible with the different types of transit stations that are described below.

OHLONE-CHYNOWETH

State Route 85 buses serving the Ohlone-Chynoweth LRT is one example of an off-line transit station. All of the alternatives addressed by this assessment of engineering features assume that transit service provided by the Valley Transportation Authority will begin/end or stop off-line at this existing station. Access to SR 85 will be afforded by the on-ramp to northbound SR 85 and the off-ramp from southbound SR 85 at Santa Teresa Boulevard.

The Ohlone-Chynoweth station at Santa Teresa Boulevard serves the Guadalupe Corridor LRT line, the Almaden LRT spur line, and VTA bus routes 13 and 102. The adjacent park-and-ride lots provide 549 parking spaces. Figure 8 illustrates the bus route ingress and egress to this station from and returning to SR 85.

No construction is assumed at the Ohlone-Chynoweth LRT station to accommodate SR 85 bus service other than bus stop signage and information displays. The park-and-ride lots could become oversubscribed by the addition of SR 85 bus service, however. Construction of a parking structure or additional right-of-way acquisition for surface parking is not included in the scope of project definition.

No other design options have been investigated for this location.

BASCOM AVENUE

South Bascom Avenue is the next proposed station location, 5.0 miles north of the Ohlone-Chynoweth Station. The Good Samaritan Hospital complex is immediately adjacent along with the Los Gatos “North 40” specific plan development parcels. The freeway median is 66 to 68 feet wide at this location including the paved shoulders adjacent to the mainline travel lanes. South Bascom Avenue crosses over SR 85, and the arterial street’s name changes to Los Gatos Boulevard south of the freeway. VTA bus routes 49 and 61 operate along this road with Route 49 stopping both north and south of SR 85.

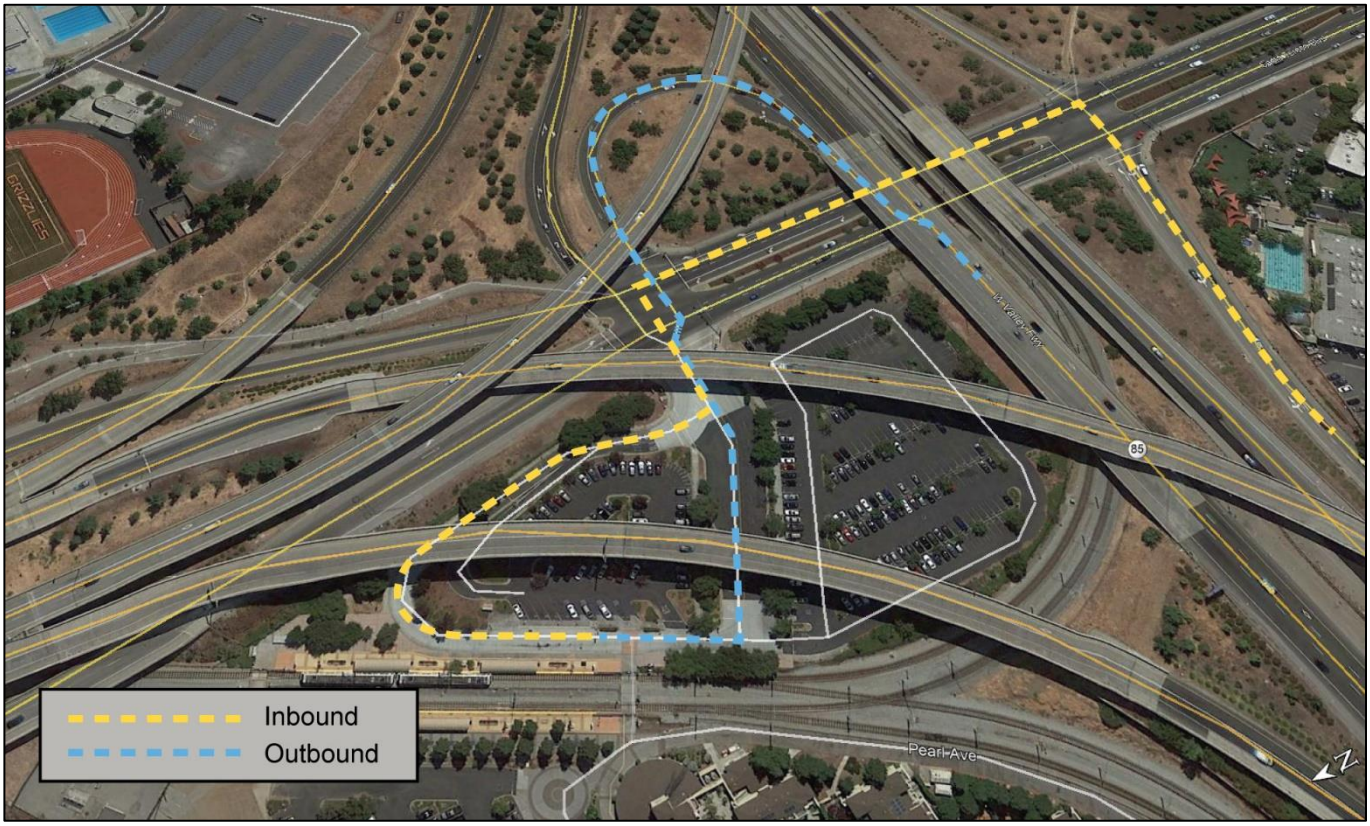


Figure 8 Bus Routing between Ohlone-Chynoweth Station and State Route 85

Station design options for the Bascom Avenue location include:

- Median crossover platform
- Median split platforms
- Side platforms
- On-ramp/off-ramp bus stops.

The median crossover platform option is discussed below. The other options will be discussed for the Saratoga Avenue Station and the Stevens Creek Boulevard station.

The **median crossover platform** option is modeled on the Minneapolis-Saint Paul Twin Cities Metro station on I-35W at 46th Street. The station is located between the northbound and southbound lanes of I-35W, which allows buses to pick up and drop off customers without leaving the freeway. Customers can board express or BRT buses on the freeway level or transfer to local buses on the 46th Street bridge, which crosses over I-35W. There are two stairway and elevator towers, one on each side of 46th Street, that provide movement between the upper-level bridge and lower-level freeway.

Freeway buses crossover from one side of the median platform to the other to permit boarding from the right side of the bus. Gates and traffic signals control movements of buses passing through the crossover maneuver.

Photographs of the I-35W/46th Street Station are provided as Exhibit 4. An aerial photograph of a median crossover platform station at this location is presented as Figure 9.

Geometric cross sections for several of the design options for a transit station at Bascom Avenue are presented as Figure 10.

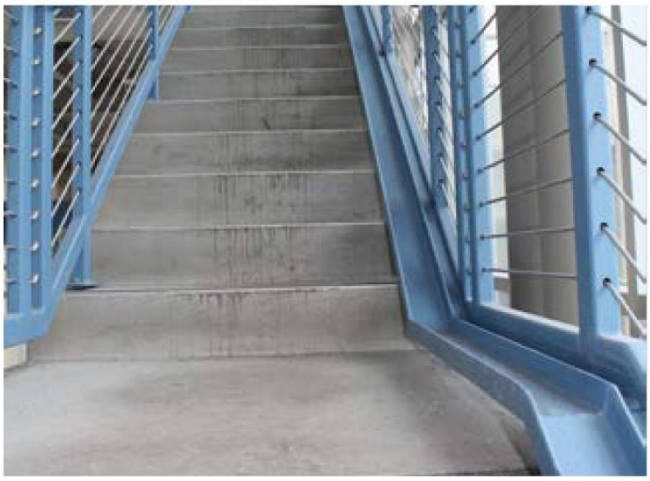
Exhibit 4. I-35W/46th Street Bus Rapid Transit Station in Minneapolis, Minnesota

46th: Existing BRT Station

46th: Entrance to BRT Station

46th: Lower level of BRT Station

46th: Stairs and Bike Rail



46th: Center Platform at BRT Station

46th: Real-time Information

Source: *Orange Line Bus Rapid Transit Existing Conditions Report,* Metro Transit, December 2013

Figure 9 Aerial View of Median Crossover Platform Station at I-35W/46th Street

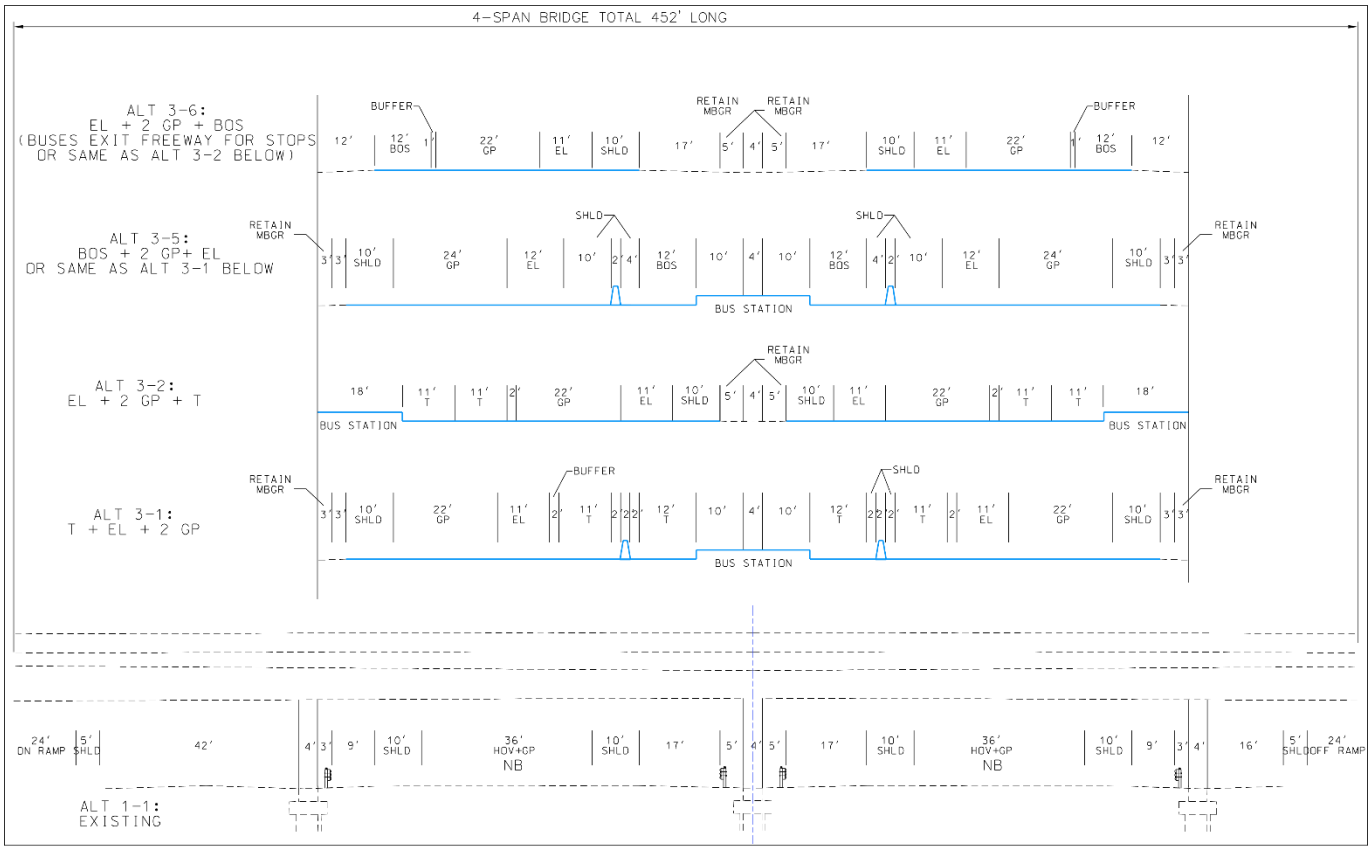


Figure 10 Bascom Avenue Transit Station Geometric Cross Sections

SARATOGA AVENUE

Saratoga Avenue is the next proposed station location, situated 3.5 miles north of South Bascom Avenue. Saratoga Avenue crosses under SR 85 with two through lanes, dual left-turn lanes, a bicycle lane and sidewalk in each direction. The twin SR 85 bridges crossing Saratoga Avenue are each 190 feet long on two spans and are each 60 feet wide. The bridges are box girders in which the main beams comprise girders in the shape of a hollow box composed of prestressed concrete.

The twin bridges are separated by a gap that is 22 feet wide. The gap would be filled by constructing a new box girder bridge between the two existing bridges. Station design options for the Saratoga Avenue location include:

- Median crossover platform
- Median split platforms
- Side platforms
- On-ramp/off-ramp bus stops.

A **median crossover platform for part-time shoulder** use is discussed below.

Exhibit 4 and Figure 9, presented previously, illustrate a median crossover platform designed for two-way, all-day use. Separate lanes for buses which do not stop at the station lay astride the station area in Lane 1 of the four travel lanes, in both directions.

A variation of the above would address the needs of Alternative 3-5, Bus on Median Shoulder. With part-time shoulder use, buses would utilize the shoulder adjacent to Lane 1 (the express lane) for northbound travel during the morning peak hours and southbound travel during the afternoon and early evening peak hours. During off-peak hours and in the off-peak direction of travel, buses would use express lanes or general-purpose lanes which are uncongested.

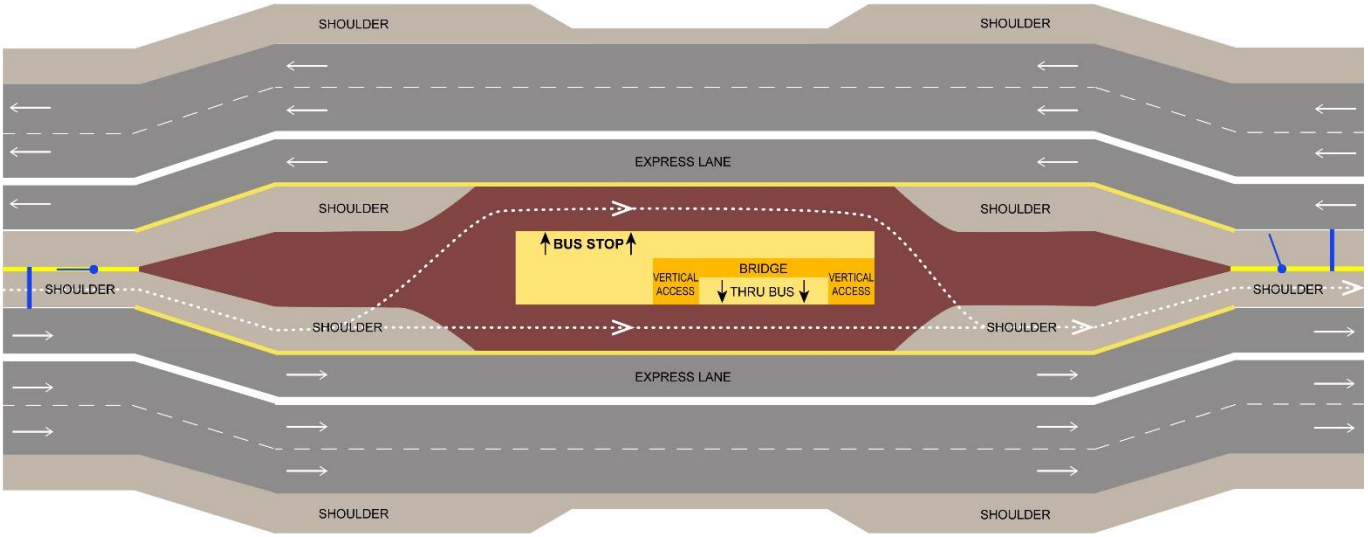
Figure 11 illustrates the movement of buses passing through a median crossover platform station being utilized for part-time shoulder use. The Santa Clara Valley Transportation Authority buses stopping at the station would cross from the right side of the platform to the left side of the platform so that customers can board from the right side of the buses.

Figure 11 Aerial View of Median Crossover Platform Station for Part-time Shoulder Use at I-35W/46th Street

Commuter shuttle buses which do not stop at the station would continue straight along the right side of the platform without stopping. Figure 12 illustrates the directionality of the bus flows during the AM and PM peak periods.

During off-peak times and/or directions, VTA buses would utilize bus stops located along the off-ramps or on-ramps at Saratoga Avenue.

AM Peak Direction Only—Reversible



PM Peak Direction Only—Reversible

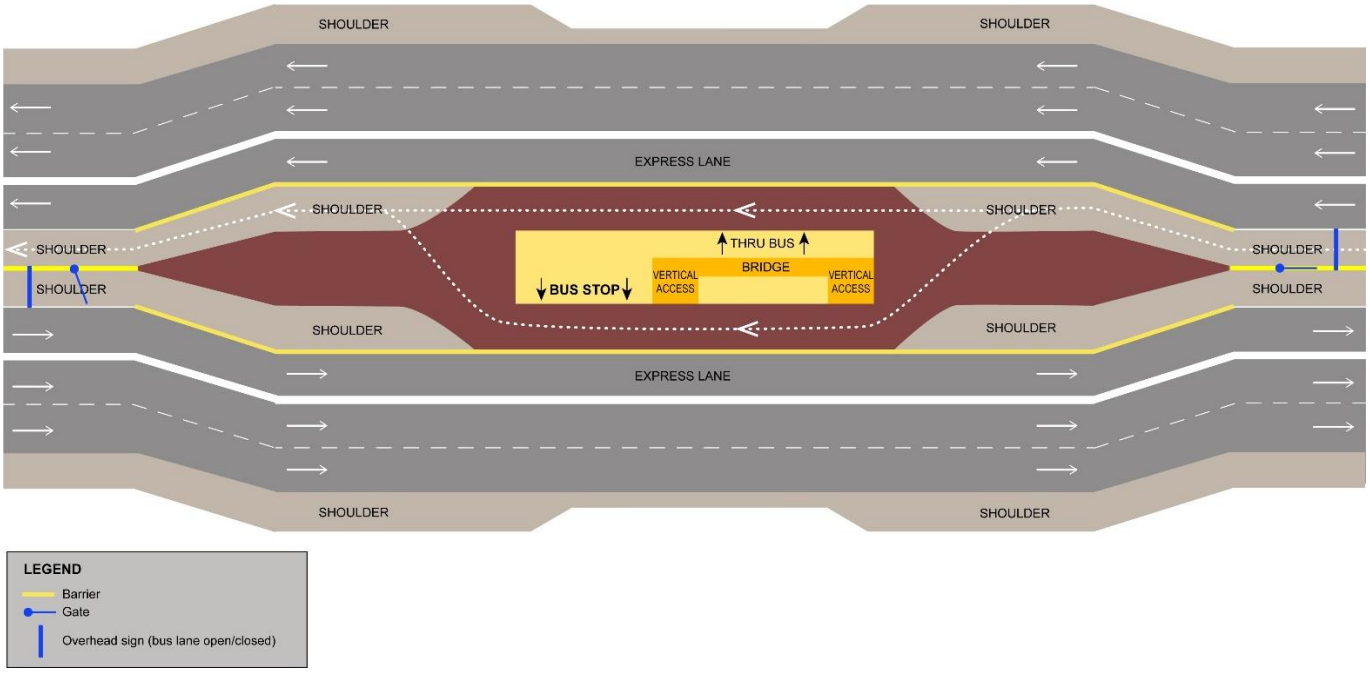


Figure 12 Conceptual View of Median Crossover Platform Station for Part-time Shoulder Use during Peak Periods

Figure 13 illustrates a variety of geometric cross sections for a potential transit station at Saratoga Avenue.

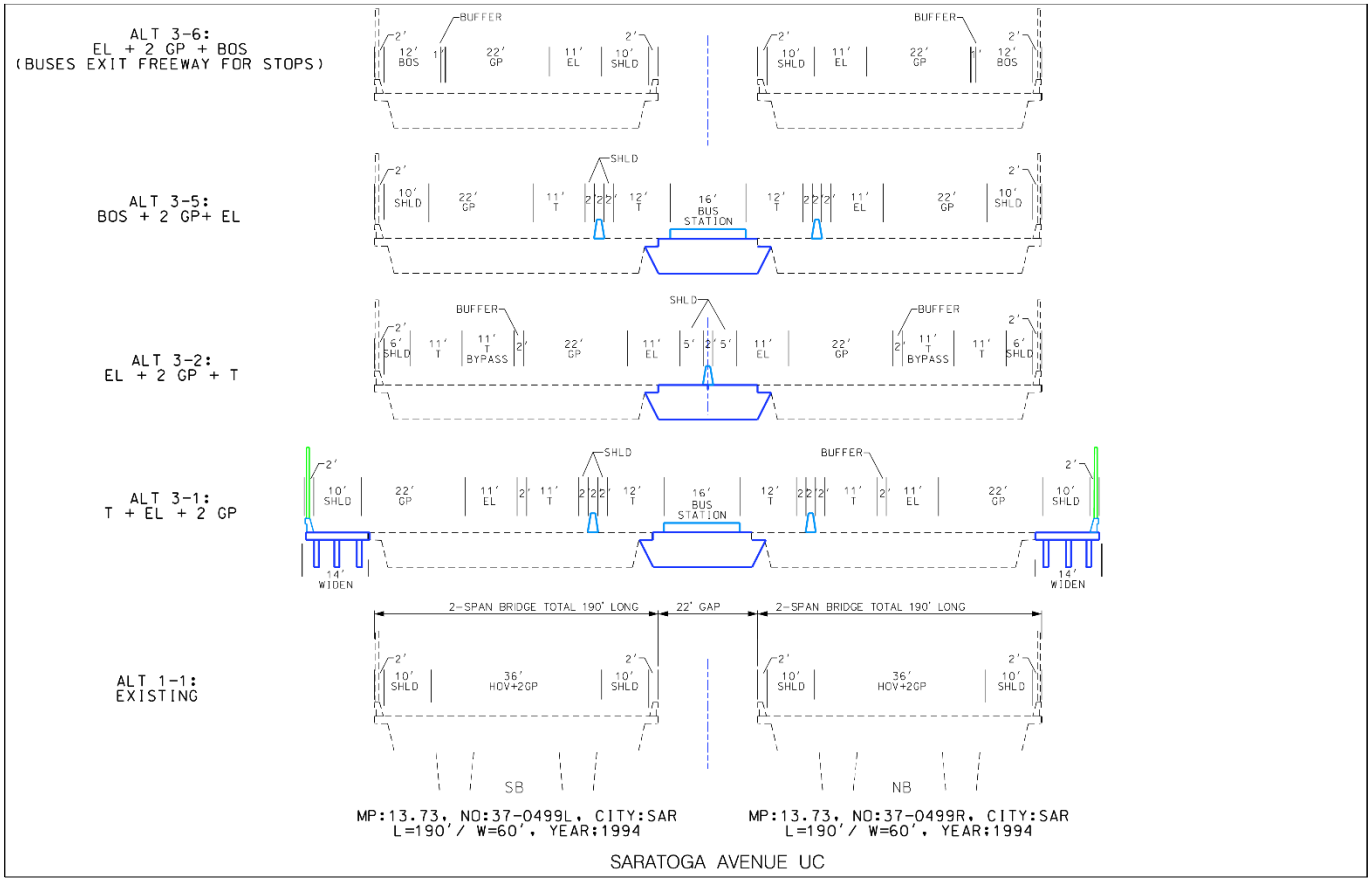


Figure 13 Saratoga Avenue Transit Station Geometric Cross Sections

STEVENS CREEK BOULEVARD

Whereas the median including inside shoulders is 44 feet wide at Saratoga Avenue, it begins to narrow north of South Stelling Road opposite Kenmore Court (PM 16.85). At Stevens Creek Boulevard, the median is approximately 24 feet wide including the paved shoulders and Type 60 concrete barrier. Four travel lanes lay astride the median in both directions.

Figure 14 illustrates a variety of cross sections for accommodating a bus station at this location. These include:

- Median crossover platform
- Side platforms
- On-ramp/off-ramp bus stops.

Figure 15 illustrates potential cross sections for a median split platform station option that is discussed below.

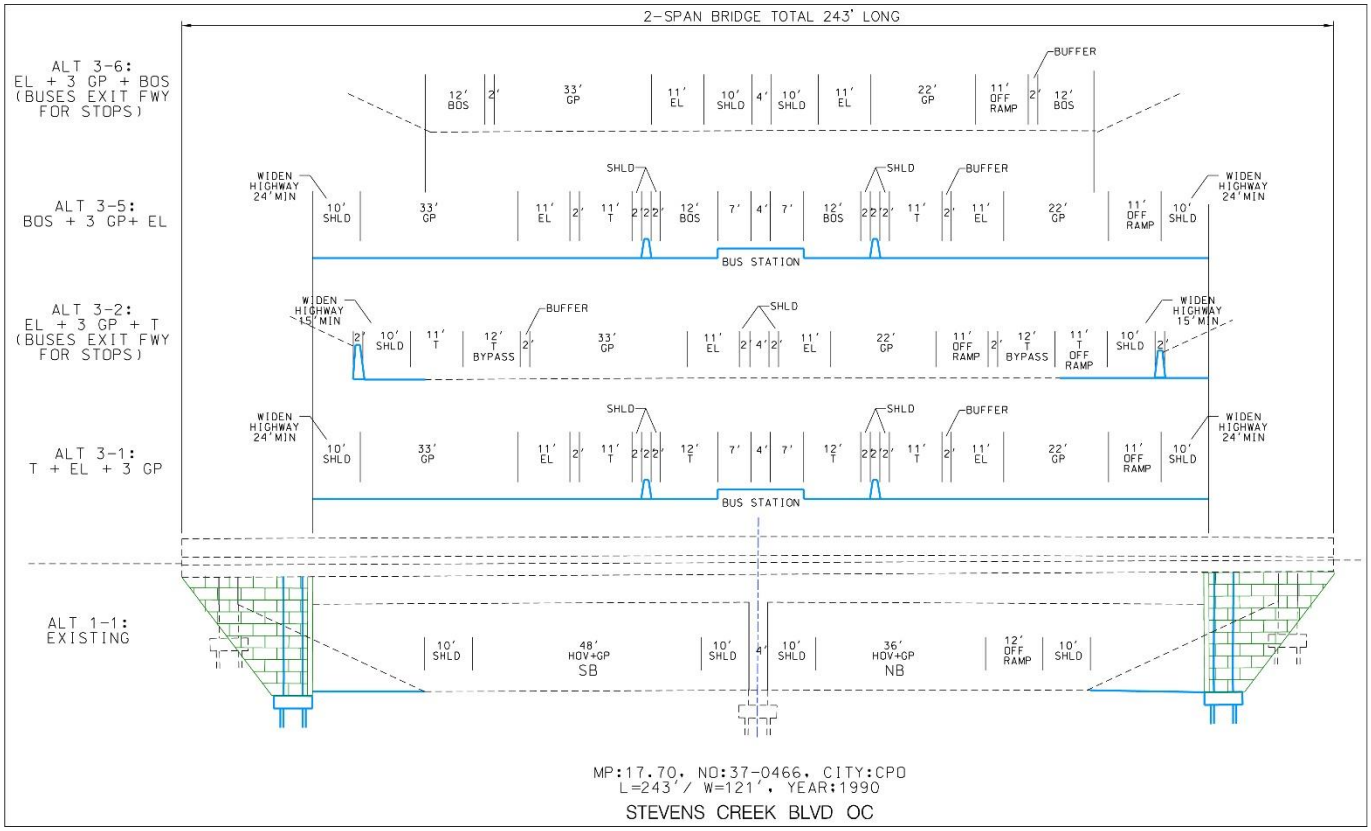


Figure 14 Stevens Creek Boulevard Transit Station Geometric Cross Sections

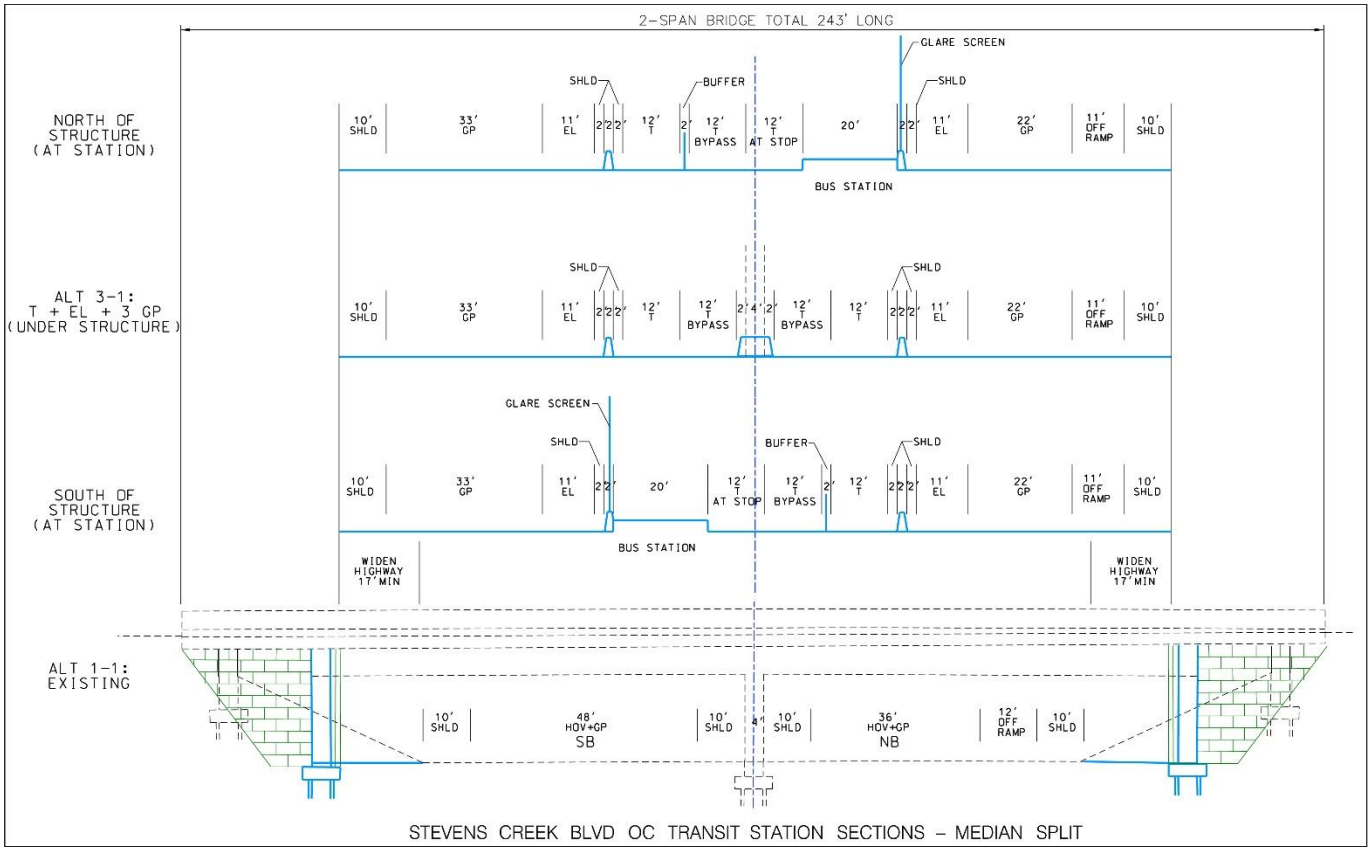
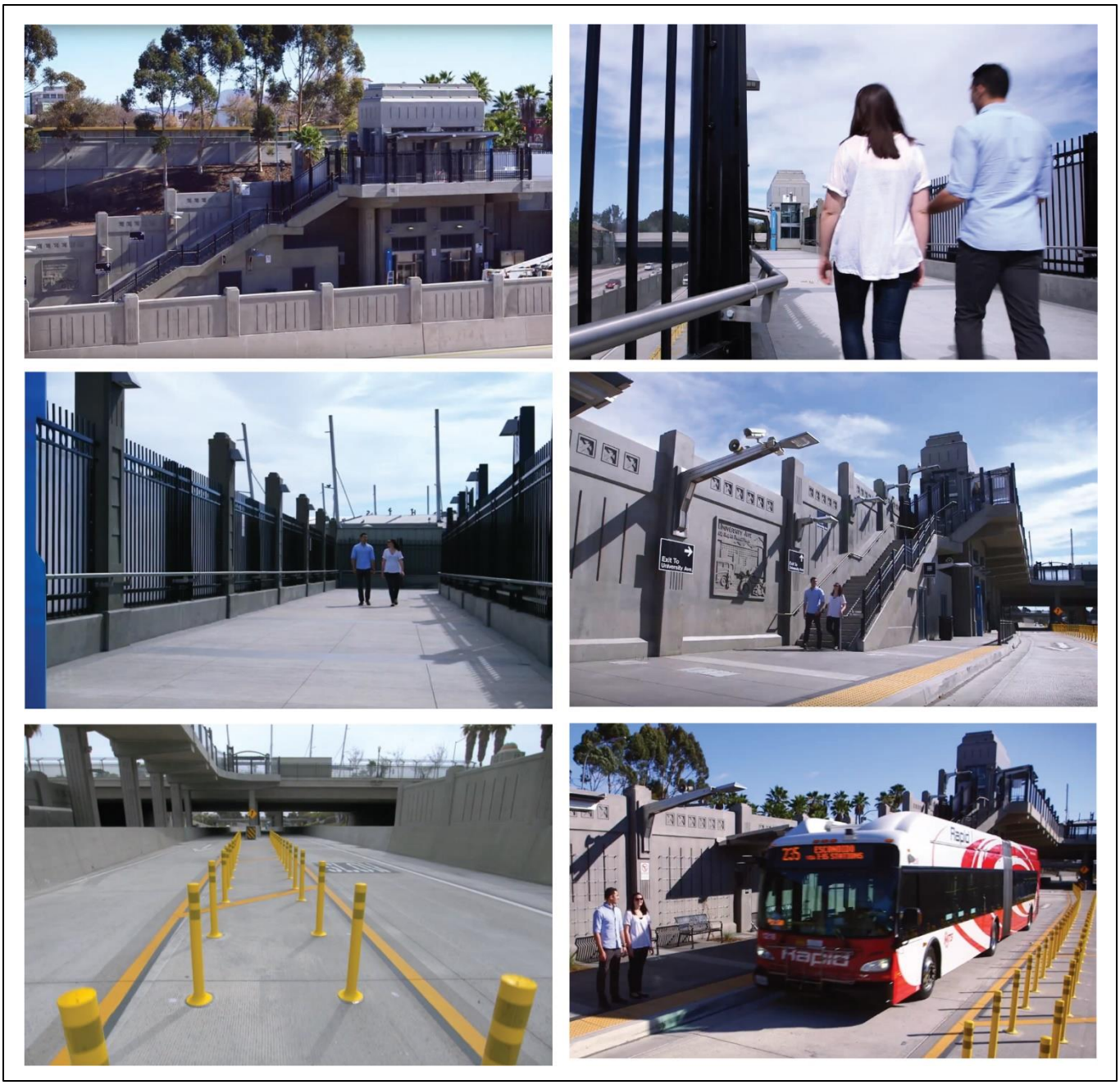


Figure 15 Median Split Platform Geometric Cross Sections

The **median split platforms option** is modeled on the San Diego Metropolitan Transit System (MTS) Bus Rapid Transit Stations on I-15 at University Avenue and at El Cajon Boulevard. These stations are approximately 0.4 mile apart. Both stations feature a bus plaza serving local buses at street level and freeway level split boarding platforms for passengers transferring to/from bus rapid transit vehicles. Each platform provides a stairway and elevator tower for movement between the upper-level bridge and lower-level freeway.

Photographs of these stations are provided as Exhibit 5. An aerial photograph of the split platform station at this location is presented as Figure 16.

Exhibit 5 San Diego MTS Bus Rapid Transit Stations: I-15 at University Avenue and at El Cajon Boulevard



Source: *How to Use Centerline Rapid Transit Stations,* San Diego MTS, March 12, 2018

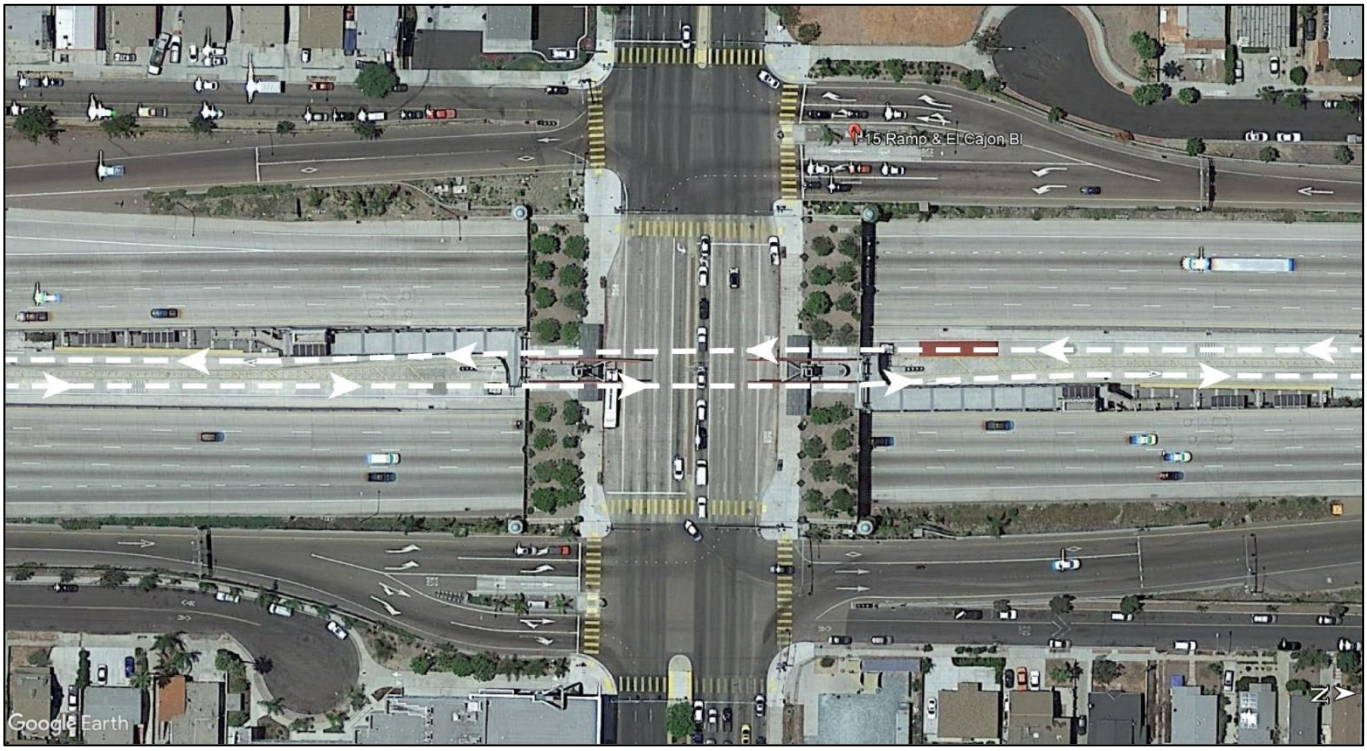


Figure 16 Aerial View of Split Platform Station at I-15 and El Cajon Boulevard

State Route 85 freeway buses will be able to stop at the far side platform or, in the case of commuter shuttles, use a bypass lane to avoid VTA buses which stop to pick up or discharge riders. In both cases, the speed limit passing through the station will be 25 mph due to the shift of the entering vs exiting lane alignments.

The width of the median required to accommodate this station design option is 60 feet as indicated on Figure 15. The width of the median required to accommodate the crossover median station, including the two transit lanes which bypass the station altogether, is 72 feet as depicted on Figure 14. The tradeoff between the two designs is the speed afforded to the commuter shuttle buses.

In both cases, the northbound and southbound freeway travel lanes will need to be spread to accommodate the transit station, as the median is only 24 feet wide at this location.

EL CAMINO REAL (SR 82)

El Camino Real is located four miles north of Stevens Creek Boulevard along SR 85. This state route crosses above SR 85 as a six-lane principal arterial. A four-quadrant cloverleaf (Type L-10) interchange connects the two roadways.

The median along SR 85 is 20 feet wide passing under SR 85, measured from the inside edges of the mainline PCC pavement. The cloverleaf ramps limit the width of the outside shoulders to six feet. To provide adequate width for a median station, the Type L-10 interchange will need to be reconfigured as a Type L-2 spread diamond interchange. The right side running transit lane (Alternative 3-2) would also require this same reconfiguration of the interchange.

Station design options for El Camino Real include:

- Median overpass platforms
- Median crossover platform
- Median split platforms
- Side platforms
- On-ramp/off-ramp bus stops.

These options are discussed below.

A **median overpass station** design could accompany Alternative 3-1, Long Transit Lane (Median Adjacent Lane). As envisioned for El Camino Real, northbound and southbound SR 85 would each provide a transit lane occupying the number 1 lane position, an express lane as the number 2 lane, and two general purpose lanes in the numbers 3 and 4 positions. Between the two transit lanes, a one-way reversible ramp would be constructed between the freeway median and the El Camino Real bridge crossing over SR 85. Far side bus stop platforms would be constructed at the top of the ramps adjacent to El Camino Real. The bus stop boarding platforms would cantilever over the transit lanes below. A traffic signal would be installed along El Camino Real where the VTA buses cross, northbound in the morning and southbound in the afternoon/early evening. The fourth lane (per direction) which currently exists on the bridge connecting the cloverleaf ramps would be repurposed as a bus stopping lane for VTA buses operating along El Camino Real (SR 82). The ramps up and down to the overcrossing bridge would each be 24 feet wide and approximately 500 feet long. During off-peak hours and off-peak directions, a second set of bus stops would be constructed at the freeway level, connected to El Camino Real above by stairs and an elevator tower.

Figure 17 presents a partial alignment plan for this station option paired with Alternative 3-1. An expanded view of the freeway widening needed to accommodate this design option can be viewed on sheets 8 through 10 of the portion of Attachment 3 illustrating the alignment plans for Alternative 3-1. Figure 18 provides an aerial view of a median overpass station constructed along I-405 at NE 128th Street in the Seattle metropolitan area. The I-405 example provides two-way ramps as more space is available compared with SR 85 at El Camino Real.

An alignment plan for a **median crossover station** is presented on Figure 19. This design option is appropriate for Alternative 3-5, Long Shoulder (Median) whereby VTA and commuter buses pass through the station during peak hours in the peak direction of travel. During off-peak hours and off-peak direction of travel, VTA buses stop at side platforms located at the freeway level. All platforms are connected to El Camino Real above via stairs and elevator towers located on both the north and south sides of the arterial street.

A **median split platform station** alignment plan is illustrated on Figure 20. All buses (VTA and commuter shuttles) pass through the station. Due to the shift in travel lane alignment between the south and north side of the bridge, speeds are limited to 25 mph. A traffic signal midblock would be installed along El Camino Real to allow bus passengers to cross the arterial as needed to board eastbound or westbound local buses.

Conceptual plans are provided at the end of the alignment plans for Alternative 3-5 or 3-1, respectively, for deploying these two design options at El Camino Real.

Alternatives 3-2, Long Transit Lane (Right-side Lane) and 3-6, Long Shoulder (Right-side) will utilize the number 4 outside right lane or the reconstructed and widened right-side shoulder adjacent to lane number 3. In either case, **side platforms** would be constructed at the freeway level with lanes for stopping to the right of the transit lane (Alternative 3-2) or shoulder (Alternative 3-6), respectively. An alignment plan displaying this side platform station configuration is presented as Figure 21. A more complete set of alignment plans for Alternative 3-2 is provided in Attachment 3, which additionally illustrate side platform stations at Stevens Creek Boulevard (sheet 22) and both Saratoga Avenue and Bascom Avenue (following sheet 29). Figure 22 provides an example of a side platform station along the I-10 express lanes serving the California State University, Los Angeles campus.

Utilization of **on-ramp or off-ramp bus stops** has been mentioned previously as a station design option for Bascom Avenue, Saratoga Avenue, and Stevens Creek Boulevard, for pairing typically with Alternative 3-6, Bus on Right-side Shoulder. At El Camino Real, a southbound off-ramp is typically missing from the Type L-2 spread diamond interchange plans proposed for this location, to replace the Type L-10 cloverleaf configuration which exists currently. For the right-side bus on shoulder alternative, it may be possible to include an auxiliary lane from the westbound SR 237 on-ramp to a new diagonal off-ramp to El Camino Real subject to further investigation and Caltrans approval of design exceptions. Inclusion of a southbound diagonal off-ramp would allow this on-ramp/off-ramp bus stop option to be worthy of consideration.

Figure 23 illustrates a prototypical freeway ramp bus stop proposed for implementation in Minneapolis/Saint Paul.

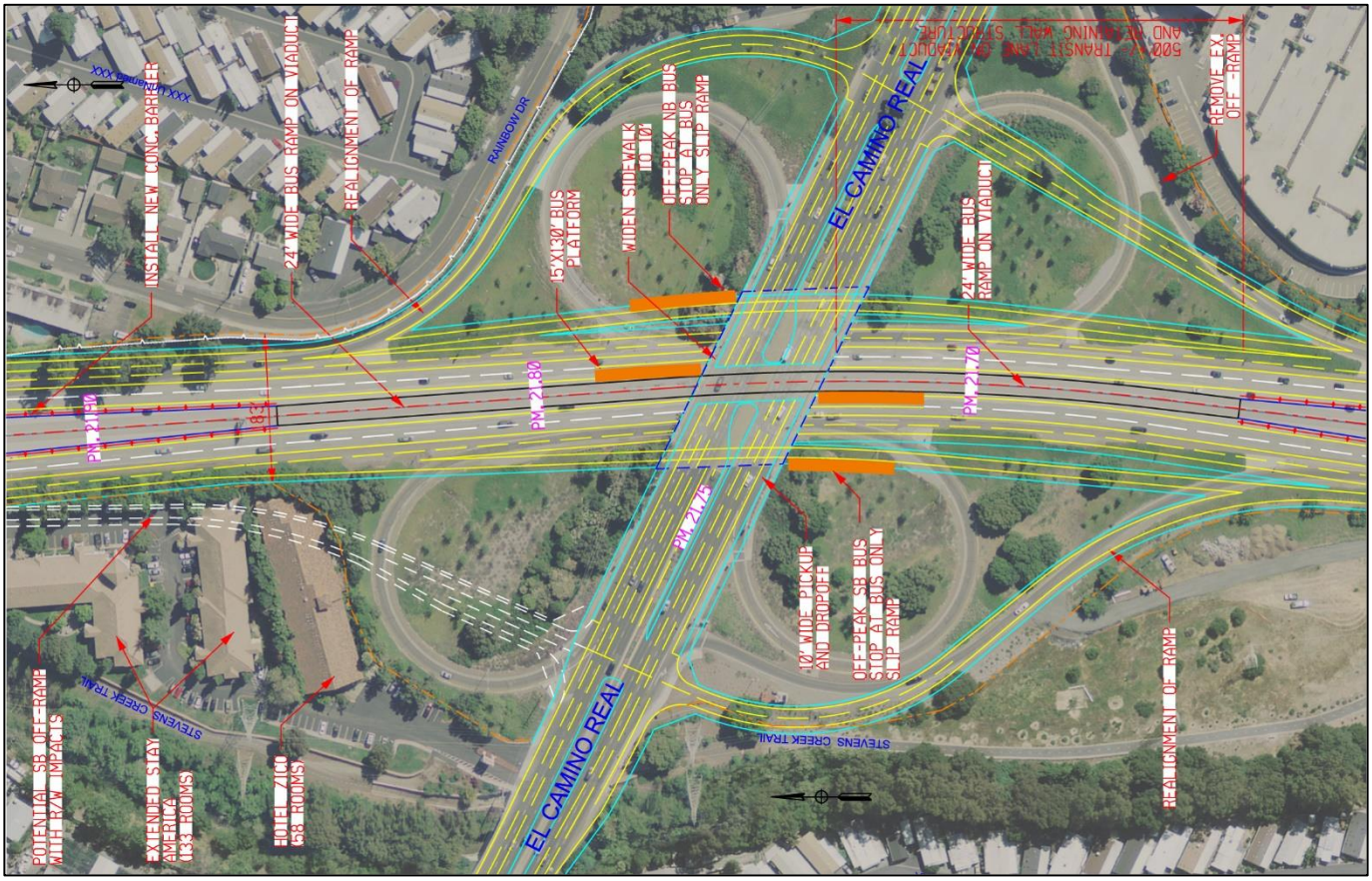


Figure 17 El Camino Real Station Partial Median Overpass Station Design

Figure 18 Aerial View of a Median Overpass Station along I-405 at NE 128th Street

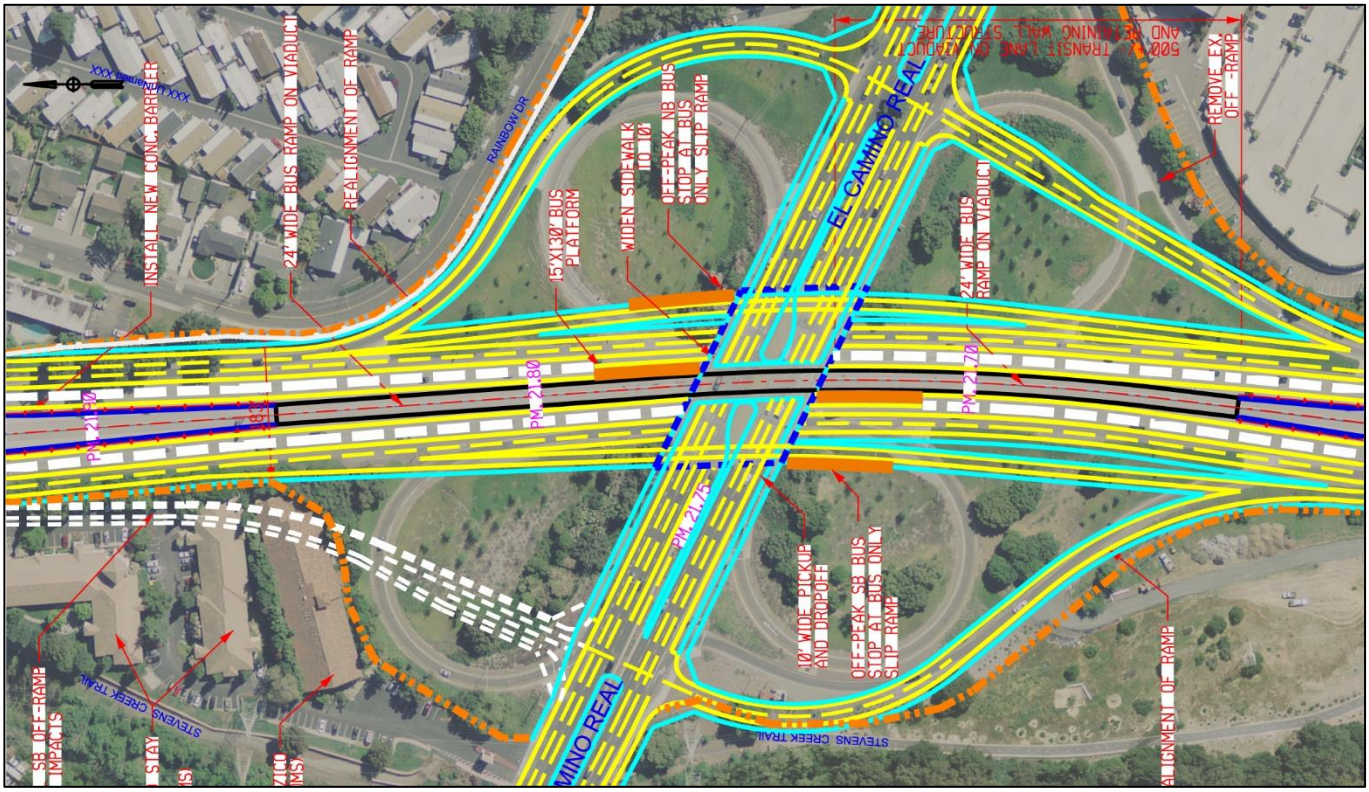


Figure 19 Median Crossover Station

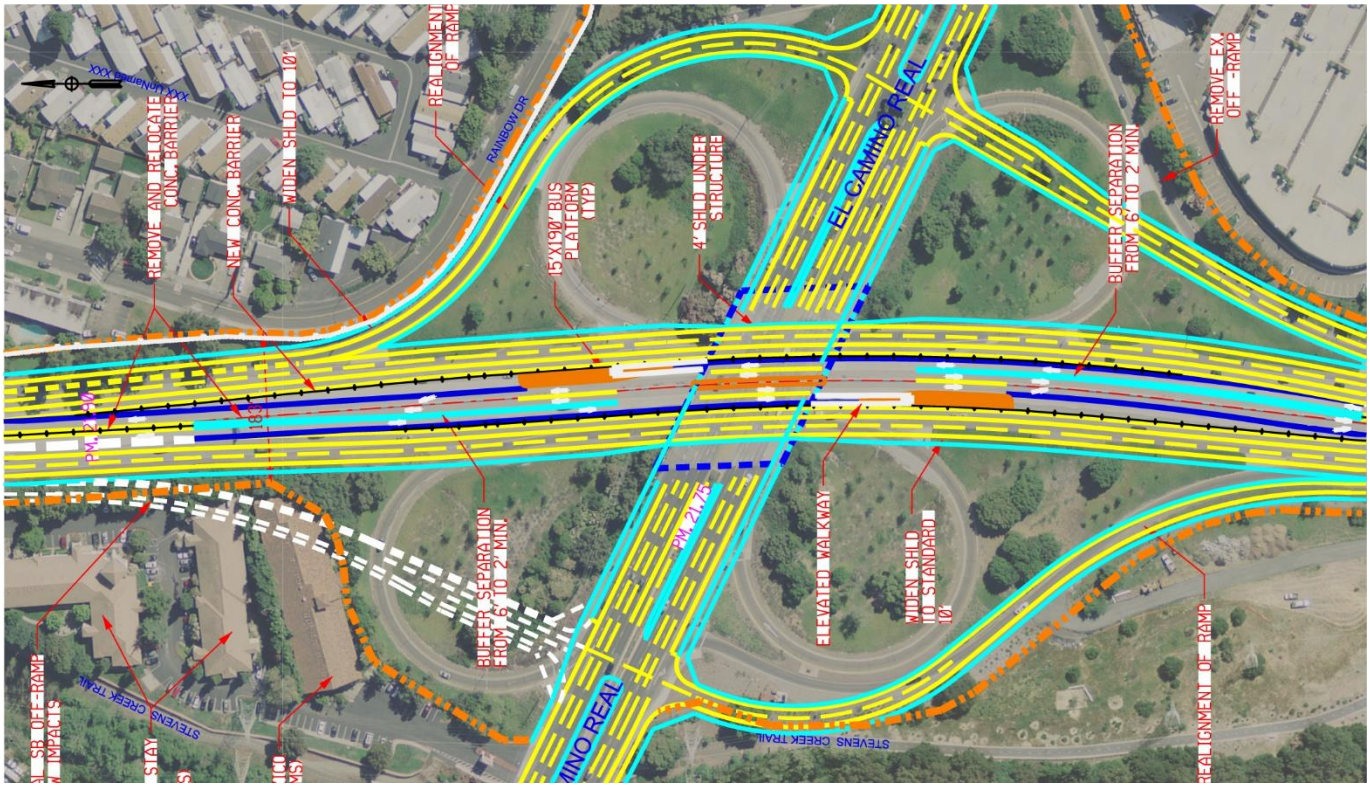


Figure 20 Median Split Platform Station

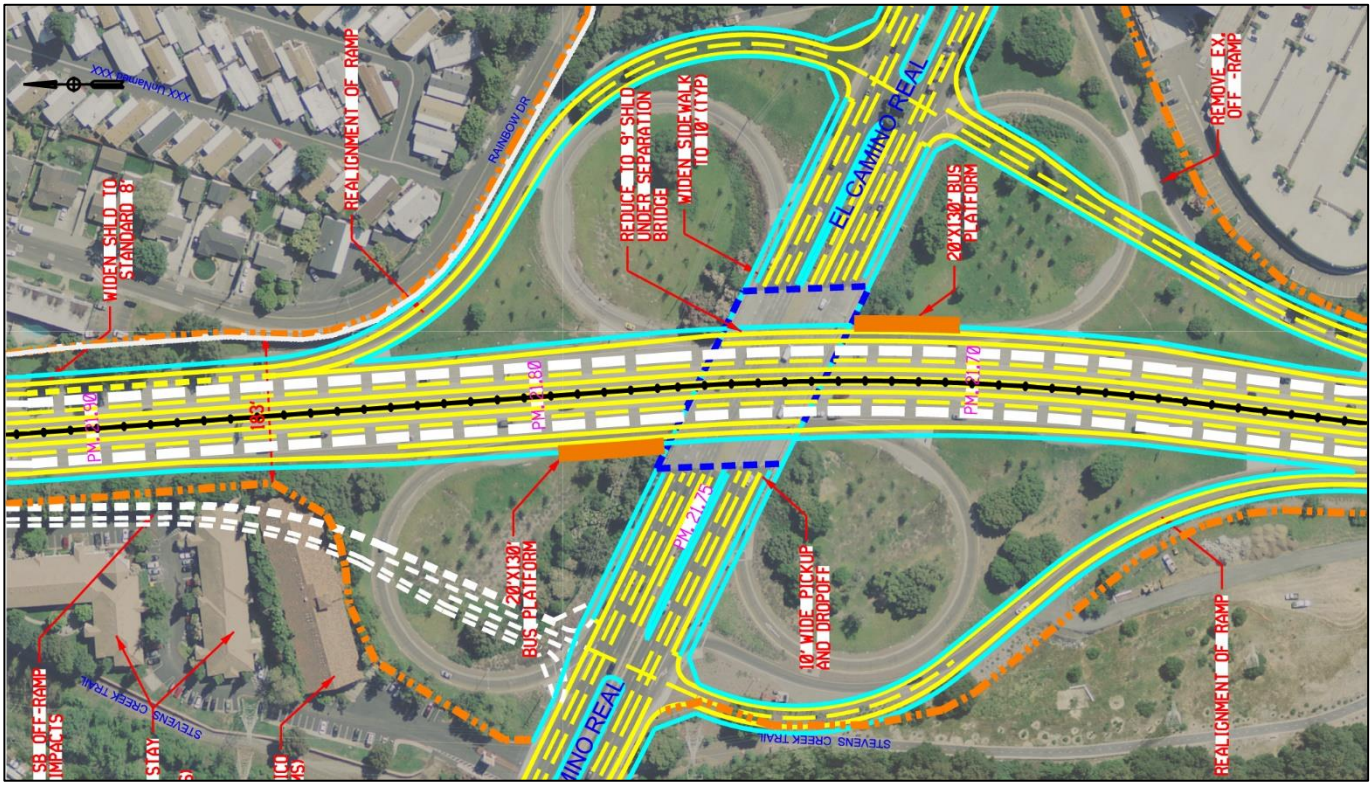
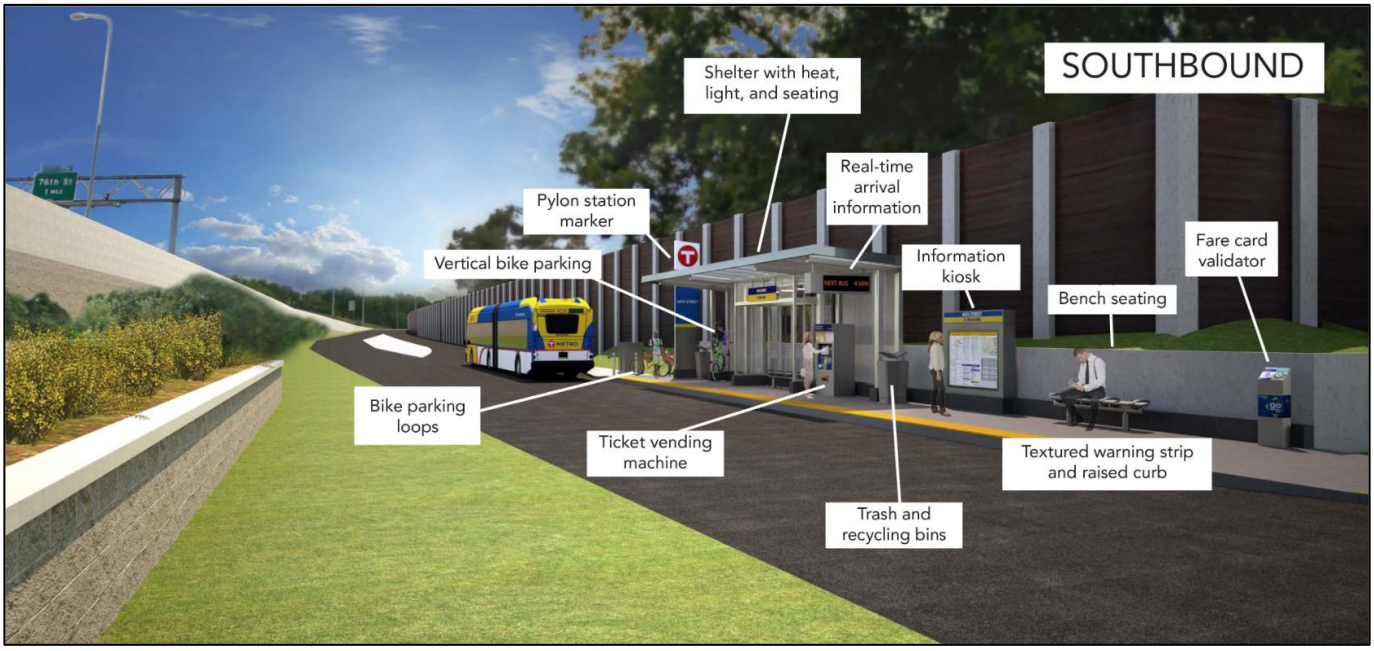


Figure 21 Side Platform Station at El Camino Real

Figure 22 Side Platform Station along I-10 at Cal State, Los Angeles



Source: Metro Transit, Minneapolis/St. Paul Area, I-35W & 66th St Station, Richfield, Metro Orange Line, https://www.metrotransit.org/orange-line-66th-street-station, downloaded 10/7/2019

Figure 23 Prototypical Freeway Ramp Bus Stop

Cross sections covering most of these station design options for El Camino Real are presented on Figure 24 and Figure 25.

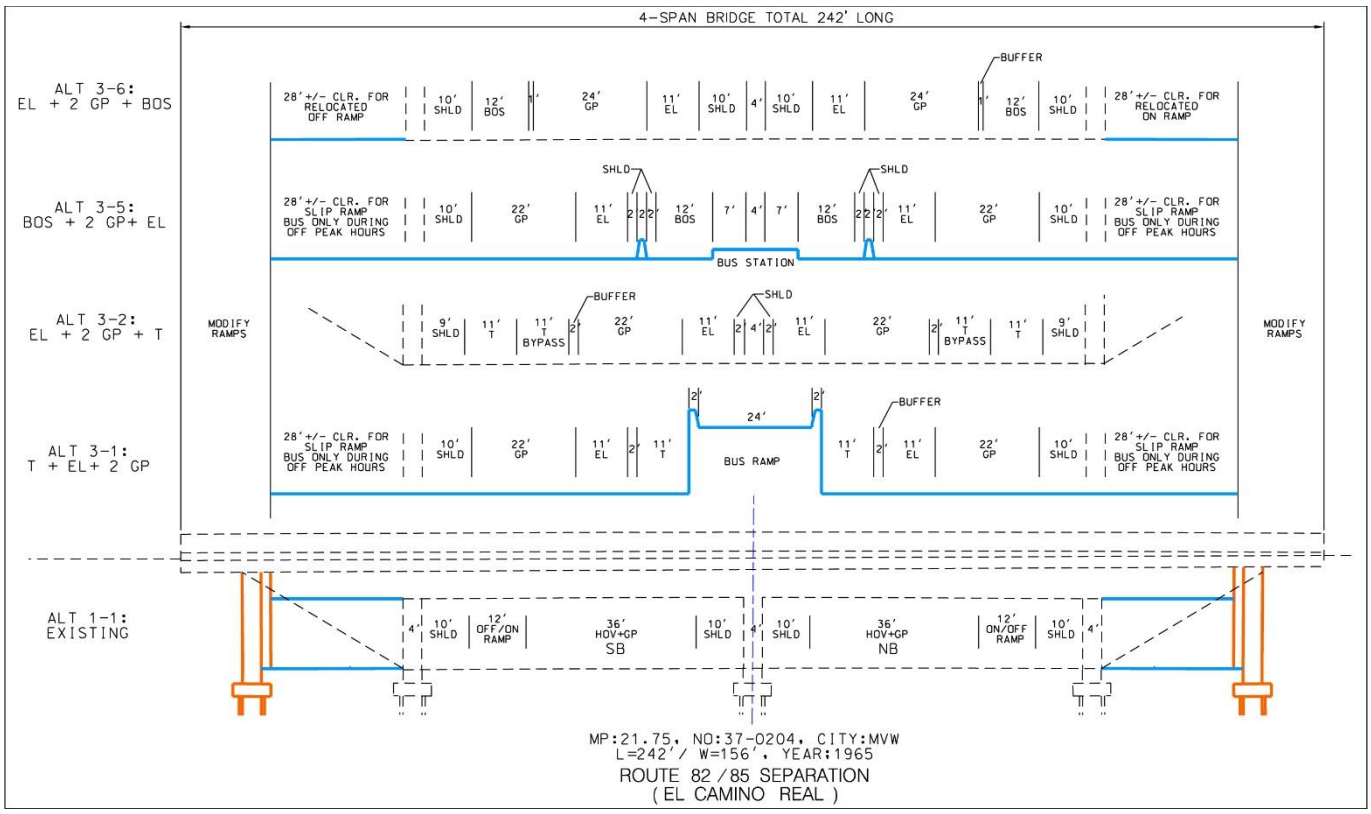


Figure 24 El Camino Real Transit Station Geometric Cross Sections

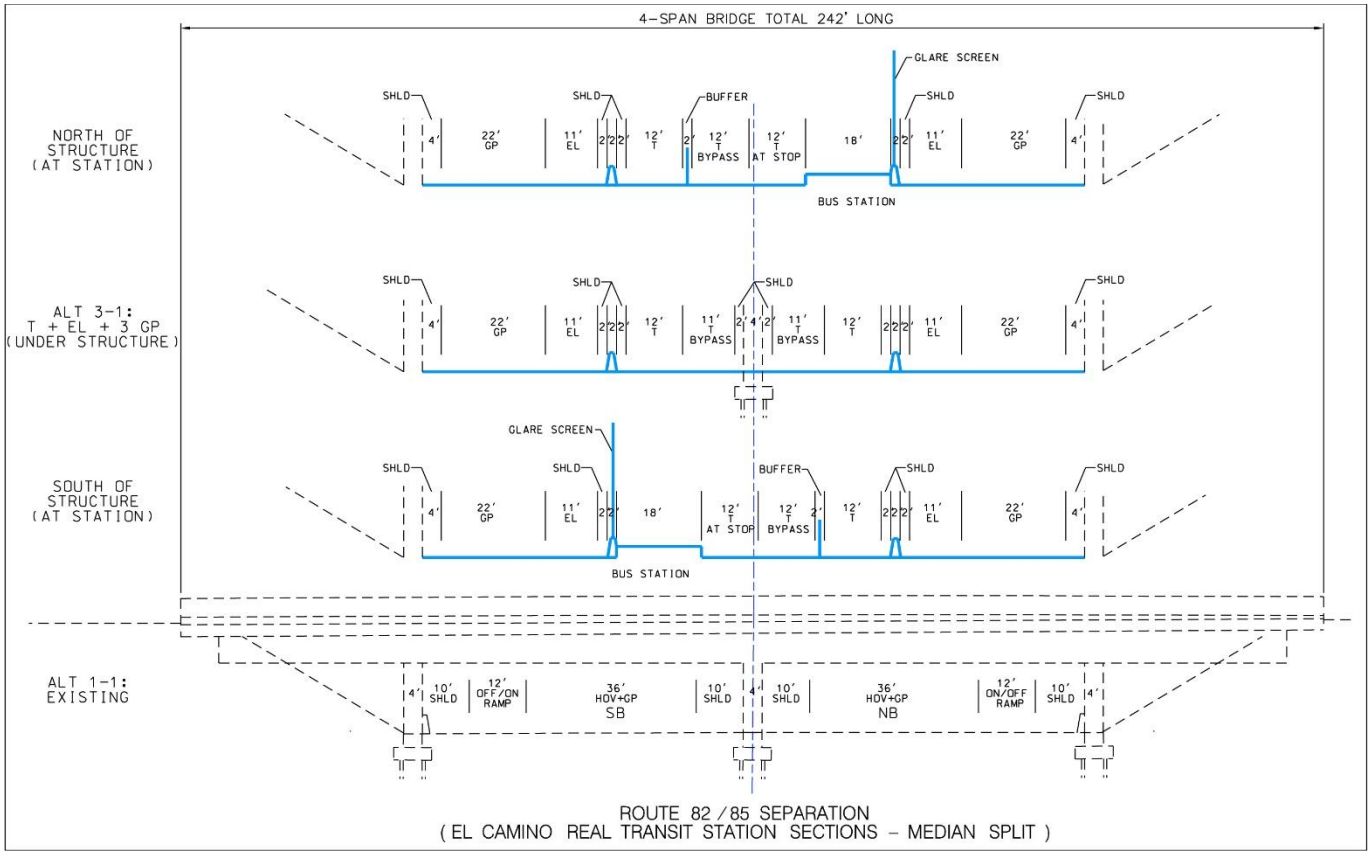


Figure 25 Median Split Platform Geometric Cross Sections at El Camino Real

Coordination with Other Potential Improvements

A number of transportation investments are planned for implementation along the SR 85 corridor. Several of these will be potentially impacted by one or more of the alternatives considered by this SR 85 Transit Guideway Study. Table 10 lists projects included in the Metropolitan Transportation Commission's *Plan Bay Area 2040* adopted on July 16, 2017 and those submitted by VTA to MTC in July/August 2019 for potential inclusion in the upcoming Plan Bay Area 2050 (PBA 2050).

Planned projects potentially impacted by the transit guideway are discussed following the table.

Table 10 PBA 2050 Regionally Significant Projects Potentially Impacted by SR 85 Transit Guideway Study Alternatives

	Alternative									
	1-1 No Build	1-2 HOV to Express Lane Conversion	2-1 Express Lanes Project	2-2 Long Express Lanes	3-1 Long Transit Lane in Median	3-2 Long Transit Lane on Right Side	3-3 Long Transit Lane Hybrid	3-4 Short Transit Lane	3-5 Long Bus on Median Shoulder	3-6 Long Bus on Right Shoulder
1. Extend light rail transit from Winchester Station to SR 85 (Vasona Junction)					X	X	X	X	X	X
2. Mountain View Transit Center improvements					X		X		X	
3. SR 85 NB to EB SR 237 connector ramp and NB SR 85 auxiliary lane										
4. SR 85/El Camino Real interchange improvements										
5. SR 237 WB to SB SR 85 connector ramp improvements				X	X	X	X		X	
6. SR 85/I-280/Homestead Road interchange improvements										
7. SR 85 soundwalls										
8. SR 85 to I-280 HOT direct connector	X			X	X	X	X		X	
9. SR 85 Express Lanes: U.S. 101 (south San Jose) to Mountain View	X				X	X	X	X	X	
10. SR 87 Express Lanes: I-880 to SR 85										
11. SR 85 corridor improvements—reserve amount	X									

1. Extend light rail transit from Winchester Station to SR 85. Winchester Boulevard lies 0.7 miles north of the proposed SR 85 Transit Guideway station at South Bascom Avenue. Approximately 2,000 persons are employed nearby at Netflix and VTA bus route 48 operates along Winchester Boulevard passing SR 85. Figure 26 provides an aerial view of the proposed Vasona Junction end-of-line LRT station and its adjacent park-and-ride lot with 108 to 135 spaces.

The median of SR 85 is 48 feet wide at Winchester Boulevard including two paved inside shoulders. This width is nearly sufficient to accommodate a number of station design options presented earlier. Given widening of the freeway mainline to spread the northbound and southbound travel lanes, a transit guideway station with pedestrian overcrossing bridge could be constructed to interconnect these two services. As an example, Figure 27 illustrates a median crossover station with a pedestrian overcrossing to an adjacent local bus transfer stop and park-and-ride lot along the Metro Red (BRT) Line in the Twin Cities at Route 77 and Cedar Grove.

2. Mountain View Transit Center Improvements. The City of Mountain View has nominated extensive improvements at the existing transit center adjacent to its downtown at Evelyn Avenue and Castro Street. Figure 3, presented previously,

Figure 26 Vasona Junction at SR 85

Figure 27 Cedar Grove Transit Station Median Crossover Platform with Pedestrian Overcrossing

illustrated a potential direct connector drop ramp to Evelyn Avenue from the median of SR 85. This optional ramp could be an element of all median running transit guideway alternatives (3-1, 3-3 potentially, and 3-5).

3. SR 85 Northbound to Eastbound SR 237 Connector Ramp and Northbound SR 85 Auxiliary Lane. A northbound SR 85 auxiliary lane from the El Camino Real interchange on-ramp to the SR 237 off-ramp is included with each of the alignment plan sets provided as Attachment 3 to this document (sheets 8 and 9) for alternatives 2-2, 3-1, and 3-2. Details for the connector ramp to eastbound SR 237 are not available. It should be noted that construction of any transit platform in the median of SR 85 at El Camino Real will constrain the space available along SR 85 for connector ramp improvements to SR 237.

4. SR 85/El Camino Real Interchange Improvements. Conversion of the SR 85 interchange at SR 82/El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration is an optional improvement for Scenario A—Limited Physical Change and Scenario B—Freeway Widening without Transit Stations; and required for Scenario C—Freeway Widening with Transit Stations and Scenario D—Part-time Shoulder Use (Bus on Shoulder).

Implementation of any of the Scenario B, C, or D alternatives limit the opportunity to provide a southbound diagonal off-ramp directly to El Camino Real without the need for potentially expensive right-of-way acquisition, or shifting the freeway mainline toward the east.

5. SR 237 Westbound to Southbound SR 85 Connector Ramp Improvements (including SR 85 Auxiliary Lane between El Camino Real and SR 237). The right-of-way along the west side of SR 85 is constrained from PM 21.85 (opposite the northbound on-ramp from El Camino Real) to PM 22.0 (opposite the off-ramp to eastbound SR 237). Two hotels with surface parking lots lay astride the west side of this pinch point. Widening the freeway to provide dual express lanes or the addition of a transit lane or the addition of a station for the bus on shoulder alternatives would preclude the inclusion of a southbound auxiliary lane between SR 237 and El Camino Real.

6. SR 85/I-280/Homestead Road Interchange Improvements. No conflicts with the SR 85 transit guideway alternatives identified for study are known to exist. All freeway widening alternatives under Scenario B and C should be monitored for potential conflicts with this interchange improvement.

7. SR 85 Soundwalls. Implementation of the transit guideway study alternatives are not anticipated to conflict with soundwall improvements implemented by others.

8. SR 85 to I-280 HOT Direct Connector. The "Long Transit Lane" alternatives will construct a new travel lane in each direction along SR 85 passing through the separation with I-280. Space in the median of SR 85 will not exist for the addition of a two-way direct connector ramp absent the widening of all SR 85 bridge structures (3) crossing over the I-280 mainline and connector ramps.

9. SR 85 Express Lanes: U.S. 101 (South San Jose to Mountain View. This project reflects Alternative 2-1 addressed by this transit guideway study. Implementation of the Transit Lane Alternatives would preclude this investment. The single lane HOV to express lane conversion (Alternative 1-2) would not conflict given prior planning for overhead sign and toll antenna cantilever structure foundations and lighting installed on mast-arm standards. Implementation of Alternative 3-6, Long Bus on Right-side Shoulder, could also be added to this project or precede it.

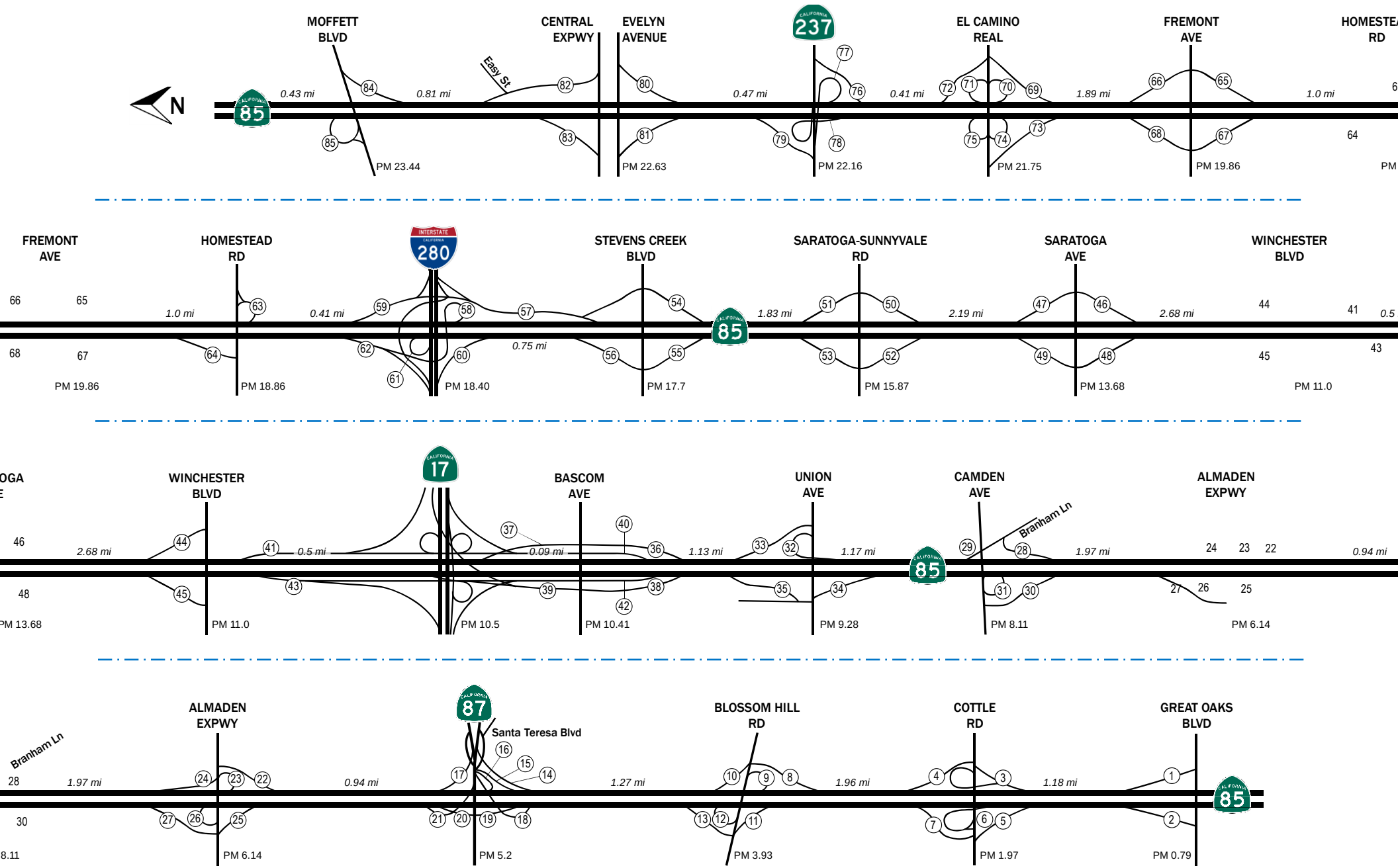
10. SR 87 Express Lanes: I-880 to SR 85. A modest budget of $41 million is identified for this HOV to express lane conversion; hence, no direct connector ramps to the express lanes along SR 85 appear to be envisioned. No conflict would occur by implementing any of the SR 85 Transit Guideway Study alternatives.

11. SR 85 Corridor Improvements—Reserve Amount. The Santa Clara Valley Transportation Authority has listed a budget of $400 million for this line item in its submittal to MTC for the PBA 2050 Regionally Significant Project List.

The budget reserve would not be required for Alternative 1-1, No Build. Less than this amount would be required for Alternatives 2-1 and 2-2. All or less than all of this amount would be required for the transit guideway alternatives given the inclusion of in-line transit stations along SR 85.

ATTACHMENT 1

SR 85 Interchange Ramps



State Route 85 Proposed Engineering Features

Version 2.0, November 8, 2019

Basis of Design Report

STATE ROUTE 85 TRANSIT GUIDEWAY STUDY

Part 1: Proposed Engineering Features

October 9, 2019
November 8, 2019

PARSONS
100 West San Fernando Street, Suite 375
San Jose, CA 95113-2233

Valley Transportation Authority
Solutions that move you

MEASURE B

Revision History

Revision	Date	Description
1.0	October 9, 2019	Initial Draft Submission
2.0	November 8, 2019	Revised Draft Submission

Table of Contents

Introduction

The Santa Clara Valley Transportation Authority (VTA), in cooperation with the California Department of Transportation (Caltrans), proposes transit and managed lane improvements along 24 miles of State Route (SR) 85 between U.S. 101 in south San Jose and U.S. 101 in Mountain View, California (see Figure 1). These improvements are intended to enhance trip reliability, increase person throughput, encourage mode shift to transit and carpools, and provide long-term congestion management of the corridor.

Within the project limits, SR 85 is generally a six-lane, divided, controlled-access freeway with two general-purpose lanes in each direction plus one high-occupancy vehicle (HOV) lane in each direction. At the southern end of the route, from postmile (PM) 1.33 to PM 5.27, VTA additionally provides a light rail transit (LRT) line with two tracks and stations in the median of the divided freeway. Some parts of SR 85 also have auxiliary lanes that extend from on-ramps to off-ramps.

The existing travel lane width is generally 12 feet throughout the corridor. The inside shoulder has a standard width of 10 feet throughout the corridor with the exception of one overcrossing (northbound at Homestead Road). The outside shoulder has the standard width of 10 feet in the portion of the corridor from its southern junction with U.S. 101 to the separation with I-280, 18.4 miles to the north. From I-280 to the northern junction with U.S. 101, the outside shoulders range in width from 4 feet to 10 feet.

The width of the median varies considerably from end to end. Table 1 lists the approximate width of the median from inside edge of travelway to inside edge of travelway. This measurement includes paved shoulders, barriers, columns supporting overhead structures, and the width between bridges. South of Santa Teresa Boulevard, the listed median width does not include VTA's LRT trackway.

The pavement is generally in excellent condition. From U.S. 101 at the south end of SR 85 to the Guadalupe River Bridge (PM 5.59), the mainline lanes are full depth asphalt concrete (AC). From that point north, the mainline pavement is Portland cement concrete (PCC). Shoulders, both inside and outside, are partial depth AC. Heavy trucks, those in excess of 4.5 tons, are prohibited from utilizing SR 85 between I-280 and U.S. 101 in southern San Jose.

The freeway generally lies on level original ground, but alternates between segments on embankments and in depressed sections. The northbound and southbound roadbeds are typically at the same elevation and separated by a median concrete barrier(s) south of Almaden Expressway (PM 6.00) and north of McClellan Road (PM 17.17). Between these points, a thrie metal beam barrier separates the roadbeds.

For the purpose of defining managed lane investments, the corridor is segmented into three parts:

- Segment 1 from U.S. 101 in South San Jose to SR 87. This segment includes a VTA light rail line in the median of SR 85.
- Segment 2 from SR 87 to I-280. This segment for the most part includes a wide unpaved median.
- Segment 3 from I-280 to U.S. 101 in Mountain View. This segment includes a narrow median.

In all three segments, SR 85 passes through predominately residential neighborhoods. Sound walls line both sides of the freeway. The PCC pavement is grooved and microplaned. A SR 85 Noise Reduction Study is underway and five locations have been identified to test alternative noise reduction strategies. Balancing the noise concerns of residents and the mobility aspirations of commuters is an important aspect of VTA's Route 85 Transit Guideway Study.

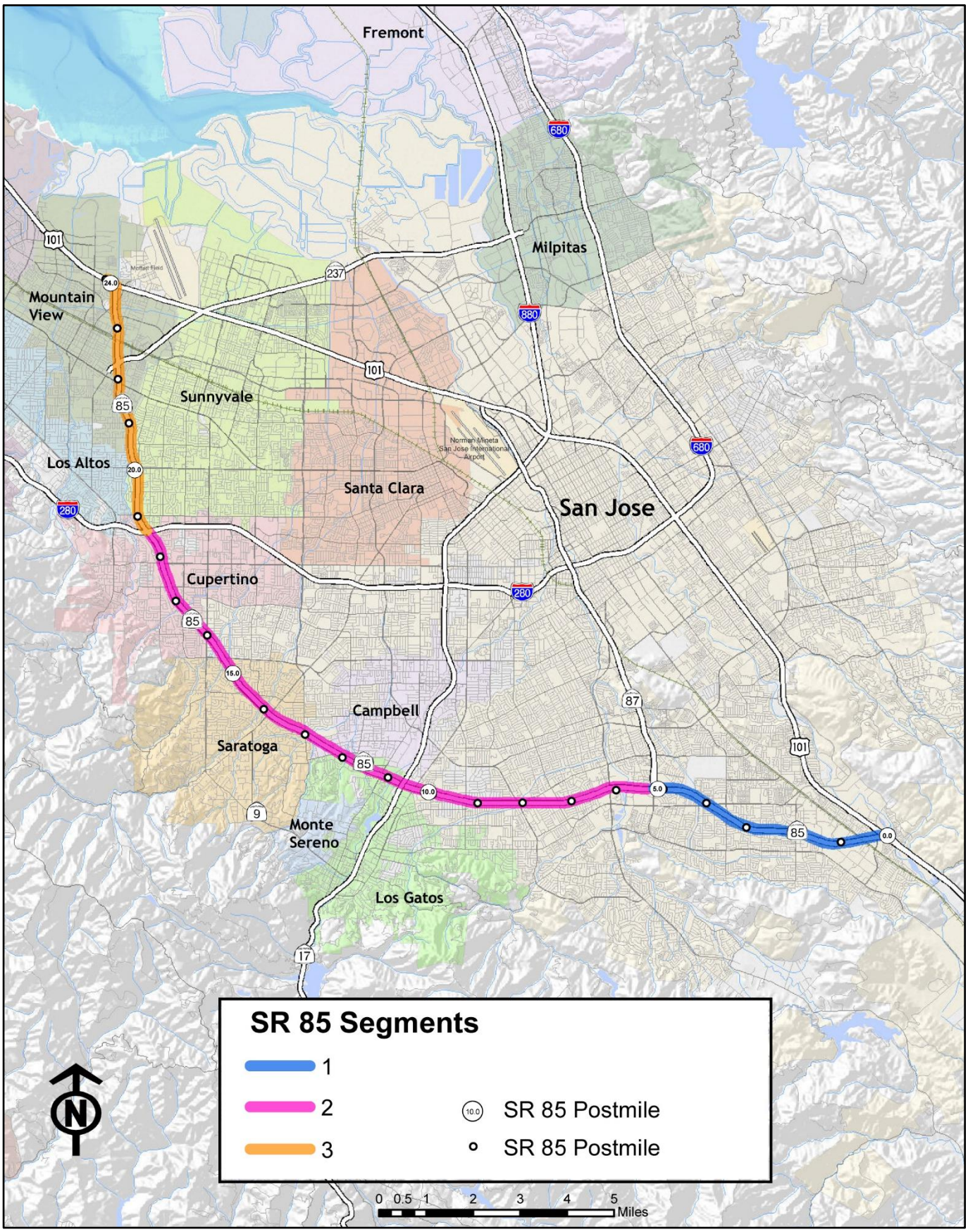


Figure 1 Vicinity Map

Table 1 Median Width along State Route 85

Structure No.	Postmile	Structure Name	Type*	Median Width (feet)
1	0.20	Bernal Road	Undercrossing	33
2	0.29	Monterey Road/Union Pacific/Great Oaks Boulevard	Undercrossing/overpass	46
3	1.22	Via Del Oro	Undercrossing	60
4	1.33	VTA Light Rail	Overpass	68
5	1.97	Cottle Road	Overcrossing	20
6	2.73	Lean Avenue	Overcrossing	18
7	3.48	Snell Avenue	Overcrossing	18
8	3.93	Blossom Hill Road	Overcrossing	16
9	4.28	Canoas Creek	Bridge	18
10	4.50	Cahalan Avenue	Pedestrian undercrossing	20
11	4.84	Southbound SR 87 to southbound SR 85	Separation	19
12	5.20	Santa Teresa Boulevard	Undercrossing	68
13	5.27	VTA Light Rail	Overpass	18
14	5.31	Southbound SR 85 to northbound SR 87	Separation	68
15	5.59	Winfred Blvd/Guadalupe River/Sanchez Drive	Bridge	68
16	6.00	Almaden Expressway	Undercrossing	70
17	6.46	Russo Drive	Pedestrian overcrossing	48
18	7.30	Meridian Avenue	Overcrossing	48
19	7.50	Dent Avenue	Pedestrian overcrossing	48
20	8.11	Camden Avenue	Undercrossing	66
21	8.77	Leigh Avenue	Overcrossing	48
22	9.28	Union Avenue	Overcrossing	68
23	9.93	Samaritan Place	Pedestrian overcrossing	50
24	10.23	Bascom Avenue	Overcrossing	66
25	10.40	Southbound SR 17 to southbound SR 85	Separation	56
26	10.48	SR 17	Separation	50
27	10.60	Oka Road	Undercrossing	50
28	10.80	Los Gatos Creek	Bridge	48
29	10.90	Winchester Boulevard	Underpass	48
30	11.00	Winchester Boulevard	Overcrossing	48
31	11.97	Pollard Road	Undercrossing	44
32	12.45	More Avenue	Pedestrian overcrossing	44
33	12.68	San Tomas Aquino Creek	Bridge	44
34	12.91	Quito Road	Overcrossing	44
35	13.73	Saratoga Avenue	Undercrossing	44
36	13.91	Saratoga Creek	Bridge	44
37	14.28	Cox Avenue	Overcrossing	44
38	14.31	Cox Avenue utility	Overcrossing	44
39	14.73	Scully Avenue utility	Overcrossing	44
40	14.84	Blue Hills	Pedestrian overcrossing	44
41	15.27	Prospect Road	Overcrossing	45
42	15.40	Calabazas Creek	Bridge	44
43	15.87	South De Anza Boulevard	Overcrossing	44
44	16.61	South Stelling Road	Overcrossing	44
45	17.17	McClellan Road	Overcrossing	30
46	17.70	Stevens Creek Boulevard	Overcrossing	24
47	18.35	Southbound/eastbound I-280	Separation	20
48	18.41	SR 85/I-280	Separation	20
49	18.43	Northbound/westbound I-280	Separation	20
50	18.86	Homestead Road	Overcrossing	18
51	19.39	The Dalles	Pedestrian overcrossing	22

Table 1 Median Width along State Route 85

Structure No.	Postmile	Structure Name	Type*	Median Width (feet)
52	19.86	Fremont Avenue	Undercrossing	20
53	20.02	Stevens Creek	Bridge	20
54	20.37	Hawkins Drive	Right-of-way	20
55	20.69	Permanente Creek Diversion Channel	Culvert	20
56	21.10	Stevens Creek Trail/Dale Avenue	Pedestrian overcrossing	22
57	21.75	SR 82/SR 85/El Camino Real	Separation	20
58	22.13	SR 85/SR 237	Separation	22
59	22.43	Dana Street	Overcrossing	20
60	22.63	Evelyn Avenue/Caltrain/Light Rail/Central Expressway	Undercrossing/overpass	20
61	22.95	Stevens Creek	Bridge	22
62	23.19	Middlefield Road	Overcrossing	22
63	23.44	Moffett Boulevard	Undercrossing	22

*Type:
- Undercrossing = local road under State highway
- Overcrossing = local road over State highway
- Pedestrian overcrossing = Pedestrian crossing over State highway
- Separation = State highway crossing
- Underpass = State highway under railroad
- Overpass = State highway over railroad
- Right-of-way = right-of-way required

Basis of Design

To enhance trip reliability, increase person throughput, encourage mode shift to transit and carpools, and provide long-term congestion management of the corridor, VTA and its State Route 85 Policy Advisory Board (PAB) are considering the installation of express lanes and/or transit lanes along SR 85. Earlier phases of this study considered, but eventually ruled out other investment options such as light rail transit, or reversible lanes using movable barriers.

The purpose of this document is to provide a physical definition of the alternatives advanced for further study, based on conceptual engineering considerations. As such, this documentation of "Proposed Engineering Features" provides scoping information for subsequent capital cost estimating, preliminary environmental assessment, and stakeholder/community outreach.

As SR 85 is owned and maintained by the State of California, alterations or expansions of the facility must be approved by Caltrans, no matter the source of funding. Documents which guide and govern the design of the proposed investments include:

- Caltrans Transportation Planning Manual
- Caltrans Project Development Procedures Manual
- Caltrans Highway Design Manual
- Manual on Uniform Traffic Control Devices (MUTCD) and the California Supplement to the MUTCD
- Caltrans Traffic Operations Policy Directives.

As the installation of express lanes and/or transit lanes are frequently retrofits of existing facilities, Caltrans has also published *High-Occupancy Vehicle Guidelines for Planning, Design and Operations.* The guidelines acknowledge, "For most situations, retrofitting an HOV [high occupancy vehicle] lane [includes express and transit lanes] on an existing freeway requires some compromises in design standards." The guidelines go on to emphasize the following:

> "The Guidelines are advisory in nature and are to be used only when every effort to conform to established standards has been exhausted. When conformance is not possible, the deviation must be documented by a sound and defensible analysis and an approved design exception fact sheet."

Collectively, the guidance covering the alteration of State Route 85 covers literally hundreds, if not thousands, of topics. For the purpose of this physical definition and conceptual design investigation, select guidance covering the geometric cross section of the proposed investments are summarized in Table 2.

Guidance provided in Caltrans Highway Design Manual is extremely important. Deviations from this guidance typically requires approval of a Design Standards Decision Document by the Chief, Division of Design. Caltrans recognizes that retrofitting state facilities to include managed lane elements will typically require design exceptions and they have issued *High Occupancy Vehicle Guidelines* to indicate the department's priorities for the reduction of lane widths. Neither of these resources address part-time use of shoulders for bus use. The Federal Highway Administration (FHWA) recognizes this option as a valuable resource potential and has issued planning and design guidelines to advise State and local transportation agencies such as Caltrans. Lastly, Table 2 presents SR 85 project specific guidelines the design team has followed, in addition to those provided by Caltrans and FHWA.

Table 2 SR 85 Transit Corridor Design Guidance

Source	Topic	Horizontal Geometric Standard/Guidance Applicable to SR 85
Caltrans Highway Design Manual	108.3—Commuter and Light Rail Facilities within State Right of Way (3) Parallel Rail Facilities	As necessary, rail facilities may be located within the median upon approval from the District Director.
	108.5—Bus Rapid Transit	Bus rapid transit (BRT) is to be considered the same as commuter and light rail facilities with regard to approvals and design guidance.

Table 2 SR 85 Transit Corridor Design Guidance

Source	Topic	Horizontal Geometric Standard/Guidance Applicable to SR 85
		BRT located on freeways should be designed in accordance with the HOV Guidelines and per standards contained in the HDM (Highway Design Manual).
	108.6—High-occupancy Toll and Express Lanes	High-occupancy vehicle guidelines are to be consulted. High-occupancy toll (HOT) and express toll lane facilities are to comply with HDM design standards.
	301.1—Lane Width	12 feet
	302.1—Highway Shoulder Width	On freeways with six or more lanes, 10 feet left and 10 feet right paved shoulders. Ramps—4 feet left and 8 feet right. For single or two-lane branch connections, 5 feet left and 10 feet right.
	305.1—Median Width for (3) Facilities under Restrictive Conditions	22 feet minimum
	305.5—Paved Medians	On freeways of six or more lanes, medians 30 feet wide or less should be paved. Where medians are paved, each half should be paved in the same plane as the adjacent traveled way.
	307.5—Multilane All Paved Cross Sections with Special (Narrow) Median Widths	May be used for widening of existing facilities.
	309.1—Horizontal Clearances	
	(3) a. Minimum to objects	Equal to standard shoulder width, but not less than 4 feet.
	b. Minimum to walls (including noise barriers)	10 feet
	(5) Parallel BRT facilities on freeways	4-foot separation between (mainline) lanes—see HOV Guidelines
High-occupancy Vehicle Guidelines[1]	3.10—Relative Priority of Cross-Sectional Elements	
	(0) General	A reduction in standards for cross-sectional elements may be necessary for most retrofit HOV projects and will require approved Design Standards Decision Documents.
	(3) Buffer-Separated HOV Facilities	First, reduce the median shoulder from 14 feet (the width to accommodate continuous enforcement areas) to 10 feet. Any reduction of the median shoulders should be accompanied by the addition of California Highway Patrol (CHP) enforcement areas. Second, reduce the buffer to 2 feet. Third, reduce the median shoulders to a minimum of 8 feet. Fourth, reduce the HOV lane to 11 feet. Fifth, reduce the number one general purpose lane to 11 feet. Sixth, reduce the remaining general-purpose lanes to 11 feet, starting with the number two lane and moving to the right as needed. The outside general-purpose lane should remain at 12 feet unless truck volume is less than 3 percent. Seventh, reduce the median shoulders to a minimum of 2 feet. Shoulders less than 8 feet, but greater than 5 feet, are not recommended. Any excess width resulting from a reduction of median shoulder width from 8 feet to 5 feet or less should be used to restore the general-purpose lane widths to 12 feet starting from the outside and moving left. The reduction of median shoulders from 14 feet to either 8 feet or 2 feet should be combined with the construction of enforcement areas.
	(4) Contiguous HOV Facilities	First, reduce the median shoulders from 14 feet (the width to accommodate continuous enforcement areas) to 10 feet. Any reduction of the median shoulders should be accompanied by the addition of CHP enforcement areas. Second, reduce the median shoulders to a minimum of 8 feet. Third, reduce the HOV lane to 11 feet. Fourth, reduce the general-purpose lanes to 11 feet, starting with the left lane and moving to the right as needed. The outside general-purpose lane should remain at 12 feet unless truck volumes are less than 3 percent.

[1] January 2018

Table 2 SR 85 Transit Corridor Design Guidance

Source	Topic	Horizontal Geometric Standard/Guidance Applicable to SR 85
		Fifth, reduce the median shoulders to a minimum of 2 feet. Shoulders less than 8 feet, but greater than 5 feet are not recommended. Any excess width from 8 feet to 5 feet or less should be used to restore the general-purpose lane widths to 12 feet starting from the outside and moving to the left.
FHWA[2]	Part-time Shoulder Use	Used for travel only during those times of day when the adjoining lanes are likely to be heavily congested. When not needed as an additional travel lane, the shoulder is restored to its original purpose.
	Bus-only Use of Shoulders (Bus on Shoulder—BOS)	To improve bus travel time and reliability.
	Lane Width	12 feet or more preferred.
	Shoulder Width	"Several" feet beyond BOS lane.
	Bridge Width	The minimum shoulder width on bridges is 11.5 feet (10 foot BOS lane plus 1.5 foot lateral offset to obstruction).
	Signage	Typically static, ground mounted.
	Pavement Markings	Solid edge line typically used between the shoulder and the adjacent travel lane remains in place. A second solid line is used on the outside of the shoulder beside the edge of pavement. The two solid lines should be the same color: white for part-time use of the right shoulder and yellow for part-time use of the left (median) shoulder.
Parsons	Preliminary Pavement Widths	Vary at interchange ramps, lane/shoulder transition areas, bridge columns and other roadway elements. Widths also vary where additional shoulder width is needed to improve stopping sight distance to obstructions (e.g., left shoulder along outside of horizontal curve with a median concrete barrier or right shoulder along outside of horizontal curves adjacent to a soundwall).
	Existing Bridges and Overcrossing Structures	Avoid replacement wherever possible.
	Restrictive Right of Way (R/W)	The R/W is particularly narrow in the northern/western segment of the project between I-280 and US 101. The surrounding area is fully developed with residential and commercial land uses. Reduced cross sections will be necessary where significant R/W acquisition and community impacts would otherwise be required.
	Existing Soundwalls	Reduced cross sections will be necessary to avoid reconstruction of soundwalls which would result in significant R/W acquisitions, park land and community impacts.
	Heavy Truck Volumes	Trucks in excess of 4.5 tons are prohibited from utilizing SR 85 south of I-280. Outside lanes may be reduced from 12 feet to 11 feet where necessary. A Design Standards Decision Document (DSDD) will need to be prepared for approval by the Chief, Division of Design.
	Proposed Lane Widths	Should be reasonably consistent throughout each segment of the corridor, without excessive variations (narrowing or widening) within short distances. The standard lane width of 12 feet may be reduced to 11 feet per Caltrans High-occupancy Vehicle Guidelines Topic 3.10. A design exception will need to be prepared for approval by the Chief, Division of Design.
	Buffer	No buffer is proposed between express lanes and general-purpose lanes as contiguous lane striping is assumed. A buffer width of 2 feet is proposed to separate transit lanes from adjacent HOV, express lane, and/or general-purpose lanes.
	Right Shoulder Width	The standard right shoulder width of 10 feet should be provided throughout the corridor. In restrictive conditions (e.g., existing bridges, overcrossings, soundwalls), the right shoulder may be reduced to below 10 feet, but no less than 8 feet. The transit lane buffer may need to be

[2] Use of Freeway Shoulders for Travel—Guide for Planning, Evaluating, and Designing Part-time Shoulder Use as a Traffic Management Strategy, Federal Highway Administration (FHWA), February 2016.

Table 2 SR 85 Transit Corridor Design Guidance

Source	Topic	Horizontal Geometric Standard/Guidance Applicable to SR 85
		removed to achieve the 8-foot right shoulder width minimum. An approved DSDD will be required.
	Left Shoulder Width	The standard left shoulder width of 10 feet may be reduced per Caltrans High-occupancy Vehicle Guidelines Topic 3.10. An approved DSDD will be required.
	Median Width	The standard median width of 22 feet may be reduced to 10 feet between structures to accommodate a concrete Type 60 median barrier with left shoulder widths of 4 feet or left shoulder widths of 2 feet at locations with overhead signs or bridge columns. An approved DSDD will be required.

A Concept of Operations Report, prepared by CDM Smith, will additionally set forth proposals for tolling the express lanes and managing the use of the transit lanes where provided. This Concept of Operations Report will additionally match the types of transit services which are compatible with the physical design options which are presented in this Proposed Engineering Features document.

Alternatives

ALTERNATIVES CONSIDERED

Ten alternatives are being considered. These are briefly described below and are illustrated on Figure 2.

Alternative 1-1: No Build

This alternative would not make any changes to SR 85. Metrics for this alternative can serve as a point of comparison for other alternatives.

Alternative 1-2: HOV to Express Lane Conversion

In this alternative, the existing HOV lane on SR 85 would be converted to an express lane, but the unused space in the median between I-280 and SR 87 would not be changed, leaving it available for a future transportation investment.

Alternative 2-1: Express Lanes Project

This alternative would convert the existing HOV lane on SR 85 to an express lane and would construct a new express lane between I-280 and SR 87 in accordance with the design in VTA's Silicon Valley Express Lane Program.

Alternative 2-2: Long Express Lanes

This alternative would convert the existing HOV lanes into express lanes and construct a new express lane between U.S. 101 in Mountain View and SR 87.

Alternative 3-1: Long Transit Lane (Median Adjacent Lane)

This alternative would construct a new, median-adjacent transit lane between U.S. 101 in Mountain View and SR 87 in San Jose. Access to the lane would be limited to large, space-efficient vehicles like public transit and private shuttles.

Stations would be located at El Camino Real, Stevens Creek Boulevard, Saratoga Avenue, Bascom Avenue, and the Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard. Except for the Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard, which already exists, buses would serve stations located in the median of SR 85.

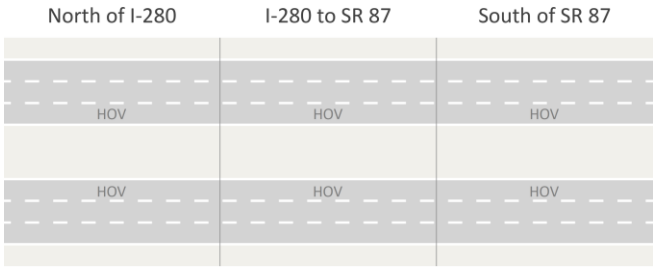
In this alternative, VTA transit buses would travel in a direct path along the corridor, serving median stations. This would permit the fastest, most reliable travel time for the transit lane since the buses would not need to leave the freeway to pick up and drop off riders nor interact with other vehicles.

Alternative 3-2: Long Transit Lane (Right-side Lane)

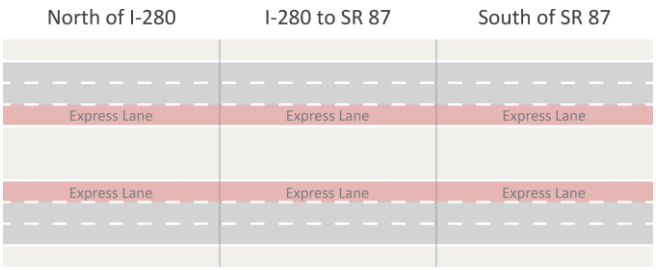
This alternative would install a transit lane between U.S. 101 in Mountain View and SR 87 that would be located along the right side of the roadway. Access to the lane would be limited to large, space-efficient vehicles like public transit buses and private shuttles and vehicles merging across the lane to enter/exit the freeway at on-ramps/off-ramps.

Stations would be located at on-ramps and off-ramps at El Camino Real, Stevens Creek Boulevard, Saratoga Avenue, Bascom Avenue and the existing Oholone-Chynoweth Light Rail Station at Santa Teresa Boulevard. Routing deviations from the corridor to access high-demand locations or transit connections would be easily made since the buses are traveling in the right lane.

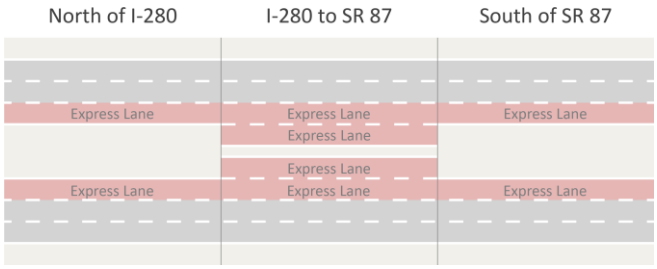
Alternative 1-1: No Build



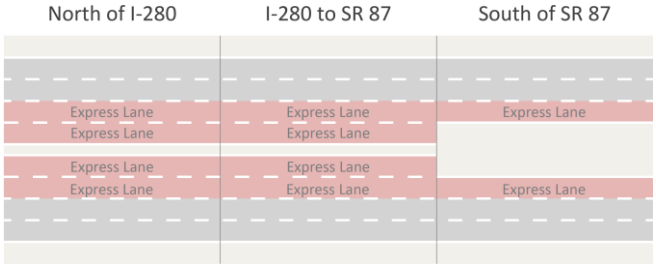
Alternative 1-2: HOV to Express Lane Conversion



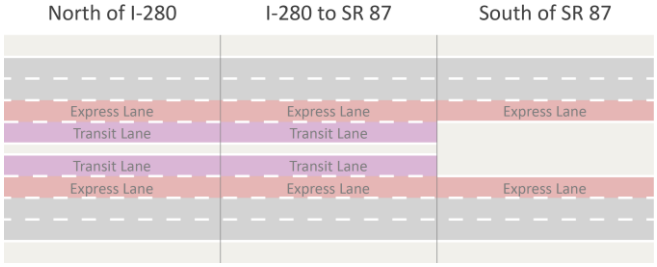
Alternative 2-1: Express Lanes Project



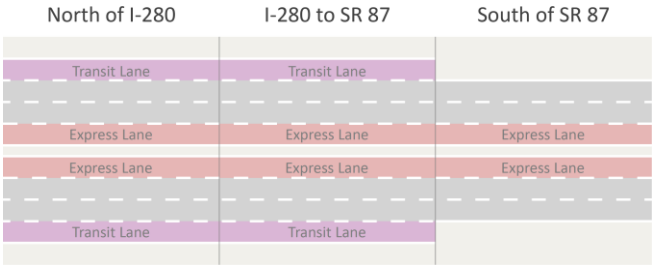
Alternative 2-2: Long Express Lanes Project



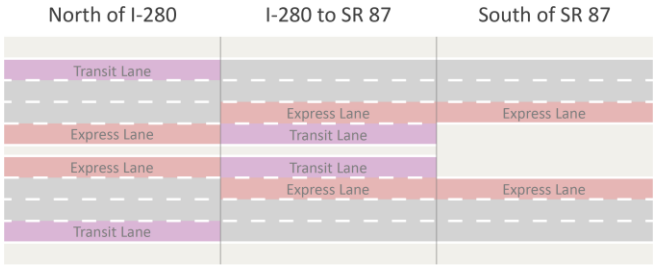
Alternative 3-1: Long Transit Lane (Median Adjacent Lane)



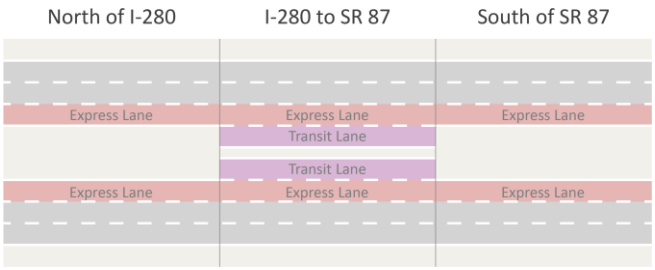
Alternative 3-2: Long Transit Lane (Right-side Lane)



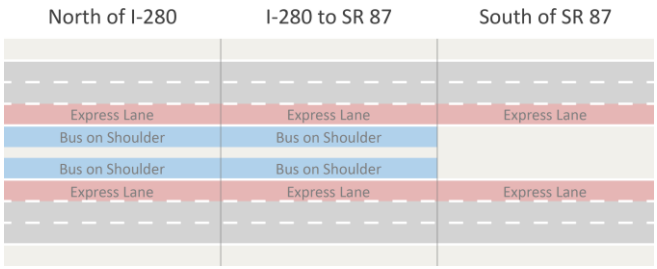
Alternative 3-3: Long Transit Lane (Hybrid)



Alternative 3-4: Short Transit Lane



Alternative 3-5: Long Shoulder (Median)



Alternative 3-6: Long Shoulder (Right-side)

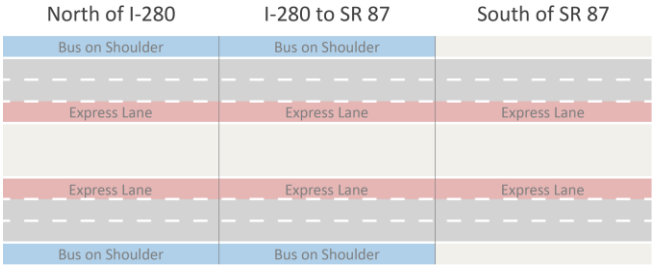


Figure 2 State Route 85 Transit Guideway Study Alternatives

Alternative 3-3: Long Transit Lane (Hybrid Median and Right-side Lanes)

This alternative is a combination of Alternatives 3-1 and 3-2, 3-1 and 3-5, or 3-2 and 3-6. Where the transit lane is median-adjacent, stations would be in the median. Where the transit lane is on the right side, stations would be on on-ramps or off-ramps. Among the Long Transit Lane alternatives, this alternative would strike a balance between capital cost, travel speeds and access. (Note: This alternative will be defined once the other alternatives are evaluated insofar as traffic and transit operations.)

Alternative 3-4: Short Transit Lane

This alternative would build a new transit lane in the unused space adjacent to the SR 85 median between I-280 and SR 87. Median stations would be located at Stevens Creek Boulevard, Saratoga Avenue and Bascom Avenue. An on-ramp/off-ramp station would be located at El Camino Real. Public transit buses are also envisioned to serve the existing Ohlone-Chynoweth Light Rail Station.

Alternative 3-5: Long Shoulder (Median)

This alternative would widen the median shoulder to provide enough space to accommodate bus operations. Physical changes would include building a more durable shoulder to support the increased use and weight of buses and restriping lanes.

Stations would be located at El Camino Real, Stevens Creek Boulevard, Saratoga Avenue, Bascom Avenue, and the existing Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard.

Alternative 3-6: Long Shoulder (Right-side)

This alternative would widen the right-side shoulder to provide enough space to accommodate bus operations. Physical changes would include building a more durable shoulder to support the increased use and weight of buses and restriping lanes.

On-ramp/off-ramp stations would be located at El Camino Real, Stevens Creek Boulevard, Saratoga Avenue and Bascom Avenue. Public transit buses are also envisioned to serve the existing Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard.

ALTERNATIVES REMOVED FROM FURTHER CONSIDERATION

During the course of this SR 85 Transit Guideway Study and presentations to the State Route 85 Corridor Policy Advisory Board, which preceded the current study, several additional alternatives were considered, but ultimately removed from further consideration. These included:

- Adding one new transit lane (in each direction) in the median without stations and retaining the HOV lanes.
- Adding one new transit lane (in each direction) in the median without stations and replacing the HOV lane with one express lane in each direction.
- Adding one new transit lane in the median (in each direction) with stations and park-and-ride lots and retaining the HOV lanes.
- Adding a new LRT line in the median and retaining the HOV lanes.
- Adding a new LRT line in the median and replacing the HOV lane with one express lane (in each direction).
- Constructing reversible lanes in the median of SR 85 using movable barriers to separate the directional traffic or retractable gates to regulate how vehicles enter and exit a dedicated reversible roadway.

Physical Construction Scenarios

From an engineering design perspective, the 10 alternatives can be grouped into four physical construction scenarios.

- Scenario A—Limited Physical Change
  - Alternative 1-1: No Build
  - Alternative 1-2: HOV to Express Lane Conversion

No freeway widening occurs with either alternative. Investment is limited to the addition of tolling infrastructure including toll gantries with transponder readers and high-speed digital cameras, directional and informational signage, dynamic message signs, closed circuit television coverage of the entire corridor, and duct bank installation for power supply and fiber optic communications.

- Scenario B—Freeway Widening without Transit Stations
  - Alternative 2-1: Express Lane Project
  - Alternative 2-2: Long Express Lanes

Alternative 2-1, Dual Express Lanes, between I-280 and SR 87 is a subset of Alternative 2-2. Tolling infrastructure identified for Alternative 1-2 applies to both Scenario B alternatives.

- Scenario C—Freeway Widening with Transit Stations
  - Alternative 3-1: Long Transit Lane (Median Adjacent Lane)
  - Alternative 3-2: Long Transit Lane (Right-side Lane)
  - Alternative 3-4: Short Transit Lane

The footprint of the freeway widening is similar to Scenario B. With median stations, the freeway mainline is bowed to create space for the stations depending on station design. For right-side running, stations can be constructed on line, or along off- or on-ramps. Commuter buses which do not stop at the stations are provided with a bypass lane. Alternative 3-4 is a subset of Alternative 3-1 or 3-2.

- Scenario D—Part-time Shoulder Use (Bus on Shoulder)
  - Alternative 3-5: Long Shoulder (Median)
  - Alternative 3-6: Long Shoulder (Right-side)

These alternatives include the installation of HOV to Express Lane Conversion (Alternative 1-2) tolling infrastructure plus the reconstruction and widening of the median shoulder or the right-side shoulder with full depth PCC or AC pavement. Stations, similar to those considered under the Transit Lane Alternatives, would also be included.

Alternative 3-3, Long Transit Lane Hybrid, is a mix and match by freeway segment option of Scenarios C and D elements. This alternative will be further defined once the other alternatives are evaluated insofar as traffic and transit operations.

SCENARIO A—LIMITED PHYSICAL CHANGE

Alternative 1-2: HOV to Express Lane Conversion

Mainline Improvements

- Convert existing HOV lane in each direction from Bernal Road, near U.S. 101 in south San Jose to Moffett Boulevard, near U.S. 101 in Mountain View, a distance of 23.2 miles.
- Provide continuous access to express lane from the adjacent general-purpose lanes.
- Install toll infrastructure in median to support express lanes.
- Reconstruct concrete median barrier south of Santa Teresa Boulevard and north of Stelling Road to accommodate toll gantries and dynamic message signs.
- Widen paved median shoulder to 14 feet in both directions from Santa Teresa Boulevard to South Stelling Road (excepting structures) to provide continuous CHP enforcement area.

- Widen right-side shoulders to meet Highway Design Manual standards (10 feet). Relocate drainage inlets as needed to the outside edge of shoulder.
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing (optional improvement).

Interchange Improvements

No ramp improvements are required to implement this alternative. Conversion of the SR 85 interchange at SR 82/El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration is an optional improvement for consideration.

Local Street Improvements

No streets crossing under or over SR 85 would be reconstructed to accommodate the HOV to express lane conversion. Conversion of the SR 85 interchange at SR 82/El Camino Real from a Type L-10 to a Type L-2, as an optional improvement, would require reconstruction of the ramp terminal intersections, installation of traffic signals, removal of a portion of the raised median and landscaping, and pavement signing and striping to accommodate dual left-turn lanes to the northbound and southbound on-ramps. No widening of El Camino Real would be required.

Conversion of the HOV lane to an express lane would allow for improved enforcement, a reduction in the proportion of HOV2+ "cheaters," and improved managed use to achieve speeds of 45 mph or higher in the express lane.

The HOV to Express Lane Conversion alternative would not yield additional vehicle throughput, however. The HOV and general-purpose lanes each accommodate roughly 1,500 vehicles per hour per lane (vphpl) during peak hours in the peak direction. The capacity of the express lane at level of service (LOS) C is 1,600 vphpl. While the volume of vehicles will likely remain unchanged, the speed of the vehicles using the express lane will likely increase, encouraging more single occupant vehicle (SOV) drivers to carpool and/or utilize commuter buses, if available.

With mainline traffic volumes expected to remain unchanged from no build conditions, no impacts to local streets would be expected.

Railroad Involvement

Six (6) railroad crossings over or under SR 85 occur within the project limits.

1. VTA light rail tracks (Guadalupe Corridor) under southbound SR 85 at PM 1.33.
2. VTA light rail tracks (Guadalupe Corridor) under northbound SR 85 at PM 5.27, just west of Santa Teresa Boulevard.
3. VTA light rail track under SR 85 adjacent to Winfred Boulevard at PM 5.59.
4. Union Pacific track over SR 85 adjacent to Winchester Boulevard at PM 10.98.
5. Caltrain Peninsula Commuter tracks under SR 85 adjacent to Evelyn Avenue at PM 22.63.
6. VTA light rail tracks under SR 85 adjacent to Central Expressway at PM 22.63.

None of these crossings would require bridge work to accommodate the proposed HOV to Express Lane Conversion.

Structure Improvements

Including the Bernal Road and Moffett Boulevard undercrossings at the two ends of the corridor, there are 63 structures which could be affected by the build alternatives. None of these structures would require widening or replacing as a result of implementing the HOV to Express Lane Conversion alternative.

Drainage Improvements

Storm runoff is collected by inlets located along the outside edge of the right-side shoulders and in the center of the median. North of I-280, the right side-shoulders range in width from 4 to 10 feet. To meet the HDM standards for shoulder width, the AC paved shoulders would need to be widened, generally to 10 feet, and drainage inlets relocated to the outside edge of the shoulder.

Utilities

The project area contains overhead electric and communications lines and underground electric, gas, sanitary sewer, water, reclaimed water, communications, and fiber optic lines. Utility providers in the project area are listed below by category.

- Gas and electric—PG&E
- Communications—AT&T, Comcast, Level 3, Verizon, Nextlink, and MCI
- Water—San Jose Water Company, Santa Clara Valley Water District, California Water Service Company, Great Oaks Water Company, City of Sunnyvale Water Division, and City of Mountain View Water Division
- Sanitary—City of San Jose, West Valley Sanitation District, City of Cupertino, and City of Mountain View.

The project would not require utility relocations. Utility impacts would be limited to the extension of casings (protective pipes or channels) for existing underground facilities whose casings do not extend through the right-of-way. All other existing utilities would be protected in place.

Express Lane Begin/End Transitions

The SR 85 express lanes would extend from U.S. 101 in south San Jose to U.S. 101 in Mountain View. The existing HOV direct-connector ramps at both ends of SR 85 would be converted to express lane connectors.

Express Lane Buffer

No buffer is proposed between the express lane and the adjacent general-purpose lanes. A single, white-striped lane line would separate the lanes and continuous access between the lanes would be permitted.

California Highway Patrol Observation/Enforcement Areas and Emergency Refuge Areas

State-of-the-art toll infrastructure will be installed to reduce the need for CHP observation areas given the right-of-way constraints north of South Stelling Road.

Pending future agreements, it is anticipated that the CHP will be contracted to provide toll enforcement including express lane eligibility violations.

Inside median shoulders will be widened south of Stelling Road to Santa Teresa Boulevard to 14 feet in both directions to provide a continuous CHP enforcement area. At structures such as bridges and undercrossings, existing shoulders will be maintained and structures will not be widened for this purpose.

Emergency refuge areas (pullouts for stopped vehicles) along the outside shoulders would be unaffected by the HOV to express lane conversion alternatives.

Toll Infrastructure

The express lane facility would incorporate various toll infrastructure including toll gantries with transponder readers and high-speed digital cameras (49), directional and informational signage, dynamic message signs to communicate real-time toll rates to drivers (25), complete closed circuit television coverage of the entire express lanes corridor, and fiber optics linking the infrastructure to a centralized toll operations office. Toll equipment would meet Title 21 specification and national protocol, as well as interoperability with other toll facilities in California.

The Metropolitan Transportation Commission has prepared a simple fact sheet to further explain toll infrastructure components. This fact sheet is reproduced in whole as Exhibit 1 along with photographs of express lane construction work along I-680 in Walnut Creek and Concord.

The Operations Center mentioned in Exhibit 1 is assumed to be funded by a separate project and not a component of cost for the Route 85 Transit Guideway Project.

3. System Technology and Elements

MTC Express Lanes are implemented by overlaying communications equipment on new and existing freeway infrastructure. Express lanes implementation requires four discrete elements that are integrated through design, construction and operations, including:

Civil Infrastructure (Highway Modifications)

For lane conversions, the civil infrastructure consists of sign structures, sign panels, lane striping, and conduit work for power and communications. For gap closure and extension projects, the civil infrastructure includes highway widening to add lanes as well as the signage and communications equipment required for conversions.

The civil contractor will put in place the foundations and structures upon which the toll systems contractor will install the toll equipment. In addition, the civil contractor will construct the infrastructure necessary to provide power and communications to the toll system.

Toll System

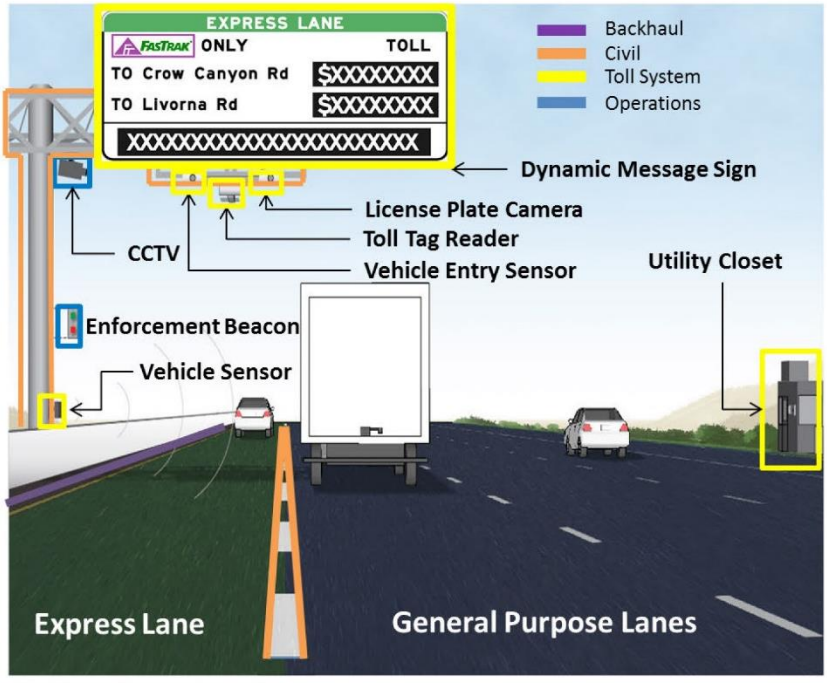
The toll system consists of two components, the in-lane system and the back-end "host" system. The lane system consists of all the equipment on the highway needed to operate the toll system including toll tag readers, cameras and vehicle detection. The host system serves as the brain of the toll system, which collects and processes all the data from the highway and sends it to the regional customer service center for billing.

Backhaul Communications Network

The backhaul network is the communication line along which data collected in the lanes is sent to the toll host system, operations center and regional customer service center. The backhaul contractor will install new conduit and communications fiber as well as utilize existing Caltrans, BART and other infrastructure to build the network. The backhaul network is being designed with the expectation that it will become part of a broader regional communications network.

Operations

The operations element consists of everything that is needed to successfully operate the express lanes including: an operations center, the regional customer service center, enforcement, public outreach, performance monitoring and ongoing maintenance. An express lanes Regional Operations Center will be established in the Bay Area Metrocenter building in San Francisco where operators will actively monitor the condition of the lanes and coordinate with Caltrans and the California Highway Patrol to ensure that the lanes operate efficiently.



For illustrative purposes only

Source: MTC Express Lanes Program Quarterly Report/1st Quarter 2019

Exhibit 1B

Installing drainage on I-680 in Walnut Creek

Drilling an overhead sign foundation on I-680 in Concord

Extending PG&E service connections on I-680 in Concord

Source: MTC Express Lanes Program Quarterly Report/1st Quarter 2019

Tolling Policies

A *Concept of Operations Report* will be prepared to address various tolling policies under which the express lanes will be operated. This report will provide preliminary information regarding the type of tolling, toll exemption or rate reduction for HOVs, maximum target volume to maintain speed and minimize congestion in the express lanes, method for determining toll amount, methods for toll collection and toll enforcement, penalty rates for toll violations, and provision of supplemental service patrol. The items listed below represent key policies which have been assumed for the SR 85 express lanes; however, they are subject to change pending further studies.

- The express lanes are anticipated to operate part-time during peak hours, Monday through Friday.
- It is anticipated that HOVs with two or more occupants (HOV2+) will be allowed to use the express lanes toll-free. Single-occupancy vehicles will be allowed to use the express lanes for a toll.
- Motorcycles will be allowed to travel in the express lanes toll-free and are not required to have a transponder.
- Exempted vehicles including emergency response vehicles, highway maintenance vehicles serving the express lanes facility, and CHP vehicles assigned to patrol the express lane facility will have toll-free access to the express lanes, by registering these vehicles as toll exempt in the License Plate Recognition system.
- Clean air vehicles with valid clean air vehicle decals will be able to use the express lanes for a toll discount, assumed to 15 percent.
- Tolling is anticipated to be dynamic pricing based on real-time traffic levels to ensure peak period speed of no less than 45 mph.

Additional studies will be performed to establish the operating policies and business rules and determine pricing structures and toll violation rates.

Toll Operations and Maintenance

The institutional arrangements for operation and maintenance of the express lanes will be consistent with those implemented by VTA for the express lane system in Santa Clara County.

Express Lanes Incident Responses

At this time, it is anticipated that Freeway Service Patrol will be contracted to provide incident response for the express lanes similar to the current arrangement in the HOV and general-purpose lanes. It is currently planned to have dedicated roving Freeway Service Patrol patrolling the express lanes during hours of peak congestion, to respond to incidents that might affect the express lanes including clearing of debris, towing disabled vehicles, and minor auto repairs.

Conceptual Engineering Plans

Geometric cross sections for mainline segments and alignment plans **have not been developed** for this alternative. Physical changes include installing toll infrastructure in the median barrier south of Santa Teresa Boulevard and north of Stelling Road to accommodate toll gantries and dynamic message signs and widening the paved median shoulder to 14 feet in both directions from Santa Teresa Boulevard to South Stelling Road.

Right-of-Way Requirements

The HOV to Express Lane conversion project would be constructed entirely within the existing right-of-way.

SCENARIO B—FREEWAY WIDENING WITHOUT TRANSIT STATIONS

Alternative 2-1 and 2-2: Dual Express Lanes

Mainline Improvements

- Add one express lane in each direction from Almaden Expressway to Moffett Boulevard to operate jointly with existing HOV lanes as two express lanes in each direction.
- Convert existing HOV lane in each direction from U.S. 101 (southern end of SR 85) to Almaden Expressway to operate as one express lane in each direction.
- Provide continuous access to the express lane(s) from the adjacent general-purpose lanes.

- Extend existing auxiliary lane on northbound SR 85 from the South De Anza Boulevard northbound on-ramp to 0.2 mile south of the Stevens Creek Boulevard off-ramp.
- Provide CHP enforcement/observation areas in the median at selected locations along the corridor.
- Install double-luminaire mast arm lighting at 250- to 400-foot intervals from PM 6.00 (Almaden Expressway) to PM 17.70 (Stevens Creek Boulevard) and from PM 18.86 (Homestead Road) to PM 23.44 (Moffett Boulevard) as an optional improvement.
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing as an optional improvement.

Interchange Improvements

Ramp improvements are required to implement this alternative. Conversion of the SR 85 interchange at SR 82/El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration is an optional improvement for consideration.

Partial realignment of ramps is proposed at the interchanges listed in Table 3. A diagram showing the relative location of the ramps is attached to this document as Attachment 1.

Local Street Improvements

No streets crossing under or over SR 85 would be reconstructed to accommodate the dual express lanes alternative. Conversion of the SR 85 interchange at SR 82/El Camino Real from a Type L-10 to a Type L-2, as an optional improvement, would require reconstruction of the ramp terminal intersections, installation of traffic signals, removal of a portion of the raised median and landscaping, and pavement signing and striping to accommodate dual left-turn lanes to the northbound and southbound on-ramps. No widening would be required along El Camino Real.

Table 3 Alternative 2-1 Ramp Improvements

Interchange Name	Ramp No.	Description	Ramp Improvement		
			Partial	Full	None
South De Anza Boulevard	51	South De Anza Boulevard northbound on-ramp	X		
Stevens Creek Boulevard	54	Stevens Creek Boulevard northbound off-ramp			X
	55	Stevens Creek Boulevard southbound on-ramp	X		
	56	Stevens Creek Boulevard southbound off-ramp			X
I-280	57	I-280 northbound off-ramp			X
	58	I-280 northbound loop on-ramp	X		
	59	I-280 northbound on-ramp	X		
	60	I-280 southbound on-ramp			X
	61	I-280 southbound loop on-ramp	X		
	62	I-280 southbound off-ramp	X		
Homestead Road	63	Homestead Road northbound on-ramp	X		
	64	Homestead Road southbound off-ramp	X		
Fremont Avenue	65	Fremont Avenue northbound off-ramp			X
	66	Fremont Avenue northbound on-ramp	X		
	67	Fremont Avenue southbound on-ramp	X		
	68	Fremont Avenue southbound off-ramp	X		
SR 82/El Camino Real	69	SR 82/El Camino Real northbound off-ramp	X		
	70	SR 82/El Camino Real northbound loop on-ramp	X		
	71	SR 82/El Camino Real northbound loop off-ramp	X		
	72	SR 82/El Camino Real northbound on-ramp	X		
	73	SR 82/El Camino Real southbound on-ramp	X		
	74	SR 82/El Camino Real southbound loop off-ramp	X		
	75	SR 82/El Camino Real southbound on-ramp	X		
SR 237	76	SR 237 northbound off-ramp	X		
	77	SR 237 northbound on-ramp	X		
	78	SR 237 southbound on-ramp	X		
	79	SR 237 southbound off-ramp			X
Evelyn Avenue	80	Evelyn Avenue northbound off-ramp	X		
	81	Evelyn Avenue southbound on-ramp	X		

Table 3 Alternative 2-1 Ramp Improvements

Interchange Name	Ramp No.	Description	Ramp Improvement		
			Partial	Full	None
Central Expressway	82	Central Expressway northbound on-ramp	X		
	83	Central Expressway southbound off-ramp	X		
Moffett Boulevard	84	Moffett Boulevard northbound off-ramp	X		
	85	Moffett Boulevard southbound on-ramp	X		

The dual express lane alternative would accommodate additional throughput on the mainline and additional traffic volumes on the off-ramps and on-ramps. An environmental document for express lanes on SR 85, similar in definition to this alternative, was prepared and circulated for public comment from December 30, 2013 until February 28, 2014. The document was an Initial Study (IS) with Negative Declaration/Environmental Assessment (EA) with Finding of No Significant Impact. The Draft IS/EA did not include an analysis of local roadways and arterials.

In response to comments from the City of Saratoga and City of Cupertino, a supplemental assessment of project-related traffic impacts on the local roadways was conducted for 19 intersections in Saratoga and Cupertino, including the intersections of local roadways with SR 85 ramps. Saratoga and Cupertino staff reviewed and provided comments on the assessment materials, and their comments were incorporated into the final IS/EA. The assessment showed that none of the studied intersections would be significantly impacted by the proposed project.

Should this alternative advance to a new environmental assessment of project impacts, the topic of local street improvements, particularly at ramp terminal and adjacent intersections, will need to be revisited.

Railroad Involvement

Six (6) railroad crossings over or under SR 85 occur within the project limits.

1. VTA light rail tracks (Guadalupe Corridor) under southbound SR 85 at PM 1.33.
2. VTA light rail tracks (Guadalupe Corridor) under northbound SR 85 at PM 5.27, just west of Santa Teresa Boulevard.
3. VTA light rail track under SR 85 adjacent to Winfred Boulevard at PM 5.59.
4. Union Pacific track over SR 85 adjacent to Winchester Boulevard at PM 10.98.
5. Caltrain Peninsula Commuter tracks under SR 85 adjacent to Evelyn Avenue at PM 22.63.
6. VTA light rail tracks under SR 85 adjacent to Central Expressway at PM 22.63.

None of these crossings would require bridge work to accommodate the proposed freeway widening for the addition of one express lane in each direction.

Structure Improvements

The dual express lane alternative would necessitate the widening of nine bridge or undercrossing structures, the replacement of embankments with retaining walls at two overcrossings, and the replacement of one pedestrian overcrossing. Table 4 summarizes the proposed structure improvements under Alternative 2-2.

Table 4 Alternative 2-2 Structure Improvements

Structure No.	Postmile	Structure Name	Type*	Structure Improvement		
				No Work	Widen	Replace
1	0.20	Bernal Road	Undercrossing	X		
2	0.29	Monterey Road/Union Pacific/Great Oaks Boulevard	Undercrossing/overpass	X		
3	1.22	Via Del Oro	Undercrossing	X		
4	1.33	VTA Light Rail	Overpass	X		
5	1.97	Cottle Road	Overcrossing	X		
6	2.73	Lean Avenue	Overcrossing	X		
7	3.48	Snell Avenue	Overcrossing	X		
8	3.93	Blossom Hill Road	Overcrossing	X		
9	4.28	Canoas Creek	Bridge	X		
10	4.50	Cahalan Avenue	Pedestrian undercrossing	X		
11	4.84	Southbound SR 87 to southbound SR 85	Overcrossing	X		

Table 4 Alternative 2-2 Structure Improvements

Structure No.	Postmile	Structure Name	Type*	Structure Improvement		
				No Work	Widen	Replace
12	5.20	Santa Teresa Boulevard	Undercrossing	X		
13	5.27	VTA Light Rail	Overpass	X		
14	5.31	Southbound SR 85 to northbound SR 87	Overcrossing	X		
15	5.59	Winfred Blvd/Guadalupe River/Sanchez Drive	Bridge	X		
16	6.00	Almaden Expressway	Undercrossing		X	
17	6.46	Russo Drive	Pedestrian overcrossing	X		
18	7.30	Meridian Avenue	Overcrossing	X		
19	7.50	Dent Avenue	Pedestrian overcrossing	X		
20	8.11	Camden Avenue	Undercrossing		X	
21	8.77	Leigh Avenue	Overcrossing	X		
22	9.28	Union Avenue	Overcrossing	X		
23	9.93	Samaritan Place	Pedestrian overcrossing	X		
24	10.23	Bascom Avenue	Overcrossing	X		
25	10.40	Southbound SR 17 to southbound SR 85	Undercrossing	X		
26	10.48	SR 17	Separation	X		
27	10.60	Oka Road	Undercrossing		X	
28	10.80	Los Gatos Creek	Bridge		X	
29	10.90	Winchester Boulevard	Underpass	X		
30	11.00	Winchester Boulevard	Overcrossing	X		
31	11.97	Pollard Road	Undercrossing		X	
32	12.45	More Avenue	Pedestrian overcrossing	X		
33	12.68	San Tomas Aquino Creek	Bridge		X	
34	12.91	Quito Road	Overcrossing	X		
35	13.73	Saratoga Avenue	Undercrossing		X	
36	13.91	Saratoga Creek	Bridge		X	
37	14.28	Cox Avenue	Overcrossing	X		
38	14.31	Cox Avenue utility	Overcrossing	X		
39	14.73	Scully Avenue utility	Overcrossing	X		
40	14.84	Blue Hills	Pedestrian overcrossing	X		
41	15.27	Prospect Road	Overcrossing	X		
42	15.40	Calabazas Creek	Bridge		X	
43	15.87	South De Anza Boulevard	Overcrossing	X		
44	16.61	South Stelling Road	Overcrossing		X	
45	17.17	McClellan Road	Overcrossing		X	
46	17.70	Stevens Creek Boulevard	Overcrossing	X		
47	18.35	Southbound/eastbound I-280	Undercrossing	X		
48	18.41	SR 85/I-280	Separation	X		
49	18.43	Northbound/westbound I-280	Undercrossing	X		
50	18.86	Homestead Road	Overcrossing	X		
51	19.39	The Dalles	Pedestrian overcrossing			X
52	19.86	Fremont Avenue	Undercrossing	X		
53	20.02	Stevens Creek	Bridge	X		
54	20.37	Hawkins Drive	Right-of-way	X		
55	20.69	Permanente Creek Diversion Channel	Culvert	X		
56	21.10	Stevens Creek Trail/Dale Avenue	Pedestrian overcrossing	X		
57	21.75	SR 82/SR 85/El Camino Real	Separation	X		
58	22.13	SR 85/SR 237	Separation	X		
59	22.43	Dana Street	Overcrossing	X		
60	22.63	Evelyn Avenue/Caltrain/Light Rail/Central Expressway	Undercrossing/overpass	X		
61	22.95	Stevens Creek	Bridge	X		
62	23.19	Middlefield Road	Overcrossing	X		
63	23.44	Moffett Boulevard	Undercrossing	X		

*Type:
- Undercrossing = local road under State highway
- Overcrossing = local road over State highway
- Pedestrian overcrossing = Pedestrian crossing over State highway
- Separation = State highway crossing
- Underpass = State highway under railroad
- Overpass = State highway over railroad
- Right-of-way = right-of-way required

The bridge and undercrossing widening would close the existing spaces between the separate northbound and southbound structures by installing new bridge decking in the median. At each location, the bridge decks would be extended using precast, prestressed concrete beams supported by new abutments and columns. Bridge crossings of creeks are assumed to be free span between the abutments at each end of the bridge, except for the Los Gatos Creek bridge which has two spans. **Table 5** provides more specific information regarding the nine bridge and undercrossing structures that would be widened.

An existing auxiliary lane would be extended along a 1.1-mile segment of northbound SR 85 between the existing South De Anza Boulevard northbound on-ramp and 0.2 mile south of the Stevens Creek Boulevard northbound off-ramp where the auxiliary lane currently begins. The existing pavement would be widened by up to 14 feet to the outside (northeast). To accommodate the auxiliary lane, sections of the existing abutments at South Stelling Road and McClellan Road overcrossings adjacent to northbound SR 85 would be removed and replaced by new retaining walls to support the embankments behind them.

Table 5 Alternative 2-2 Structure Improvements

Structure No.	Postmile	Name	Type	Length (feet)	Spans (existing)	Minimum Vertical Clearances (feet)	Widening (feet)
16	6.0	Almaden Expressway	Undercrossing	238	2	19.16	50
20	8.11	Camden Avenue	Undercrossing	210	2	15.49	45
27	10.60	Oka Road	Undercrossing	102	1	16.31	33
28	10.80	Los Gatos Creek	Bridge	178	2	—	29
31	11.97	Pollard Road	Undercrossing	196	1	16.47	23
33	12.68	San Tomas Aquino Creek	Bridge	105	1	—	23
35	13.73	Saratoga Avenue	Undercrossing	192	2	16.67	23
36	13.91	Saratoga Creek	Bridge	100	1	—	23
42	15.40	Calabazas Creek	Bridge	156	2	—	22

The segment of northbound SR 85 where the extended auxiliary lane is proposed is up to 25 feet lower in elevation than surrounding development. In the majority of this segment, retaining walls extend along the toe of the slope by approximately 14 feet beyond the northbound shoulder, and sound walls exist at the top of the slope along the edge of the right-of-way. Widening for the proposed auxiliary lane would occur in the area between the northbound shoulder and the retaining walls or toe of the slope. The new retaining walls at the South Stelling Road and McClellan Road overcrossings would replace existing slope areas adjacent to northbound SR 85.

Drainage Improvements

Storm runoff is collected by inlets located along the outside edge of the right-side shoulders and in the center of the median. The dual express lane alternative will widen the travelway by adding one lane in each direction in the median. The elevation of the inlets located in the median may need to be adjusted (raised) to meet the plane of the widened travelway.

North of I-280, the right-side shoulders range in width from 4 to 10 feet. To meet the HDM standards for shoulder width, the AC paved shoulders would need to be widened, generally to 10 feet, and drainage inlets relocated to the outside edge of the shoulder.

Utilities

The project area contains overhead electric and communications lines and underground electric, gas, sanitary sewer, water, reclaimed water, communications, and fiber optic lines. Utility providers in the project area are listed below by category.

- Gas and electric—PG&E
- Communications—AT&T, Comcast, Level 3, Verizon, Nextlink, and MCI

- Water—San Jose Water Company, Santa Clara Valley Water District, California Water Service Company, Great Oaks Water Company, City of Sunnyvale Water Division, and City of Mountain View Water Division
- Sanitary—City of San Jose, West Valley Sanitation District, City of Cupertino, and City of Mountain View.

The project would not require utility relocations. Utility impacts would be limited to the extension of casings (protective pipes or channels) for existing underground facilities whose casings do not extend through the right-of-way. All other existing utilities would be protected in place.

Express Lane Begin/End Transitions

The SR 85 express lanes would extend from U.S. 101 in south San Jose to U.S. 101 in Mountain View. The existing HOV direct-connector ramps at both ends of SR 85 would be converted to express lane connectors. North of the northbound and southbound mainline bridges spanning Winfred Boulevard, Guadalupe River, and Sanchez Drive, a second express lane would be added in the median traveling northbound and dropped traveling southbound.

At the north end of SR 85, the second express lane would be added in the median immediately south of the southbound U.S. 101 to southbound SR 85 express lane (converted HOV lane) direct-connector ramp. Northbound, the inside express lane would connect directly with the northbound SR 85 to northbound U.S. 101 express lane (converted HOV lane) direct-connector ramp. The remaining express lane would continue as a general-purpose lane.

Express Lane Buffer

No buffer is proposed between the dual express lanes and the adjacent general-purpose lanes. A single, white striped lane line would separate the lanes and continuous access between the lanes would be permitted.

California Highway Patrol Observation/Enforcement Areas and Emergency Refuge Areas

State-of-the-art toll infrastructure will be installed to reduce the need for CHP observation areas given the right-of-way constraints north of South Stelling Road.

Pending future agreements, it is anticipated that the CHP will be contracted to provide toll enforcement including express lane eligibility violations.

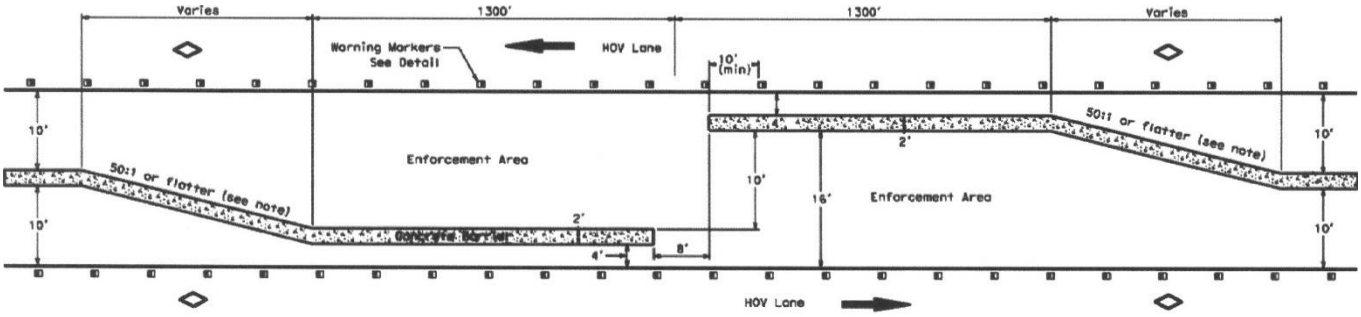
Existing emergency refuge areas (ERA) and proposed CHP observation/enforcement areas are listed in Table 6.

Table 6 Existing Emergency Refuge Areas and Proposed CHP Observation/Enforcement Areas

Northbound		Southbound	
1. Cottle Road	PM 1.97	1. Cottle Road	PM 1.97
2. Blossom Hill Road	PM 3.93	2. Blossom Hill Road	PM 3.93
3. Santa Teresa Boulevard	PM 5.20	*Rimwood Drive CHP*	*PM 6.72*
4. Almaden Expressway	PM 5.98	3. North of Russo Drive	PM 6.78
5. Almaden Expressway	PM 6.02	4. North of Leigh Avenue	PM 8.80
Rimwood Drive CHP	*PM 6.72*	5. North of Union Avenue	PM 9.66
6. North of Dent Avenue	PM 7.65	*Mulberry Drive CHP*	*PM 11.60*
7. North of Union Avenue	PM 9.34	6. South of Pollard Road	PM 11.71
8. North of Union Avenue	PM 9.50	7. More Avenue pedestrian overcrossing	PM 12.45
9. South of SR 17	PM 10.38	8. San Tomas Aquino Creek	PM 12.69
10. North of SR 17	PM 10.57	9. North of Saratoga Creek	PM 14.05
Mulberry Drive CHP	*PM 11.60*	10. Cox Avenue utility	PM 14.31
11. More Avenue pedestrian overcrossing	PM 12.45	*Hollanderry Place CHP*	*PM 16.23*
12. San Tomas Aquino Creek	PM 12.67	11. South of El Camino Real	PM 21.68
13. North of Saratoga Creek	PM 14.05	12. North of El Camino Real	PM 21.80
14. Cox Avenue utility	PM 14.31	13. North of El Camino Real	PM 21.84
Hollanderry Place CHP	*PM 16.23*		
15. South of Homestead Road	PM 18.80		
16. South of El Camino Real	PM 21.66		

Exhibit 2 illustrates a suggested layout for the proposed CHP observation/enforcement areas.

Exhibit 2. Bidirectional Enforcement Areas for Wide Medians



Toll Infrastructure

The express lane facility would incorporate various toll infrastructure including toll gantries with transponder readers and high-speed digital cameras (49), directional and informational signage, dynamic message signs to communicate real-time toll rates to drivers (25), complete closed circuit television coverage of the entire express lanes corridor, and fiber optics linking the infrastructure to a centralized toll operations office. Toll equipment would meet Title 21 specification and national protocol, as well as interoperability with other toll facilities in California.

Trenching would be conducted along the outside edge of pavement for installation of conduits. The depth of trenching would be 3 to 5 feet below the roadway surface. Conduits would be jacked across the freeway to the median where needed to provide power and communication feeds to the new overhead signs and toll structures.

The project would install new overhead and barrier-mounted signs, including dynamic message signs. The overhead signs would be installed in the median on cantilever structures supported on piles.

In some locations the express lane signs would replace existing signs or be added to existing sign structures, but most would be at new locations along SR 85. The exact number and locations of these features will be determined during the project design phase in coordination with the toll system design.

Please see Exhibit 1A, which further clarifies toll infrastructure components.

Tolling Policies

A *Concept of Operations Report* will be prepared to address various tolling policies under which the express lanes will be operated. This report will provide preliminary information regarding the type of tolling, toll exemption or rate reduction for HOVs, maximum target volume to maintain speed and minimize congestion in the express lanes, method for determining toll amount, methods for toll collection and toll enforcement, penalty rates for toll violations, and provision of supplemental service patrol. The items listed below represent key policies which have been assumed for the SR 85 express lanes; however, they are subject to change pending further studies.

- The express lanes are anticipated to operate part-time during peak hours, Monday through Friday.
- It is anticipated that HOVs with two or more occupants (HOV2+) will be allowed to use the express lanes toll-free. Single-occupancy vehicles will be allowed to use the express lanes for a toll.
- Motorcycles will be allowed to travel in the express lanes toll-free and are not required to have a transponder.
- Exempted vehicles including emergency response vehicles, highway maintenance vehicles serving the express lanes facility, and CHP vehicles assigned to patrol the express lane facility will have toll-free access to the express lanes, by registering these vehicles as toll exempt in the License Plate Recognition system.
- Clean air vehicles with valid clean air vehicle decals will be able to use the express lanes for a toll discount, assumed to 15 percent.
- Tolling is anticipated to be dynamic pricing based on real-time traffic levels to ensure peak period speed of no less than 45 mph.

Additional studies will be performed to establish the operating policies and business rules and determine pricing structures and toll violation rates.

Toll Operations and Maintenance

The institutional arrangements for operation and maintenance of the express lanes will be consistent with those implemented by VTA for the express lane system in Santa Clara County.

Express Lanes Incident Responses

At this time, it is anticipated that Freeway Service Patrol will be contracted to provide incident response for the express lanes similar to the current arrangement in the HOV and general-purpose lanes. It is currently planned to have dedicated roving Freeway Service Patrol patrolling the express lanes during hours of peak congestion, to respond to incidents that might affect the express lanes including clearing of debris, towing disabled vehicles, and minor auto repairs.

Conceptual Engineering Plans

Geometric cross sections for mainline segments and segments passing structures with restrictive widths are provided in Attachment 2.

Alignment plans for the dual express lane alternative are provided in Attachment 3 for the mainline segment from Prospect Road (PM 15.27) to just south of U.S. 101 in Mountain View (PM 23.70). Plan sheets are also provided for the segment from Almaden Boulevard to Santa Teresa Boulevard where the express lanes transition from one to two lanes in each direction.

Right-of-Way Requirements

South of I-280, in segments 1 and 2 of the corridor, the project would be constructed entirely within the existing right-of-way.

North of I-280, in segment 3 of the corridor, the alignment plans provided in Attachment 3 indicate that the pedestrian overcrossing at The Dalles (PM 19.39), illustrated on Sheet 17, will need to be relocated. This relocation will likely require new right-of-way to the east of SR 85 if the pedestrian overcrossing is reconstructed at this location.

A potential right-of-way impact is illustrated on Sheet 14 in Attachment 3 at PM 20.37 where the right-side shoulder narrows to six feet. A Design Standards Decision Document will need to be prepared and approved by Caltrans Division of Design Chief to avoid acquiring right-of-way and relocating the adjacent sound wall at this location.

SCENARIO C—FREEWAY WIDENING WITH TRANSIT STATIONS

Alternative 3-1 (Median) and Alternative 3-2 (Right-side)

Mainline Improvements

- Convert existing HOV lane in each direction from U.S. 101 (southern end of SR 85) to U.S. 101 in Mountain View to operate as a single express lane in each direction.
- Add one lane in each direction from Almaden Expressway to Evelynn Avenue or Moffett Boulevard. The added lane would be positioned in the existing median as the number 1 (inside) lane.
- With Alternative 3-1, the transit lane would occupy the number 1 lane position. With Alternative 3-2, the transit lane would occupy the number 4 (outside) lane position.
- Provide a buffer to separate the transit lane from the adjacent express lane (Alternative 3-1) or general-purpose lane (Alternative 3-2).
- Provide continuous access to the express lane(s) from the adjacent general-purpose lanes.
- Extend existing auxiliary lane on northbound SR 85 from the South De Anza Boulevard northbound on-ramp to 0.2 mile south of the Stevens Creek Boulevard off-ramp.
- Provide CHP enforcement/observation areas in the median at selected locations along the corridor.

- Install double-luminaire mast arm lighting at 250- to 400-foot intervals from postmile (PM) 6.00 (Almaden expressway) to PM 17.70 (Stevens Creek Boulevard) and from PM 18.86 (Homestead Road) to PM 23.44 (Moffett Boulevard) as an optional improvement.
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing lighting as an optional improvement.

Interchange Improvements

Ramp improvements are required to implement this alternative. Conversion of the SR 85 interchange at SR 82/El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration is required to enable the provision of a transit station at this location.

Partial realignment of ramps is proposed at the interchanges listed in Table 7. A diagram showing the relative location of the ramps is attached to this document as Attachment 1.

Table 7 Alternative 3-2 Structure Improvements

			Ramp Improvement			
Interchange Name	Ramp No.	Description	Partial	Full	Remove	None
South De Anza Boulevard	51	South De Anza Boulevard northbound on-ramp	X			
Stevens Creek Boulevard	54	Stevens Creek Boulevard northbound off-ramp	X			
	55	Stevens Creek Boulevard southbound on-ramp	X			
	56	Stevens Creek Boulevard southbound off-ramp	X			
I-280	57	I-280 northbound off-ramp	X			
	58	I-280 northbound loop on-ramp				X
	59	I-280 northbound on-ramp	X			
	60	I-280 southbound on-ramp				X
	61	I-280 southbound loop on-ramp				X
	62	I-280 southbound off-ramp	X			
Homestead Road	63	Homestead Road northbound on-ramp	X			
	64	Homestead Road southbound off-ramp	X			
Fremont Avenue	65	Fremont Avenue northbound off-ramp				X
	66	Fremont Avenue northbound on-ramp	X			
	67	Fremont Avenue southbound on-ramp	X			
	68	Fremont Avenue southbound off-ramp	X			
SR 82/El Camino Real	69	SR 82/El Camino Real northbound off-ramp		X		
	70	SR 82/El Camino Real northbound loop on-ramp			X	
	71	SR 82/El Camino Real northbound loop off-ramp			X	
	72	SR 82/El Camino Real northbound on-ramp		X		
	73	SR 82/El Camino Real southbound on-ramp	X			
	74	SR 82/El Camino Real southbound loop off-ramp			X	
	75	SR 82/El Camino Real southbound on-ramp			X	
SR 237	76	SR 237 northbound off-ramp	X			
	77	SR 237 northbound on-ramp	X			
	78	SR 237 southbound on-ramp	X			
	79	SR 237 southbound off-ramp				X
Evelyn Avenue	80	Evelyn Avenue northbound off-ramp	X			
	81	Evelyn Avenue southbound on-ramp	X			
Central Expressway	82	Central Expressway northbound on-ramp	X			
	83	Central Expressway southbound off-ramp	X			
Moffett Boulevard	84	Moffett Boulevard northbound off-ramp	X			
	85	Moffett Boulevard southbound on-ramp	X			

The “Mainline Improvements” listed above indicated that the one lane added in each direction would extend from Almaden Expressway to Evelyn Avenue or Moffett Boulevard. As an option, Alternative 3-1 (Median) Long Transit Lane could include a drop ramp from the median of SR 85 to Evelyn Avenue in lieu of continuing the transit lanes to Moffett Boulevard.

Figure 3 illustrates a conceptual alignment plan for this option. The median direct connector ramp is facilitated by the freeway mainline rising by 16 feet between Dana Street and Evelyn Avenue, while the median transit lanes drop in elevation by 12 feet to meet the grade of Evelyn Avenue (see Figure 4). To construct the drop ramp, a tunnel could be "jacked" under the northbound travel lanes without the need to temporarily close the freeway (see Exhibit 3). Commuter buses not using the median drop lane could continue north to Moffett Boulevard and U.S. 101 using the adjacent express lane. Alternative 3-2 (Right-side) Long Transit Lane would allow VTA buses to utilize the right-side off-ramp and on-ramp to and from Evelyn Avenue while also allowing the transit lane to continue north to Moffett Boulevard for use by commuter buses.

Local Street Improvements

No streets crossing under or over SR 85 would be reconstructed to accommodate the transit lanes alternatives. Conversion of the SR 85 interchange at SR 82/El Camino Real from a Type L-10 cloverleaf layout to a Type L-2 spread diamond layout would require reconstruction of the ramp terminal intersections, installation of traffic signals, removal of a portion of the raised median and landscaping, and pavement signing and striping to accommodate dual left-turn lanes to the northbound and southbound on-ramps. No widening of El Camino Real would be required.

Conversion of the HOV lane to an express lane would allow for improved enforcement, a reduction in the proportion of HOV2+ "cheaters," and improved managed use to achieve speeds of 45 mph or higher in the express lane.

The HOV to Express Lane Conversion aspect of this alternative would not yield additional vehicle throughput, however. The HOV and general-purpose lanes each accommodate roughly 1,500 vehicles per hour per lane (vphpl) during peak hours in the peak direction. The capacity of the express lane at LOS C is 1,600 vphpl. While the volume of vehicles will likely remain unchanged, the speed of the vehicles using the express lane will likely increase, encouraging more SOV drivers to carpool and/or utilize commuter buses, if available.

With mainline traffic volumes expected to remain unchanged from no build conditions, no impacts to local streets would be expected.

Railroad Involvement

Six (6) railroad crossings over or under SR 85 occur within the project limits.

1. VTA light rail tracks (Guadalupe Corridor) under southbound SR 85 at PM 1.33.
2. VTA light rail tracks (Guadalupe Corridor) under northbound SR 85 at PM 5.27, just west of Santa Teresa Boulevard.
3. VTA light rail track under SR 85 adjacent to Winfred Boulevard at PM 5.59.
4. Union Pacific track over SR 85 adjacent to Winchester Boulevard at PM 10.98.
5. Caltrain Peninsula Commuter tracks under SR 85 adjacent to Evelyn Avenue at PM 22.63.
6. VTA light rail tracks under SR 85 adjacent to Central Expressway at PM 22.63.

None of these crossings would require bridge work to accommodate the proposed freeway widening for the addition of one transit lane in each direction.

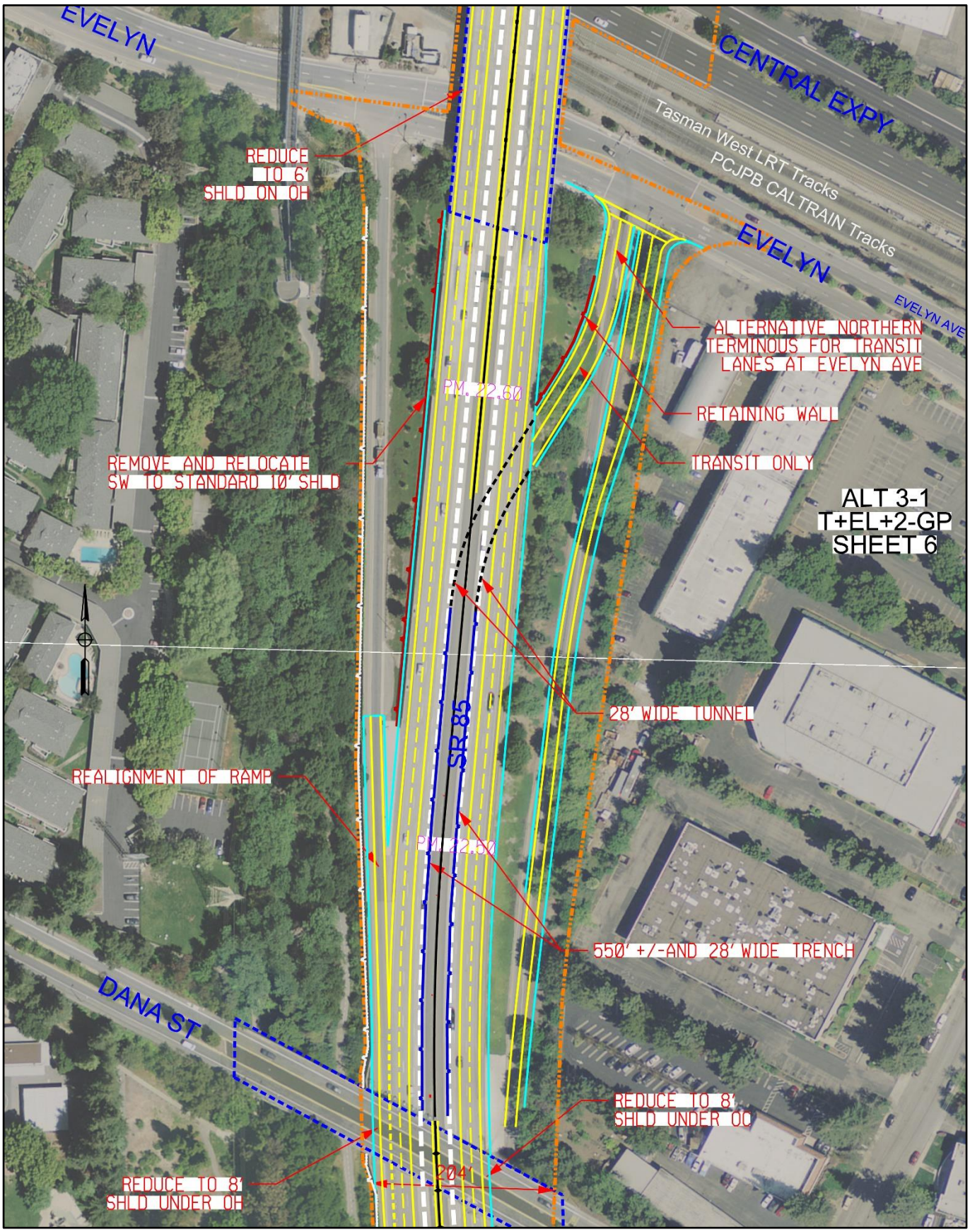


Figure 3 Alternative 3-1 Conceptual Alignment Plan for Direct Connector Drop Ramp to Evelyn Avenue

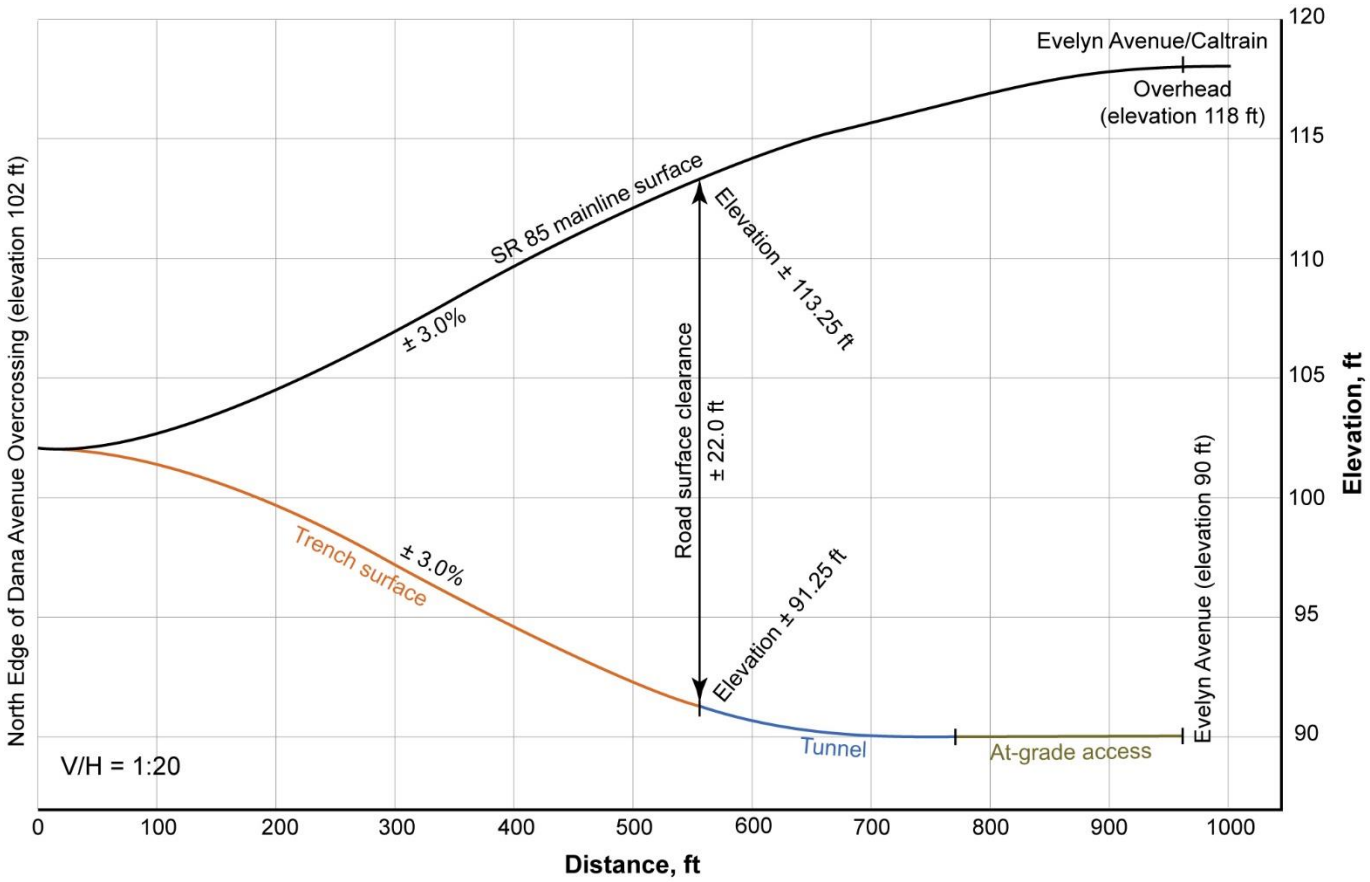
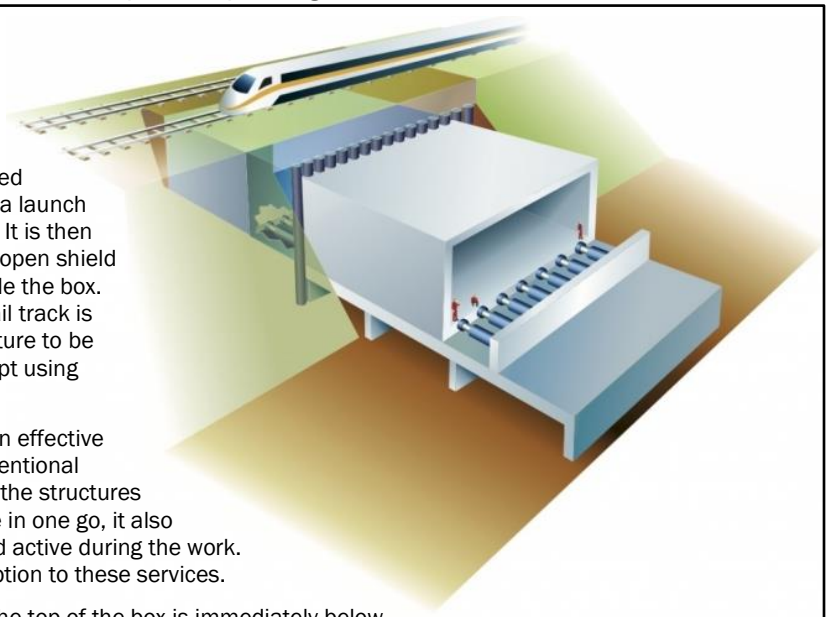


Figure 4 Conceptual Vertical Profile for Direct Connector Drop Ramp to Evelyn Avenue

Exhibit 3. Box (or Tunnel) Jacking

BOX JACKING



Box jacking, also known as Tunnel Jacking, involves the advancement of a site cast rectangular or other shaped sections using high capacity hydraulic jacks. The structure to be installed is constructed, normally in reinforced concrete, on a launch pad at site adjacent to where it has to be installed. It is then thrust forward horizontally using advance support, open shield and jacking technology with taking place from inside the box. This is frequently used where an existing road or rail track is on an embankment and space exists for the structure to be cast at the side. There are variations on this concept using short pre-cast units to form the box.

The main benefit of this approach is that it offers an effective alternative to disruptive open cut techniques, conventional tunneling methods being inappropriate so close to the structures above. Tunnel jacking can install the final structure in one go, it also allows the above infrastructure to remain "live" and active during the work. This obviously significantly reduces potential disruption to these services.

A number of installations have been made where the top of the box is immediately below the track. The system is designed for the track loads to be picked up by the box roof as it advances.

Source: Jacked Structures, Cheshire, United Kingdom

Structure Improvements

The transit lane alternatives would necessitate the widening of nine bridge or undercrossing structures, the replacement of embankments with retaining walls at three overcrossings, and the replacement of one pedestrian overcrossing. Table 8 summarizes the proposed structure improvements under Alternatives 3-1 and 3-2.

Table 8 Long Transit Lane Alternatives Structure Improvements

Structure No.	Postmile	Structure Name	Type*	Structure Improvement		
				No Work	Widen	Replace
1	0.20	Bernal Road	Undercrossing	X		
2	0.29	Monterey Road/Union Pacific/Great Oaks Boulevard	Undercrossing/overpass	X		
3	1.22	Via Del Oro	Undercrossing	X		
4	1.33	VTA Light Rail	Overpass	X		
5	1.97	Cottle Road	Overcrossing	X		
6	2.73	Lean Avenue	Overcrossing	X		
7	3.48	Snell Avenue	Overcrossing	X		
8	3.93	Blossom Hill Road	Overcrossing	X		
9	4.28	Canoas Creek	Bridge	X		
10	4.50	Cahalan Avenue	Pedestrian undercrossing	X		
11	4.84	Southbound SR 87 to southbound SR 85	Separation	X		
12	5.20	Santa Teresa Boulevard	Undercrossing	X		
13	5.27	VTA Light Rail	Overpass	X		
14	5.31	Southbound SR 85 to northbound SR 87	Separation	X		
15	5.59	Winfred Blvd/Guadalupe River/Sanchez Drive	Bridge	X		
16	6.00	Almaden Expressway	Undercrossing		X	
17	6.46	Russo Drive	Pedestrian overcrossing	X		
18	7.30	Meridian Avenue	Overcrossing	X		
19	7.50	Dent Avenue	Pedestrian overcrossing	X		
20	8.11	Camden Avenue	Undercrossing	X	X	
21	8.77	Leigh Avenue	Overcrossing	X		
22	9.28	Union Avenue	Overcrossing	X		
23	9.93	Samaritan Place	Pedestrian overcrossing	X		
24	10.23	Bascom Avenue	Overcrossing	X		
25	10.40	Southbound SR 17 to southbound SR 85	Separation	X		
26	10.48	SR 17	Separation	X		
27	10.60	Oka Road	Undercrossing		X	
28	10.80	Los Gatos Creek	Bridge		X	
29	10.90	Winchester Boulevard	Underpass	X		
30	11.00	Winchester Boulevard	Overcrossing	X		
31	11.97	Pollard Road	Undercrossing		X	
32	12.45	More Avenue	Pedestrian overcrossing	X		
33	12.68	San Tomas Aquino Creek	Bridge		X	
34	12.91	Quito Road	Overcrossing	X		
35	13.73	Saratoga Avenue	Undercrossing		X	
36	13.91	Saratoga Creek	Bridge		X	
37	14.28	Cox Avenue	Overcrossing	X		
38	14.31	Cox Avenue utility	Overcrossing	X		
39	14.73	Scully Avenue utility	Overcrossing	X		
40	14.84	Blue Hills	Pedestrian overcrossing	X		
41	15.27	Prospect Road	Overcrossing	X		
42	15.40	Calabazas Creek	Bridge		X	
43	15.87	South De Anza Boulevard	Overcrossing	X		
44	16.61	South Stelling Road	Overcrossing		X	
45	17.17	McClellan Road	Overcrossing		X	
46	17.70	Stevens Creek Boulevard	Overcrossing		X	
47	18.35	Southbound/eastbound I-280	Separation	X		
48	18.41	SR 85/I-280	Separation	X		
49	18.43	Northbound/westbound I-280	Separation	X		
50	18.86	Homestead Road	Overcrossing	X		
51	19.39	The Dalles	Pedestrian overcrossing			X

Table 8 Long Transit Lane Alternatives Structure Improvements

Structure No.	Postmile	Structure Name	Type*	Structure Improvement		
				No Work	Widen	Replace
52	19.86	Fremont Avenue	Undercrossing	X		
53	20.02	Stevens Creek	Bridge	X		
54	20.37	Hawkins Drive	Right-of-way	X		
55	20.69	Permanente Creek Diversion Channel	Culvert	X		
56	21.10	Stevens Creek Trail/Dale Avenue	Pedestrian overcrossing	X		
57	21.75	SR 82/SR 85/El Camino Real	Separation	X		
58	22.13	SR 85/SR 237	Separation	X		
59	22.43	Dana Street	Overcrossing	X		
60	22.63	Evelyn Avenue/Caltrain/Light Rail/Central Expressway	Undercrossing/overpass	X		
61	22.95	Stevens Creek	Bridge	X		
62	23.19	Middlefield Road	Overcrossing	X		
63	23.44	Moffett Boulevard	Undercrossing	X		

*Type:
- Undercrossing = local road under State highway
- Overcrossing = local road over State highway
- Pedestrian overcrossing = Pedestrian crossing over State highway
- Separation = State highway crossing
- Underpass = State highway under railroad
- Overpass = State highway over railroad
- Right-of-way = right-of-way required

The bridge and undercrossing widening would close the existing spaces between the separate northbound and southbound structures by installing new bridge decking in the median. At each location, the bridge decks would be extended using precast, prestressed concrete beams supported by new abutments and columns. Bridge crossings of creeks are assumed to be free span between the abutments at each end of the bridge, except for the Los Gatos Creek bridge which has two spans. **Table 5**, reported earlier, provides more specific information regarding the nine bridge and undercrossing structures that would be widened.

An existing auxiliary lane would be extended along a 1.1-mile segment of northbound SR 85 between the existing South De Anza Boulevard northbound on-ramp and 0.2 mile south of the Stevens Creek Boulevard northbound off-ramp where the auxiliary lane currently begins. The existing pavement would be widened by up to 14 feet to the outside (northeast). To accommodate the auxiliary lane, sections of the existing abutments at South Stelling Road and McClellan Road overcrossings adjacent to northbound SR 85 would be removed and replaced by new retaining walls to support the embankments behind them.

The segment of northbound SR 85 where the extended auxiliary lane is proposed is up to 25 feet lower in elevation than surrounding development. In the majority of this segment, retaining walls extend along the toe of the slope by approximately 14 feet beyond the northbound shoulder, and sound walls exist at the top of the slope along the edge of the right-of-way. Widening for the proposed auxiliary lane would occur in the area between the northbound shoulder and the retaining walls or toe of the slope. The new retaining walls at the South Stelling Road and McClellan Road overcrossings would replace existing slope areas adjacent to northbound SR 85.

Drainage Improvements

Storm runoff is collected by inlets located along the outside edge of the right-side shoulders and in the center of the median. The transit lane alternatives will widen the travelway by adding one lane in each direction in the median. The elevation of the inlets located in the median may need to be adjusted (raised) to meet the plane of the widened travelway.

North of I-280, the right-side shoulders range in width from 4 to 10 feet. To meet the HDM standards for shoulder width, the AC paved shoulders would need to be widened, generally to 10 feet, and drainage inlets relocated to the outside edge of the shoulder.

Utilities

The project area contains overhead electric and communications lines and underground electric, gas, sanitary sewer, water, reclaimed water, communications, and fiber optic lines. Utility providers in the project area are listed below by category.

- Gas and electric—PG&E
- Communications—AT&T, Comcast, Level 3, Verizon, Nextlink, and MCI
- Water—San Jose Water Company, Santa Clara Valley Water District, California Water Service Company, Great Oaks Water Company, City of Sunnyvale Water Division, and City of Mountain View Water Division
- Sanitary—City of San Jose, West Valley Sanitation District, City of Cupertino, and City of Mountain View.

The project would not require utility relocations. Utility impacts would be limited to the extension of casings (protective pipes or channels) for existing underground facilities whose casings do not extend through the right-of-way. All other existing utilities would be protected in place.

Transit and Express Lane Begin/End Transitions

The SR 85 express lanes would extend from U.S. 101 in south San Jose to U.S. 101 in Mountain View. The existing direct-connector ramps at both ends of SR 85 would be converted to express lane connectors. North of Santa Teresa Boulevard, the northbound and southbound mainline bridges spanning Winfred Boulevard, Guadalupe River, and Sanchez Drive, a second lane would be added in the median traveling northbound and dropped traveling southbound.

At the north end of SR 85, the second lane would be added in the median immediately south of the southbound U.S. 101 to southbound SR 85 express lane (converted HOV lane) direct-connector ramp. Northbound, the inside lane would connect directly with the northbound SR 85 to northbound U.S. 101 express lane (converted HOV lane) direct-connector ramp. The remaining lanes would continue as general-purpose lanes.

With Alternative 3-1, the number 1 one lane will be designated and signed for transit use plus qualifying first responder and CHP use. With Alternative 3-2, the number 4 lane will be designated for these uses along with users of the general-purpose lanes who are exiting or entering the freeway to off-ramps and on-ramps, respectively.

Express Lane Buffer

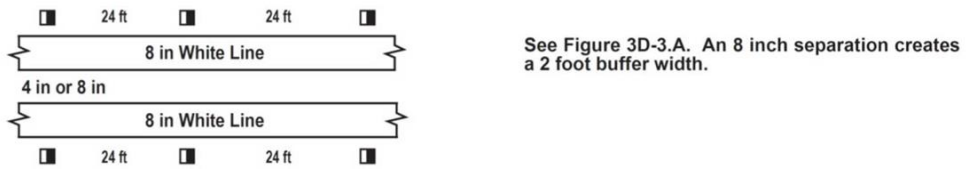
No buffer is proposed between the express lane and the adjacent general-purpose lanes. A single, white striped lane line would separate the lanes and continuous access between the lanes would be permitted.

Transit Lane Buffer

The proposed transit lanes would be located in lane 1 nearest the median or lane 4 nearest the right-side shoulder of the widened SR 85 freeway. The transit lanes are proposed to be buffer-separated from the adjacent express lane or general-purpose lanes.

A minimum buffer width of two feet is proposed. The diagram below presents the anticipated striping detail for the 2-foot buffer, which is Detail 44 with an 8-inch separation per the 2014 California MUTCD Revision 4, effective March 29, 2019.

Figure 3A-113 (CA). Examples of Preferential Lane Lines

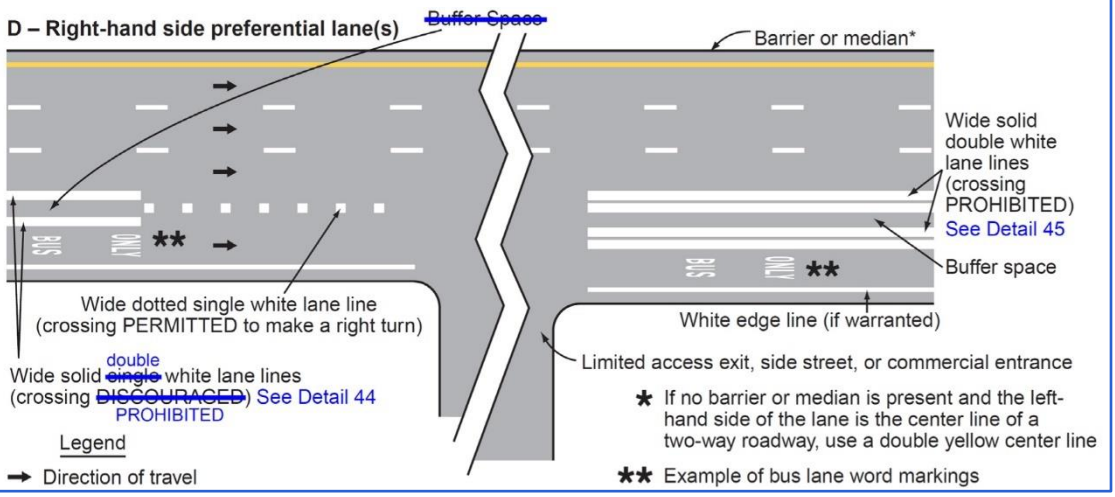


Source: California Manual on Uniform Traffic Control Devices, 2014 Edition, Revision 4 (March 29, 2019), California State Transportation Agency, 2019

Transit Lane Intermediate Access Points

Intermediate access points for the transit lanes will be identified once transit routing plans are refined during the PA/ED phase of project development. In the case of Alternative 3-2, access through the striped buffer to off-ramps and from on-ramps will be as defined by the CA MUTCD in Figure 3D-2D, Right-hand Side Preferential Lane(s), shown below.

Figure 3D-2D. Right-hand side Preferential Lane(s)



Source: California Manual on Uniform Traffic Control Devices, 2014 Edition, Revision 4 (March 29, 2019), California State Transportation Agency, 2019

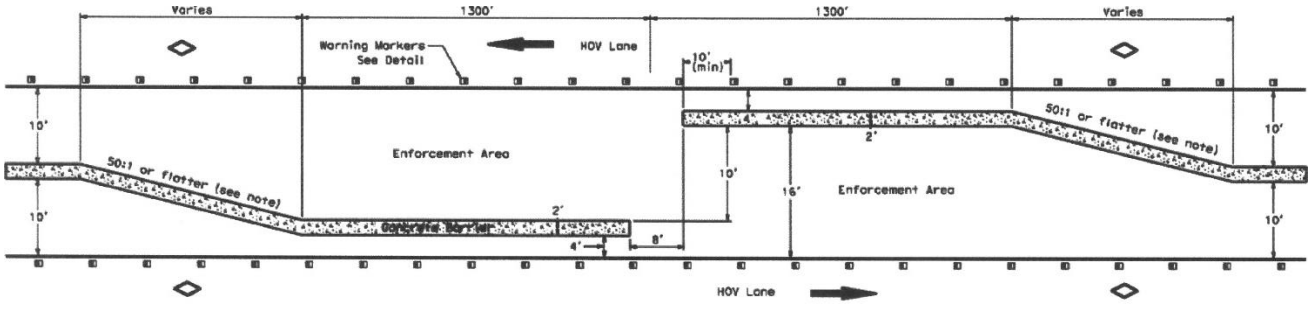
California Highway Patrol Observation/Enforcement and Emergency Refuge Areas

State-of-the-art toll infrastructure will be installed to reduce the need for CHP observation areas given the right-of-way constraints north of South Stelling Road.

Pending future agreements, it is anticipated that the CHP will be contracted to provide toll enforcement including express lane eligibility violations.

California Highway Patrol observation/enforcement areas are proposed at locations where the width of the median and separation between upstream and downstream structures will permit the design guidance illustrated as Figure 6.1 of Caltrans' High-Occupancy Vehicle Guidelines dated January 2018 to be implemented. Figure 6.1 is illustrated below for reference.

Figure 6.1 Bi-directional Enforcement Areas for Wide Medians
NOT TO SCALE



Source: High-Occupancy Vehicle Guidelines for Planning, Design and Operations, California State Transportation Agency, January 2018

The locations which permit the installation of these bi-directional CHP enforcement areas are:

- Rimwood Drive (north of Almaden Expressway at PM 6.72)
- Mulberry Drive (north of Winchester Boulevard at PM 11.60)
- Hollanderry Place (north of De Anza Boulevard at PM 16.23).

The CHP is anticipated to be contracted to conduct routine and supplemental enforcement services on SR 85 express lanes.

The locations of emergency refuge areas were listed previously on Table 6. All of the emergency refuge areas would be retained with this alternative.

Toll Infrastructure

The express lane facility would incorporate various toll infrastructure including toll gantries with transponder readers and high-speed digital cameras (49), directional and informational signage, dynamic message signs to communicate real-time toll rates to drivers (25), complete closed circuit television coverage of the entire express lanes corridor, and fiber optics linking the infrastructure to a centralized toll operations office. Toll equipment would meet Title 21 specification and national protocol, as well as interoperability with other toll facilities in California. Please see Exhibit 1A, displayed previously, for an illustration of the tolling infrastructure.

Trenching would be conducted along the outside edge of pavement for installation of conduits. The depth of trenching would be 3 to 5 feet below the roadway surface. Conduits would be jacked across the freeway to the median where needed to provide power and communication feeds to the new overhead signs and toll structures.

The project would install new overhead and barrier-mounted signs, including dynamic message signs. The overhead signs would be installed in the median on cantilever structures supported on piles.

In some locations the express lane signs would replace existing signs or be added to existing sign structures, but most would be at new locations along SR 85. The exact number and locations of these features will be determined during the project design phase in coordination with the toll system design.

Tolling Policies

A *Concept of Operations Report* will be prepared to address various tolling policies under which the express lanes will be operated. This report will provide preliminary information regarding the type of tolling, toll exemption or rate reduction for HOVs, maximum target volume to maintain speed and minimize congestion in the express lanes, method for determining toll amount, methods for toll collection and toll enforcement, penalty rates for toll violations, and provision of supplemental service patrol. The items listed below represent key policies which have been assumed for the SR 85 express lanes; however, they are subject to change pending further studies.

- The express lanes are anticipated to operate part-time during peak hours, Monday through Friday.
- It is anticipated that HOVs with two or more occupants (HOV2+) will be allowed to use the express lanes toll-free. Single-occupancy vehicles will be allowed to use the express lanes for a toll.
- Motorcycles will be allowed to travel in the express lanes toll-free and are not required to have a transponder.
- Exempted vehicles including emergency response vehicles, highway maintenance vehicles serving the express lanes facility, and CHP vehicles assigned to patrol the express lane facility will have toll-free access to the express lanes, by registering these vehicles as toll exempt in the License Plate Recognition system.
- Clean air vehicles with valid clean air vehicle decals will be able to use the express lanes for a toll discount, assumed to 15 percent.
- Tolling is anticipated to be dynamic pricing based on real-time traffic levels to ensure peak period speed of no less than 45 mph.

Additional studies will be performed to establish the operating policies and business rules and determine pricing structures and toll violation rates.

Toll Operations and Maintenance

The institutional arrangements for operation and maintenance of the express lanes will be consistent with those implemented by VTA for the express lane system in Santa Clara County.

Express Lanes Incident Responses

At this time, it is anticipated that Freeway Service Patrol will be contracted to provide incident response for the express lanes similar to the current arrangement in the HOV and general-purpose lanes. It is currently planned to have dedicated roving Freeway Service Patrol patrolling the express lanes during hours of peak congestion, to respond to incidents that might affect the express lanes including clearing of debris, towing disabled vehicles, and minor auto repairs.

Conceptual Engineering Plans

Conceptual cross sections for mainline segments and segments passing structures with restrictive widths are provided in Attachment 2.

Alignment plans for the transit lane alternatives are provided in Attachment 3 for the mainline segment from Prospect Road (PM 15.27) to just south of U.S. 101 in Mountain View (PM 23.70). Plan sheets are also provided for segments including transit stations at El Camino Real, Stevens Creek Boulevard, Saratoga Avenue and Bascom Avenue.

Right-of-Way Requirements

South of I-280, in segments 1 and 2 of the corridor, the project would be constructed entirely within the existing right-of-way.

North of I-280, in segment 3 of the corridor, the alignment plans provided in Attachment 3 indicate that the pedestrian overcrossing at The Dalles (PM 19.39) illustrated on Sheet 17, will need to be relocated. This relocation will likely require new right-of-way to the east of SR 85 if the pedestrian overcrossing is reconstructed at this location.

A potential right-of-way impact is illustrated on Sheet 14 in Attachment 3 at PM 20.37 where the right-side shoulder narrows to six feet. A Design Standards Decision Document will need to be prepared and approved by Caltrans Division of Design Chief to avoid acquiring right-of-way and relocating the adjacent sound wall at this location.

Transit Lane Stations

Stations are proposed along the Route 85 Transit Guideway at the following locations.

- Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard
- Bascom Avenue
- Saratoga Avenue
- Stevens Creek Boulevard
- SR 82/El Camino Real

These station locations are preliminary and representative of different right-of-way availability, mainline and median conditions, and interchange configurations. The locations of the stations proposed for proof of concept evaluation are illustrated on Figure 5.

The conceptual design options for these stations are presented later in this document following the discussion of engineering features for Scenario D, Part-time Shoulder Use.

SCENARIO D—PART-TIME SHOULDER USE (BUS ON SHOULDER)

Alternative 3-5 (Long Shoulder—Median) and Alternative 3-6 (Long Shoulder—Right Side)

These alternatives include utilizing the median shoulder (Alternative 3-5) or the right-side shoulder (Alternative 3-6) for bus on shoulder transit operations.

The Federal Highway Administration defines part-time shoulder use as a transportation system management and operation strategy for addressing congestion and reliability issues within the transportation system. There are many forms of part-time shoulder use or "shoulder running"; however, they all involve use of the left or right shoulders of an existing roadway for temporary travel during certain hours of the day. Part-time shoulder use has primarily been used in locations where there is recurring congestion due to lack of peak period capacity through the corridor.

Part-time shoulder use is primarily used on freeways. There are multiple examples of how highway agencies have used the shoulders of roadways to address congestion and reliability needs and to improve overall system performance. These options vary in terms of the location of the shoulder (left/right shoulder options) used, vehicle-use options [e.g., bus only, HOV only, all vehicles except trucks], operating schedule, and special speed controls. In all of these options, the use is "temporary" for part of the day, and the lane continues to operate as a refuge shoulder when not being used for these travel purposes.

Traffic Considerations

Peak period traffic volumes for three representative locations are reported in Table 9. The table indicates that traffic demand accommodated by the existing facility is highly directional, northbound in the morning and southbound in the afternoon/evening. Segment travel speed data further emphasizes the directional nature of peak period traffic.

Figure 6 illustrates a five-minute slice of traffic speeds along SR 85 at 7:30 a.m. The top portion of the graphic illustrates northbound speeds in the two general-purpose lanes and the adjacent HOV lane. In segment 2 of the corridor, from SR 87 to I-280, speeds drop below 35 mph, which indicates "significant congestion." Southbound during the same 5-minute slice of time, motorists travel at or above the speed limit of 65 mph.

Similar speed profiles exist for the afternoon peak hours. Figure 7 illustrates speeds during the 5:30 p.m. 5-minute slice of time.

More extensive analysis of existing traffic conditions and congestion is presented in the Traffic Study Report prepared for this SR 85 Transit Guideway Study.

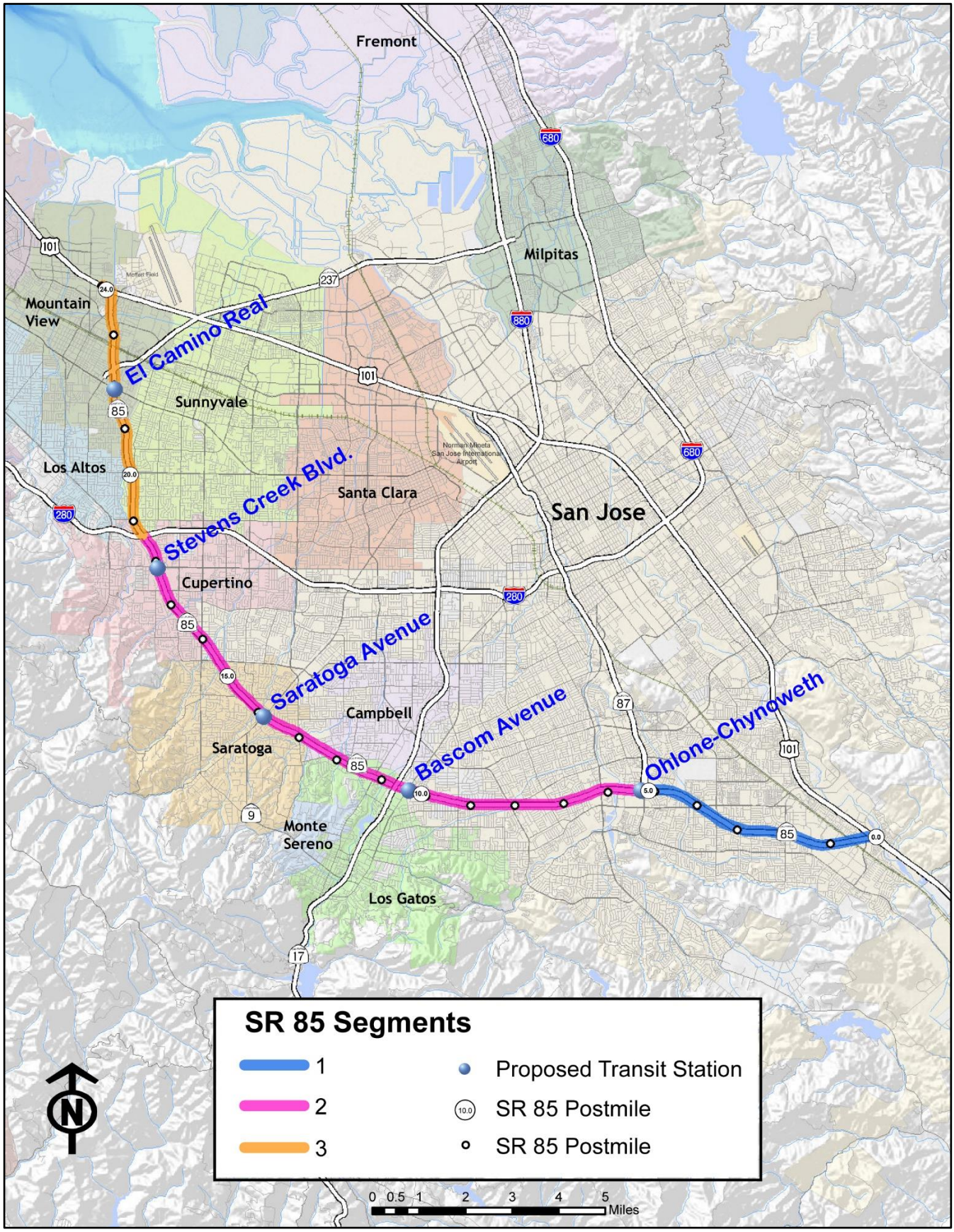


Figure 5 Transit Lane Station Locations

Table 9 State Route 85 Peak Period Hourly Traffic Volumes

	Northbound Throughput (vehicles/hour) at Location		
AM Peak Hour	❶	❷	❸
0600	1,871	2,824	5,309
0700	3,098	3,535	5,849
0800	4,612	3,961	5,162
0900	3,995	3,711	4,760
1000	4,154	3,638	4,542
PM Peak Hour	❶	❷	❸
1400	4,930	3,536	3,300
1500	4,737	3,553	3,634
1600	5,024	3,673	3,571
1700	5,634	4,101	3,868
1800	5,154	3,702	3,741
1900	4,043	2,860	2,933
Daily Total	**71,841**	**58,934**	**71,641**

	Southbound Throughput (vehicles/hour) at Location		
AM Peak Hour	❶	❷	❸
0600	963	936	1,170
0700	2,600	2,329	2,736
0800	3,445	2,824	3,077
0900	2,970	2,453	2,686
1000	2,597	2,182	2,427
PM Peak Hour	❶	❷	❸
1400	4,367	4,086	4,968
1500	5,985	4,504	4,476
1600	6,357	4,726	4,630
1700	6,177	4,710	4,749
1800	5,677	4,448	4,619
1900	4,405	3,992	4,735
Daily Total	**63,356**	**53,925**	**59,823**

Locations:

❶ Camden Avenue to Union Avenue

❷ Saratoga Avenue to De Anza Boulevard

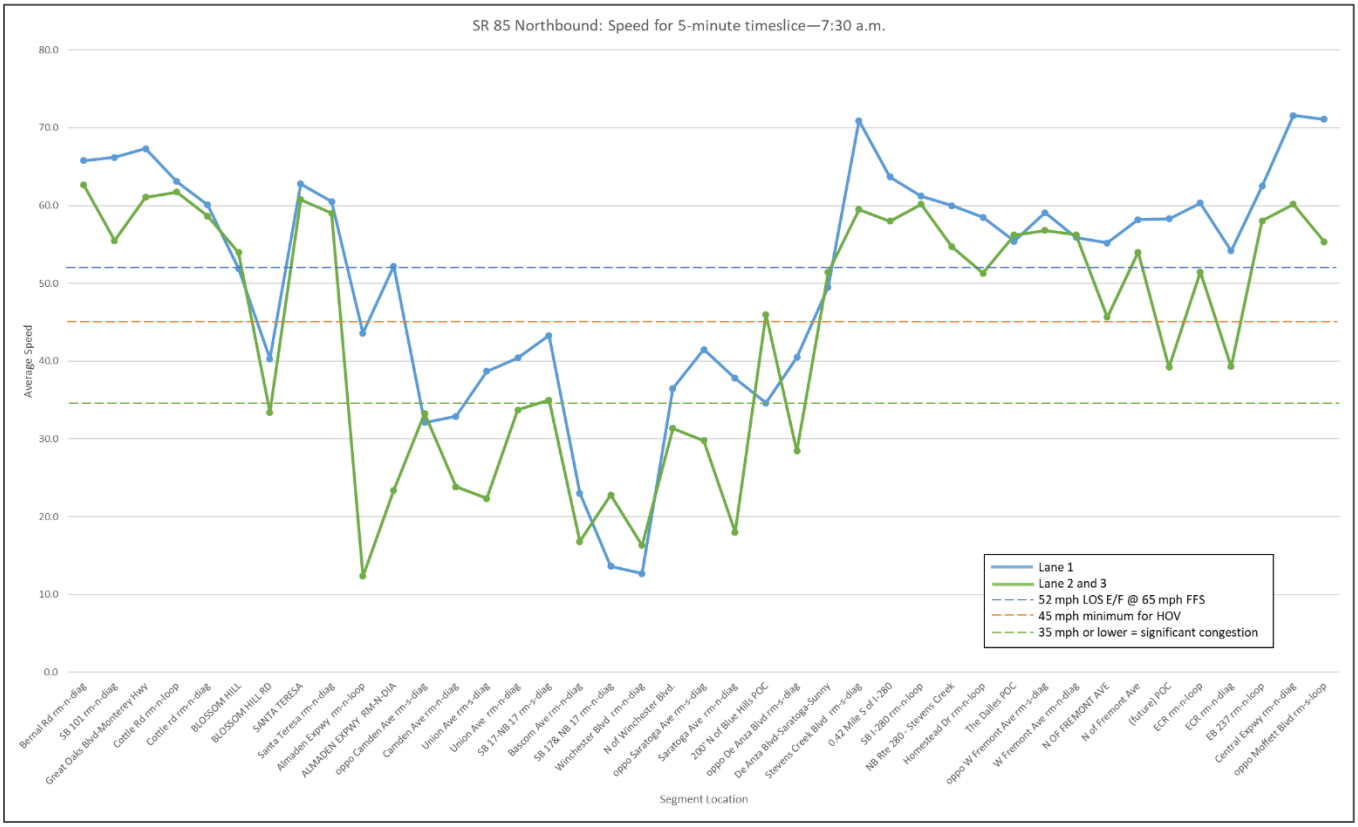
❸ Fremont Avenue to El Camino Real

Mainline Improvements

- Includes all elements of Alternative 1-2, HOV to Express Lane Conversion
  - Convert existing HOV lane in each direction from Bernal Road, near U.S. 101 in south San Jose to Moffett Boulevard, near U.S. 101 in Mountain View, a distance of 23.2 miles.
  - Provide continuous access to express lane from the adjacent general-purpose lanes.
  - Install toll infrastructure in median to support express lanes.
  - Reconstruct concrete median barrier south of Santa Teresa Boulevard and north of Stelling Road to accommodate toll gantries and dynamic message signs.
  - Widen paved median shoulder to 14 feet in both directions from Santa Teresa Boulevard to South Stelling Road (excepting structures) to provide continuous CHP enforcement area.
  - Widen right-side shoulders to meet Highway Design Manual standards (10 feet). Relocate drainage inlets as needed to the outside edge of shoulder.
  - Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing (optional improvement).
- For Alternative 3-5, the median shoulder is assumed to be paved with full depth AC or PCC to provide a 12-foot-wide part-time travel lane and a total shoulder width of 14 feet where space permits (from Santa Teresa Boulevard to South Stelling Road, excepting structures).
- For Alternative 3-6, the right-side shoulder is assumed to be paved with full depth AC or PCC to provide a 12-foot-wide part-time travel lane and a total width of 14 feet where space permits. In many to most cases, widening the right-side shoulders will involve widening the median shoulder with full depth PCC and relocating the lane markings and delineators. This will avoid the need for retaining the side slopes, reconstructing existing retaining walls and/or soundwalls.
- At structures, shoulders used by buses will be a minimum of 11.5 feet wide.

Interchange Improvements

Conversion of the SR 85 interchange at SR 82/El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration is a required improvement for these alternatives.



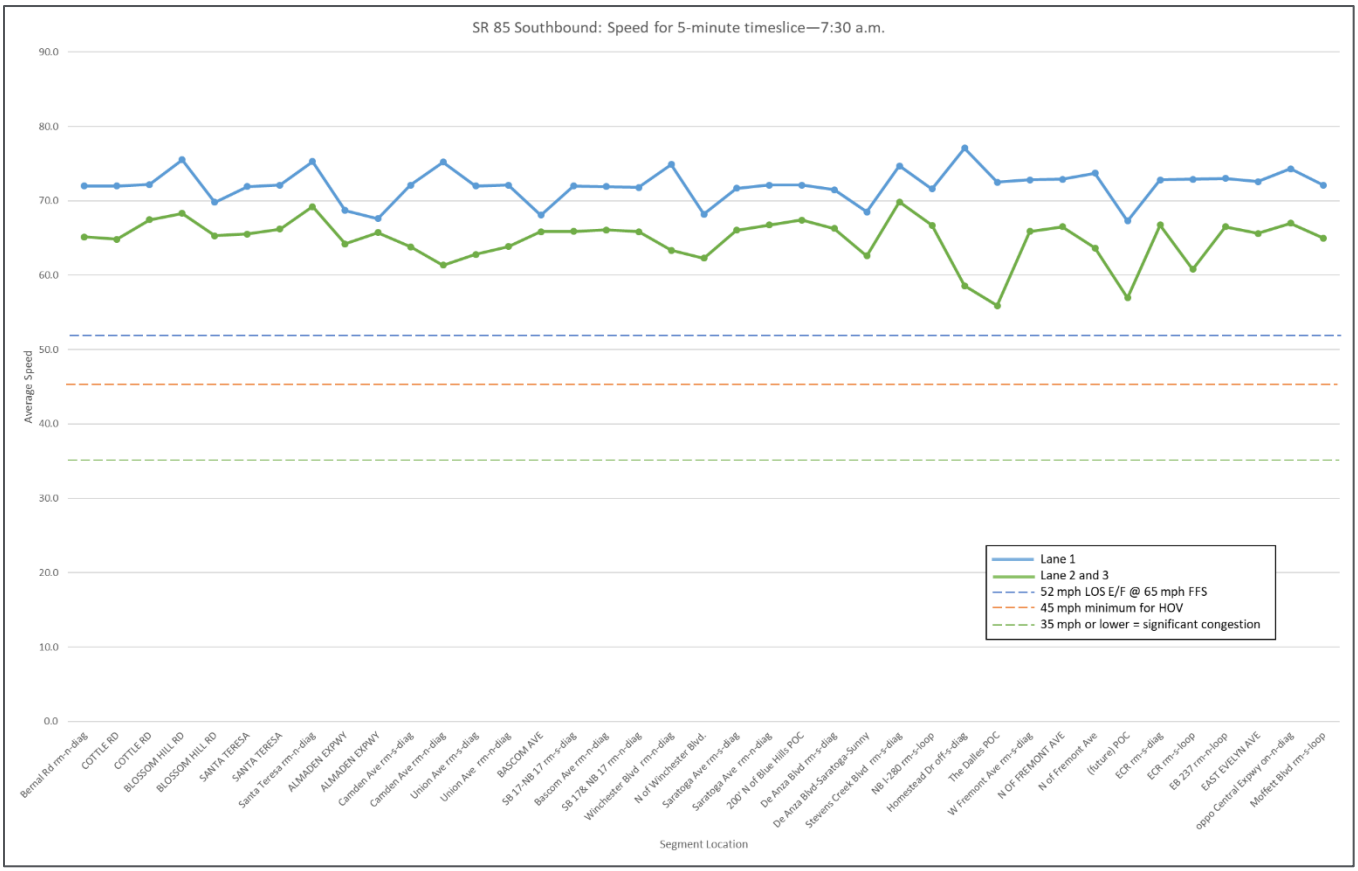
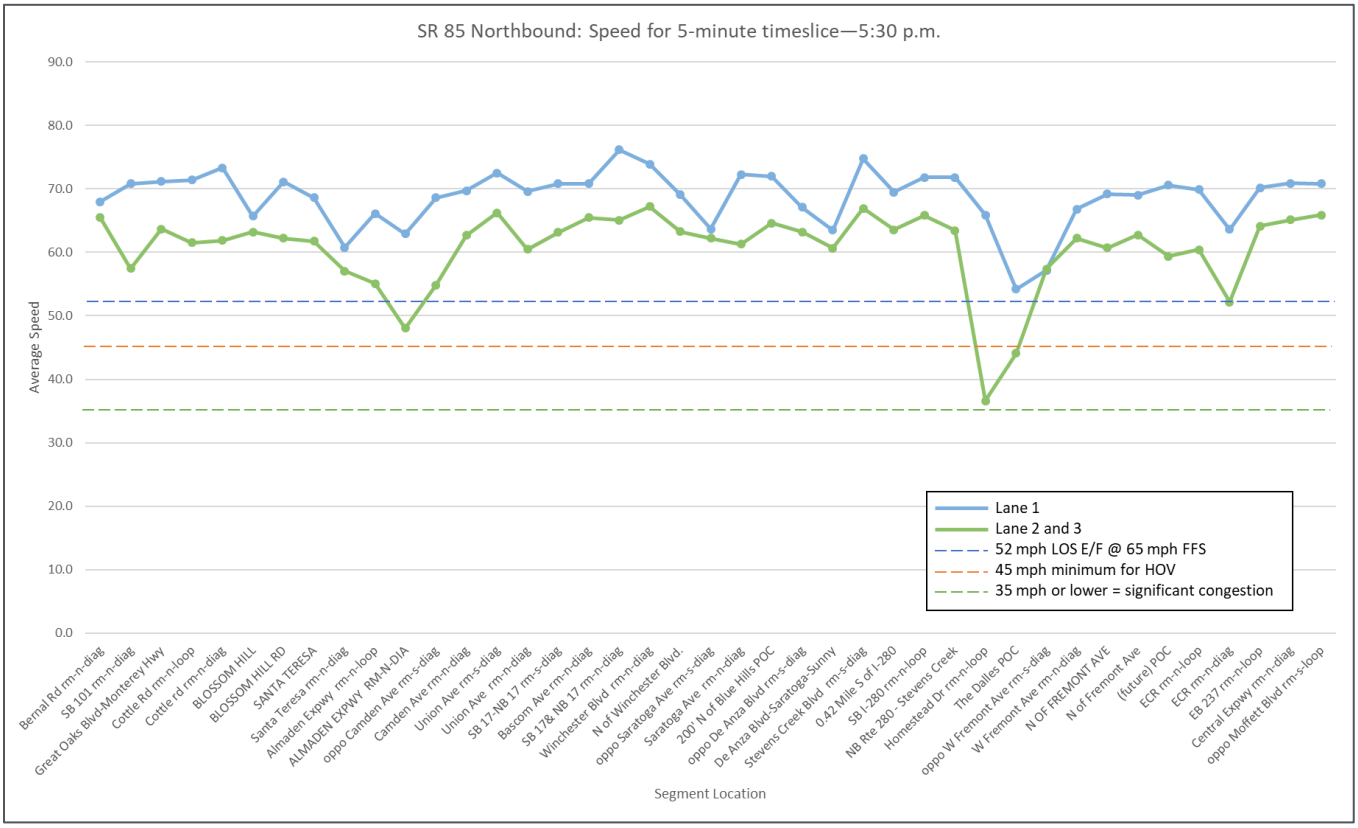


Figure 6 State Route 85 AM Peak Period 5-minute Timeslice



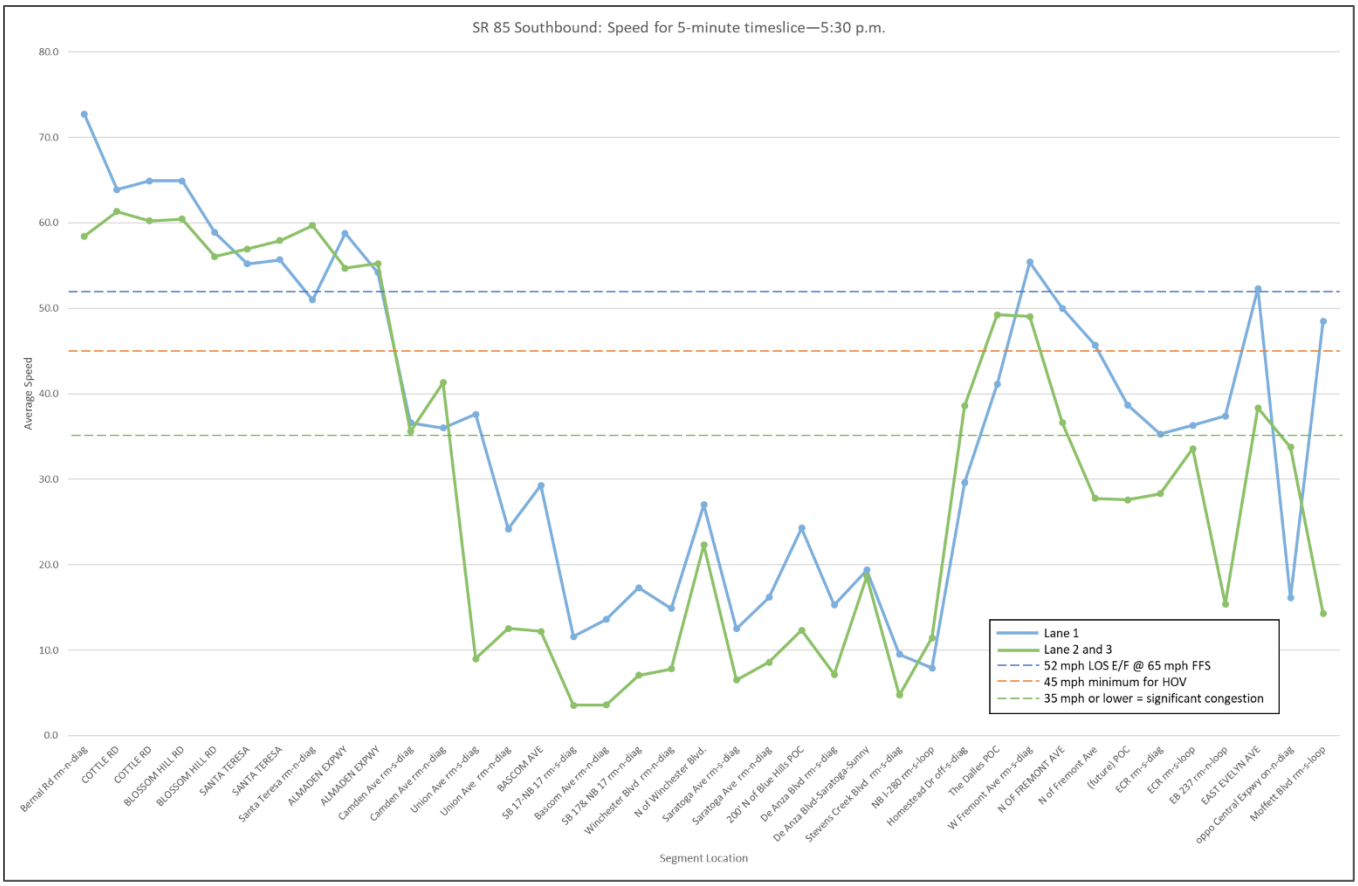


Figure 7 State Route 85 PM Peak Period 5-minute Timeslice

Local Street Improvements

No streets crossing under or over SR 85 would be reconstructed to accommodate the HOV to express lane conversion or bus on shoulder operations. Conversion of the SR 85 interchange at SR 82/El Camino Real from a Type L-10 to a Type L-2 will require reconstruction of the ramp terminal intersections, installation of traffic signals, removal of a portion of the raised median and landscaping, and pavement signing and striping to accommodate dual left-turn lanes to the northbound and southbound on-ramps. No widening of El Camino Real will be required.

Conversion of the HOV lane to an express lane would allow for improved enforcement, a reduction in the proportion of HOV2+ "cheaters," and improved managed use to achieve speeds of 45 mph or higher in the express lane.

The HOV to Express Lane Conversion element of these alternatives would not yield additional vehicle throughput, however. The HOV and general-purpose lanes each accommodate roughly 1,500 vehicles per hour per lane (vphpl) during peak hours in the peak direction. The capacity of the express lane at LOS C is 1,600 vphpl. While the volume of vehicles will likely remain unchanged, the speed of the vehicles using the express lane will likely increase, encouraging more SOV drivers to carpool and/or utilize commuter buses, if available.

With mainline traffic volumes expected to remain unchanged from no build conditions, no impacts to local streets would be expected.

Railroad Involvement

Six (6) railroad crossings over or under SR 85 occur within the project limits.

1. VTA light rail tracks (Guadalupe Corridor) under southbound SR 85 at PM 1.33.
2. VTA light rail tracks (Guadalupe Corridor) under northbound SR 85 at PM 5.27, just west of Santa Teresa Boulevard.
3. VTA light rail track under SR 85 adjacent to Winfred Boulevard at PM 5.59.
4. Union Pacific track over SR 85 adjacent to Winchester Boulevard at PM 10.98.
5. Caltrain Peninsula Commuter tracks under SR 85 adjacent to Evelyn Avenue at PM 22.63.
6. VTA light rail tracks under SR 85 adjacent to Central Expressway at PM 22.63.

None of these crossings would require bridge work to accommodate the proposed HOV to express lane conversion or bus on shoulder operations.

Structure Improvements

Including the Bernal Road and Moffett Boulevard undercrossings at the two ends of the corridor, there are 63 structures which could be affected by the build alternatives. One of these structures at Saratoga Avenue would require widening to accommodate a median station as a result of implementing bus on shoulder operations with Alternative 3-5. The replacement of embankments with retaining walls to accommodate a median station at Stevens Creek Boulevard would also be required for Alternative 3-5.

Drainage Improvements

Storm runoff is collected by inlets located along the outside edge of the right-side shoulders and in the center of the median. North of I-280, the right side-shoulders range in width from 4 to 10 feet. To meet the HDM standards for shoulder width, the AC paved shoulders would need to be widened, generally to 10 feet, and drainage inlets relocated to the outside edge of the shoulder. In the case of Alternative 3-6, the right-side shoulder will need to be repaved with full depth AC or PCC and widened to 14 feet, except at structures.

Utilities

The project area contains overhead electric and communications lines and underground electric, gas, sanitary sewer, water, reclaimed water, communications, and fiber optic lines. Utility providers in the project area are listed below by category.

- Gas and electric—PG&E
- Communications—AT&T, Comcast, Level 3, Verizon, Nextlink, and MCI
- Water—San Jose Water Company, Santa Clara Valley Water District, California Water Service Company, Great Oaks Water Company, City of Sunnyvale Water Division, and City of Mountain View Water Division
- Sanitary—City of San Jose, West Valley Sanitation District, City of Cupertino, and City of Mountain View.

The project would not require utility relocations. Utility impacts would be limited to the extension of casings (protective pipes or channels) for existing underground facilities whose casings do not extend through the right-of-way. All other existing utilities would be protected in place.

Express Lane Begin/End Transitions

The SR 85 express lanes would extend from U.S. 101 in south San Jose to U.S. 101 in Mountain View. The existing HOV direct-connector ramps at both ends of SR 85 would be converted to express lane connectors.

Bus on Shoulder Limits of Operation

Bus on shoulder operations will extend from Almaden Expressway to Moffett Boulevard.

Bus on Shoulder Access

Continuous access between the adjacent travel lanes and the shoulder is assumed.

Express Lane Buffer

No buffer is proposed between the express lane and the adjacent general-purpose lanes. A single, white-striped lane line would separate the lanes and continuous access between the lanes would be permitted.

California Highway Patrol Observation/Enforcement Areas and Emergency Refuge Areas

State-of-the-art toll infrastructure will be installed to reduce the need for CHP observation areas given the right-of-way constraints north of South Stelling Road.

Pending future agreements, it is anticipated that the CHP will be contracted to provide toll enforcement including express lane eligibility violations.

Inside median shoulders will be widened south of Stelling Road to Santa Teresa Boulevard to 14 feet in both directions to provide a continuous CHP enforcement area. In the case of Alternative 3-5, the median shoulder will need to be repaved with full depth AC or PCC. At structures such as bridges and undercrossings, existing shoulders will be maintained and structures will not be widened for this purpose.

Emergency refuge areas along the outside shoulders would be unaffected by the part-time shoulder operations.

Toll Infrastructure

The express lane facility would incorporate various toll infrastructure including toll gantries with transponder readers and high-speed digital cameras (49), directional and informational signage, dynamic message signs to communicate real-time toll rates to drivers (25), complete closed circuit television coverage of the entire express lanes corridor, and fiber optics linking the infrastructure to a centralized toll operations office. Toll equipment would meet Title 21 specification and national protocol, as well as interoperability with other toll facilities in California.

The Metropolitan Transportation Commission has prepared a simple fact sheet to further explain toll infrastructure components. This fact sheet is reproduced in whole as Exhibit 1A along with photographs of express lane construction work along I-680 in Walnut Creek and Concord.

The Operations Center mentioned in Exhibit 1A is assumed to be funded by a separate project and not a component of cost for the Route 85 Transit Guideway Project.

Tolling Policies

A *Concept of Operations Report* will be prepared to address various tolling policies under which the express lanes will be operated. This report will provide preliminary information regarding the type of tolling, toll exemption or rate reduction for HOVs, maximum target volume to maintain speed and minimize congestion in the express lanes, method for determining toll amount, methods for toll collection and toll enforcement, penalty rates for toll violations, and provision of supplemental service patrol. The items listed below represent key policies which have been assumed for the SR 85 express lanes; however, they are subject to change pending further studies.

- The express lanes are anticipated to operate part-time during peak hours, Monday through Friday.
- It is anticipated that HOVs with two or more occupants (HOV2+) will be allowed to use the express lanes toll-free. Single-occupancy vehicles will be allowed to use the express lanes for a toll.
- Motorcycles will be allowed to travel in the express lanes toll-free and are not required to have a transponder.
- Exempted vehicles including emergency response vehicles, highway maintenance vehicles serving the express lanes facility, and CHP vehicles assigned to patrol the express lane facility will have toll-free access to the express lanes, by registering these vehicles as toll exempt in the License Plate Recognition system.
- Clean air vehicles with valid clean air vehicle decals will be able to use the express lanes for a toll discount, assumed to 15 percent.
- Tolling is anticipated to be dynamic pricing based on real-time traffic levels to ensure peak period speed of no less than 45 mph.

Additional studies will be performed to establish the operating policies and business rules and determine pricing structures and toll violation rates.

Toll Operations and Maintenance

The institutional arrangements for operation and maintenance of the express lanes will be consistent with those implemented by VTA for the express lane system in Santa Clara County.

Express Lanes Incident Responses

At this time, it is anticipated that Freeway Service Patrol will be contracted to provide incident response for the express lanes similar to the current arrangement in the HOV and general-purpose lanes. It is currently planned to have dedicated roving Freeway Service Patrol patrolling the express lanes during hours of peak congestion, to respond to incidents that might affect the express lanes including clearing of debris, towing disabled vehicles, and minor auto repairs.

Conceptual Engineering Plans

Geometric cross sections for mainline segments and segments passing structures with restrictive widths are provided in Attachment 2.

Alignment plans for bus-on-shoulder alternatives are not provided in Attachment 3, except for the median crossover station option at El Camino Real for Alternative 3-5.

Right-of-Way Requirements

South of I-280, in segments 1 and 2 of the corridor, the project would be constructed entirely within the existing right-of-way.

North of I-280, in segment 3 of the corridor, the project would also be constructed within the existing right-of-way and the pedestrian overcrossing at The Dalles (PM 19.39), would not need to be relocated.

Bus on Shoulder Stations

Stations are proposed along the Route 85 Transit Guideway at the following locations.

- Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard

- Bascom Avenue
- Saratoga Avenue
- Stevens Creek Boulevard
- SR 82/El Camino Real

These station locations are preliminary and representative of different right-of-way availability, mainline and median conditions, and interchange configurations. The locations of the stations proposed for proof of concept evaluation were previously illustrated on Figure 5.

The conceptual design options for these stations are the same or similar to those proposed for the Scenario C, Freeway Widening with Transit Stations alternatives and are presented in the following section of this document.

Stations

Transit stations are proposed for the transit lane alternatives (3-1, 3-2, 3-3, and 3-4) and the bus on shoulder alternatives (3-3, 3-5, and 3-6). Alternative 3-3 is a hybrid alternative which could include dedicated transit lanes south of I-280 and bus on shoulder use north of I-280.

In all cases, the stations are proposed for the following locations for the purpose of this alternatives analysis investigation.

- Ohlone-Chynoweth Light Rail Station at Santa Teresa Boulevard
- Bascom Avenue
- Saratoga Avenue
- Stevens Creek Boulevard
- El Camino Real

Alternatives featuring left-side running in Lane 1 or the shoulder adjacent to lane 1 situate the station platform(s) in the median. Alternatives featuring right-side running in lane 4 or the shoulder adjacent to lane 3 situate the station platforms to the right of the transit lane or shoulder.

Right-side running alternatives could additionally or alternatively provide bus stops along on-ramps or off-ramps near the ramp terminal intersections with cross streets. The flexible routing capabilities of bus service also allow these transit vehicles to deviate from the freeway corridor altogether, to access nearby (but off-line) transit centers.

Design options are presented below for each of the five stations proposed to support the SR 85 Transit Guideway service.

The Concept of Operations Report, prepared by CDM Smith, provides additional insights regarding which types of transit services are most compatible with the different types of transit stations that are described below.

OHLONE-CHYNOWETH

State Route 85 buses serving the Ohlone-Chynoweth LRT is one example of an off-line transit station. All of the alternatives addressed by this assessment of engineering features assume that transit service provided by the Valley Transportation Authority will begin/end or stop off-line at this existing station. Access to SR 85 will be afforded by the on-ramp to northbound SR 85 and the off-ramp from southbound SR 85 at Santa Teresa Boulevard.

The Ohlone-Chynoweth station at Santa Teresa Boulevard serves the Guadalupe Corridor LRT line, the Almaden LRT spur line, and VTA bus routes 13 and 102. The adjacent park-and-ride lots provide 549 parking spaces. Figure 8 illustrates the bus route ingress and egress to this station from and returning to SR 85.

No construction is assumed at the Ohlone-Chynoweth LRT station to accommodate SR 85 bus service other than bus stop signage and information displays. The park-and-ride lots could become oversubscribed by the addition of SR 85 bus service, however. Construction of a parking structure or additional right-of-way acquisition for surface parking is not included in the scope of project definition.

No other design options have been investigated for this location.

BASCOM AVENUE

South Bascom Avenue is the next proposed station location, 5.0 miles north of the Ohlone-Chynoweth Station. The Good Samaritan Hospital complex is immediately adjacent along with the Los Gatos “North 40” specific plan development parcels. The freeway median is 66 to 68 feet wide at this location including the paved shoulders adjacent to the mainline travel lanes. South Bascom Avenue crosses over SR 85, and the arterial street’s name changes to Los Gatos Boulevard south of the freeway. VTA bus routes 49 and 61 operate along this road with Route 49 stopping both north and south of SR 85.

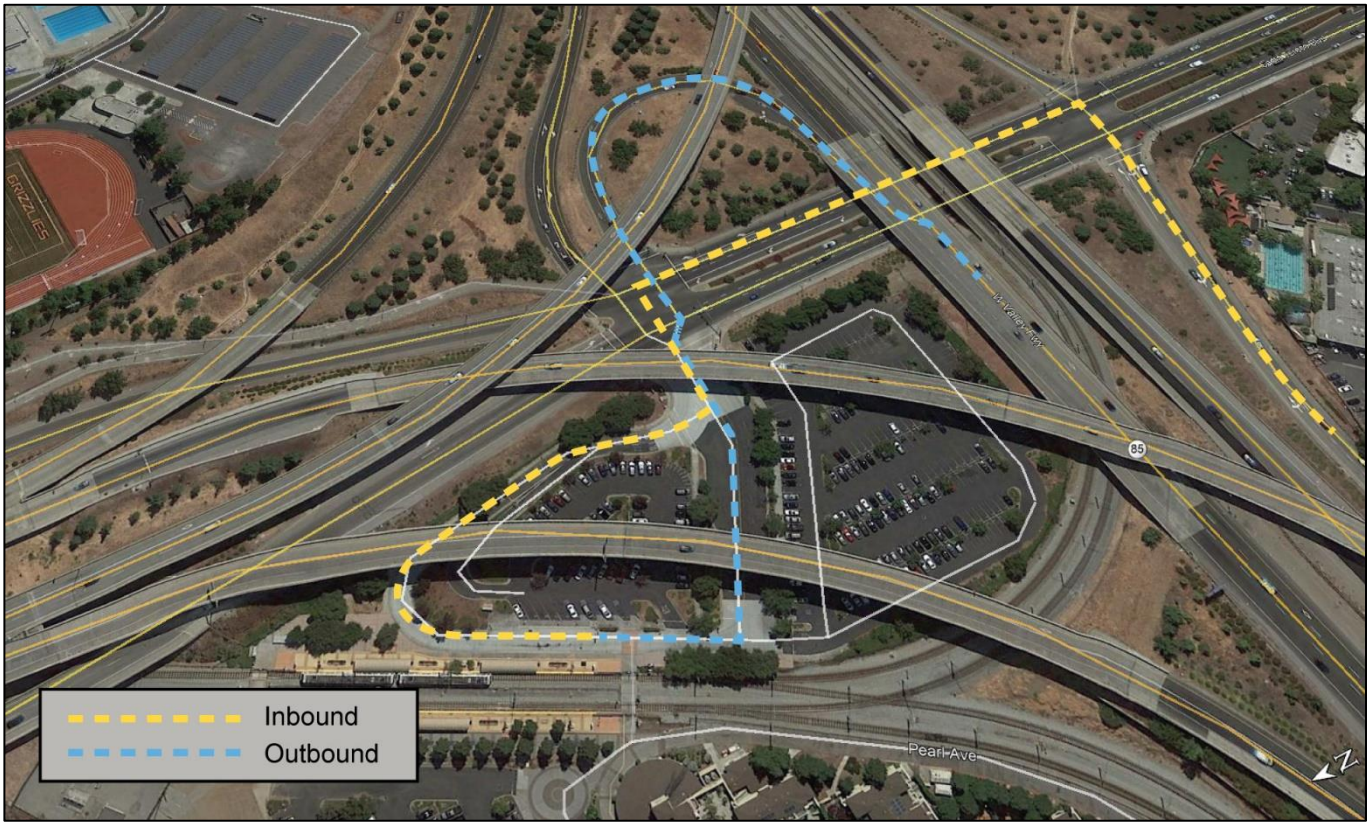


Figure 8 Bus Routing between Ohlone-Chynoweth Station and State Route 85

Station design options for the Bascom Avenue location include:

- Median crossover platform
- Median split platforms
- Side platforms
- On-ramp/off-ramp bus stops.

The median crossover platform option is discussed below. The other options will be discussed for the Saratoga Avenue Station and the Stevens Creek Boulevard station.

The **median crossover platform** option is modeled on the Minneapolis-Saint Paul Twin Cities Metro station on I-35W at 46th Street. The station is located between the northbound and southbound lanes of I-35W, which allows buses to pick up and drop off customers without leaving the freeway. Customers can board express or BRT buses on the freeway level or transfer to local buses on the 46th Street bridge, which crosses over I-35W. There are two stairway and elevator towers, one on each side of 46th Street, that provide movement between the upper-level bridge and lower-level freeway.

Freeway buses crossover from one side of the median platform to the other to permit boarding from the right side of the bus. Gates and traffic signals control movements of buses passing through the crossover maneuver.

Photographs of the I-35W/46th Street Station are provided as Exhibit 4. An aerial photograph of a median crossover platform station at this location is presented as Figure 9.

Geometric cross sections for several of the design options for a transit station at Bascom Avenue are presented as Figure 10.

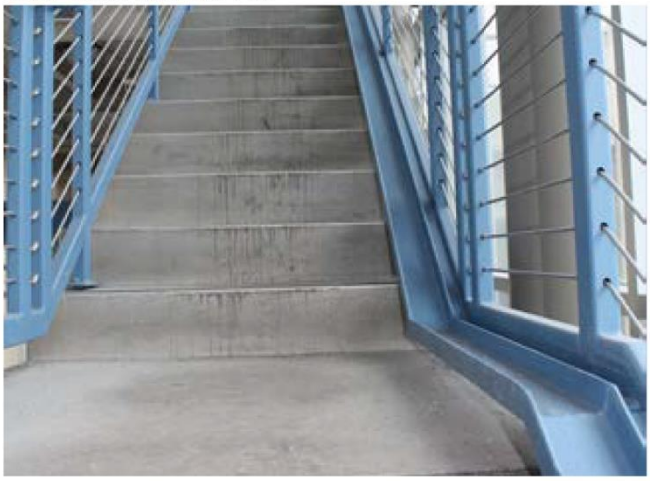
Exhibit 4. I-35W/46th Street Bus Rapid Transit Station in Minneapolis, Minnesota

46th: Existing BRT Station

46th: Entrance to BRT Station

46th: Lower level of BRT Station

46th: Stairs and Bike Rail



46th: Center Platform at BRT Station

46th: Real-time Information

Source: *Orange Line Bus Rapid Transit Existing Conditions Report,* Metro Transit, December 2013

Figure 9 Aerial View of Median Crossover Platform Station at I-35W/46th Street

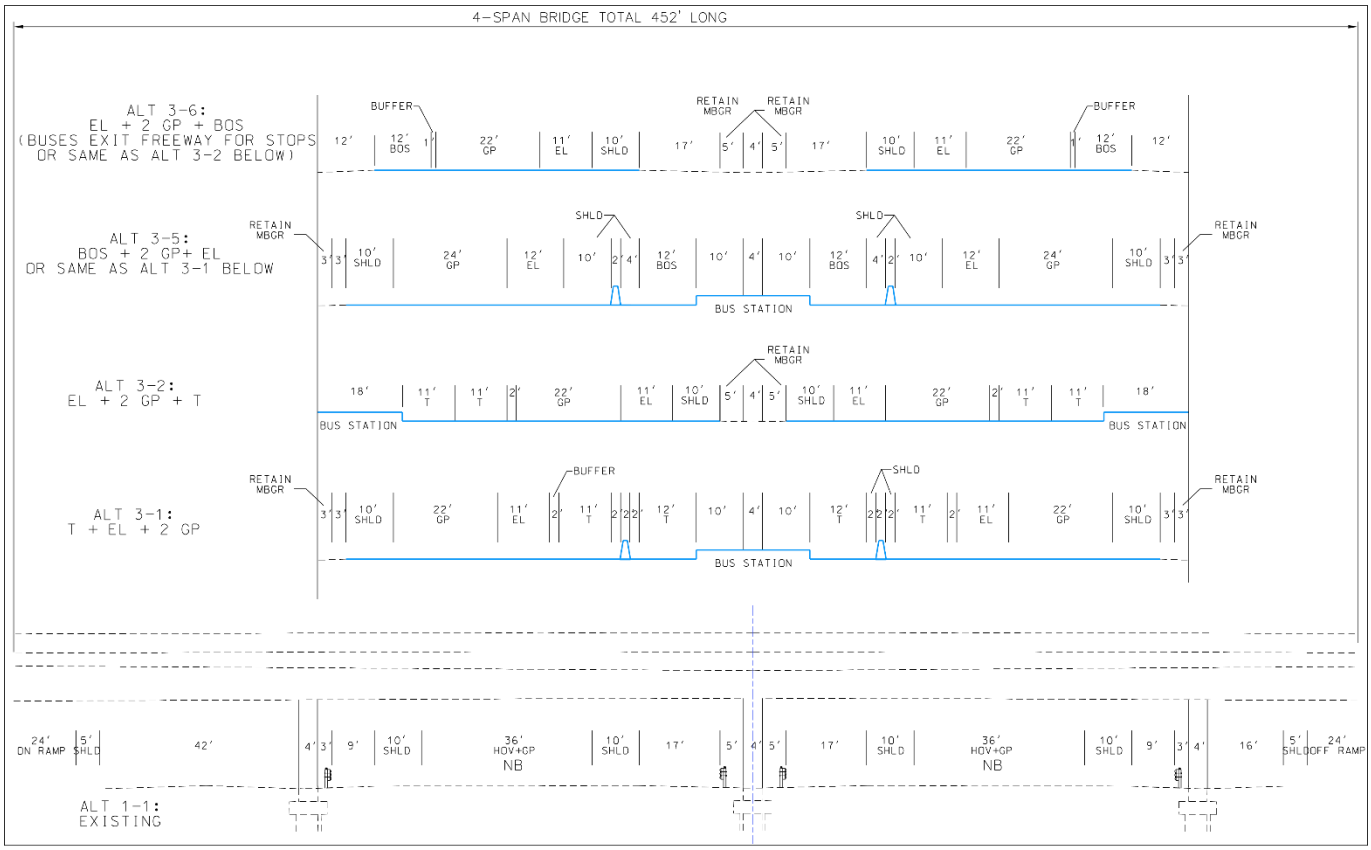


Figure 10 Bascom Avenue Transit Station Geometric Cross Sections

SARATOGA AVENUE

Saratoga Avenue is the next proposed station location, situated 3.5 miles north of South Bascom Avenue. Saratoga Avenue crosses under SR 85 with two through lanes, dual left-turn lanes, a bicycle lane and sidewalk in each direction. The twin SR 85 bridges crossing Saratoga Avenue are each 190 feet long on two spans and are each 60 feet wide. The bridges are box girders in which the main beams comprise girders in the shape of a hollow box composed of prestressed concrete.

The twin bridges are separated by a gap that is 22 feet wide. The gap would be filled by constructing a new box girder bridge between the two existing bridges. Station design options for the Saratoga Avenue location include:

- Median crossover platform
- Median split platforms
- Side platforms
- On-ramp/off-ramp bus stops.

A **median crossover platform for part-time shoulder** use is discussed below.

Exhibit 4 and Figure 9, presented previously, illustrate a median crossover platform designed for two-way, all-day use. Separate lanes for buses which do not stop at the station lay astride the station area in Lane 1 of the four travel lanes, in both directions.

A variation of the above would address the needs of Alternative 3-5, Bus on Median Shoulder. With part-time shoulder use, buses would utilize the shoulder adjacent to Lane 1 (the express lane) for northbound travel during the morning peak hours and southbound travel during the afternoon and early evening peak hours. During off-peak hours and in the off-peak direction of travel, buses would use express lanes or general-purpose lanes which are uncongested.

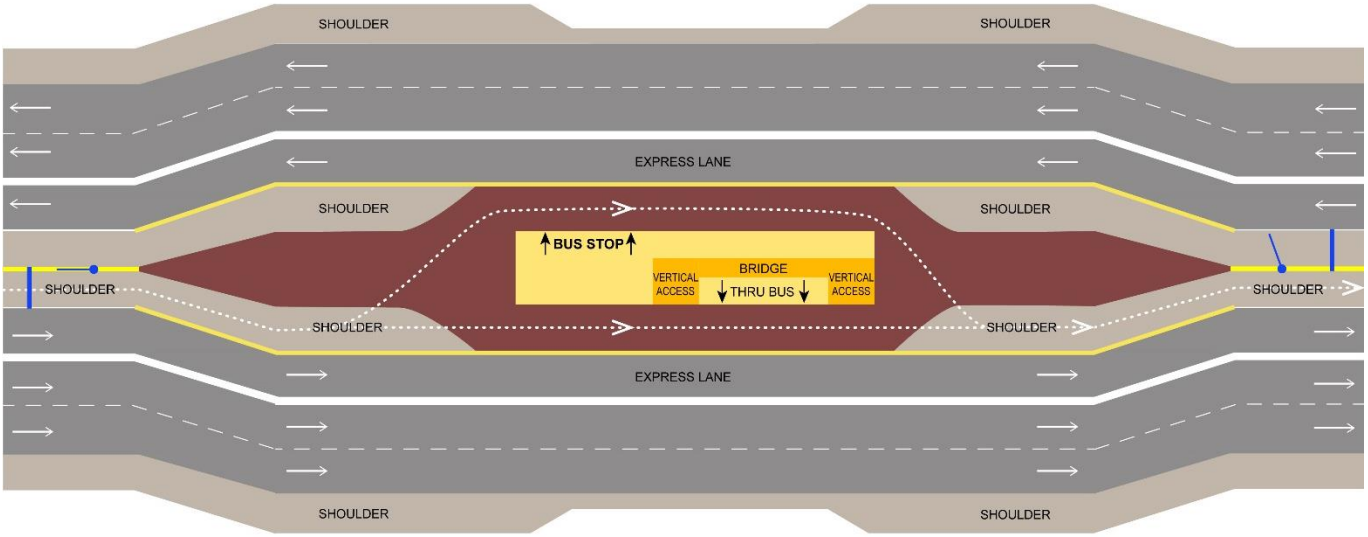
Figure 11 illustrates the movement of buses passing through a median crossover platform station being utilized for part-time shoulder use. The Santa Clara Valley Transportation Authority buses stopping at the station would cross from the right side of the platform to the left side of the platform so that customers can board from the right side of the buses.

Figure 11 Aerial View of Median Crossover Platform Station for Part-time Shoulder Use at I-35W/46th Street

Commuter shuttle buses which do not stop at the station would continue straight along the right side of the platform without stopping. Figure 12 illustrates the directionality of the bus flows during the AM and PM peak periods.

During off-peak times and/or directions, VTA buses would utilize bus stops located along the off-ramps or on-ramps at Saratoga Avenue.

AM Peak Direction Only—Reversible



PM Peak Direction Only—Reversible

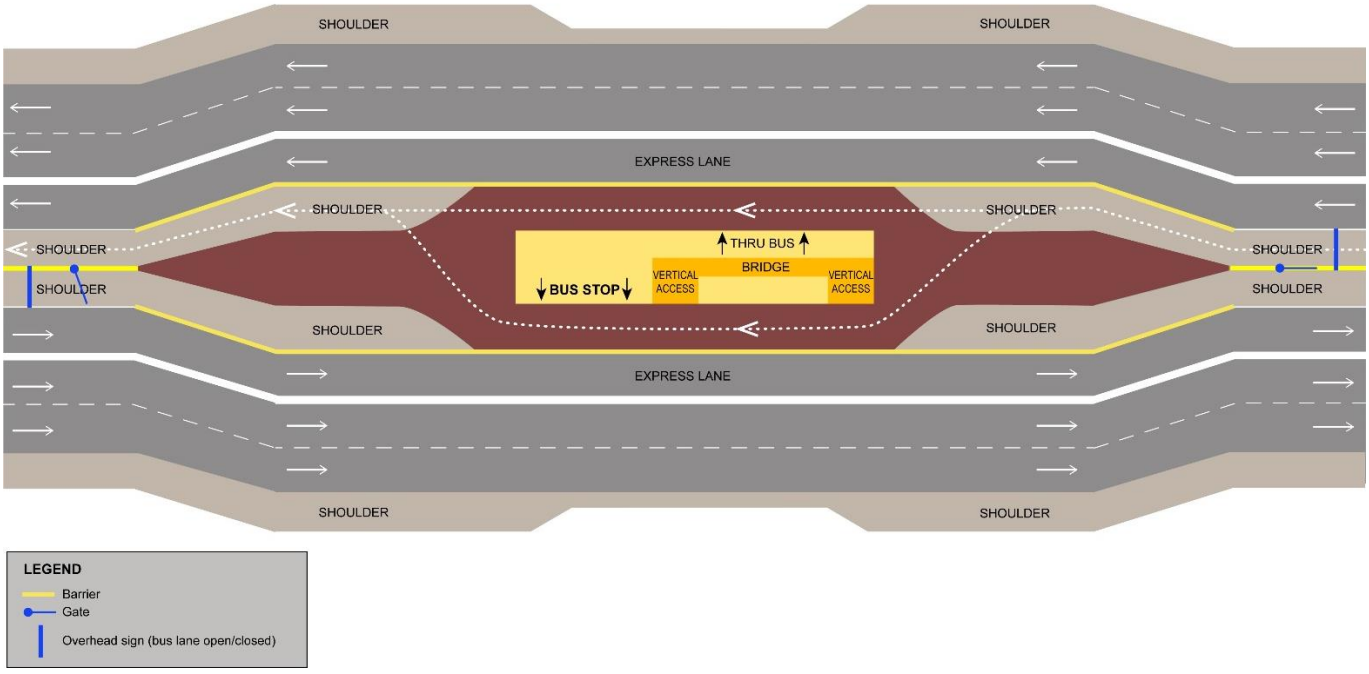


Figure 12 Conceptual View of Median Crossover Platform Station for Part-time Shoulder Use during Peak Periods

Figure 13 illustrates a variety of geometric cross sections for a potential transit station at Saratoga Avenue.

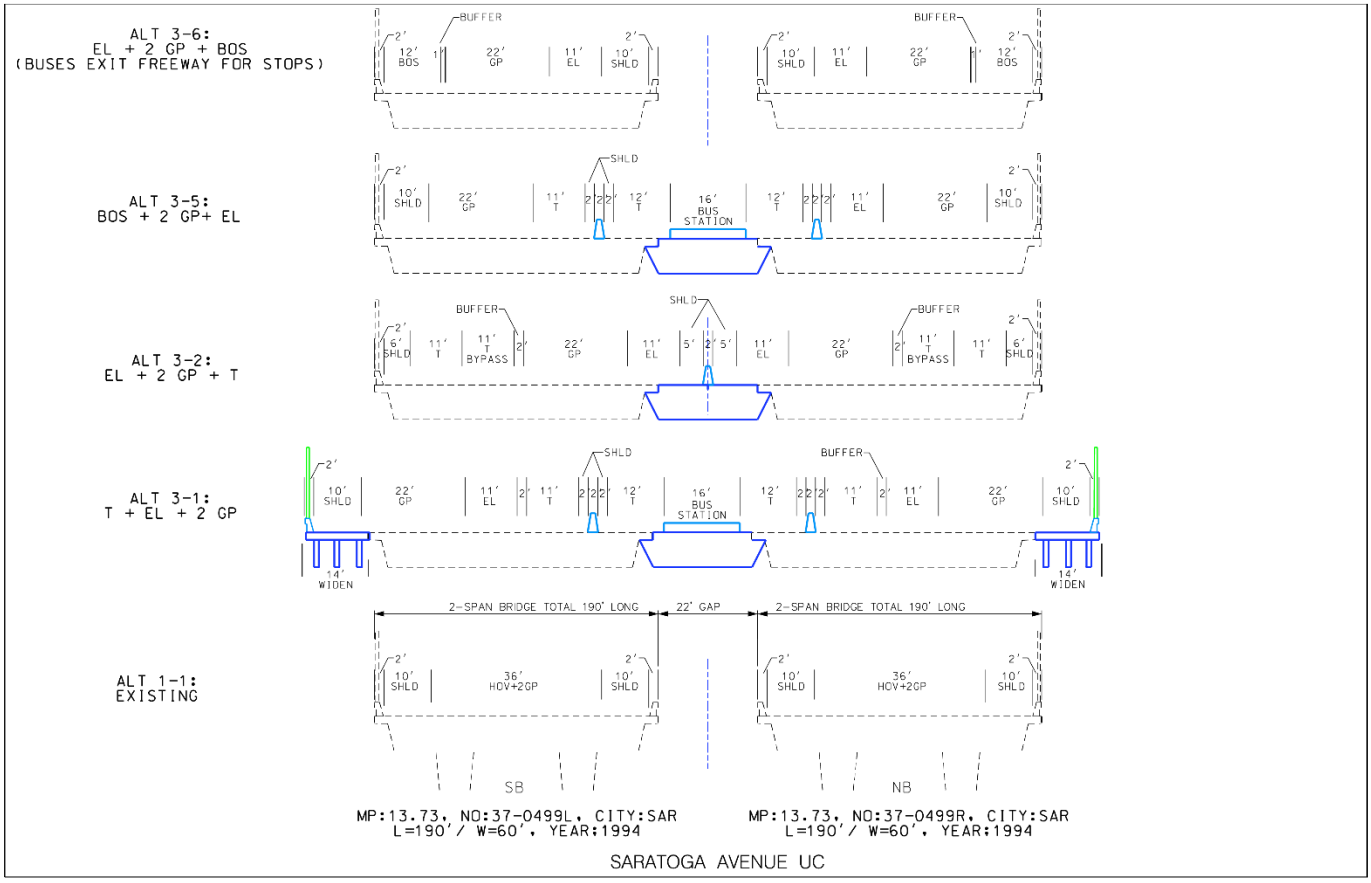


Figure 13 Saratoga Avenue Transit Station Geometric Cross Sections

STEVENS CREEK BOULEVARD

Whereas the median including inside shoulders is 44 feet wide at Saratoga Avenue, it begins to narrow north of South Stelling Road opposite Kenmore Court (PM 16.85). At Stevens Creek Boulevard, the median is approximately 24 feet wide including the paved shoulders and Type 60 concrete barrier. Four travel lanes lay astride the median in both directions.

Figure 14 illustrates a variety of cross sections for accommodating a bus station at this location. These include:

- Median crossover platform
- Side platforms
- On-ramp/off-ramp bus stops.

Figure 15 illustrates potential cross sections for a median split platform station option that is discussed below.

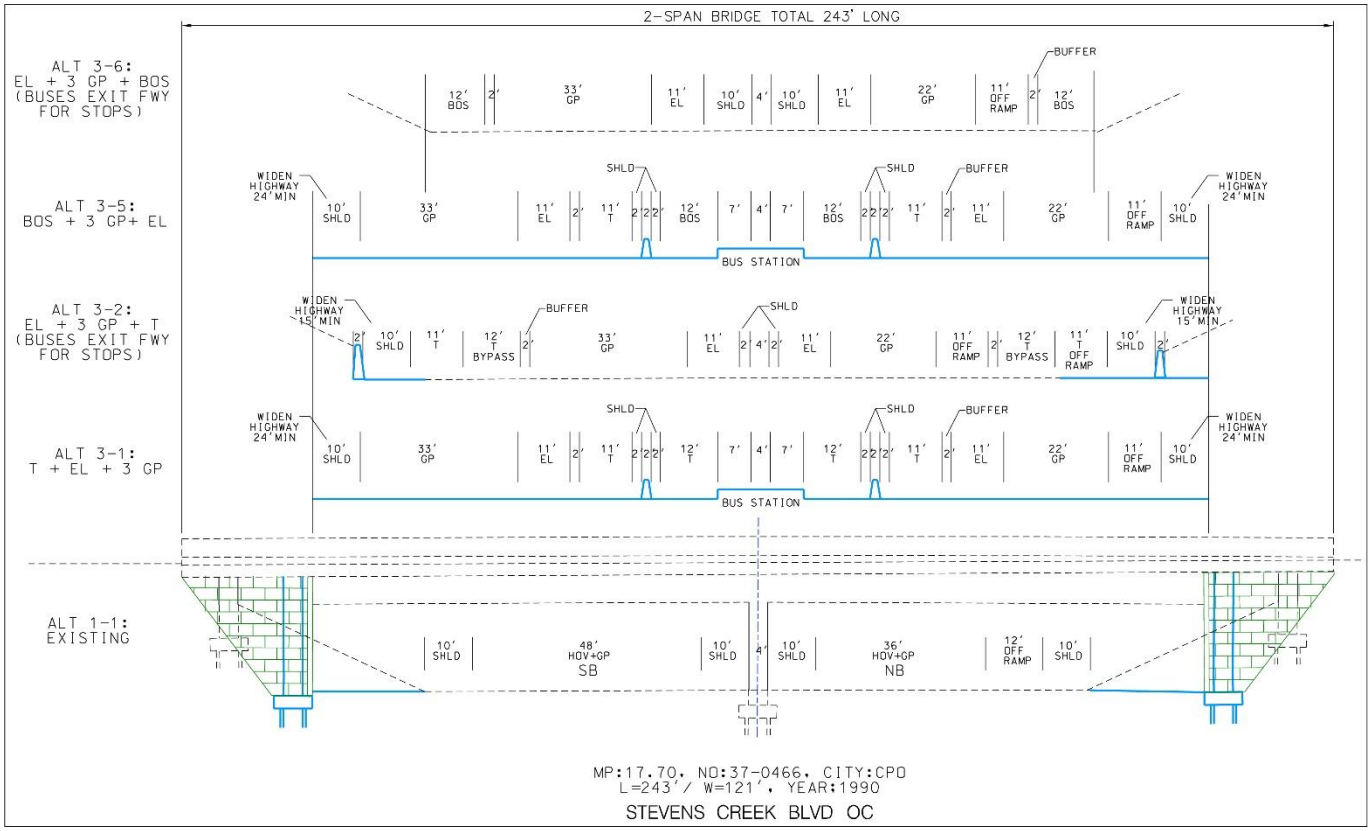


Figure 14 Stevens Creek Boulevard Transit Station Geometric Cross Sections

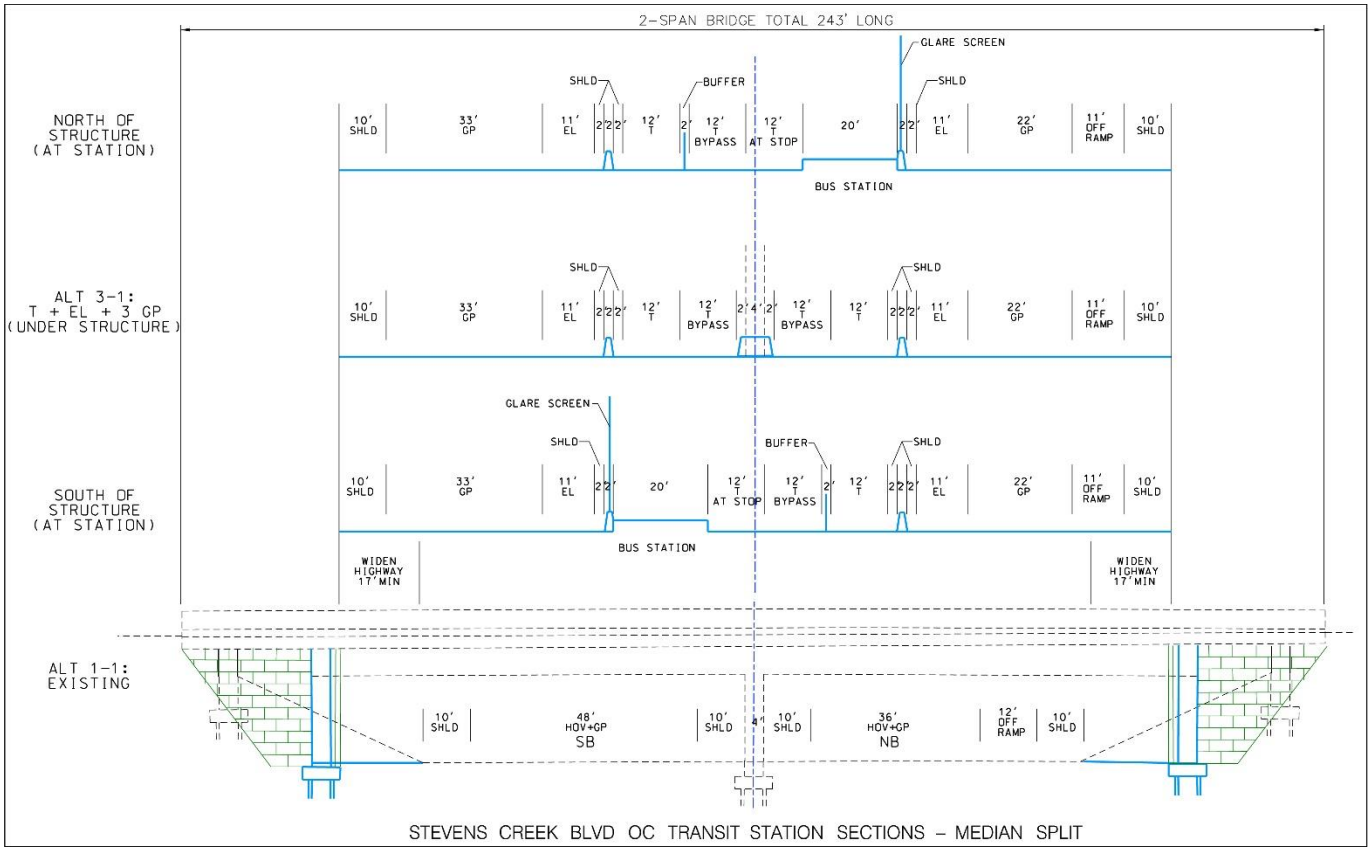
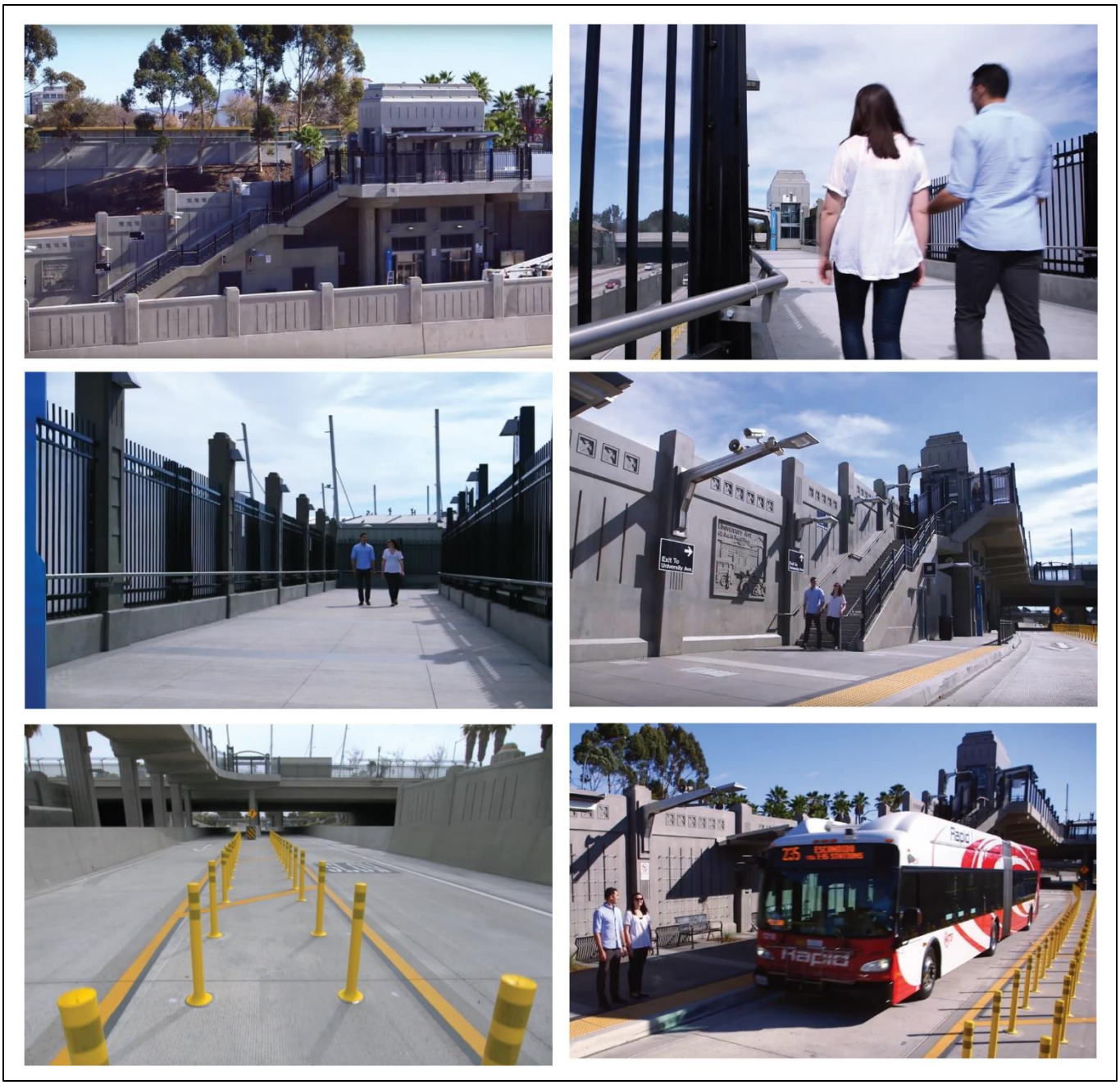


Figure 15 Median Split Platform Geometric Cross Sections

The **median split platforms option** is modeled on the San Diego Metropolitan Transit System (MTS) Bus Rapid Transit Stations on I-15 at University Avenue and at El Cajon Boulevard. These stations are approximately 0.4 mile apart. Both stations feature a bus plaza serving local buses at street level and freeway level split boarding platforms for passengers transferring to/from bus rapid transit vehicles. Each platform provides a stairway and elevator tower for movement between the upper-level bridge and lower-level freeway.

Photographs of these stations are provided as Exhibit 5. An aerial photograph of the split platform station at this location is presented as Figure 16.

Exhibit 5 San Diego MTS Bus Rapid Transit Stations: I-15 at University Avenue and at El Cajon Boulevard



Source: *How to Use Centerline Rapid Transit Stations,* San Diego MTS, March 12, 2018

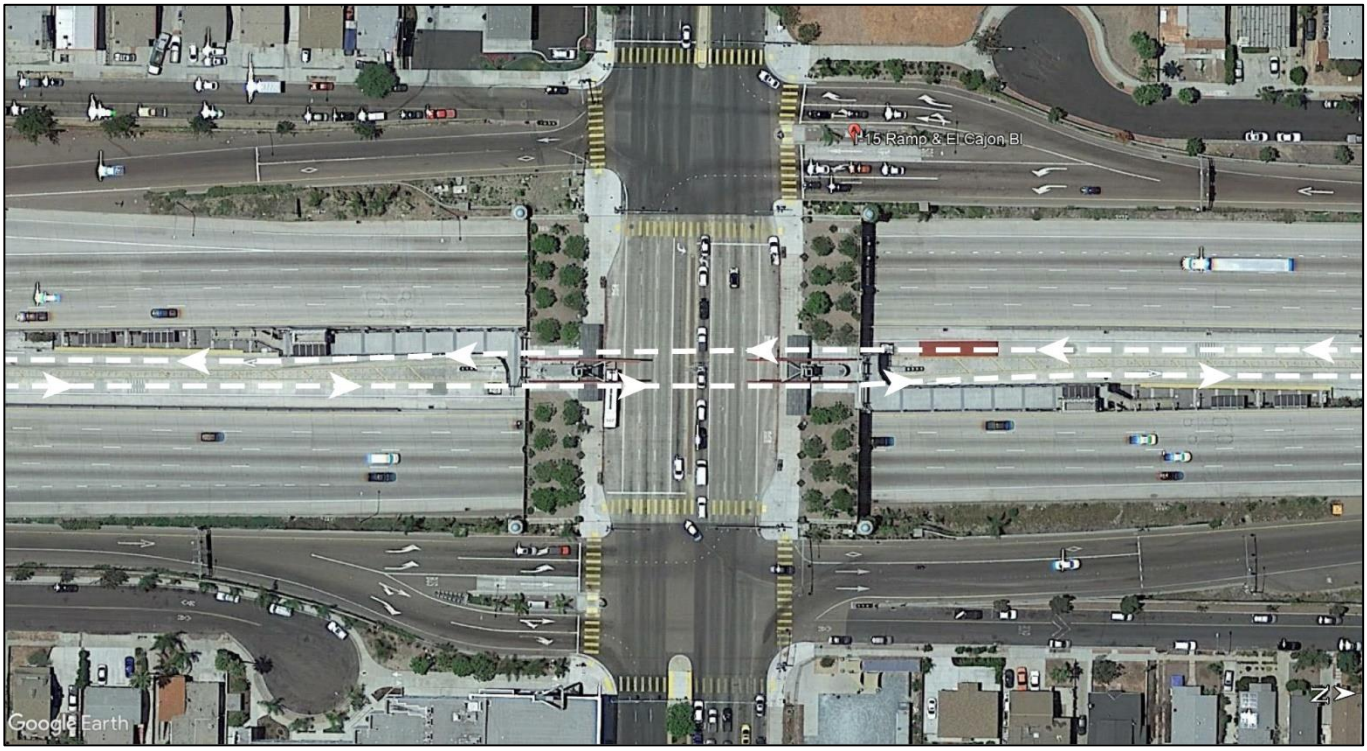


Figure 16 Aerial View of Split Platform Station at I-15 and El Cajon Boulevard

State Route 85 freeway buses will be able to stop at the far side platform or, in the case of commuter shuttles, use a bypass lane to avoid VTA buses which stop to pick up or discharge riders. In both cases, the speed limit passing through the station will be 25 mph due to the shift of the entering vs exiting lane alignments.

The width of the median required to accommodate this station design option is 60 feet as indicated on Figure 15. The width of the median required to accommodate the crossover median station, including the two transit lanes which bypass the station altogether, is 72 feet as depicted on Figure 14. The tradeoff between the two designs is the speed afforded to the commuter shuttle buses.

In both cases, the northbound and southbound freeway travel lanes will need to be spread to accommodate the transit station, as the median is only 24 feet wide at this location.

EL CAMINO REAL (SR 82)

El Camino Real is located four miles north of Stevens Creek Boulevard along SR 85. This state route crosses above SR 85 as a six-lane principal arterial. A four-quadrant cloverleaf (Type L-10) interchange connects the two roadways.

The median along SR 85 is 20 feet wide passing under SR 85, measured from the inside edges of the mainline PCC pavement. The cloverleaf ramps limit the width of the outside shoulders to six feet. To provide adequate width for a median station, the Type L-10 interchange will need to be reconfigured as a Type L-2 spread diamond interchange. The right side running transit lane (Alternative 3-2) would also require this same reconfiguration of the interchange.

Station design options for El Camino Real include:

- Median overpass platforms
- Median crossover platform
- Median split platforms
- Side platforms
- On-ramp/off-ramp bus stops.

These options are discussed below.

A **median overpass station** design could accompany Alternative 3-1, Long Transit Lane (Median Adjacent Lane). As envisioned for El Camino Real, northbound and southbound SR 85 would each provide a transit lane occupying the number 1 lane position, an express lane as the number 2 lane, and two general purpose lanes in the numbers 3 and 4 positions. Between the two transit lanes, a one-way reversible ramp would be constructed between the freeway median and the El Camino Real bridge crossing over SR 85. Far side bus stop platforms would be constructed at the top of the ramps adjacent to El Camino Real. The bus stop boarding platforms would cantilever over the transit lanes below. A traffic signal would be installed along El Camino Real where the VTA buses cross, northbound in the morning and southbound in the afternoon/early evening. The fourth lane (per direction) which currently exists on the bridge connecting the cloverleaf ramps would be repurposed as a bus stopping lane for VTA buses operating along El Camino Real (SR 82). The ramps up and down to the overcrossing bridge would each be 24 feet wide and approximately 500 feet long. During off-peak hours and off-peak directions, a second set of bus stops would be constructed at the freeway level, connected to El Camino Real above by stairs and an elevator tower.

Figure 17 presents a partial alignment plan for this station option paired with Alternative 3-1. An expanded view of the freeway widening needed to accommodate this design option can be viewed on sheets 8 through 10 of the portion of Attachment 3 illustrating the alignment plans for Alternative 3-1. Figure 18 provides an aerial view of a median overpass station constructed along I-405 at NE 128th Street in the Seattle metropolitan area. The I-405 example provides two-way ramps as more space is available compared with SR 85 at El Camino Real.

An alignment plan for a **median crossover station** is presented on Figure 19. This design option is appropriate for Alternative 3-5, Long Shoulder (Median) whereby VTA and commuter buses pass through the station during peak hours in the peak direction of travel. During off-peak hours and off-peak direction of travel, VTA buses stop at side platforms located at the freeway level. All platforms are connected to El Camino Real above via stairs and elevator towers located on both the north and south sides of the arterial street.

A **median split platform station** alignment plan is illustrated on Figure 20. All buses (VTA and commuter shuttles) pass through the station. Due to the shift in travel lane alignment between the south and north side of the bridge, speeds are limited to 25 mph. A traffic signal midblock would be installed along El Camino Real to allow bus passengers to cross the arterial as needed to board eastbound or westbound local buses.

Conceptual plans are provided at the end of the alignment plans for Alternative 3-5 or 3-1, respectively, for deploying these two design options at El Camino Real.

Alternatives 3-2, Long Transit Lane (Right-side Lane) and 3-6, Long Shoulder (Right-side) will utilize the number 4 outside right lane or the reconstructed and widened right-side shoulder adjacent to lane number 3. In either case, **side platforms** would be constructed at the freeway level with lanes for stopping to the right of the transit lane (Alternative 3-2) or shoulder (Alternative 3-6), respectively. An alignment plan displaying this side platform station configuration is presented as Figure 21. A more complete set of alignment plans for Alternative 3-2 is provided in Attachment 3, which additionally illustrate side platform stations at Stevens Creek Boulevard (sheet 22) and both Saratoga Avenue and Bascom Avenue (following sheet 29). Figure 22 provides an example of a side platform station along the I-10 express lanes serving the California State University, Los Angeles campus.

Utilization of **on-ramp or off-ramp bus stops** has been mentioned previously as a station design option for Bascom Avenue, Saratoga Avenue, and Stevens Creek Boulevard, for pairing typically with Alternative 3-6, Bus on Right-side Shoulder. At El Camino Real, a southbound off-ramp is typically missing from the Type L-2 spread diamond interchange plans proposed for this location, to replace the Type L-10 cloverleaf configuration which exists currently. For the right-side bus on shoulder alternative, it may be possible to include an auxiliary lane from the westbound SR 237 on-ramp to a new diagonal off-ramp to El Camino Real subject to further investigation and Caltrans approval of design exceptions. Inclusion of a southbound diagonal off-ramp would allow this on-ramp/off-ramp bus stop option to be worthy of consideration.

Figure 23 illustrates a prototypical freeway ramp bus stop proposed for implementation in Minneapolis/Saint Paul.

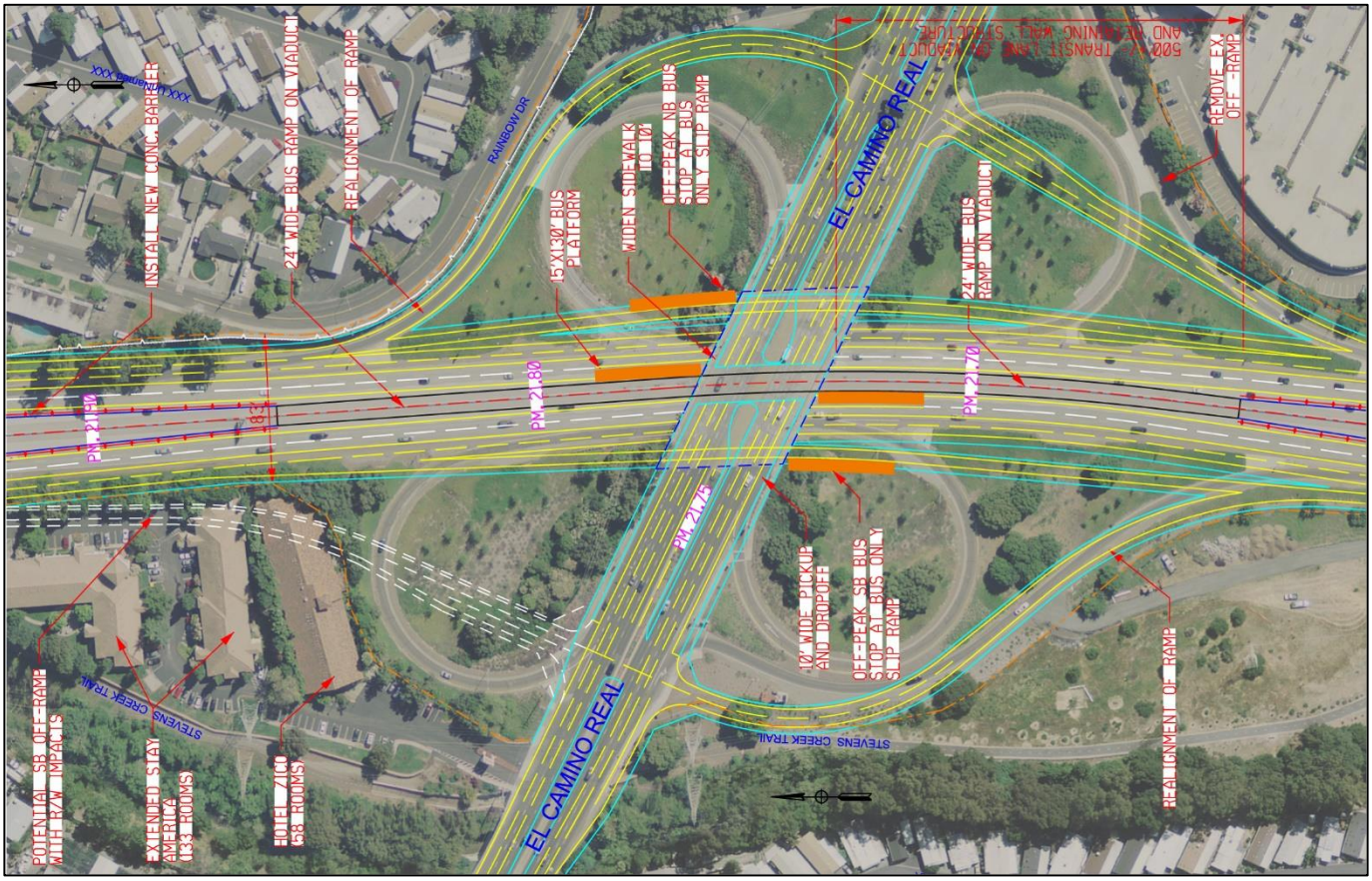


Figure 17 El Camino Real Station Partial Median Overpass Station Design

Figure 18 Aerial View of a Median Overpass Station along I-405 at NE 128th Street

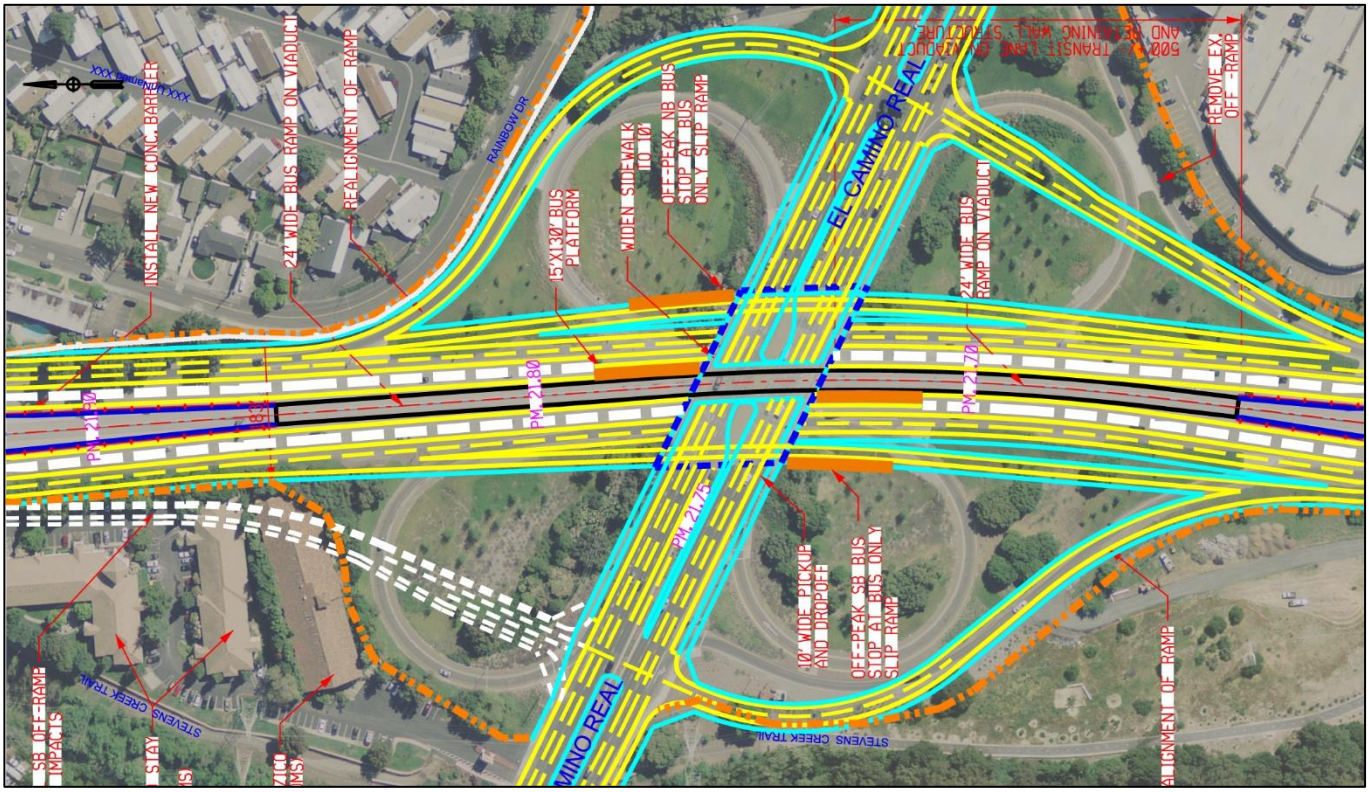


Figure 19 Median Crossover Station

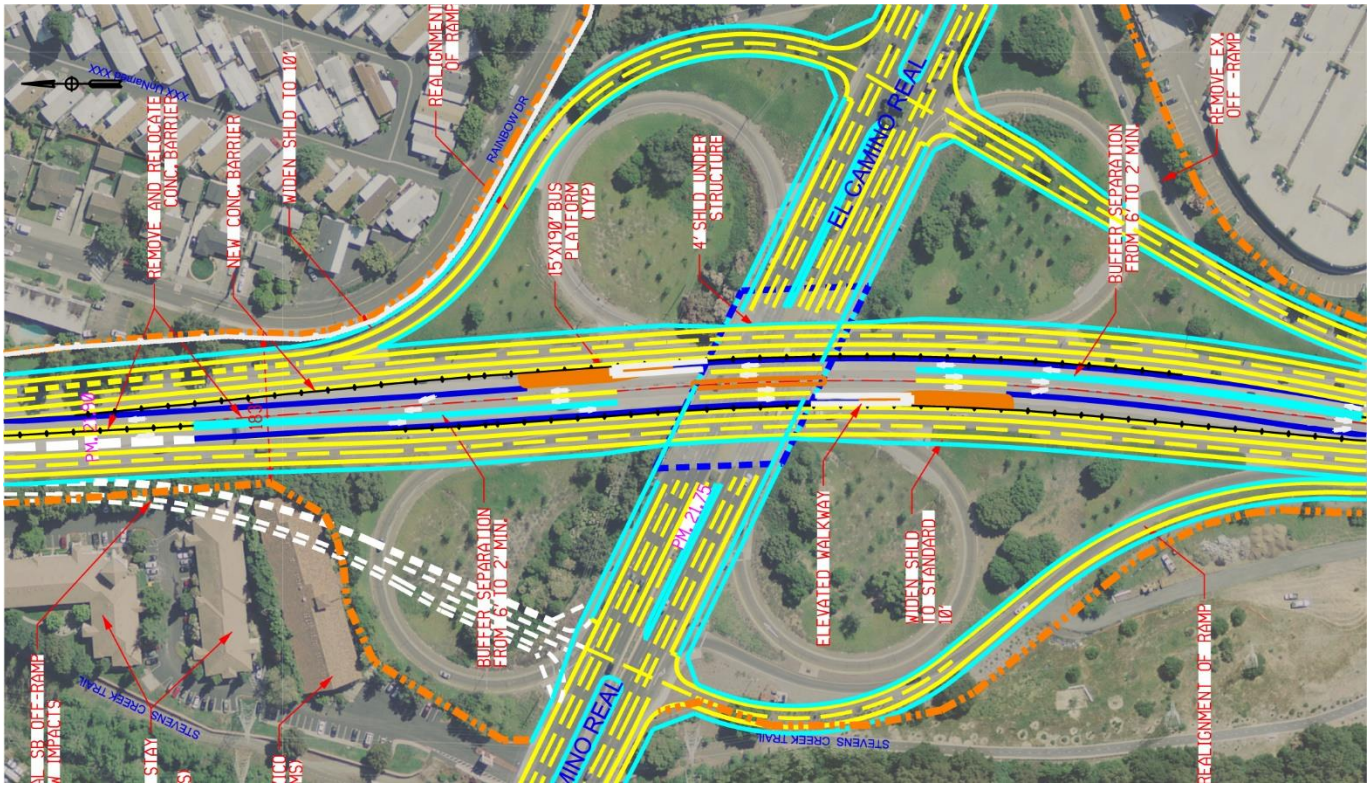


Figure 20 Median Split Platform Station

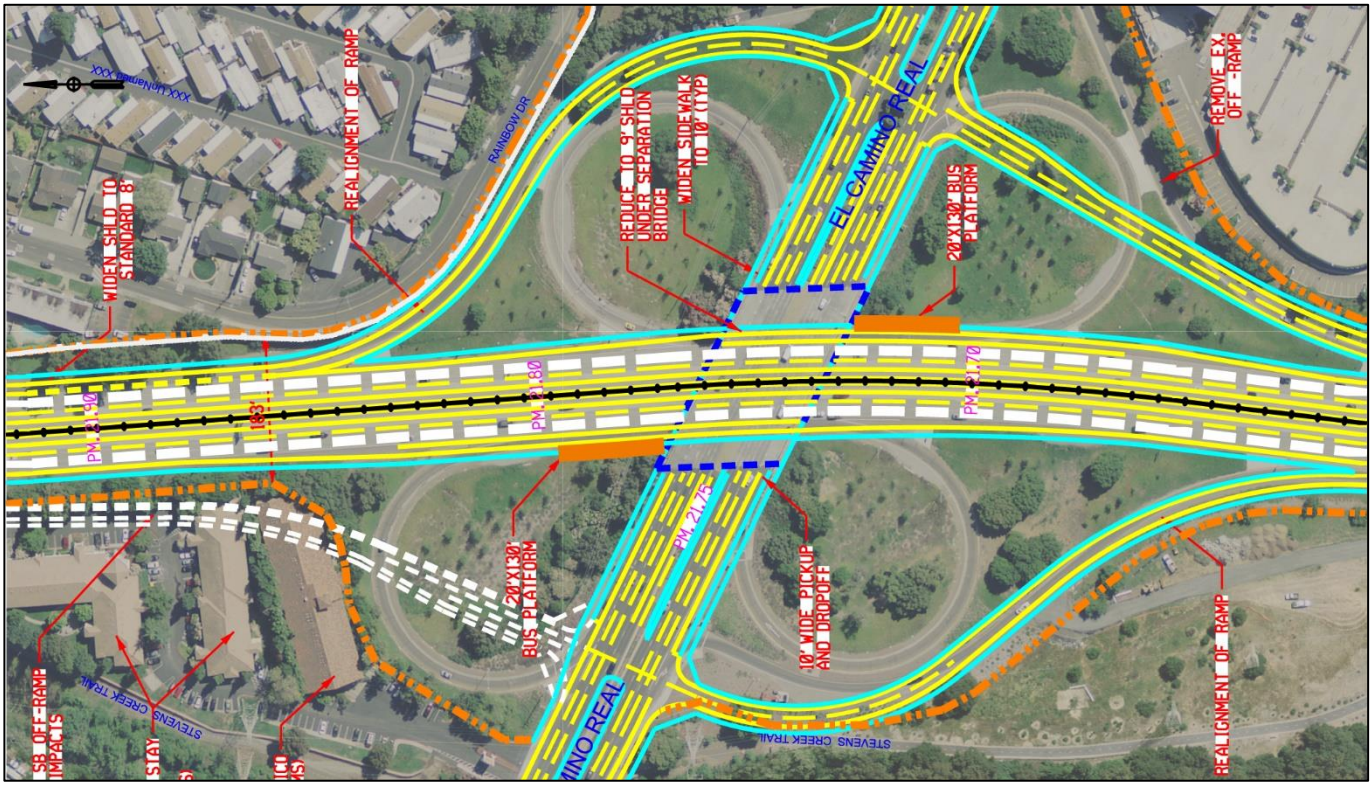
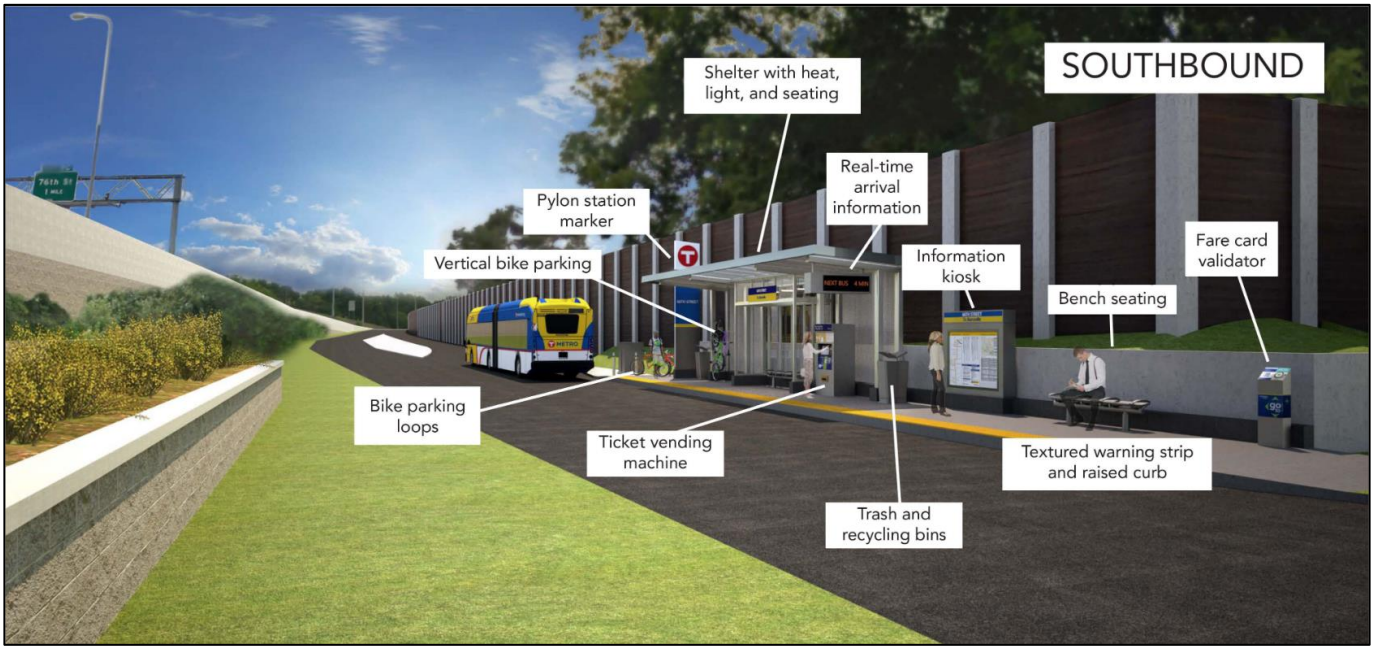


Figure 21 Side Platform Station at El Camino Real

Figure 22 Side Platform Station along I-10 at Cal State, Los Angeles



Source: Metro Transit, Minneapolis/St. Paul Area, I-35W & 66th St Station, Richfield, Metro Orange Line, https://www.metrotransit.org/orange-line-66th-street-station, downloaded 10/7/2019

Figure 23 Prototypical Freeway Ramp Bus Stop

Cross sections covering most of these station design options for El Camino Real are presented on Figure 24 and Figure 25.

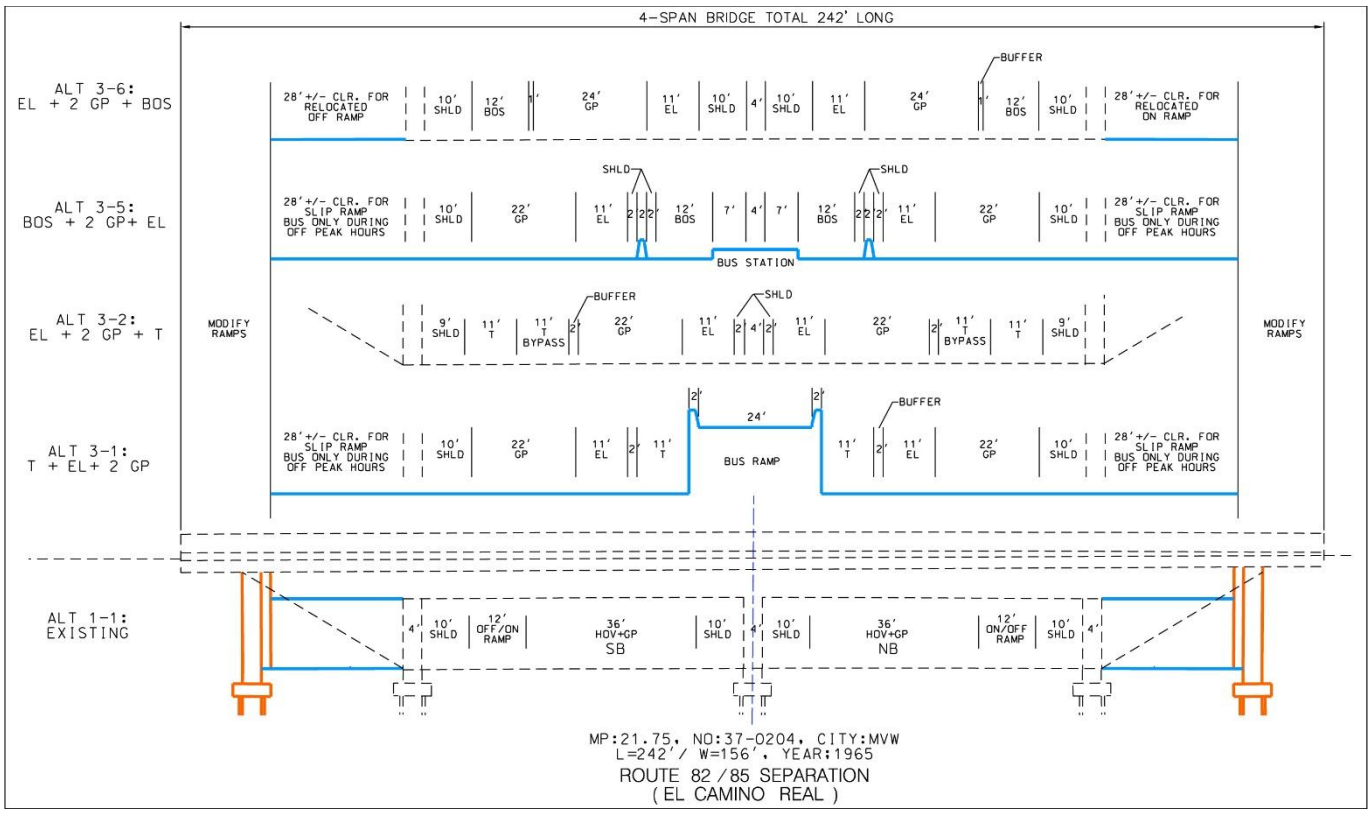


Figure 24 El Camino Real Transit Station Geometric Cross Sections

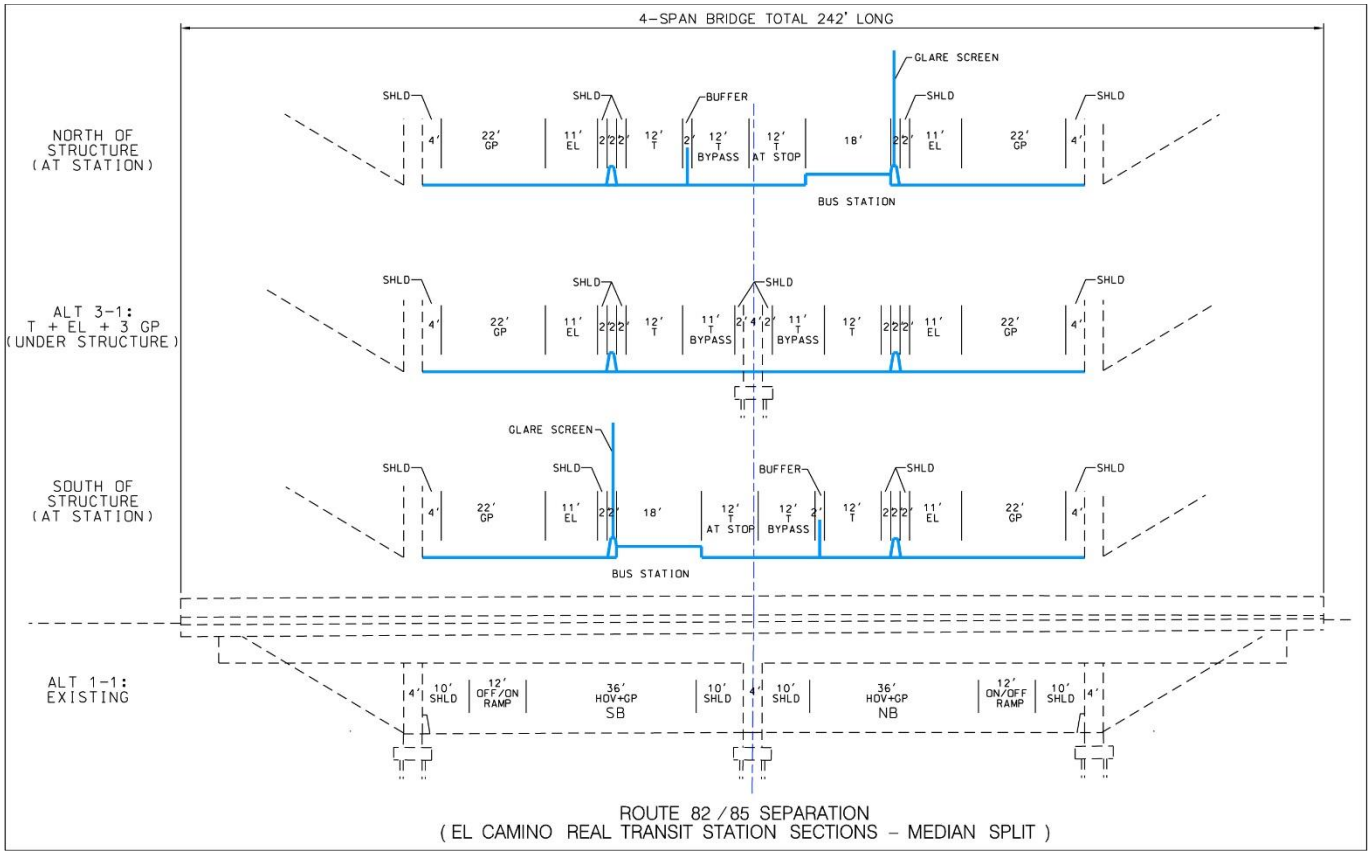


Figure 25 Median Split Platform Geometric Cross Sections at El Camino Real

Coordination with Other Potential Improvements

A number of transportation investments are planned for implementation along the SR 85 corridor. Several of these will be potentially impacted by one or more of the alternatives considered by this SR 85 Transit Guideway Study. Table 10 lists projects included in the Metropolitan Transportation Commission's *Plan Bay Area 2040* adopted on July 16, 2017 and those submitted by VTA to MTC in July/August 2019 for potential inclusion in the upcoming Plan Bay Area 2050 (PBA 2050).

Planned projects potentially impacted by the transit guideway are discussed following the table.

Table 10 PBA 2050 Regionally Significant Projects Potentially Impacted by SR 85 Transit Guideway Study Alternatives

	Alternative									
	1-1 No Build	1-2 HOV to Express Lane Conversion	2-1 Express Lanes Project	2-2 Long Express Lanes	3-1 Long Transit Lane in Median	3-2 Long Transit Lane on Right Side	3-3 Long Transit Lane Hybrid	3-4 Short Transit Lane	3-5 Long Bus on Median Shoulder	3-6 Long Bus on Right Shoulder
1. Extend light rail transit from Winchester Station to SR 85 (Vasona Junction)					X	X	X	X	X	X
2. Mountain View Transit Center improvements					X		X		X	
3. SR 85 NB to EB SR 237 connector ramp and NB SR 85 auxiliary lane										
4. SR 85/El Camino Real interchange improvements										
5. SR 237 WB to SB SR 85 connector ramp improvements				X	X	X	X		X	
6. SR 85/I-280/Homestead Road interchange improvements										
7. SR 85 soundwalls										
8. SR 85 to I-280 HOT direct connector	X			X	X	X	X		X	
9. SR 85 Express Lanes: U.S. 101 (south San Jose) to Mountain View	X				X	X	X	X	X	
10. SR 87 Express Lanes: I-880 to SR 85										
11. SR 85 corridor improvements—reserve amount	X									

1. Extend light rail transit from Winchester Station to SR 85. Winchester Boulevard lies 0.7 miles north of the proposed SR 85 Transit Guideway station at South Bascom Avenue. Approximately 2,000 persons are employed nearby at Netflix and VTA bus route 48 operates along Winchester Boulevard passing SR 85. Figure 26 provides an aerial view of the proposed Vasona Junction end-of-line LRT station and its adjacent park-and-ride lot with 108 to 135 spaces.

The median of SR 85 is 48 feet wide at Winchester Boulevard including two paved inside shoulders. This width is nearly sufficient to accommodate a number of station design options presented earlier. Given widening of the freeway mainline to spread the northbound and southbound travel lanes, a transit guideway station with pedestrian overcrossing bridge could be constructed to interconnect these two services. As an example, Figure 27 illustrates a median crossover station with a pedestrian overcrossing to an adjacent local bus transfer stop and park-and-ride lot along the Metro Red (BRT) Line in the Twin Cities at Route 77 and Cedar Grove.

2. Mountain View Transit Center Improvements. The City of Mountain View has nominated extensive improvements at the existing transit center adjacent to its downtown at Evelyn Avenue and Castro Street. Figure 3, presented previously,

Figure 26 Vasona Junction at SR 85

Figure 27 Cedar Grove Transit Station Median Crossover Platform with Pedestrian Overcrossing

illustrated a potential direct connector drop ramp to Evelyn Avenue from the median of SR 85. This optional ramp could be an element of all median running transit guideway alternatives (3-1, 3-3 potentially, and 3-5).

3. SR 85 Northbound to Eastbound SR 237 Connector Ramp and Northbound SR 85 Auxiliary Lane. A northbound SR 85 auxiliary lane from the El Camino Real interchange on-ramp to the SR 237 off-ramp is included with each of the alignment plan sets provided as Attachment 3 to this document (sheets 8 and 9) for alternatives 2-2, 3-1, and 3-2. Details for the connector ramp to eastbound SR 237 are not available. It should be noted that construction of any transit platform in the median of SR 85 at El Camino Real will constrain the space available along SR 85 for connector ramp improvements to SR 237.

4. SR 85/El Camino Real Interchange Improvements. Conversion of the SR 85 interchange at SR 82/El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration is an optional improvement for Scenario A—Limited Physical Change and Scenario B—Freeway Widening without Transit Stations; and required for Scenario C—Freeway Widening with Transit Stations and Scenario D—Part-time Shoulder Use (Bus on Shoulder).

Implementation of any of the Scenario B, C, or D alternatives limit the opportunity to provide a southbound diagonal off-ramp directly to El Camino Real without the need for potentially expensive right-of-way acquisition, or shifting the freeway mainline toward the east.

5. SR 237 Westbound to Southbound SR 85 Connector Ramp Improvements (including SR 85 Auxiliary Lane between El Camino Real and SR 237). The right-of-way along the west side of SR 85 is constrained from PM 21.85 (opposite the northbound on-ramp from El Camino Real) to PM 22.0 (opposite the off-ramp to eastbound SR 237). Two hotels with surface parking lots lay astride the west side of this pinch point. Widening the freeway to provide dual express lanes or the addition of a transit lane or the addition of a station for the bus on shoulder alternatives would preclude the inclusion of a southbound auxiliary lane between SR 237 and El Camino Real.

6. SR 85/I-280/Homestead Road Interchange Improvements. No conflicts with the SR 85 transit guideway alternatives identified for study are known to exist. All freeway widening alternatives under Scenario B and C should be monitored for potential conflicts with this interchange improvement.

7. SR 85 Soundwalls. Implementation of the transit guideway study alternatives are not anticipated to conflict with soundwall improvements implemented by others.

8. SR 85 to I-280 HOT Direct Connector. The "Long Transit Lane" alternatives will construct a new travel lane in each direction along SR 85 passing through the separation with I-280. Space in the median of SR 85 will not exist for the addition of a two-way direct connector ramp absent the widening of all SR 85 bridge structures (3) crossing over the I-280 mainline and connector ramps.

9. SR 85 Express Lanes: U.S. 101 (South San Jose to Mountain View. This project reflects Alternative 2-1 addressed by this transit guideway study. Implementation of the Transit Lane Alternatives would preclude this investment. The single lane HOV to express lane conversion (Alternative 1-2) would not conflict given prior planning for overhead sign and toll antenna cantilever structure foundations and lighting installed on mast-arm standards. Implementation of Alternative 3-6, Long Bus on Right-side Shoulder, could also be added to this project or precede it.

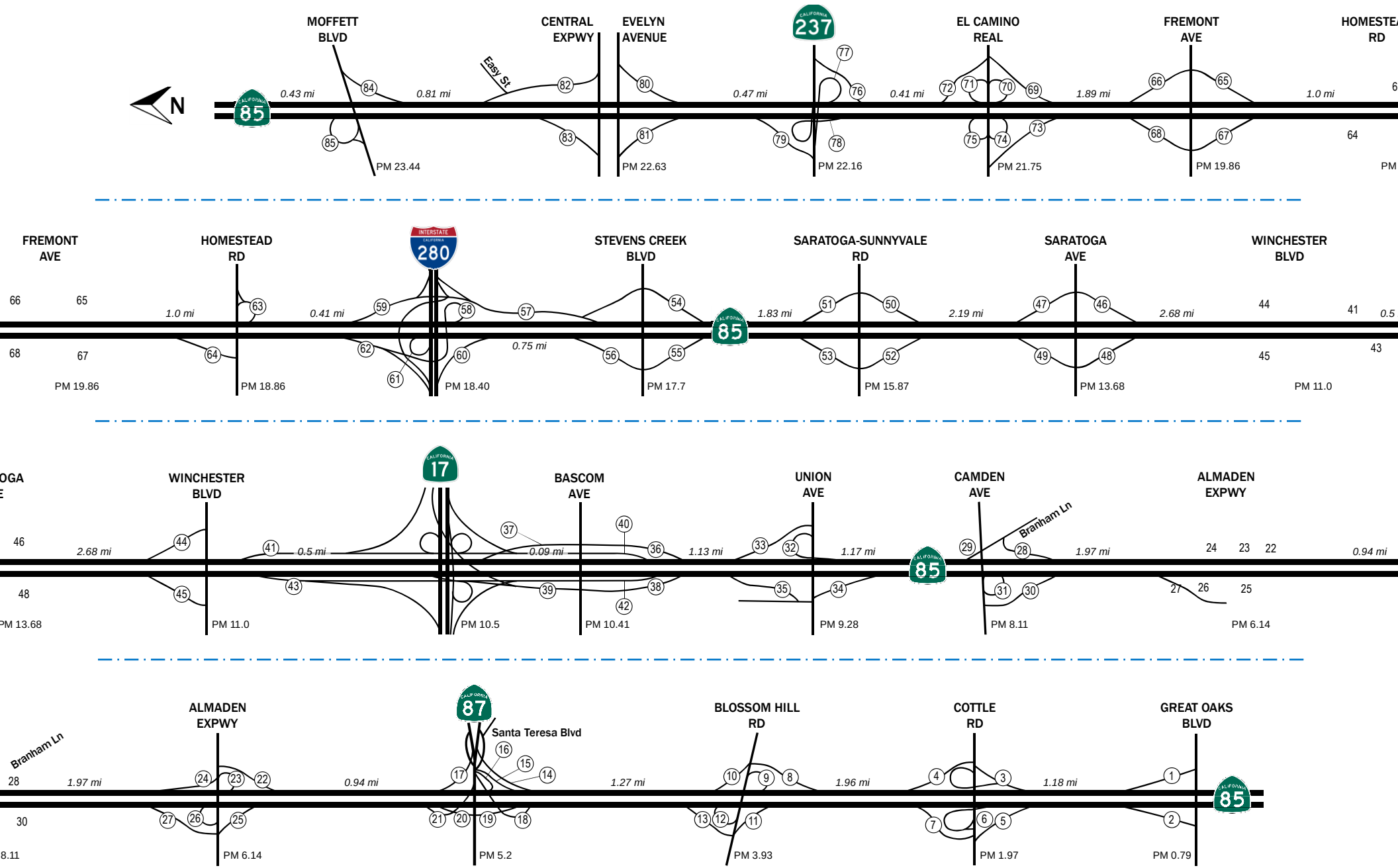
10. SR 87 Express Lanes: I-880 to SR 85. A modest budget of $41 million is identified for this HOV to express lane conversion; hence, no direct connector ramps to the express lanes along SR 85 appear to be envisioned. No conflict would occur by implementing any of the SR 85 Transit Guideway Study alternatives.

11. SR 85 Corridor Improvements—Reserve Amount. The Santa Clara Valley Transportation Authority has listed a budget of $400 million for this line item in its submittal to MTC for the PBA 2050 Regionally Significant Project List.

The budget reserve would not be required for Alternative 1-1, No Build. Less than this amount would be required for Alternatives 2-1 and 2-2. All or less than all of this amount would be required for the transit guideway alternatives given the inclusion of in-line transit stations along SR 85.

ATTACHMENT 1

SR 85 Interchange Ramps



State Route 85 Proposed Engineering Features

Version 2.0, November 8, 2019

Basis of Design Report

STATE ROUTE 85 TRANSIT GUIDEWAY STUDY

Part 3: Capital Costs

December 23, 2019

PARSONS

100 West San Fernando Street, Suite 375

San Jose, CA 95113-2233

Valley Transportation Authority

Solutions that move you

MEASURE B

Revision History

Revision	Date	Description
1.0	December 23, 2019	Initial Draft Submission

ATTACHMENT 4

Capital Costs

Capital Cost Estimates for
HOV to Express Lane Conversion and Lane Additions

- Summary of Conceptual Capital Costs
- Alternative 1-2 HOV to Express Lane Conversion
- Alternative 2-1 Express Lanes Project
- Alternative 2-2 Long Express Lanes Project
- Alternative 3-1 Long Transit Lane (Median Adjacent Lane)
- Alternative 3-2 Long Transit Lane (Right-side Lane)
- Alternative 3-4 Short Transit Lane
- Alternative 3-5 Long Shoulder (Median Lane)
- Alternative 3-6 Long Shoulder (Right-side Lane)

Note: No cost estimate is provided for Alternative 3-3 Long Transit Lane (Hybrid) as this alternative is not defined.

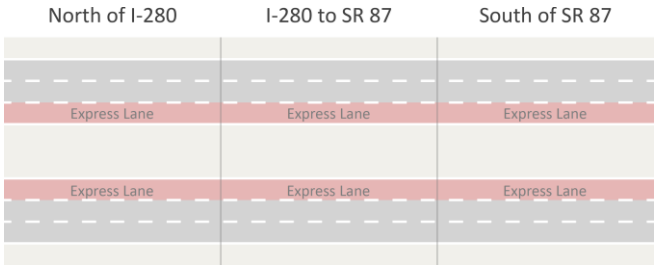
Summary of Conceptual Capital Costs ($, millions)

Alternative		HOV to Express Lane Conversion	Lane Additions	Transit Stations	Optional Items	Total Capital Cost	
						Current	Escalated
1-1	No Build	$ 0	$ 0	$ 0	$0	$ 0	$ 0
1-2	HOV to Express Lane Conversion	$250.14	$ 0	$ 0	$0	$250.14	$303.00
2-1	Express Lanes Project	$250.14	$ 96.09	$ 0	$0	$346.23	$464.00
2-2	Long Express Lanes Project	$250.14	$129.60	$ 0	$0	$379.74	$500.00
3-1	Long Transit Lane (Median Adjacent Lane)	$250.14	$135.77	$45.26	$8.47	$439.64	$589.12
3-2	Long Transit Lane (Right-side Lane)	$250.14	$135.77	$ 8.60	$0	$394.51	$530.00
3-3	Long Transit Lane (Hybrid)	TBD	TBD	TBD	TBD	TBD	TBD
3-4	Short Transit Lane	$250.14	$ 99.73	$33.95	$0	$383.82	$514.32
3-5	Long Shoulder (Median)	$250.14	$107.76	$45.26	$8.47	$411.63	$551.58
3-6	Long Shoulder (Right-side)	$250.14	$ 85.99	$ 8.60	$0	$344.73	$463.00

Note: Capital cost excludes “SR 85/El Camino Real Interchange Improvements” multi-agency project, Bay Area 2040 ID 17-07-0037, with total project cost of $27 million.

Alternative 1-2: HOV to Express Lane Conversion

- Convert existing HOV lane in each direction from Bernal Road, near U.S. 101 in south San Jose to Moffett Boulevard, near U.S. 101 in Mountain View, a distance of 23.2 miles, to operate as one express lane in each direction.
- Provide continuous access to express lane from the adjacent general-purpose lanes.
- Install toll infrastructure in median to support express lanes.
- Reconstruct concrete median barrier south of Santa Teresa Boulevard and north of Stelling Road to accommodate toll gantries and dynamic message signs.
- Widen paved median shoulder to 14 feet in both directions from Santa Teresa Boulevard to South Stelling Road (excepting structures) to provide continuous CHP enforcement area.
- Widen right-side shoulders to meet Highway Design Manual standards (10 feet). Relocate drainage inlets as needed to the outside edge of shoulder.
- Install double-luminaire mast arm lighting at 250- to 400-foot intervals from PM 6.00 (Almaden Expressway) to PM 17.70 (Stevens Creek Boulevard) and from PM 18.86 (Homestead Road) to PM 23.44 (Moffett Boulevard).
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing (optional improvement).



Alternative 1-2: HOV to Express Lane Conversion

Engineer Cost Estimate --- Alternative 1-2
Preliminary Project Study Report

Project ID: XXXXXX

Type of Estimate :	Preliminary Project Study Report (Dec 2019)
Program Code :	04-XXXXX
Project Limits :	From Hwy 101 Interchange in Santa Jose to South of Hwy 101 Interchange in Mt. View
Description:	From PM 0.00 to PM 23.68
Scope :	Convert the Existing HOV on SR 85 to An Express Lanes But the Unused Space in the Median Between I-280 and SR 87 would not be changed, Leaving it for A future Transportation Investment
Alternative :	Alternative 1-2 HOV to Express Lane Conversion

	Current Cost	Escalated Cost
ROADWAY ITEMS	$ 185,288,856	$ 223,916,200
STRUCTURE ITEMS	$ -	$ -
SUBTOTAL CONSTRUCTION COST	$ 185,288,856	$ 223,916,200
RIGHT OF WAY	$ -	$ -
TOTAL CAPITAL OUTLAY COST	$ 185,289,000	$ 223,917,000
PR/ED SUPPORT (3%)	$ 5,559,000	$ 6,718,000
PS&E SUPPORT (12%)	$ 22,235,000	$ 26,870,000
RIGHT OF WAY SUPPORT		
CONSTRUCTION SUPPORT (12%)	$ 22,235,000	$ 26,870,000
AGENCY SUPPORT (8%)	$ 14,824,000	$ 17,914,000
TOTAL CAPITAL OUTLAY SUPPORT COST*	$ 64,853,000	$ 78,372,000
TOTAL PROJECT COST	$ 250,142,000	$ 303,000,000

If Project has been programmed enter Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	12	/	2019
Estimated Date of Construction Start (Month/Year)	10	/	2023
Number of Working Days	750		Working Days
Estimated Mid-Point of Construction (Month/Year)	4	/	2024
Number of Plant Establishment Days			Days

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	Earthwork	$	-
2	Pavement Structural Section	$	-
3	Drainage	$	-
4	Specialty Items	$	30,000
5	Environmental	$	545,000
6	Traffic Items	$	116,510,800
7	Detours	$	250,000
8	Minor Items	$	5,866,800
9	Roadway Mobilization	$	12,320,300
10	Supplemental Work	$	6,160,200
11	State Furnished	$	5,332,100
12	Contingencies	$	30,881,500
13	Overhead	$	7,392,156
	TOTAL ROADWAY ITEMS	**$**	**185,288,856**

Estimate Prepared By : _____

Name and Title Date Phone

Estimate Reviewed By : _____

Name and Title Date Phone

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)		Cost
160101	Clearing & Grubbing	AC	0	x	1,725	=	$0
170101	Develop Water Supply	LS	0	x	50,000	=	$0
190101	Roadway Excavation	CY	0	x	29	=	$0
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$0
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$0
192037	Structure Excavation (Retaining Wall)	CY		x		=	$0
193013	Structure Backfill (Retaining Wall)	CY		x		=	$0
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$0
194001	Ditch Excavation	CY		x		=	$0
198001	Impored Borrow	CY	0	x	17	=	$0
198007	Imported Material (Shoulder Backing)	TON		x		=	$0
XXXXXX	Some Item			x		=	$0

TOTAL EARTHWORK SECTION ITEMS $ -

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)		Cost
150771	Remove Asphalt Concrete Dike	LF	0	x		= $	-
150860	Remove Base and Surfacing	CY	0	x	12.5	= $	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	0	x	8	= $	-
150854	Remove Concrete Pavement	CY	0	x	156	= $	-
260201	Class 4 Aggregate Base	CY	0	x	61	= $	-
250401	Class 4 Aggregate Subbase	CY	0	x	38	= $	-
290201	Asphalt Treated Permeable Base	CY	0	x	160	= $	-
365001	Sand Cover	TON		x		= $	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= $	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= $	-
3750XX	Screenings (Type XX)	TON		x		= $	-
377501	Slurry Seal	TON		x		= $	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= $	-
390132	Hot Mix Asphalt (Type A)	TON		x		= $	-
390136	Minor Hot Mix Asphalt	TON		x		= $	-
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= $	-
393003	Geosynthetic Pavement Interlayer	SQYD		x		= $	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Indent*	STA		x		= $	-
394071	Place Hot Mix Asphalt Dike	LF	0	x		= $	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		= $	-
397005	Tack Coat	TON		x		= $	-
400050	Continuously Reinfored Concrete Pavement	CY	0	x	300	= $	-
401108	Replace Concrete Pavement (Rapid Strength	CY		x		= $	-
404092	Seal Pavement Joint	LF		x		= $	-
404094	Seal Longitudinal Isolation Joint	LF		x		= $	-
413112A	Repair Spalled Joints (Polyester Grout)	SQYD		x		= $	-
413115	Seal Existing Concrete Pavement Joint	LF		x		= $	-
420102	Groove Existing Concrete Pavement	SQYD		x		= $	-
420201	Grind Existing Concrete Pavement	SQYD		x		= $	-
731502	Minor Concrete (Misc. Const)	CY		x		= $	-
731530	Minor Concrete (Textured Paving)	SQFT		x		= $	-
XXXXXX	Some Item			x		= $	-

TOTAL STRUCTURAL SECTION ITEMS $ -

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
150206	Abandon Culvert	LF		x		=	$	-
150805	Remove Culvert	LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
193114	Sand Backfill	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
510512	Minor Concrete (Box Culvert)	CY		x		=	$	-
510XXX	Culvert (Roadway Crossing)	EA		x		=	$	-
62XXXX	XXX" APC Pipe	LF		x		=	$	-
64XXXX	XXX" Plastic Pipe	LF		x		=	$	-
65XXXX	XXX" RCP Pipe	LF		x		=	$	-
66XXXX	XXX" CSP Pipe	LF		x		=	$	-
680905	Underdrain (6" Alternative)	LF	0	x	36	=	$	-
681103	Edge Drain (3" Plastic Pipe)	LF	0	x	21	=	$	-
69XXXX	XXX" Pipe Downdrain	LF		x		=	$	-
70XXXX	XXX" Pipe Inlet	LF		x		=	$	-
70XXXX	XXX" Pipe Riser	LF		x		=	$	-
70XXXX	XXX" Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
729010	Rock Slope Protection Fabric	SQYD		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Additional Drainage (Detention Base, etc)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL DRAINAGE ITEMS **$ -**

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	30,000	=	$	30,000
150662	Remove Metal Beam Guard Railing	LF	0	x	15	=	$	-
150668	Remove Terminal Systems	EA		x		=	$	-
1532XX	Remove Concrete Barrier (25, 50 or 50C)	LF	0	x	16	=	$	-
153250	Remove Sound Wall	SQFT	0	x	25	=	$	-
150606	Remove Fence (BW)	LF		x		=	$	-
190110	Lead Compliance Plan	LS	0	x	18,000	=	$	-
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$	-
510060	Structural Concrete (Retaining Wall)	CY		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$	-
510XXX	Retaining Wall (MSE)	SQFT	0	x	85	=	$	-
XXXXXX	Sound Wall (On Pile, On Barrier or On Ret. Wall)	SQFT	0	x	40	=	$	-
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$	-
511048	Apply Anti-Graffiti Coating	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$	-
518002	Sound Wall (Masonry Block)	SQFT		x		=	$	-
520103	Bar Reinf. Steel (Retaining Wall)	LB		x		=	$	-
800007	Fence (BW)	LF		x		=	$	-
832001	Metal Beam Guard Railing	LF	0	x	47	=	$	-
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
83954X	Transition Railing *(Insert Type)*	EA		x		=	$	-
8395XX	Terminal System (Type CAT)	EA		x		=	$	-
8395XX	Alternative Flared Terminal System	EA	0	x	1,200	=	$	-
8395XX	End Anchor Assembly (*Insert Type*)	EA		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
839596	Crash Cushion *(G.R.E.A.T)*	EA		x		=	$	-
839701	Concrete Barrier *(50 or 60)*	LF	0	x	78	=	$	-
833128	Concrete Barrier *(25 Modify)*	LF	0	x	128	=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL SPECIALTY ITEMS **$ 30,000**

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
XXXXXX	Biological Mitigation	LS		x		=	$	-
071325	Temporary Reinforced Silt Fence	LF		x		=	$	-
XXXXXX	Hazardous Material Remediation	LS	0	x	180,000	=	$	-
XXXXXX	Permits	LS	1	x	45,000	=	$	45,000
071325	Temporary Fence (Type ESA)	LF		x		=	$	-

Subtotal Environmental *$ 45,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
200001	Highway Planting	ACRE		x		=	$	-
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-*	LF		x		=	$	-
20XXXX	Extend XXX" *(Insert Type)* Conduit	LF		x		=	$	-
201700	Imported Topsoil	CY		x		=	$	-
203015	Erosion Control	ACRE		x		=	$	-
203021	Fiber Rolls	LF		x		=	$	-
203026	Move In/ Move Out (Erosion Control)	EA		x		=	$	-
204099	Plant Establishment Work	LS		x		=	$	-
204101	Extend Plant Establishment (X Years)	LS		x		=	$	-
208000	Irrigation System	LS		x		=	$	-
208304	Water Meter	EA		x		=	$	-
209801	Maintenance Vehicle Pullout	EA		x		=	$	-
XXXXXX	Some Item							

Subtotal Landscape and Irrigation *$ -*

5C - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost
074016	Construction Site Management	LS	1	x	300,000	=	$	300,000
074017	Prepare WPCP	LS	0	x	20,000	=	$	-
074019	Prepare SWPPP	LS	0	x	20,000	=	$	-
074023	Temporary Erosion Control	ACRE	0	x	2,500	=	$	-
074027	Temporary Erosion Control Blanket	SQYD		x		=	$	-
074028	Temporary Fiber Roll	LF		x		=	$	-
074032	Temporary Concrete Washout Facility	EA		x		=	$	-
074033	Temporary Construction Entrance	EA		x		=	$	-
074035	Temporary Check Dam	LF		x		=	$	-
074037	Move In/ Move Out (Temp Erosion Control)	EA		x		=	$	-
074038	Temp. Drainage Inlet Protection	EA	0	x	60	=	$	-
XXXXXX	Site Job Management	LS	1	x	200,000	=	$	200,000
074042	Temporary Concrete Washout (Portable)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

Supplemental Work for NPDES

(These costs are not accounted in total here but under Supplemental Work on sheet 7 of 11).

074021	Water Pollution Control Maintenance Work*	LS	0	x	45,500	=	$	-
066596	Additional Water Pollution Control**	LS		x		=	$	-
066597	Storm Water Sampling and Analysis***	LS		x		=	$	-
XXXXXX	Some Item							

Subtotal NPDES (Without Supplemental Work) *$ 500,000*

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $ 545,000

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LB		x		=	$	-
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
56XXXX	Install Overhead Sign (Two Post)	EA	15	x	400,000	=	$	6,000,000
56XXXX	Install Overhead Sign (One Post)	EA	10	x	160,000	=	$	1,600,000
860090	Maintain Existing Traffic Management System	LS	1	x	900,000	=	$	900,000
860810	Inductive Loop Detectors	EA		x		=	$	-
86055X	Lighting & Sign Illumination	EA	378	x	4,000	=	$	1,512,000
8607XX	Interconnection Facilities	LS		x		=	$	-
8609XX	Traffic Traffic Monitoring Stations	LS	1	x	200,000	=	$	200,000
860XXX	Signals & Lighting	LS		x		=	$	-
860XXX	ITS Elements	LS		x		=	$	-
861100	Ramp Metering System	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXXX	Ramp Terminal Intersection Improvement	LS	0	x	1,000,000	=	$	-
XXXXXX	Toll Equipment and System Integration (Capital)	LS	1	x	100,000,000	=	$	100,000,000
XXXXXX	Some Item							

Subtotal Traffic Electrical *$ 110,212,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120090	Construction Area Signs	LS	1	x	600,000	=	$	600,000
150701	Remove Yellow Painted Traffic Stripe	LF	0	x	4	=	$	-
150710	Remove Traffic Stripe	LF	0	x	0.25	=	$	-
150713	Remove Pavement Marking	SQFT	9,071	x	4.50	=	$	40,820
150742	Remove Roadside Sign	EA	20	x	120	=	$	2,400
15075X	Remove Sign Structure	EA	30	x	20,000	=	$	600,000
15075X	Remove Sign Structure (On Bridge)	EA	8	x	5,000	=	$	40,000
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
566011	Roadside Sign (One Post)	EA	30	x	340	=	$	10,200
566012	Roadside Sign (Two Post)	EA	10	x	1,250	=	$	12,500
560XXX	Furnish Sign Panels	SQFT		x		=	$	-
560XXX	Install Sign Panels	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	350,000	=	$	350,000
840504	Thermoplastic Traffic Strip (4")	LF	0	x	0.50	=	$	-

Subtotal Traffic Signing and Striping *$ 1,655,920*

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	1	x	4,000,000	=	$	4,000,000
120120	Type III Barricade	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	LS	0	x	90,000	=	$	-
120159	Temporary Traffic Strip (Paint)	LS	0	x	90,000	=	$	-
12016X	Channelizer	EA		x		=	$	-
128650	Portable Changeable Message Signs	EA	18	x	10,000	=	$	180,000
129000	Temporary Railing (Type K)	LF	6,000	x	17	=	$	102,000
129100	Temp. Crash Cushion Module	EA	4	x	200	=	$	800
129099A	Traffic Plastic Drum	EA		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
XXXXXX	Misc. Items (Traffic Management Plan)	LS	1	x	360,000	=	$	360,000
XXXXXX	Some Item	LS		x		=	$	-

Subtotal Stage Construction and Traffic Handling *$ 4,642,800*

TOTAL TRAFFIC ITEMS **$ 116,510,800**

SECTION 7: DETOURS

Include constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
0713XX	Temporary Fence (Type X)	LF		x		=	$ -
07XXXX	Temporary Drainage	LS		x		=	$ -
120143	Temporary Pavement Delineation	LF		x		=	$ -
1286XX	Temporary Signals	EA		x		=	$ -
129000	Temporary Railing (Type K)	LF		x		=	$ -
190101	Roadway Excavation	CY		x		=	$ -
198001	Imported Borrow	CY		x		=	$ -
198050	Embankment	CY		x		=	$ -
250401	Class 4 Aggregate Subbase	CY		x		=	$ -
260201	Class 2 Aggregate Base	CY		x		=	$ -
390132	Hot Mix Asphalt (Type A)	TON		x		=	$ -
XXXXXX	Some Item	LS	1	x	$250,000	=	$ 250,000

TOTAL DETOURS **$ 250,000**

SUBTOTAL SECTIONS 1-7 $ 117,335,800

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items

ADA Items $ -

8B - Bike Path Items

Bike Path Items $ -

8C - Other Minor Items

Other Minor Items 5.0% $ 5,866,790

Total of Section 1-7 $ 117,335,800 x 5.0% = $ 5,866,790

TOTAL MINOR ITEMS **$ 5,866,800**

SECTIONS 9: MOBILIZATION

Item code							
999990	Total Section 1-8	$	123,202,600	x	10%	=	$ 12,320,260

TOTAL MOBILIZATION **$ 12,320,300**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066015	Federal Trainee Program	LS		x		=	$ -
066063	Traffic Management Plan - Public Information	LS		x		=	$ -
066090	Maintain Traffic	LS		x		=	$ -
066094	Value Analysis	LS		x		=	$ -
066204	Remove Rock & Debris	LS		x		=	$ -
066222	Locate Existing Cross-Over	LS		x		=	$ -
066670	Payment Adjustments For Price Index Fluctuations	LS		x		=	$ -
066700	Partnering	LS		x		=	$ -
066866	Operation of Existing Traffic Management System Eler	LS		x		=	$ -
066920	Dispute Review Board	LS		x		=	$ -
066XXX	Some Item	LS		x		=	$ -

*Cost of **NPDES** Supplemental Work specified in Section 5C* = $ -

Total Section 1-8 $ 123,202,600 5% = $ 6,160,130

TOTAL SUPPLEMENTAL WORK **$ 6,160,200**

Note: Mobilization item will automatically calculate if working days are 50 or more. For Project less than 50 Working Days Mobilization is not required as a separate contract, however contract item prices should take into consideration mobilization as part of the price. If the building portion of the project is greater than 50% of the total project cost,

If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066063	Public Information	LS	0	x	$100,000	=	$0
066105	RE Office	LS	1	x	$400,000	=	$400,000
066803	Padlocks	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
066062A	COZEEP Expenses	LS		x		=	$0
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
XXXXXX	Toll Back Office System	LS	1	x	$1,700,000	=	$1,700,000
06684X	TMS Controller Assembly	LS	1	x	$2,000,000	=	$2,000,000
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
XXXXXX	Some Item						

Total Section 1-8	$	123,202,600	1%	=	$ 1,232,026

TOTAL STATE FURNISHED	**$5,332,100**

SECTION 12: TIME-RELATED OVERHEAD

Estimated Time-Releated Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity		Unit Price ($)		Cost	
			Total of All Contract Items Only				$ 123,202,600	(used to calculate TR
070018	Time-Related Overhead	$	123,202,600	X	6%	=	$7,392,156	

TOTAL TIME-RELATED OVERHEAD	**$7,392,156**

SECTION 13: CONTINGENCY

Total Section 1-12	$	154,407,356	x	20%	=	$30,881,472	

TOTAL CONTINGENCY	**$30,881,500**

Note: TRO is a contract item if total project cost is (non-escalated) over $5 million AND 100 or more working days.
If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.
TRO calculated for you as percentage of the sum of all contract items only;
excluding mobilization, supplemental work, state furnished materials and expenses, and contingency.

II. STRUCTURE ITEMS

	Bridge 1	Bridge 2	Bridge 3
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	ALAMADEN UC	CAMDEN UC	OKA UC
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	0 LF	0 LF	0 LF
Total Bridge Length (Feet)	238 LF	210 LF	102 LF
Total Area (Square Feet)	0 SQFT	0 SQFT	0 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	None	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$0**	**$0**	**$0**

	Bridge 4	Bridge 5	Bridge 6
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	LOS GATOS CREEK BRIDGE	POLLARD UC	SAN TOMAS AQUINAS CREEK
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	0 LF	0 LF	0 LF
Total Bridge Length (Feet)	178 LF	196 LF	105 LF
Total Area (Square Feet)	0 SQFT	0 SQFT	0 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$0**	**$0**	**$0**

	Bridge 7	Bridge 8	Bridge 9
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	SARATOGA UC	SARATOGA CREEK BRIDGE	CALABAZAS CREEK BRG
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	0 LF	0 LF	0 LF
#REF!	192 LF	100 LF	156 LF
Total Area (Square Feet)	0 SQFT	0 SQFT	0 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH	**$0**	**$0**	**$0**

	Bridge 10
DATE OF ESTIMATE	Dec, 2019
Bridge Name	Pedestrian Bridge (Dalles Ave)
Bridge Number	
Structure Type	CIP/PS Box Girder
Width (Feet) [out to out]	0 LF
#REF!	370 LF
Total Area (Square Feet)	0 SQFT
Structure Depth (Feet)	LF
Footing Type (pile or spread)	Pile
Cost Per Square Foot	$300
COST OF EACH	**$0**

TOTAL COST OF STRUCTURES[1]	**0**

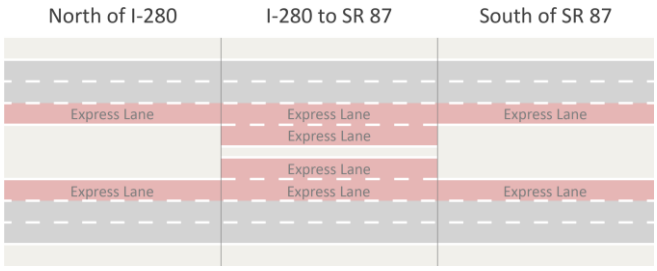
Estimate Prepared By: _____ _____

XXXXXXXXXXXXXXXX ------ Division of Structures — Date

[1]Structure's Estimate includes Overhead and Mobilization are based on 2019 CALTRAN's "COMPARATIVE BRIDGE COSTS".

Alternative 2-1: Express Lanes Project

- Add one express lane in each direction from Almaden Expressway to I-280 to operate jointly with existing HOV lanes as two express lanes in each direction.
- Convert existing HOV lane in each direction from U.S. 101 (southern end of SR 85) to Almaden Expressway to operate as one express lane in each direction.
- Provide continuous access to the express lane(s) from the adjacent general-purpose lanes.
- Extend existing auxiliary lane on northbound SR 85 from the South De Anza Boulevard northbound on-ramp to 0.2 mile south of the Stevens Creek Boulevard off-ramp.
- Provide CHP enforcement/observation areas in the median at selected locations along the corridor.
- Install double-luminaire mast arm lighting at 250- to 400-foot intervals from PM 6.00 (Almaden Expressway) to PM 17.70 (Stevens Creek Boulevard).
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing.
- Widen nine bridge structures.



Alternative 2-1: Express Lanes Project

Engineer Cost Estimate --- Alternative 2-1
Preliminary Project Study Report

Project ID: XXXXXX

Type of Estimate :	Preliminary Project Study Report (Dec 2019)
Program Code :	04-XXXXX
Project Limits :	From Hwy 101 Interchange in Santa Jose to South of Hwy 101 Interchange in Mt. View
Description:	From PM 0.00 to PM 23.68
Scope :	Convert the Existing HOV Lanes Into Express Lane on SR 85 to An Express Lane and Construct A New Express Lane Between I-280 to SR 87 In Accordance with the Design in VTA's Silicon Valley Lane Program
Alternative :	Alternative 2-1 Express Lanes Project

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	242,381,278	$	324,755,400
STRUCTURE ITEMS	$	14,084,700	$	18,871,500
SUBTOTAL CONSTRUCTION COST	$	256,465,978	$	343,626,900
RIGHT OF WAY	$	-	$	-
TOTAL CAPITAL OUTLAY COST	$	256,466,000	$	343,627,000
PR/ED SUPPORT (3%)	$	7,694,000	$	10,309,000
PS&E SUPPORT (12%)	$	30,776,000	$	41,236,000
RIGHT OF WAY SUPPORT				
CONSTRUCTION SUPPORT (12%)	$	30,776,000	$	41,236,000
AGENCY SUPPORT (8%)	$	20,518,000	$	27,491,000
TOTAL CAPITAL OUTLAY SUPPORT COST*	$	89,764,000	$	120,272,000
TOTAL PROJECT COST	$	346,230,000	$	464,000,000

If Project has been programmed enter Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	12	/	2019
Estimated Date of Construction Start (Month/Year)	10	/	2023
Number of Working Days	1500		Working Days
Estimated Mid-Point of Construction (Month/Year)	10	/	2026
Number of Plant Establishment Days			Days

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	**Earthwork**	$	4,928,700
2	**Pavement Structural Section**	$	18,859,800
3	**Drainage**	$	1,737,900
4	**Specialty Items**	$	10,301,700
5	**Environmental**	$	1,112,600
6	**Traffic Items**	$	116,706,000
7	**Detours**	$	150,000
8	**Minor Items**	$	7,689,900
9	**Roadway Mobilization**	$	16,148,700
10	**Supplemental Work**	$	8,099,900
11	**State Furnished**	$	5,714,900
12	**Contingencies**	$	40,396,900
13	**Overhead**	$	10,534,278
	TOTAL ROADWAY ITEMS	**$**	**242,381,278**

Estimate Prepared By : _____

Name and Title Date Phone

Estimate Reviewed By : _____

Name and Title Date Phone

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)		Cost
160101	Clearing & Grubbing	AC	36	x	1,725	=	$62,100
170101	Develop Water Supply	LS	1	x	50,000	=	$50,000
190101	Roadway Excavation	CY	151,427	x	29	=	$4,330,812
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$0
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$0
192037	Structure Excavation (Retaining Wall)	CY		x		=	$0
193013	Structure Backfill (Retaining Wall)	CY		x		=	$0
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$0
194001	Ditch Excavation	CY		x		=	$0
198001	Impored Borrow	CY	29,441	x	17	=	$485,777
198007	Imported Material (Shoulder Backing)	TON		x		=	$0
XXXXXX	Some Item			x		=	$0

TOTAL EARTHWORK SECTION ITEMS	**$ 4,928,700**

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)		Cost
150771	Remove Asphalt Concrete Dike	LF		x		= $	-
150860	Remove Base and Surfacing	CY		x		= $	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	12,305	x	8	= $	98,440
150854	Remove Concrete Pavement	CY	2,912	x	156	= $	454,272
260201	Class 4 Aggregate Base	CY	20,561	x	61	= $	1,243,941
250401	Class 4 Aggregate Subbase	CY	39,359	x	38	= $	1,495,642
290201	Asphalt Treated Permeable Base	CY	14,686	x	160	= $	2,349,760
365001	Sand Cover	TON		x		= $	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= $	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= $	-
3750XX	Screenings (Type XX)	TON		x		= $	-
377501	Slurry Seal	TON		x		= $	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= $	-
390132	Hot Mix Asphalt (Type A)	TON		x		= $	-
390136	Minor Hot Mix Asphalt	TON		x		= $	-
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= $	-
393003	Geosynthetic Pavement Interlayer	SQYD		x		= $	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Inden*	STA		x		= $	-
394071	Place Hot Mix Asphalt Dike	LF		x		= $	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		= $	-
397005	Tack Coat	TON		x		= $	-
400050	Continuously Reinfored Concrete Pavement	CY	44,059	x	300	= $	13,217,700
401108	Replace Concrete Pavement (Rapid Strength	CY		x		= $	-
404092	Seal Pavement Joint	LF		x		= $	-
404094	Seal Longitudinal Isolation Joint	LF		x		= $	-
413112A	Repair Spalled Joints (Polyester Grout)	SQYD		x		= $	-
413115	Seal Existing Concrete Pavement Joint	LF		x		= $	-
420102	Groove Existing Concrete Pavement	SQYD		x		= $	-
420201	Grind Existing Concrete Pavement	SQYD		x		= $	-
731502	Minor Concrete (Misc. Const)	CY		x		= $	-
731530	Minor Concrete (Textured Paving)	SQFT		x		= $	-
XXXXXX	Some Item			x		= $	-

TOTAL STRUCTURAL SECTION ITEMS	**$ 18,859,800**

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
150206	Abandon Culvert	LF		x		=	$	-
150805	Remove Culvert	LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
193114	Sand Backfill	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
510512	Minor Concrete (Box Culvert)	CY		x		=	$	-
510XXX	Culvert (Roadway Crossing)	EA		x		=	$	-
62XXXX	XXX" APC Pipe	LF		x		=	$	-
64XXXX	XXX" Plastic Pipe	LF		x		=	$	-
65XXXX	XXX" RCP Pipe	LF		x		=	$	-
66XXXX	XXX" CSP Pipe	LF		x		=	$	-
680905	Underdrain (6" Alternative)	LF	7,866	x	36	=	$	283,176
681103	Edge Drain (3" Plastic Pipe)	LF	69,269	x	21	=	$	1,454,649
69XXXX	XXX" Pipe Downdrain	LF		x		=	$	-
70XXXX	XXX" Pipe Inlet	LF		x		=	$	-
70XXXX	XXX" Pipe Riser	LF		x		=	$	-
70XXXX	XXX" Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
729010	Rock Slope Protection Fabric	SQYD		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Additional Drainage (Detention Base, etc)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL DRAINAGE ITEMS **$ 1,737,900**

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	30,000	=	$	30,000
150662	Remove Metal Beam Guard Railing	LF	61,156	x	15	=	$	886,762
150668	Remove Terminal Systems	EA		x		=	$	-
1532XX	Remove Concrete Barrier (25, 50 or 50C)	LF	3,110	x	16	=	$	49,760
153250	Remove Sound Wall	SQFT	0	x	25	=	$	-
150606	Remove Fence (BW)	LF		x		=	$	-
190110	Lead Compliance Plan	LS	1	x	18,000	=	$	18,000
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$	-
510060	Structural Concrete (Retaining Wall)	CY		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$	-
510XXX	Retaining Wall (MSE)	SQFT	39,520	x	85	=	$	3,359,200
XXXXXX	Sound Wall (On Pile, On Barrier or On Ret. Wall)	SQFT	0	x	40	=	$	-
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$	-
511048	Apply Anti-Graffiti Coating	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$	-
518002	Sound Wall (Masonry Block)	SQFT		x		=	$	-
520103	Bar Reinf. Steel (Retaining Wall)	LB		x		=	$	-
800007	Fence (BW)	LF		x		=	$	-
832001	Metal Beam Guard Railing	LF	52,594	x	47	=	$	2,445,621
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
83954X	Transition Railing *(Insert Type)*	EA		x		=	$	-
8395XX	Terminal System (Type CAT)	EA		x		=	$	-
8395XX	Alternative Flared Terminal System	EA	4	x	1,200	=	$	4,800
8395XX	End Anchor Assembly (*Insert Type*)	EA		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
839596	Crash Cushion *(G.R.E.A.T)*	EA		x		=	$	-
839701	Concrete Barrier *(50 or 60)*	LF	44,180	x	78	=	$	3,446,040
833128	Concrete Barrier *(25 Modify)*	LF	480	x	128	=	$	61,440
XXXXXX	Some Item			x		=	$	-

TOTAL SPECIALTY ITEMS **$ 10,301,700**

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
XXXXXX	Biological Mitigation	LS		x		=	$	-
071325	Temporary Reinforced Silt Fence	LF		x		=	$	-
XXXXXX	Hazardous Material Remediation	LS	1	x	45,000	=	$	45,000
XXXXXX	Permits	LS	1	x	45,000	=	$	45,000
071325	Temporary Fence (Type ESA)	LF		x		=	$	-

Subtotal Environmental *$ 90,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
200001	Highway Planting	ACRE		x		=	$	-
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-*	LF		x		=	$	-
20XXXX	Extend XXX" *(Insert Type)* Conduit	LF		x		=	$	-
201700	Imported Topsoil	CY		x		=	$	-
203015	Erosion Control	ACRE		x		=	$	-
203021	Fiber Rolls	LF		x		=	$	-
203026	Move In/ Move Out (Erosion Control)	EA		x		=	$	-
204099	Plant Establishment Work	LS		x		=	$	-
204101	Extend Plant Establishment (X Years)	LS		x		=	$	-
208000	Irrigation System	LS		x		=	$	-
208304	Water Meter	EA		x		=	$	-
209801	Maintenance Vehicle Pullout	EA		x		=	$	-
XXXXXX	Some Item							

Subtotal Landscape and Irrigation *$ -*

5C - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost
074016	Construction Site Management	LS	1	x	450,000	=	$	450,000
074017	Prepare WPCP	LS	1	x	10,000	=	$	10,000
074019	Prepare SWPPP	LS	1	x	10,000	=	$	10,000
074023	Temporary Erosion Control	ACRE	36	x	2,500	=	$	90,000
074027	Temporary Erosion Control Blanket	SQYD		x		=	$	-
074028	Temporary Fiber Roll	LF		x		=	$	-
074032	Temporary Concrete Washout Facility	EA		x		=	$	-
074033	Temporary Construction Entrance	EA		x		=	$	-
074035	Temporary Check Dam	LF		x		=	$	-
074037	Move In/ Move Out (Temp Erosion Control)	EA		x		=	$	-
074038	Temp. Drainage Inlet Protection	EA	210	x	60	=	$	12,600
XXXXXX	Site Job Management	LS	1	x	450,000	=	$	450,000
074042	Temporary Concrete Washout (Portable)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

Supplemental Work for NPDES

(These costs are not accounted in total here but under Supplemental Work on sheet 7 of 11).

074021	Water Pollution Control Maintenance Work*	LS	1	x	25,500	=	$	25,500
066596	Additional Water Pollution Control**	LS		x		=	$	-
066597	Storm Water Sampling and Analysis***	LS		x		=	$	-
XXXXXX	Some Item							

Subtotal NPDES (Without Supplemental Work) *$ 1,022,600*

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $ 1,112,600

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LB		x		=	$	-
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
56XXXX	Install Overhead Sign (Two Post)	EA	15	x	400,000	=	$	6,000,000
56XXXX	Install Overhead Sign (One Post)	EA	10	x	160,000	=	$	1,600,000
860090	Maintain Existing Traffic Management System	LS	1	x	900,000	=	$	900,000
860810	Inductive Loop Detectors	EA		x		=	$	-
86055X	Lighting & Sign Illumination	EA	253	x	4,000	=	$	1,012,000
8607XX	Interconnection Facilities	LS		x		=	$	-
8609XX	Traffic Traffic Monitoring Stations	LS	1	x	200,000	=	$	200,000
860XXX	Signals & Lighting	LS		x		=	$	-
860XXX	ITS Elements	LS		x		=	$	-
861100	Ramp Metering System (Location X)	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXXX	Ramp Terminal Intersection Improvement	LS	0	x	1,000,000	=	$	-
XXXXXX	Toll Equipment and System Integration (Capital)	LS	1	x	100,000,000	=	$	100,000,000
XXXXX	Some Item							

Subtotal Traffic Electrical *$ 109,712,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120090	Construction Area Signs	LS	1	x	900,000	=	$	900,000
150701	Remove Yellow Painted Traffic Stripe	LF	63,360	x	4	=	$	253,440
150710	Remove Traffic Stripe	LF	633,600	x	0.25	=	$	158,400
150713	Remove Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA	10	x	120	=	$	1,200
15075X	Remove Sign Structure	EA	15	x	20,000	=	$	300,000
15075X	Remove Sign Structure (On Bridge)	EA	8	x	5,000	=	$	40,000
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
566011	Roadside Sign (One Post)	EA	15	x	340	=	$	5,100
566012	Roadside Sign (Two Post)	EA	5	x	1,250	=	$	6,250
560XXX	Furnish Sign Panels	SQFT		x		=	$	-
560XXX	Install Sign Panels	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	450,000	=	$	450,000
840504	Thermoplastic Traffic Strip (4")	LF	633,600	x	0.50	=	$	316,800

Subtotal Traffic Signing and Striping *$ 2,431,190*

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	1	x	4,000,000	=	$	4,000,000
120120	Type III Barricade	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	LS	1	x	90,000	=	$	90,000
120159	Temporary Traffic Strip (Paint)	LS	1	x	90,000	=	$	90,000
12016X	Channelizer	EA		x		=	$	-
128650	Portable Changeable Message Signs	EA	10	x	10,000	=	$	100,000
129000	Temporary Railing (Type K)	LF	6,000	x	17	=	$	102,000
129100	Temp. Crash Cushion Module	EA	4	x	200	=	$	800
129099A	Traffic Plastic Drum	EA		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
XXXXXX	Misc. Items (Traffic Management Plan)	LS	1	x	180,000	=	$	180,000
XXXXXX	Some Item	LS		x		=	$	-

Subtotal Stage Construction and Traffic Handling *$ 4,562,800*

TOTAL TRAFFIC ITEMS **$ 116,706,000**

SECTION 7: DETOURS

Include constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
0713XX	Temporary Fence (Type X)	LF		x		=	$ -
07XXXX	Temporary Drainage	LS		x		=	$ -
120143	Temporary Pavement Delineation	LF		x		=	$ -
1286XX	Temporary Signals	EA		x		=	$ -
129000	Temporary Railing (Type K)	LF		x		=	$ -
190101	Roadway Excavation	CY		x		=	$ -
198001	Imported Borrow	CY		x		=	$ -
198050	Embankment	CY		x		=	$ -
250401	Class 4 Aggregate Subbase	CY		x		=	$ -
260201	Class 2 Aggregate Base	CY		x		=	$ -
390132	Hot Mix Asphalt (Type A)	TON		x		=	$ -
XXXXXX	Some Item	LS	1	x	$150,000	=	$ 150,000

TOTAL DETOURS **$ 150,000**

SUBTOTAL SECTIONS 1-7 $ 153,796,700

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items

ADA Items $ -

8B - Bike Path Items

Bike Path Items $ -

8C - Other Minor Items

Other Minor Items 5.0% $ 7,689,835

Total of Section 1-7 $ 153,796,700 x 5.0% = $ 7,689,835

TOTAL MINOR ITEMS **$ 7,689,900**

SECTIONS 9: MOBILIZATION

Item code							
999990	Total Section 1-8	$	161,486,600	x	10%	=	$ 16,148,660

TOTAL MOBILIZATION **$ 16,148,700**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066015	Federal Trainee Program	LS		x		=	$ -
066063	Traffic Management Plan - Public Information	LS		x		=	$ -
066090	Maintain Traffic	LS		x		=	$ -
066094	Value Analysis	LS		x		=	$ -
066204	Remove Rock & Debris	LS		x		=	$ -
066222	Locate Existing Cross-Over	LS		x		=	$ -
066670	Payment Adjustments For Price Index Fluctuations	LS		x		=	$ -
066700	Partnering	LS		x		=	$ -
066866	Operation of Existing Traffic Management System Eler	LS		x		=	$ -
066920	Dispute Review Board	LS		x		=	$ -
066XXX	Some Item	LS		x		=	$ -

*Cost of **NPDES** Supplemental Work specified in Section 5C* = $ 25,500

Total Section 1-8 $ 161,486,600 5% = $ 8,074,330

TOTAL SUPPLEMENTAL WORK **$ 8,099,900**

Note: Mobilization item will automatically calculate if working days are 50 or more. For Project less than 50 Working Days Mobilization is not required as a separate contract, however contract item prices should take into consideration mobilization as part of the price. If the building portion of the project is greater than 50% of the total project cost,

If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066063	Public Information	LS	0	x	$100,000	=	$0
066105	RE Office	LS	1	x	$400,000	=	$400,000
066803	Padlocks	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
066062A	COZEEP Expenses	LS		x		=	$0
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
XXXXXX	Toll Back Office System	LS	1	x	$1,700,000	=	$1,700,000
06684X	TMS Controller Assembly	LS	1	x	$2,000,000	=	$2,000,000
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
XXXXXX	Some Item						

Total Section 1-8	$	161,486,600	1%	=	$ 1,614,866

TOTAL STATE FURNISHED	**$5,714,900**

SECTION 12: TIME-RELATED OVERHEAD

Estimated Time-Releated Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity		Unit Price ($)		Cost	
			Total of All Contract Items Only				$ 175,571,300	(used to calculate TR
070018	Time-Related Overhead	$	175,571,300	X	6%	=	$10,534,278	

TOTAL TIME-RELATED OVERHEAD	**$10,534,278**

SECTION 13: CONTINGENCY

Total Section 1-12	$	201,984,378	x	20%	=	$40,396,876	

TOTAL CONTINGENCY	**$40,396,900**

Note: TRO is a contract item if total project cost is (non-escalated) over $5 million AND 100 or more working days.
If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.
TRO calculated for you as percentage of the sum of all contract items only;
excluding mobilization, supplemental work, state furnished materials and expenses, and contingency.

II. STRUCTURE ITEMS

	Bridge 1	Bridge 2	Bridge 3
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	ALAMADEN UC	CAMDEN UC	OKA UC
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	50 LF	45 LF	33 LF
Total Bridge Length (Feet)	238 LF	210 LF	102 LF
Total Area (Square Feet)	11,900 SQFT	9,450 SQFT	3,366 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	None	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$3,570,000**	**$2,835,000**	**$1,009,800**

	Bridge 4	Bridge 5	Bridge 6
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	LOS GATOS CREEK BRIDGE	POLLARD UC	SAN TOMAS AQUINAS CREEK
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	29 LF	23 LF	23 LF
Total Bridge Length (Feet)	178 LF	196 LF	105 LF
Total Area (Square Feet)	5,162 SQFT	4,508 SQFT	2,415 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$1,548,600**	**$1,352,400**	**$724,500**

	Bridge 7	Bridge 8	Bridge 9
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	SARATOGA UC	SARATOGA CREEK BRIDGE	CALABAZAS CREEK BRG
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	23 LF	23 LF	22 LF
#REF!	192 LF	100 LF	156 LF
Total Area (Square Feet)	4,416 SQFT	2,300 SQFT	3,432 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH	**$1,324,800**	**$690,000**	**$1,029,600**

	Bridge 10
DATE OF ESTIMATE	Dec, 2019
Bridge Name	Pedestrian Bridge (Dalles Ave)
Bridge Number	
Structure Type	CIP/PS Box Girder
Width (Feet) [out to out]	0 LF
#REF!	370 LF
Total Area (Square Feet)	0 SQFT
Structure Depth (Feet)	LF
Footing Type (pile or spread)	Pile
Cost Per Square Foot	$300
COST OF EACH	**$0**

TOTAL COST OF STRUCTURES[1]	**14,084,700**

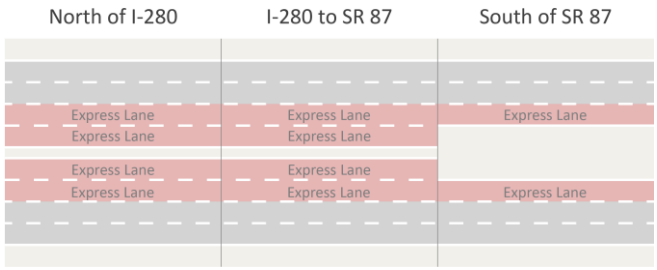
Estimate Prepared By: _____ _____

XXXXXXXXXXXXXXXX ------ Division of Structures — Date

[1]Structure's Estimate includes Overhead and Mobilization are based on 2019 CALTRAN's "COMPARATIVE BRIDGE COSTS".

Alternative 2-2: Long Express Lanes

- Add one express lane in each direction from Almaden Expressway to I-280 to operate jointly with existing HOV lanes as two express lanes in each direction.
- Convert existing HOV lane in each direction from U.S. 101 (southern end of SR 85) to Almaden Expressway to operate as one express lane in each direction.
- Provide continuous access to the express lane(s) from the adjacent general-purpose lanes.
- Extend existing auxiliary lane on northbound SR 85 from the South De Anza Boulevard northbound on-ramp to 0.2 mile south of the Stevens Creek Boulevard off-ramp.
- Provide CHP enforcement/observation areas in the median at selected locations along the corridor.
- Install double-luminaire mast arm lighting at 250- to 400-foot intervals from PM 6.00 (Almaden Expressway) to PM 17.70 (Stevens Creek Boulevard) and from PM 18.86 (Homestead Road to PM 23.44 (Moffett Boulevard).
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing.
- Widen nine bridge structures.
- Replace Dalles Avenue pedestrian bridge.



Alternative 2-2: Long Express Lanes

Engineer Cost Estimate --- Alternative 2-2
Preliminary Project Study Report

Project ID: XXXXXX

Type of Estimate :	Preliminary Project Study Report (Dec 2019)
Program Code :	04-XXXXX
Project Limits :	From Hwy 101 Interchange in Santa Jose to South of Hwy 101 Interchange in Mt. View
Description:	From PM 0.00 to PM 23.68
Scope :	Convert the Existing HOV Lanes Into Express Lanes (PM 0.00 to PM 22.13) and Construct A New Express Lane from North of Sanchez Drive (PM 5.75) to South of Highway 101 (PM 23.68)
Alternative :	Alternative 2-2 Long Express Lanes

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	266,093,526	$	356,526,300
STRUCTURE ITEMS	$	15,194,700	$	20,358,700
SUBTOTAL CONSTRUCTION COST	$	281,288,226	$	376,885,000
RIGHT OF WAY	$	-	$	-
TOTAL CAPITAL OUTLAY COST	$	281,289,000	$	376,885,000
PR/ED SUPPORT (3%)	$	8,439,000	$	11,307,000
PS&E SUPPORT (12%)	$	33,755,000	$	45,227,000
RIGHT OF WAY SUPPORT				
CONSTRUCTION SUPPORT (12%)	$	33,755,000	$	45,227,000
AGENCY SUPPORT (8%)	$	22,504,000	$	30,151,000
TOTAL CAPITAL OUTLAY SUPPORT COST*	$	98,453,000	$	131,912,000
TOTAL PROJECT COST	$	379,742,000	$	509,000,000

If Project has been programmed enter Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	12	/	2019
Estimated Date of Construction Start (Month/Year)	10	/	2023
Number of Working Days	1500		Working Days
Estimated Mid-Point of Construction (Month/Year)	10	/	2026
Number of Plant Establishment Days			Days

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	**Earthwork**	$	5,887,700
2	**Pavement Structural Section**	$	20,438,400
3	**Drainage**	$	2,619,700
4	**Specialty Items**	$	18,243,300
5	**Environmental**	$	2,128,900
6	**Traffic Items**	$	119,586,600
7	**Detours**	$	250,000
8	**Minor Items**	$	8,457,800
9	**Roadway Mobilization**	$	17,761,300
10	**Supplemental Work**	$	8,926,200
11	**State Furnished**	$	5,876,200
12	**Contingencies**	$	44,349,000
13	**Overhead**	$	11,568,426
	TOTAL ROADWAY ITEMS	**$**	**266,093,526**

Estimate Prepared By : _____

Name and Title Date Phone

Estimate Reviewed By : _____

Name and Title Date Phone

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)		Cost
160101	Clearing & Grubbing	AC	39	x	1,725	=	$67,275
170101	Develop Water Supply	LS	1	x	50,000	=	$50,000
190101	Roadway Excavation	CY	182,763	x	29	=	$5,227,022
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$0
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$0
192037	Structure Excavation (Retaining Wall)	CY		x		=	$0
193013	Structure Backfill (Retaining Wall)	CY		x		=	$0
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$0
194001	Ditch Excavation	CY		x		=	$0
198001	Impored Borrow	CY	32,931	x	17	=	$543,362
198007	Imported Material (Shoulder Backing)	TON		x		=	$0
XXXXXX	Some Item			x		=	$0

TOTAL EARTHWORK SECTION ITEMS	**$ 5,887,700**

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)		Cost
150771	Remove Asphalt Concrete Dike	LF		x		= $	-
150860	Remove Base and Surfacing	CY		x		= $	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	12,305	x	8	= $	98,440
150854	Remove Concrete Pavement	CY	3,855	x	156	= $	601,380
260201	Class 4 Aggregate Base	CY	22,168	x	61	= $	1,341,164
250401	Class 4 Aggregate Subbase	CY	42,437	x	38	= $	1,612,606
290201	Asphalt Treated Permeable Base	CY	15,835	x	160	= $	2,533,600
365001	Sand Cover	TON		x		= $	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= $	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= $	-
3750XX	Screenings (Type XX)	TON		x		= $	-
377501	Slurry Seal	TON		x		= $	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= $	-
390132	Hot Mix Asphalt (Type A)	TON		x		= $	-
390136	Minor Hot Mix Asphalt	TON		x		= $	-
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= $	-
393003	Geosynthetic Pavement Interlayer	SQYD		x		= $	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Inden*	STA		x		= $	-
394071	Place Hot Mix Asphalt Dike	LF		x		= $	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		= $	-
397005	Tack Coat	TON		x		= $	-
400050	Continuously Reinfored Concrete Pavement	CY	47,504	x	300	= $	14,251,200
401108	Replace Concrete Pavement (Rapid Strength	CY		x		= $	-
404092	Seal Pavement Joint	LF		x		= $	-
404094	Seal Longitudinal Isolation Joint	LF		x		= $	-
413112A	Repair Spalled Joints (Polyester Grout)	SQYD		x		= $	-
413115	Seal Existing Concrete Pavement Joint	LF		x		= $	-
420102	Groove Existing Concrete Pavement	SQYD		x		= $	-
420201	Grind Existing Concrete Pavement	SQYD		x		= $	-
731502	Minor Concrete (Misc. Const)	CY		x		= $	-
731530	Minor Concrete (Textured Paving)	SQFT		x		= $	-
XXXXXX	Some Item			x		= $	-

TOTAL STRUCTURAL SECTION ITEMS	**$ 20,438,400**

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
150206	Abandon Culvert	LF		x		=	$	-
150805	Remove Culvert	LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
193114	Sand Backfill	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
510512	Minor Concrete (Box Culvert)	CY		x		=	$	-
510XXX	Culvert (Roadway Crossing)	EA		x		=	$	-
62XXXX	XXX" APC Pipe	LF		x		=	$	-
64XXXX	XXX" Plastic Pipe	LF		x		=	$	-
65XXXX	XXX" RCP Pipe	LF		x		=	$	-
66XXXX	XXX" CSP Pipe	LF		x		=	$	-
680905	Underdrain (6" Alternative)	LF	32,360	x	36	=	$	1,164,960
681103	Edge Drain (3" Plastic Pipe)	LF	69,269	x	21	=	$	1,454,649
69XXXX	XXX" Pipe Downdrain	LF		x		=	$	-
70XXXX	XXX" Pipe Inlet	LF		x		=	$	-
70XXXX	XXX" Pipe Riser	LF		x		=	$	-
70XXXX	XXX" Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
729010	Rock Slope Protection Fabric	SQYD		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Additional Drainage (Detention Base, etc)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL DRAINAGE ITEMS **$ 2,619,700**

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	30,000	=	$	30,000
150662	Remove Metal Beam Guard Railing	LF	61,156	x	15	=	$	886,762
150668	Remove Terminal Systems	EA		x		=	$	-
1532XX	Remove Concrete Barrier (25, 50 or 50C)	LF	4,606	x	16	=	$	73,696
153250	Remove Sound Wall	SQFT	114,680	x	25	=	$	2,867,000
150606	Remove Fence (BW)	LF		x		=	$	-
190110	Lead Compliance Plan	LS	1	x	18,000	=	$	18,000
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$	-
510060	Structural Concrete (Retaining Wall)	CY		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$	-
510XXX	Retaining Wall (MSE)	SQFT	42,720	x	85	=	$	3,631,200
XXXXXX	Sound Wall (On Pile, On Barrier or On Ret. Wall)	SQFT	114,680	x	40	=	$	4,587,200
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$	-
511048	Apply Anti-Graffiti Coating	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$	-
518002	Sound Wall (Masonry Block)	SQFT		x		=	$	-
520103	Bar Reinf. Steel (Retaining Wall)	LB		x		=	$	-
800007	Fence (BW)	LF		x		=	$	-
832001	Metal Beam Guard Railing	LF	52,594	x	47	=	$	2,445,621
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
83954X	Transition Railing *(Insert Type)*	EA		x		=	$	-
8395XX	Terminal System (Type CAT)	EA		x		=	$	-
8395XX	Alternative Flared Terminal System	EA	4	x	1,200	=	$	4,800
8395XX	End Anchor Assembly (*Insert Type*)	EA		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
839596	Crash Cushion *(G.R.E.A.T)*	EA		x		=	$	-
839701	Concrete Barrier *(50 or 60)*	LF	44,180	x	78	=	$	3,446,040
833128	Concrete Barrier *(25 Modify)*	LF	1,976	x	128	=	$	252,928
XXXXXX	Some Item			x		=	$	-

TOTAL SPECIALTY ITEMS **$ 18,243,300**

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
XXXXXX	Biological Mitigation	LS		x		=	$	-
071325	Temporary Reinforced Silt Fence	LF		x		=	$	-
XXXXXX	Hazardous Material Remediation	LS	1	x	180,000	=	$	180,000
XXXXXX	Permits	LS	1	x	90,000	=	$	90,000
071325	Temporary Fence (Type ESA)	LF		x		=	$	-

Subtotal Environmental *$ 270,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
200001	Highway Planting	ACRE		x		=	$	-
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-*	LF		x		=	$	-
20XXXX	Extend XXX" *(Insert Type)* Conduit	LF		x		=	$	-
201700	Imported Topsoil	CY		x		=	$	-
203015	Erosion Control	ACRE		x		=	$	-
203021	Fiber Rolls	LF		x		=	$	-
203026	Move In/ Move Out (Erosion Control)	EA		x		=	$	-
204099	Plant Establishment Work	LS		x		=	$	-
204101	Extend Plant Establishment (X Years)	LS		x		=	$	-
208000	Irrigation System	LS		x		=	$	-
208304	Water Meter	EA		x		=	$	-
209801	Maintenance Vehicle Pullout	EA		x		=	$	-
XXXXXX	Some Item							

Subtotal Landscape and Irrigation *$ -*

5C - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost
074016	Construction Site Management	LS	1	x	900,000	=	$	900,000
074017	Prepare WPCP	LS	1	x	20,000	=	$	20,000
074019	Prepare SWPPP	LS	1	x	20,000	=	$	20,000
074023	Temporary Erosion Control	ACRE	0	x	2,500	=	$	-
074027	Temporary Erosion Control Blanket	SQYD		x		=	$	-
074028	Temporary Fiber Roll	LF		x		=	$	-
074032	Temporary Concrete Washout Facility	EA		x		=	$	-
074033	Temporary Construction Entrance	EA		x		=	$	-
074035	Temporary Check Dam	LF		x		=	$	-
074037	Move In/ Move Out (Temp Erosion Control)	EA		x		=	$	-
074038	Temp. Drainage Inlet Protection	EA	315	x	60	=	$	18,900
XXXXXX	Site Job Management	LS	1	x	900,000	=	$	900,000
074042	Temporary Concrete Washout (Portable)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

Supplemental Work for NPDES

(These costs are not accounted in total here but under Supplemental Work on sheet 7 of 11).

074021	Water Pollution Control Maintenance Work*	LS	1	x	45,500	=	$	45,500
066596	Additional Water Pollution Control**	LS		x		=	$	-
066597	Storm Water Sampling and Analysis***	LS		x		=	$	-
XXXXXX	Some Item							

Subtotal NPDES (Without Supplemental Work) *$ 1,858,900*

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $ 2,128,900

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LB		x		=	$	-
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
56XXXX	Install Overhead Sign (Two Post)	EA	15	x	400,000	=	$	6,000,000
56XXXX	Install Overhead Sign (One Post)	EA	10	x	160,000	=	$	1,600,000
860090	Maintain Existing Traffic Management System	LS	1	x	900,000	=	$	900,000
860810	Inductive Loop Detectors	EA		x		=	$	-
86055X	Lighting & Sign Illumination	EA	378	x	4,000	=	$	1,512,000
8607XX	Interconnection Facilities	LS		x		=	$	-
8609XX	Traffic Traffic Monitoring Stations	LS	1	x	200,000	=	$	200,000
860XXX	Signals & Lighting	LS		x		=	$	-
860XXX	ITS Elements	LS		x		=	$	-
861100	Ramp Metering System (Location X)	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXXX	Ramp Terminal Intersection Improvement	LS	1	x	1,000,000	=	$	1,000,000
XXXXXX	Toll Equipment and System Integration (Capital)	LS	1	x	100,000,000	=	$	100,000,000
XXXXX	Some Item							

Subtotal Traffic Electrical *$ 111,212,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120090	Construction Area Signs	LS	1	x	900,000	=	$	900,000
150701	Remove Yellow Painted Traffic Stripe	LF	94,494	x	4	=	$	377,976
150710	Remove Traffic Stripe	LF	944,940	x	0.25	=	$	236,235
150713	Remove Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA	20	x	120	=	$	2,400
15075X	Remove Sign Structure	EA	30	x	20,000	=	$	600,000
15075X	Remove Sign Structure (On Bridge)	EA	8	x	5,000	=	$	40,000
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
566011	Roadside Sign (One Post)	EA	30	x	340	=	$	10,200
566012	Roadside Sign (Two Post)	EA	10	x	1,250	=	$	12,500
560XXX	Furnish Sign Panels	SQFT		x		=	$	-
560XXX	Install Sign Panels	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	900,000	=	$	900,000
840504	Thermoplastic Traffic Strip (4")	LF	944,940	x	0.50	=	$	472,470

Subtotal Traffic Signing and Striping *$ 3,551,781*

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	1	x	4,000,000	=	$	4,000,000
120120	Type III Barricade	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	LS	1	x	90,000	=	$	90,000
120159	Temporary Traffic Strip (Paint)	LS	1	x	90,000	=	$	90,000
12016X	Channelizer	EA		x		=	$	-
128650	Portable Changeable Message Signs	EA	18	x	10,000	=	$	180,000
129000	Temporary Railing (Type K)	LF	6,000	x	17	=	$	102,000
129100	Temp. Crash Cushion Module	EA	4	x	200	=	$	800
129099A	Traffic Plastic Drum	EA		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
XXXXXX	Misc. Items (Traffic Management Plan)	LS	1	x	360,000	=	$	360,000
XXXXXX	Some Item	LS		x		=	$	-

Subtotal Stage Construction and Traffic Handling *$ 4,822,800*

TOTAL TRAFFIC ITEMS **$ 119,586,600**

SECTION 7: DETOURS

Include constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
0713XX	Temporary Fence (Type X)	LF		x		=	$ -
07XXXX	Temporary Drainage	LS		x		=	$ -
120143	Temporary Pavement Delineation	LF		x		=	$ -
1286XX	Temporary Signals	EA		x		=	$ -
129000	Temporary Railing (Type K)	LF		x		=	$ -
190101	Roadway Excavation	CY		x		=	$ -
198001	Imported Borrow	CY		x		=	$ -
198050	Embankment	CY		x		=	$ -
250401	Class 4 Aggregate Subbase	CY		x		=	$ -
260201	Class 2 Aggregate Base	CY		x		=	$ -
390132	Hot Mix Asphalt (Type A)	TON		x		=	$ -
XXXXXX	Some Item	LS	1	x	$250,000	=	$ 250,000

TOTAL DETOURS **$ 250,000**

SUBTOTAL SECTIONS 1-7 $ 169,154,600

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items

ADA Items $ -

8B - Bike Path Items

Bike Path Items $ -

8C - Other Minor Items

Other Minor Items 5.0% $ 8,457,730

Total of Section 1-7 $ 169,154,600 x 5.0% = $ 8,457,730

TOTAL MINOR ITEMS **$ 8,457,800**

SECTIONS 9: MOBILIZATION

Item code							
999990	Total Section 1-8	$	177,612,400	x	10%	=	$17,761,240

TOTAL MOBILIZATION **$ 17,761,300**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066015	Federal Trainee Program	LS		x		=	$ -
066063	Traffic Management Plan - Public Information	LS		x		=	$ -
066090	Maintain Traffic	LS		x		=	$ -
066094	Value Analysis	LS		x		=	$ -
066204	Remove Rock & Debris	LS		x		=	$ -
066222	Locate Existing Cross-Over	LS		x		=	$ -
066670	Payment Adjustments For Price Index Fluctuations	LS		x		=	$ -
066700	Partnering	LS		x		=	$ -
066866	Operation of Existing Traffic Management System Eler	LS		x		=	$ -
066920	Dispute Review Board	LS		x		=	$ -
066XXX	Some Item	LS		x		=	$ -

*Cost of **NPDES** Supplemental Work specified in Section 5C* = $ 45,500

Total Section 1-8 $ 177,612,400 5% = $ 8,880,620

TOTAL SUPPLEMENTAL WORK **$ 8,926,200**

Note: Mobilization item will automatically calculate if working days are 50 or more. For Project less than 50 Working Days Mobilization is not required as a separate contract, however contract item prices should take into consideration mobilization as part of the price. If the building portion of the project is greater than 50% of the total project cost,

If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066063	Public Information	LS	0	x	$100,000	=	$0
066105	RE Office	LS	1	x	$400,000	=	$400,000
066803	Padlocks	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
066062A	COZEEP Expenses	LS		x		=	$0
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
XXXXXX	Toll Back Office System	LS	1	x	$1,700,000	=	$1,700,000
06684X	TMS Controller Assembly	LS	1	x	$2,000,000	=	$2,000,000
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
XXXXXX	Some Item						

Total Section 1-8	$	177,612,400	1%	=	$ 1,776,124

TOTAL STATE FURNISHED	**$5,876,200**

SECTION 12: TIME-RELATED OVERHEAD

Estimated Time-Releated Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity		Unit Price ($)		Cost	
			Total of All Contract Items Only				$ 192,807,100	(used to calculate TR
070018	Time-Related Overhead	$	192,807,100	X	6%	=	$11,568,426	

TOTAL TIME-RELATED OVERHEAD	**$11,568,426**

SECTION 13: CONTINGENCY

Total Section 1-12	$	221,744,526	x	20%	=	$44,348,906

TOTAL CONTINGENCY	**$44,349,000**

Note: TRO is a contract item if total project cost is (non-escalated) over $5 million AND 100 or more working days.
If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.
TRO calculated for you as percentage of the sum of all contract items only;
excluding mobilization, supplemental work, state furnished materials and expenses, and contingency.

II. STRUCTURE ITEMS

	Bridge 1	Bridge 2	Bridge 3
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	ALAMADEN UC	CAMDEN UC	OKA UC
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	50 LF	45 LF	33 LF
Total Bridge Length (Feet)	238 LF	210 LF	102 LF
Total Area (Square Feet)	11,900 SQFT	9,450 SQFT	3,366 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	None	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$3,570,000**	**$2,835,000**	**$1,009,800**

	Bridge 4	Bridge 5	Bridge 6
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	LOS GATOS CREEK BRIDGE	POLLARD UC	SAN TOMAS AQUINAS CREEK
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	29 LF	23 LF	23 LF
Total Bridge Length (Feet)	178 LF	196 LF	105 LF
Total Area (Square Feet)	5,162 SQFT	4,508 SQFT	2,415 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$1,548,600**	**$1,352,400**	**$724,500**

	Bridge 7	Bridge 8	Bridge 9
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	SARATOGA UC	SARATOGA CREEK BRIDGE	CALABAZAS CREEK BRG
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	23 LF	23 LF	22 LF
#REF!	192 LF	100 LF	156 LF
Total Area (Square Feet)	4,416 SQFT	2,300 SQFT	3,432 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH	**$1,324,800**	**$690,000**	**$1,029,600**

	Bridge 10
DATE OF ESTIMATE	Dec, 2019
Bridge Name	Pedestrian Bridge (Dalles Ave)
Bridge Number	
Structure Type	CIP/PS Box Girder
Width (Feet) [out to out]	10 LF
#REF!	370 LF
Total Area (Square Feet)	3,700 SQFT
Structure Depth (Feet)	LF
Footing Type (pile or spread)	Pile
Cost Per Square Foot	$300
COST OF EACH	**$1,110,000**

TOTAL COST OF STRUCTURES[1]	**15,194,700**

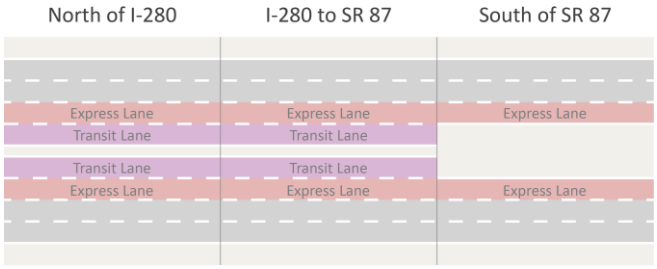
Estimate Prepared By: _____ _____

XXXXXXXXXXXXXXXX ------ Division of Structures — Date

[1]Structure's Estimate includes Overhead and Mobilization are based on 2019 CALTRAN's "COMPARATIVE BRIDGE COSTS".

Alternative 3-1: Long Median Adjacent Transit Lane

- Convert existing HOV lane in each direction from U.S. 101 (southern end of SR 85) to U.S. 101 in Mountain View to operate as a single express lane in each direction.
- Add one lane in each direction from Almaden Expressway to Evelynn Avenue or Moffett Boulevard. The added lane would be positioned in the existing median as the number 1 (inside) lane.
- With Alternative 3-1, the transit lane would occupy the number 1 lane position.
- Provide a buffer to separate the transit lane from the adjacent express lane.
- Provide continuous access to the express lane(s) from the adjacent general-purpose lanes.
- Extend existing auxiliary lane on northbound SR 85 from the South De Anza Boulevard northbound on-ramp to 0.2 mile south of the Stevens Creek Boulevard off-ramp.
- Provide CHP enforcement/observation areas in the median at selected locations along the corridor.
- Install double-luminaire mast arm lighting at 250- to 400-foot intervals from postmile (PM) 6.00 (Almaden expressway) to PM 17.70 (Stevens Creek Boulevard) and from PM 18.86 (Homestead Road) to PM 23.44 (Moffett Boulevard).
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing lighting.
- Widen nine bridges.
- Replace Dalles Avenue pedestrian structure.
- Convert SR 85 interchange at El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration.



Alternative 3-1: Long Median Adjacent Transit Lane

Engineer Cost Estimate --- Alternative 3-1
Preliminary Project Study Report

Project ID: XXXXXX

Type of Estimate : Preliminary Project Study Report (Dec 2019)
Program Code : 04-XXXXX
Project Limits : From Hwy 101 Interchange in Santa Jose to South of Hwy 101 Interchange in Mt. View
Description: From PM 0.00 to PM 23.68
Scope : Construct A New and Median-Adjacent Transit Lane Bewteen US 101 in Mt. View and SR 87 in San Jose.
Alternative : Alternative 3-1 Long Transit Lane

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	270,663,728	$	362,649,700
STRUCTURE ITEMS	$	15,194,700	$	20,358,700
SUBTOTAL CONSTRUCTION COST	$	285,858,428	$	383,008,400
RIGHT OF WAY	$	-	$	-
TOTAL CAPITAL OUTLAY COST	$	285,859,000	$	383,009,000
PR/ED SUPPORT (3%)	$	8,576,000	$	11,491,000
PS&E SUPPORT (12%)	$	34,304,000	$	45,962,000
RIGHT OF WAY SUPPORT				
CONSTRUCTION SUPPORT (12%)	$	34,304,000	$	45,962,000
AGENCY SUPPORT (8%)	$	22,869,000	$	30,641,000
TOTAL CAPITAL OUTLAY SUPPORT COST*	$	100,053,000	$	134,056,000
TOTAL PROJECT COST	$	385,912,000	$	518,000,000

If Project has been programmed enter Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	12	/	2019
Estimated Date of Construction Start (Month/Year)	10	/	2023
Number of Working Days	1500		Working Days
Estimated Mid-Point of Construction (Month/Year)	10	/	2026
Number of Plant Establishment Days			Days

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	Earthwork	$	6,364,900
2	Pavement Structural Section	$	22,598,800
3	Drainage	$	2,847,700
4	Specialty Items	$	18,243,300
5	Environmental	$	2,236,400
6	Traffic Items	$	119,586,600
7	Detours	$	250,000
8	Minor Items	$	8,606,400
9	Roadway Mobilization	$	18,073,500
10	Supplemental Work	$	9,082,300
11	State Furnished	$	5,907,400
12	Contingencies	$	45,110,700
13	Overhead	$	11,755,728
	TOTAL ROADWAY ITEMS	**$**	**270,663,728**

Estimate Prepared By : _____

Name and Title Date Phone

Estimate Reviewed By : _____

Name and Title Date Phone

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)		Cost
160101	Clearing & Grubbing	AC	43	x	1,725	=	$74,175
170101	Develop Water Supply	LS	1	x	50,000	=	$50,000
190101	Roadway Excavation	CY	201,337	x	29	=	$5,758,238
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$0
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$0
192037	Structure Excavation (Retaining Wall)	CY		x		=	$0
193013	Structure Backfill (Retaining Wall)	CY		x		=	$0
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$0
194001	Ditch Excavation	CY		x		=	$0
198001	Impored Borrow	CY	29,236	x	17	=	$482,394
198007	Imported Material (Shoulder Backing)	TON		x		=	$0
XXXXXX	Some Item			x		=	$0

TOTAL EARTHWORK SECTION ITEMS	**$ 6,364,900**

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
150771	Remove Asphalt Concrete Dike	LF		x		=	$	-
150860	Remove Base and Surfacing	CY		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	12,305	x	8	=	$	98,440
150854	Remove Concrete Pavement	CY	3,855	x	156	=	$	601,380
260201	Class 4 Aggregate Base	CY	24,595	x	61	=	$	1,487,998
250401	Class 4 Aggregate Subbase	CY	47,082	x	38	=	$	1,789,116
290201	Asphalt Treated Permeable Base	CY	17,568	x	160	=	$	2,810,880
365001	Sand Cover	TON		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
377501	Slurry Seal	TON		x		=	$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON		x		=	$	-
390136	Minor Hot Mix Asphalt	TON		x		=	$	-
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		=	$	-
393003	Geosynthetic Pavement Interlayer	SQYD		x		=	$	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Inden*	STA		x		=	$	-
394071	Place Hot Mix Asphalt Dike	LF		x		=	$	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		=	$	-
397005	Tack Coat	TON		x		=	$	-
400050	Continuously Reinfored Concrete Pavement	CY	52,703	x	300	=	$	15,810,900
401108	Replace Concrete Pavement (Rapid Strength	CY		x		=	$	-
404092	Seal Pavement Joint	LF		x		=	$	-
404094	Seal Longitudinal Isolation Joint	LF		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	SQYD		x		=	$	-
413115	Seal Existing Concrete Pavement Joint	LF		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
731502	Minor Concrete (Misc. Const)	CY		x		=	$	-
731530	Minor Concrete (Textured Paving)	SQFT		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS	**$ 22,598,800**

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
150206	Abandon Culvert	LF		x		=	$	-
150805	Remove Culvert	LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
193114	Sand Backfill	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
510512	Minor Concrete (Box Culvert)	CY		x		=	$	-
510XXX	Culvert (Roadway Crossing)	EA		x		=	$	-
62XXXX	XXX" APC Pipe	LF		x		=	$	-
64XXXX	XXX" Plastic Pipe	LF		x		=	$	-
65XXXX	XXX" RCP Pipe	LF		x		=	$	-
66XXXX	XXX" CSP Pipe	LF		x		=	$	-
680905	Underdrain (6" Alternative)	LF	38,695	x	36	=	$	1,393,020
681103	Edge Drain (3" Plastic Pipe)	LF	69,269	x	21	=	$	1,454,649
69XXXX	XXX" Pipe Downdrain	LF		x		=	$	-
70XXXX	XXX" Pipe Inlet	LF		x		=	$	-
70XXXX	XXX" Pipe Riser	LF		x		=	$	-
70XXXX	XXX" Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
729010	Rock Slope Protection Fabric	SQYD		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Additional Drainage (Detention Base, etc)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL DRAINAGE ITEMS	**$**	**2,847,700**

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	30,000	=	$	30,000
150662	Remove Metal Beam Guard Railing	LF	61,156	x	15	=	$	886,762
150668	Remove Terminal Systems	EA		x		=	$	-
1532XX	Remove Concrete Barrier (25, 50 or 50C)	LF	4,606	x	16	=	$	73,696
153250	Remove Sound Wall	SQFT	114,680	x	25	=	$	2,867,000
150606	Remove Fence (BW)	LF		x		=	$	-
190110	Lead Compliance Plan	LS	1	x	18,000	=	$	18,000
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$	-
510060	Structural Concrete (Retaining Wall)	CY		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$	-
510XXX	Retaining Wall (MSE)	SQFT	42,720	x	85	=	$	3,631,200
XXXXXX	Sound Wall (On Pile, On Barrier or On Ret. Wall)	SQFT	114,680	x	40	=	$	4,587,200
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$	-
511048	Apply Anti-Graffiti Coating	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$	-
518002	Sound Wall (Masonry Block)	SQFT		x		=	$	-
520103	Bar Reinf. Steel (Retaining Wall)	LB		x		=	$	-
800007	Fence (BW)	LF		x		=	$	-
832001	Metal Beam Guard Railing	LF	52,594	x	47	=	$	2,445,621
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
83954X	Transition Railing *(Insert Type)*	EA		x		=	$	-
8395XX	Terminal System (Type CAT)	EA		x		=	$	-
8395XX	Alternative Flared Terminal System	EA	4	x	1,200	=	$	4,800
8395XX	End Anchor Assembly (*Insert Type*)	EA		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
839596	Crash Cushion *(G.R.E.A.T)*	EA		x		=	$	-
839701	Concrete Barrier *(50 or 60)*	LF	44,180	x	78	=	$	3,446,040
833128	Concrete Barrier *(25 Modify)*	LF	1,976	x	128	=	$	252,928
XXXXXX	Some Item			x		=	$	-

TOTAL SPECIALTY ITEMS	**$**	**18,243,300**

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
XXXXXX	Biological Mitigation	LS		x		=	$	-
071325	Temporary Reinforced Silt Fence	LF		x		=	$	-
XXXXXX	Hazardous Material Remediation	LS	1	x	180,000	=	$	180,000
XXXXXX	Permits	LS	1	x	90,000	=	$	90,000
071325	Temporary Fence (Type ESA)	LF		x		=	$	-

Subtotal Environmental *$ 270,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
200001	Highway Planting	ACRE		x		=	$	-
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-*	LF		x		=	$	-
20XXXX	Extend XXX" *(Insert Type)* Conduit	LF		x		=	$	-
201700	Imported Topsoil	CY		x		=	$	-
203015	Erosion Control	ACRE		x		=	$	-
203021	Fiber Rolls	LF		x		=	$	-
203026	Move In/ Move Out (Erosion Control)	EA		x		=	$	-
204099	Plant Establishment Work	LS		x		=	$	-
204101	Extend Plant Establishment (X Years)	LS		x		=	$	-
208000	Irrigation System	LS		x		=	$	-
208304	Water Meter	EA		x		=	$	-
209801	Maintenance Vehicle Pullout	EA		x		=	$	-
XXXXXX	Some Item							

Subtotal Landscape and Irrigation *$ -*

5C - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost
074016	Construction Site Management	LS	1	x	900,000	=	$	900,000
074017	Prepare WPCP	LS	1	x	20,000	=	$	20,000
074019	Prepare SWPPP	LS	1	x	20,000	=	$	20,000
074023	Temporary Erosion Control	ACRE	43	x	2,500	=	$	107,500
074027	Temporary Erosion Control Blanket	SQYD		x		=	$	-
074028	Temporary Fiber Roll	LF		x		=	$	-
074032	Temporary Concrete Washout Facility	EA		x		=	$	-
074033	Temporary Construction Entrance	EA		x		=	$	-
074035	Temporary Check Dam	LF		x		=	$	-
074037	Move In/ Move Out (Temp Erosion Control)	EA		x		=	$	-
074038	Temp. Drainage Inlet Protection	EA	315	x	60	=	$	18,900
XXXXXX	Site Job Management	LS	1	x	900,000	=	$	900,000
074042	Temporary Concrete Washout (Portable)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

Supplemental Work for NPDES

(These costs are not accounted in total here but under Supplemental Work on sheet 7 of 11).

074021	Water Pollution Control Maintenance Work*	LS	1	x	45,500	=	$	45,500
066596	Additional Water Pollution Control**	LS		x		=	$	-
066597	Storm Water Sampling and Analysis***	LS		x		=	$	-
XXXXXX	Some Item							

Subtotal NPDES (Without Supplemental Work) *$ 1,966,400*

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $ 2,236,400

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LB		x		=	$	-
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
56XXXX	Install Overhead Sign (Two Post)	EA	15	x	400,000	=	$	6,000,000
56XXXX	Install Overhead Sign (One Post)	EA	10	x	160,000	=	$	1,600,000
860090	Maintain Existing Traffic Management System	LS	1	x	900,000	=	$	900,000
860810	Inductive Loop Detectors	EA		x		=	$	-
86055X	Lighting & Sign Illumination	EA	378	x	4,000	=	$	1,512,000
8607XX	Interconnection Facilities	LS		x		=	$	-
8609XX	Traffic Traffic Monitoring Stations	LS	1	x	200,000	=	$	200,000
860XXX	Signals & Lighting	LS		x		=	$	-
860XXX	ITS Elements	LS		x		=	$	-
861100	Ramp Metering System (Location X)	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXXX	Ramp Terminal Intersection Improvement	LS	1	x	1,000,000	=	$	1,000,000
XXXXXX	Toll Equipment and System Integration (Capital)	LS	1	x	100,000,000	=	$	100,000,000
XXXXX	Some Item							

Subtotal Traffic Electrical *$ 111,212,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120090	Construction Area Signs	LS	1	x	900,000	=	$	900,000
150701	Remove Yellow Painted Traffic Stripe	LF	94,494	x	4	=	$	377,976
150710	Remove Traffic Stripe	LF	944,940	x	0.25	=	$	236,235
150713	Remove Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA	20	x	120	=	$	2,400
15075X	Remove Sign Structure	EA	30	x	20,000	=	$	600,000
15075X	Remove Sign Structure (On Bridge)	EA	8	x	5,000	=	$	40,000
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
566011	Roadside Sign (One Post)	EA	30	x	340	=	$	10,200
566012	Roadside Sign (Two Post)	EA	10	x	1,250	=	$	12,500
560XXX	Furnish Sign Panels	SQFT		x		=	$	-
560XXX	Install Sign Panels	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	900,000	=	$	900,000
840504	Thermoplastic Traffic Strip (4")	LF	944,940	x	0.50	=	$	472,470

Subtotal Traffic Signing and Striping *$ 3,551,781*

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	1	x	4,000,000	=	$	4,000,000
120120	Type III Barricade	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	LS	1	x	90,000	=	$	90,000
120159	Temporary Traffic Strip (Paint)	LS	1	x	90,000	=	$	90,000
12016X	Channelizer	EA		x		=	$	-
128650	Portable Changeable Message Signs	EA	18	x	10,000	=	$	180,000
129000	Temporary Railing (Type K)	LF	6,000	x	17	=	$	102,000
129100	Temp. Crash Cushion Module	EA	4	x	200	=	$	800
129099A	Traffic Plastic Drum	EA		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
XXXXXX	Misc. Items (Traffic Management Plan)	LS	1	x	360,000	=	$	360,000
XXXXXX	Some Item	LS		x		=	$	-

Subtotal Stage Construction and Traffic Handling *$ 4,822,800*

TOTAL TRAFFIC ITEMS **$ 119,586,600**

SECTION 7: DETOURS

Include constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
0713XX	Temporary Fence (Type X)	LF		x		=	$ -
07XXXX	Temporary Drainage	LS		x		=	$ -
120143	Temporary Pavement Delineation	LF		x		=	$ -
1286XX	Temporary Signals	EA		x		=	$ -
129000	Temporary Railing (Type K)	LF		x		=	$ -
190101	Roadway Excavation	CY		x		=	$ -
198001	Imported Borrow	CY		x		=	$ -
198050	Embankment	CY		x		=	$ -
250401	Class 4 Aggregate Subbase	CY		x		=	$ -
260201	Class 2 Aggregate Base	CY		x		=	$ -
390132	Hot Mix Asphalt (Type A)	TON		x		=	$ -
XXXXXX	Some Item	LS	1	x	$250,000	=	$ 250,000

TOTAL DETOURS **$ 250,000**

SUBTOTAL SECTIONS 1-7 $ 172,127,700

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items

ADA Items $ -

8B - Bike Path Items

Bike Path Items $ -

8C - Other Minor Items

Other Minor Items 5.0% $ 8,606,385

Total of Section 1-7 $ 172,127,700 x 5.0% = $ 8,606,385

TOTAL MINOR ITEMS **$ 8,606,400**

SECTIONS 9: MOBILIZATION

Item code							
999990	Total Section 1-8	$	180,734,100	x	10%	=	$ 18,073,410

TOTAL MOBILIZATION **$ 18,073,500**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066015	Federal Trainee Program	LS		x		=	$ -
066063	Traffic Management Plan - Public Information	LS		x		=	$ -
066090	Maintain Traffic	LS		x		=	$ -
066094	Value Analysis	LS		x		=	$ -
066204	Remove Rock & Debris	LS		x		=	$ -
066222	Locate Existing Cross-Over	LS		x		=	$ -
066670	Payment Adjustments For Price Index Fluctuations	LS		x		=	$ -
066700	Partnering	LS		x		=	$ -
066866	Operation of Existing Traffic Management System Eler	LS		x		=	$ -
066920	Dispute Review Board	LS		x		=	$ -
066XXX	Some Item	LS		x		=	$ -

*Cost of **NPDES** Supplemental Work specified in Section 5C* = $ 45,500

Total Section 1-8 $ 180,734,100 5% = $ 9,036,705

TOTAL SUPPLEMENTAL WORK **$ 9,082,300**

Note: Mobilization item will automatically calculate if working days are 50 or more. For Project less than 50 Working Days Mobilization is not required as a separate contract, however contract item prices should take into consideration mobilization as part of the price. If the building portion of the project is greater than 50% of the total project cost,

If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066063	Public Information	LS	0	x	$100,000	=	$0
066105	RE Office	LS	1	x	$400,000	=	$400,000
066803	Padlocks	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
066062A	COZEEP Expenses	LS		x		=	$0
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
XXXXXX	Toll Back Office System	LS	1	x	$1,700,000	=	$1,700,000
06684X	TMS Controller Assembly	LS	1	x	$2,000,000	=	$2,000,000
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
XXXXXX	Some Item						

Total Section 1-8	$	180,734,100	1%	= $	1,807,341

TOTAL STATE FURNISHED	**$5,907,400**

SECTION 12: TIME-RELATED OVERHEAD

Estimated Time-Releated Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity		Unit Price ($)		Cost	
			Total of All Contract Items Only			$	195,928,800	(used to calculate TR
070018	Time-Related Overhead	$	195,928,800	X	6%	=	$11,755,728	

TOTAL TIME-RELATED OVERHEAD	**$11,755,728**

SECTION 13: CONTINGENCY

Total Section 1-12	$	225,553,028	x	20%	=	$45,110,606

TOTAL CONTINGENCY	**$45,110,700**

Note: TRO is a contract item if total project cost is (non-escalated) over $5 million AND 100 or more working days.
If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.
TRO calculated for you as percentage of the sum of all contract items only;
excluding mobilization, supplemental work, state furnished materials and expenses, and contingency.

II. STRUCTURE ITEMS

	Bridge 1	Bridge 2	Bridge 3
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	ALAMADEN UC	CAMDEN UC	OKA UC
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	50 LF	45 LF	33 LF
Total Bridge Length (Feet)	238 LF	210 LF	102 LF
Total Area (Square Feet)	11,900 SQFT	9,450 SQFT	3,366 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	None	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$3,570,000**	**$2,835,000**	**$1,009,800**

	Bridge 4	Bridge 5	Bridge 6
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	LOS GATOS CREEK BRIDGE	POLLARD UC	SAN TOMAS AQUINAS CREEK
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	29 LF	23 LF	23 LF
Total Bridge Length (Feet)	178 LF	196 LF	105 LF
Total Area (Square Feet)	5,162 SQFT	4,508 SQFT	2,415 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$1,548,600**	**$1,352,400**	**$724,500**

	Bridge 7	Bridge 8	Bridge 9
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	SARATOGA UC	SARATOGA CREEK BRIDGE	CALABAZAS CREEK BRG
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	23 LF	23 LF	22 LF
#REF!	192 LF	100 LF	156 LF
Total Area (Square Feet)	4,416 SQFT	2,300 SQFT	3,432 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH	**$1,324,800**	**$690,000**	**$1,029,600**

	Bridge 10
DATE OF ESTIMATE	Dec, 2019
Bridge Name	Pedestrian Bridge (Dalles Ave)
Bridge Number	
Structure Type	CIP/PS Box Girder
Width (Feet) [out to out]	10 LF
#REF!	370 LF
Total Area (Square Feet)	3,700 SQFT
Structure Depth (Feet)	LF
Footing Type (pile or spread)	Pile
Cost Per Square Foot	$300
COST OF EACH	**$1,110,000**

TOTAL COST OF STRUCTURES[1]	**15,194,700**

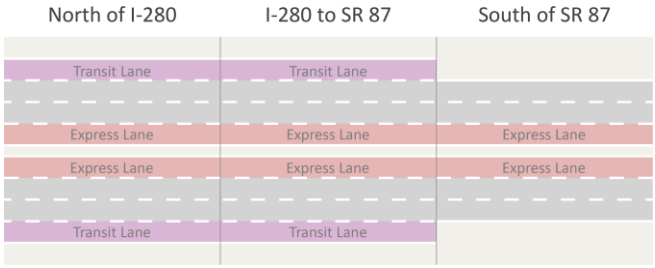
Estimate Prepared By: _____ _____

XXXXXXXXXXXXXXXX ------ Division of Structures — Date

[1]Structure's Estimate includes Overhead and Mobilization are based on 2019 CALTRAN's "COMPARATIVE BRIDGE COSTS".

Alternative 3-2: Long Right-side Transit Lane

- Convert existing HOV lane in each direction from U.S. 101 (southern end of SR 85) to U.S. 101 in Mountain View to operate as a single express lane in each direction.
- Add one lane in each direction from Almaden Expressway to Evelynn Avenue or Moffett Boulevard. The added lane would be positioned in the existing median as the number 1 (inside) lane.
- With Alternative 3-2, the transit lane would occupy the number 4 (outside) lane position.
- Provide a buffer to separate the transit lane from the adjacent general-purpose lane.
- Provide continuous access to the express lane(s) from the adjacent general-purpose lanes.
- Extend existing auxiliary lane on northbound SR 85 from the South De Anza Boulevard northbound on-ramp to 0.2 mile south of the Stevens Creek Boulevard off-ramp.
- Provide CHP enforcement/observation areas in the median at selected locations along the corridor.
- Install double-luminaire mast arm lighting at 250- to 400-foot intervals from postmile (PM) 6.00 (Almaden expressway) to PM 17.70 (Stevens Creek Boulevard) and from PM 18.86 (Homestead Road) to PM 23.44 (Moffett Boulevard) as an optional improvement.
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing lighting as an optional improvement.
- Widen nine bridges.
- Replace Dalles Avenue pedestrian structure.
- Convert SR 85 interchange at El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration.



Alternative 3-2: Long Right-side Transit Lane

Engineer Cost Estimate --- Alternative 3-2
Preliminary Project Study Report

Project ID: XXXXXX

Type of Estimate :	Preliminary Project Study Report (Dec 2019)
Program Code :	04-XXXXX
Project Limits :	From Hwy 101 Interchange in Santa Jose to South of Hwy 101 Interchange in Mt. View
Description:	From PM 0.00 to PM 23.68
Scope :	Install A Transit Lane Between US 101 in Mt. View and SR 87 in San Jose that Would Be Located Along the Right Side of the Roadway
Alternative :	Alternative 3-2 Long Transit Lane (Right-Side Lane)

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	270,663,728	$	362,649,700
STRUCTURE ITEMS	$	15,194,700	$	20,358,700
SUBTOTAL CONSTRUCTION COST	$	285,858,428	$	383,008,400
RIGHT OF WAY	$	-	$	-
TOTAL CAPITAL OUTLAY COST	$	285,859,000	$	383,009,000
PR/ED SUPPORT (3%)	$	8,576,000	$	11,491,000
PS&E SUPPORT (12%)	$	34,304,000	$	45,962,000
RIGHT OF WAY SUPPORT				
CONSTRUCTION SUPPORT (12%)	$	34,304,000	$	45,962,000
AGENCY SUPPORT (8%)	$	22,869,000	$	30,641,000
TOTAL CAPITAL OUTLAY SUPPORT COST*	$	100,053,000	$	134,056,000
TOTAL PROJECT COST	$	385,912,000	$	518,000,000

If Project has been programmed enter Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	12	/	2019
Estimated Date of Construction Start (Month/Year)	10	/	2023
Number of Working Days	1500		Working Days
Estimated Mid-Point of Construction (Month/Year)	10	/	2026
Number of Plant Establishment Days			Days

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	Earthwork	$	6,364,900
2	Pavement Structural Section	$	22,598,800
3	Drainage	$	2,847,700
4	Specialty Items	$	18,243,300
5	Environmental	$	2,236,400
6	Traffic Items	$	119,586,600
7	Detours	$	250,000
8	Minor Items	$	8,606,400
9	Roadway Mobilization	$	18,073,500
10	Supplemental Work	$	9,082,300
11	State Furnished	$	5,907,400
12	Contingencies	$	45,110,700
13	Overhead	$	11,755,728
	TOTAL ROADWAY ITEMS	**$**	**270,663,728**

Estimate Prepared By : _____

Name and Title Date Phone

Estimate Reviewed By : _____

Name and Title Date Phone

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)		Cost
160101	Clearing & Grubbing	AC	43	x	1,725	=	$74,175
170101	Develop Water Supply	LS	1	x	50,000	=	$50,000
190101	Roadway Excavation	CY	201,337	x	29	=	$5,758,238
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$0
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$0
192037	Structure Excavation (Retaining Wall)	CY		x		=	$0
193013	Structure Backfill (Retaining Wall)	CY		x		=	$0
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$0
194001	Ditch Excavation	CY		x		=	$0
198001	Impored Borrow	CY	29,236	x	17	=	$482,394
198007	Imported Material (Shoulder Backing)	TON		x		=	$0
XXXXXX	Some Item			x		=	$0

TOTAL EARTHWORK SECTION ITEMS	**$ 6,364,900**

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
150771	Remove Asphalt Concrete Dike	LF		x		=	$	-
150860	Remove Base and Surfacing	CY		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	12,305	x	8	=	$	98,440
150854	Remove Concrete Pavement	CY	3,855	x	156	=	$	601,380
260201	Class 4 Aggregate Base	CY	24,595	x	61	=	$	1,487,998
250401	Class 4 Aggregate Subbase	CY	47,082	x	38	=	$	1,789,116
290201	Asphalt Treated Permeable Base	CY	17,568	x	160	=	$	2,810,880
365001	Sand Cover	TON		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
377501	Slurry Seal	TON		x		=	$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON		x		=	$	-
390136	Minor Hot Mix Asphalt	TON		x		=	$	-
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		=	$	-
393003	Geosynthetic Pavement Interlayer	SQYD		x		=	$	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Inden*	STA		x		=	$	-
394071	Place Hot Mix Asphalt Dike	LF		x		=	$	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		=	$	-
397005	Tack Coat	TON		x		=	$	-
400050	Continuously Reinfored Concrete Pavement	CY	52,703	x	300	=	$	15,810,900
401108	Replace Concrete Pavement (Rapid Strength	CY		x		=	$	-
404092	Seal Pavement Joint	LF		x		=	$	-
404094	Seal Longitudinal Isolation Joint	LF		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	SQYD		x		=	$	-
413115	Seal Existing Concrete Pavement Joint	LF		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
731502	Minor Concrete (Misc. Const)	CY		x		=	$	-
731530	Minor Concrete (Textured Paving)	SQFT		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS	**$ 22,598,800**

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
150206	Abandon Culvert	LF		x		=	$	-
150805	Remove Culvert	LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
193114	Sand Backfill	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
510512	Minor Concrete (Box Culvert)	CY		x		=	$	-
510XXX	Culvert (Roadway Crossing)	EA		x		=	$	-
62XXXX	XXX" APC Pipe	LF		x		=	$	-
64XXXX	XXX" Plastic Pipe	LF		x		=	$	-
65XXXX	XXX" RCP Pipe	LF		x		=	$	-
66XXXX	XXX" CSP Pipe	LF		x		=	$	-
680905	Underdrain (6" Alternative)	LF	38,695	x	36	=	$	1,393,020
681103	Edge Drain (3" Plastic Pipe)	LF	69,269	x	21	=	$	1,454,649
69XXXX	XXX" Pipe Downdrain	LF		x		=	$	-
70XXXX	XXX" Pipe Inlet	LF		x		=	$	-
70XXXX	XXX" Pipe Riser	LF		x		=	$	-
70XXXX	XXX" Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
729010	Rock Slope Protection Fabric	SQYD		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Additional Drainage (Detention Base, etc)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL DRAINAGE ITEMS	**$**	**2,847,700**

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	30,000	=	$	30,000
150662	Remove Metal Beam Guard Railing	LF	61,156	x	15	=	$	886,762
150668	Remove Terminal Systems	EA		x		=	$	-
1532XX	Remove Concrete Barrier (25, 50 or 50C)	LF	4,606	x	16	=	$	73,696
153250	Remove Sound Wall	SQFT	114,680	x	25	=	$	2,867,000
150606	Remove Fence (BW)	LF		x		=	$	-
190110	Lead Compliance Plan	LS	1	x	18,000	=	$	18,000
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$	-
510060	Structural Concrete (Retaining Wall)	CY		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$	-
510XXX	Retaining Wall (MSE)	SQFT	42,720	x	85	=	$	3,631,200
XXXXXX	Sound Wall (On Pile, On Barrier or On Ret. Wall)	SQFT	114,680	x	40	=	$	4,587,200
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$	-
511048	Apply Anti-Graffiti Coating	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$	-
518002	Sound Wall (Masonry Block)	SQFT		x		=	$	-
520103	Bar Reinf. Steel (Retaining Wall)	LB		x		=	$	-
800007	Fence (BW)	LF		x		=	$	-
832001	Metal Beam Guard Railing	LF	52,594	x	47	=	$	2,445,621
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
83954X	Transition Railing *(Insert Type)*	EA		x		=	$	-
8395XX	Terminal System (Type CAT)	EA		x		=	$	-
8395XX	Alternative Flared Terminal System	EA	4	x	1,200	=	$	4,800
8395XX	End Anchor Assembly (*Insert Type*)	EA		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
839596	Crash Cushion *(G.R.E.A.T)*	EA		x		=	$	-
839701	Concrete Barrier *(50 or 60)*	LF	44,180	x	78	=	$	3,446,040
833128	Concrete Barrier *(25 Modify)*	LF	1,976	x	128	=	$	252,928
XXXXXX	Some Item			x		=	$	-

TOTAL SPECIALTY ITEMS	**$**	**18,243,300**

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
XXXXXX	Biological Mitigation	LS		x		=	$	-
071325	Temporary Reinforced Silt Fence	LF		x		=	$	-
XXXXXX	Hazardous Material Remediation	LS	1	x	180,000	=	$	180,000
XXXXXX	Permits	LS	1	x	90,000	=	$	90,000
071325	Temporary Fence (Type ESA)	LF		x		=	$	-

Subtotal Environmental *$ 270,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
200001	Highway Planting	ACRE		x		=	$	-
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-*	LF		x		=	$	-
20XXXX	Extend XXX" *(Insert Type)* Conduit	LF		x		=	$	-
201700	Imported Topsoil	CY		x		=	$	-
203015	Erosion Control	ACRE		x		=	$	-
203021	Fiber Rolls	LF		x		=	$	-
203026	Move In/ Move Out (Erosion Control)	EA		x		=	$	-
204099	Plant Establishment Work	LS		x		=	$	-
204101	Extend Plant Establishment (X Years)	LS		x		=	$	-
208000	Irrigation System	LS		x		=	$	-
208304	Water Meter	EA		x		=	$	-
209801	Maintenance Vehicle Pullout	EA		x		=	$	-
XXXXXX	Some Item							

Subtotal Landscape and Irrigation *$ -*

5C - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost
074016	Construction Site Management	LS	1	x	900,000	=	$	900,000
074017	Prepare WPCP	LS	1	x	20,000	=	$	20,000
074019	Prepare SWPPP	LS	1	x	20,000	=	$	20,000
074023	Temporary Erosion Control	ACRE	43	x	2,500	=	$	107,500
074027	Temporary Erosion Control Blanket	SQYD		x		=	$	-
074028	Temporary Fiber Roll	LF		x		=	$	-
074032	Temporary Concrete Washout Facility	EA		x		=	$	-
074033	Temporary Construction Entrance	EA		x		=	$	-
074035	Temporary Check Dam	LF		x		=	$	-
074037	Move In/ Move Out (Temp Erosion Control)	EA		x		=	$	-
074038	Temp. Drainage Inlet Protection	EA	315	x	60	=	$	18,900
XXXXXX	Site Job Management	LS	1	x	900,000	=	$	900,000
074042	Temporary Concrete Washout (Portable)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

Supplemental Work for NPDES

(These costs are not accounted in total here but under Supplemental Work on sheet 7 of 11).

074021	Water Pollution Control Maintenance Work*	LS	1	x	45,500	=	$	45,500
066596	Additional Water Pollution Control**	LS		x		=	$	-
066597	Storm Water Sampling and Analysis***	LS		x		=	$	-
XXXXXX	Some Item							

Subtotal NPDES (Without Supplemental Work) *$ 1,966,400*

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $ 2,236,400

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LB		x		=	$	-
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
56XXXX	Install Overhead Sign (Two Post)	EA	15	x	400,000	=	$	6,000,000
56XXXX	Install Overhead Sign (One Post)	EA	10	x	160,000	=	$	1,600,000
860090	Maintain Existing Traffic Management System	LS	1	x	900,000	=	$	900,000
860810	Inductive Loop Detectors	EA		x		=	$	-
86055X	Lighting & Sign Illumination	EA	378	x	4,000	=	$	1,512,000
8607XX	Interconnection Facilities	LS		x		=	$	-
8609XX	Traffic Traffic Monitoring Stations	LS	1	x	200,000	=	$	200,000
860XXX	Signals & Lighting	LS		x		=	$	-
860XXX	ITS Elements	LS		x		=	$	-
861100	Ramp Metering System (Location X)	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXXX	Ramp Terminal Intersection Improvement	LS	1	x	1,000,000	=	$	1,000,000
XXXXXX	Toll Equipment and System Integration (Capital)	LS	1	x	100,000,000	=	$	100,000,000
XXXXX	Some Item							

Subtotal Traffic Electrical *$ 111,212,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120090	Construction Area Signs	LS	1	x	900,000	=	$	900,000
150701	Remove Yellow Painted Traffic Stripe	LF	94,494	x	4	=	$	377,976
150710	Remove Traffic Stripe	LF	944,940	x	0.25	=	$	236,235
150713	Remove Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA	20	x	120	=	$	2,400
15075X	Remove Sign Structure	EA	30	x	20,000	=	$	600,000
15075X	Remove Sign Structure (On Bridge)	EA	8	x	5,000	=	$	40,000
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
566011	Roadside Sign (One Post)	EA	30	x	340	=	$	10,200
566012	Roadside Sign (Two Post)	EA	10	x	1,250	=	$	12,500
560XXX	Furnish Sign Panels	SQFT		x		=	$	-
560XXX	Install Sign Panels	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	900,000	=	$	900,000
840504	Thermoplastic Traffic Strip (4")	LF	944,940	x	0.50	=	$	472,470

Subtotal Traffic Signing and Striping *$ 3,551,781*

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	1	x	4,000,000	=	$	4,000,000
120120	Type III Barricade	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	LS	1	x	90,000	=	$	90,000
120159	Temporary Traffic Strip (Paint)	LS	1	x	90,000	=	$	90,000
12016X	Channelizer	EA		x		=	$	-
128650	Portable Changeable Message Signs	EA	18	x	10,000	=	$	180,000
129000	Temporary Railing (Type K)	LF	6,000	x	17	=	$	102,000
129100	Temp. Crash Cushion Module	EA	4	x	200	=	$	800
129099A	Traffic Plastic Drum	EA		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
XXXXXX	Misc. Items (Traffic Management Plan)	LS	1	x	360,000	=	$	360,000
XXXXXX	Some Item	LS		x		=	$	-

Subtotal Stage Construction and Traffic Handling *$ 4,822,800*

TOTAL TRAFFIC ITEMS **$ 119,586,600**

SECTION 7: DETOURS

Include constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
0713XX	Temporary Fence (Type X)	LF		x		=	$ -
07XXXX	Temporary Drainage	LS		x		=	$ -
120143	Temporary Pavement Delineation	LF		x		=	$ -
1286XX	Temporary Signals	EA		x		=	$ -
129000	Temporary Railing (Type K)	LF		x		=	$ -
190101	Roadway Excavation	CY		x		=	$ -
198001	Imported Borrow	CY		x		=	$ -
198050	Embankment	CY		x		=	$ -
250401	Class 4 Aggregate Subbase	CY		x		=	$ -
260201	Class 2 Aggregate Base	CY		x		=	$ -
390132	Hot Mix Asphalt (Type A)	TON		x		=	$ -
XXXXXX	Some Item	LS	1	x	$250,000	=	$ 250,000

TOTAL DETOURS **$ 250,000**

SUBTOTAL SECTIONS 1-7 $ 172,127,700

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items

ADA Items $ -

8B - Bike Path Items

Bike Path Items $ -

8C - Other Minor Items

Other Minor Items 5.0% $ 8,606,385

Total of Section 1-7 $ 172,127,700 x 5.0% = $ 8,606,385

TOTAL MINOR ITEMS **$ 8,606,400**

SECTIONS 9: MOBILIZATION

Item code							
999990	Total Section 1-8	$	180,734,100	x	10%	=	$ 18,073,410

TOTAL MOBILIZATION **$ 18,073,500**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066015	Federal Trainee Program	LS		x		=	$ -
066063	Traffic Management Plan - Public Information	LS		x		=	$ -
066090	Maintain Traffic	LS		x		=	$ -
066094	Value Analysis	LS		x		=	$ -
066204	Remove Rock & Debris	LS		x		=	$ -
066222	Locate Existing Cross-Over	LS		x		=	$ -
066670	Payment Adjustments For Price Index Fluctuations	LS		x		=	$ -
066700	Partnering	LS		x		=	$ -
066866	Operation of Existing Traffic Management System Eler	LS		x		=	$ -
066920	Dispute Review Board	LS		x		=	$ -
066XXX	Some Item	LS		x		=	$ -

*Cost of **NPDES** Supplemental Work specified in Section 5C* = $ 45,500

Total Section 1-8 $ 180,734,100 5% = $ 9,036,705

TOTAL SUPPLEMENTAL WORK **$ 9,082,300**

Note: Mobilization item will automatically calculate if working days are 50 or more. For Project less than 50 Working Days Mobilization is not required as a separate contract, however contract item prices should take into consideration mobilization as part of the price. If the building portion of the project is greater than 50% of the total project cost,

If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066063	Public Information	LS	0	x	$100,000	=	$0
066105	RE Office	LS	1	x	$400,000	=	$400,000
066803	Padlocks	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
066062A	COZEEP Expenses	LS		x		=	$0
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
XXXXXX	Toll Back Office System	LS	1	x	$1,700,000	=	$1,700,000
06684X	TMS Controller Assembly	LS	1	x	$2,000,000	=	$2,000,000
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
XXXXXX	Some Item						

Total Section 1-8	$	180,734,100	1%	= $	1,807,341

TOTAL STATE FURNISHED	**$5,907,400**

SECTION 12: TIME-RELATED OVERHEAD

Estimated Time-Releated Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity		Unit Price ($)		Cost	
			Total of All Contract Items Only			$	195,928,800	(used to calculate TR
070018	Time-Related Overhead	$	195,928,800	X	6%	=	$11,755,728	

TOTAL TIME-RELATED OVERHEAD	**$11,755,728**

SECTION 13: CONTINGENCY

Total Section 1-12	$	225,553,028	x	20%	=	$45,110,606

TOTAL CONTINGENCY	**$45,110,700**

Note: TRO is a contract item if total project cost is (non-escalated) over $5 million AND 100 or more working days.
If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.
TRO calculated for you as percentage of the sum of all contract items only;
excluding mobilization, supplemental work, state furnished materials and expenses, and contingency.

II. STRUCTURE ITEMS

	Bridge 1	Bridge 2	Bridge 3
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	ALAMADEN UC	CAMDEN UC	OKA UC
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	50 LF	45 LF	33 LF
Total Bridge Length (Feet)	238 LF	210 LF	102 LF
Total Area (Square Feet)	11,900 SQFT	9,450 SQFT	3,366 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	None	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$3,570,000**	**$2,835,000**	**$1,009,800**

	Bridge 4	Bridge 5	Bridge 6
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	LOS GATOS CREEK BRIDGE	POLLARD UC	SAN TOMAS AQUINAS CREEK
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	29 LF	23 LF	23 LF
Total Bridge Length (Feet)	178 LF	196 LF	105 LF
Total Area (Square Feet)	5,162 SQFT	4,508 SQFT	2,415 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$1,548,600**	**$1,352,400**	**$724,500**

	Bridge 7	Bridge 8	Bridge 9
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	SARATOGA UC	SARATOGA CREEK BRIDGE	CALABAZAS CREEK BRG
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	23 LF	23 LF	22 LF
#REF!	192 LF	100 LF	156 LF
Total Area (Square Feet)	4,416 SQFT	2,300 SQFT	3,432 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH	**$1,324,800**	**$690,000**	**$1,029,600**

	Bridge 10
DATE OF ESTIMATE	Dec, 2019
Bridge Name	Pedestrian Bridge (Dalles Ave)
Bridge Number	
Structure Type	CIP/PS Box Girder
Width (Feet) [out to out]	10 LF
#REF!	370 LF
Total Area (Square Feet)	3,700 SQFT
Structure Depth (Feet)	LF
Footing Type (pile or spread)	Pile
Cost Per Square Foot	$300
COST OF EACH	**$1,110,000**

TOTAL COST OF STRUCTURES[1]	**15,194,700**

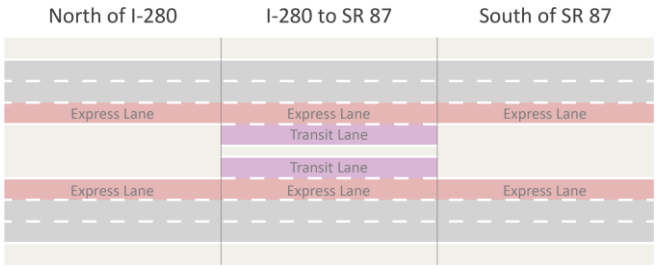
Estimate Prepared By: _____ _____

XXXXXXXXXXXXXXXX ------ Division of Structures — Date

[1]Structure's Estimate includes Overhead and Mobilization are based on 2019 CALTRAN's "COMPARATIVE BRIDGE COSTS".

Alternative 3-4: Short Median Adjacent Transit Lane

- Convert existing HOV lane in each direction from U.S. 101 (southern end of SR 85) to U.S. 101 in Mountain View to operate as a single express lane in each direction.
- Add one lane in each direction from Almaden Expressway to Stevens Creek Boulevard or I-280. The added lane would be positioned in the existing median as the number 1 (inside) lane.
- With Alternative 3-4, the transit lane would occupy the number 1 lane position.
- Provide a buffer to separate the transit lane from the adjacent express lane.
- Provide continuous access to the express lane(s) from the adjacent general-purpose lanes.
- Extend existing auxiliary lane on northbound SR 85 from the South De Anza Boulevard northbound on-ramp to 0.2 mile south of the Stevens Creek Boulevard off-ramp.
- Provide CHP enforcement/observation areas in the median at selected locations along the corridor.
- Install double-luminaire mast arm lighting at 250- to 400-foot intervals from postmile (PM) 6.00 (Almaden expressway) to PM 17.70 (Stevens Creek Boulevard) and from PM 18.86 (Homestead Road) to PM 23.44 (Moffett Boulevard).
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing lighting.
- Widen nine bridges.



Alternative 3-4: Short Median Adjacent Transit Lane

Engineer Cost Estimate --- Alternative 3-4
Preliminary Project Study Report

Project ID: XXXXXX

Type of Estimate :	Preliminary Project Study Report (Dec 2019)
Program Code :	04-XXXXX
Project Limits :	From Hwy 101 Interchange in Santa Jose to South of Hwy 101 Interchange in Mt. View
Description:	From PM 0.00 to PM 23.68
Scope :	Construct A New Transit Lane in the Unused Space Adjacent to the SR 85 Median Between I-280 and SR 87 in San Jose.
Alternative :	Alternative 3-4 Short Transit Lane

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	245,077,368	$	328,367,700
STRUCTURE ITEMS	$	14,084,700	$	18,871,500
SUBTOTAL CONSTRUCTION COST	$	259,162,068	$	347,239,200
RIGHT OF WAY	$	-	$	-
TOTAL CAPITAL OUTLAY COST	$	259,163,000	$	347,240,000
PR/ED SUPPORT (3%)	$	7,775,000	$	10,418,000
PS&E SUPPORT (12%)	$	31,100,000	$	41,669,000
RIGHT OF WAY SUPPORT				
CONSTRUCTION SUPPORT (12%)	$	31,100,000	$	41,669,000
AGENCY SUPPORT (8%)	$	20,734,000	$	27,780,000
TOTAL CAPITAL OUTLAY SUPPORT COST*	$	90,709,000	$	121,536,000
TOTAL PROJECT COST	$	349,872,000	$	469,000,000

If Project has been programmed enter Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	12	/	2019
Estimated Date of Construction Start (Month/Year)	10	/	2023
Number of Working Days	1500		Working Days
Estimated Mid-Point of Construction (Month/Year)	10	/	2026
Number of Plant Establishment Days			Days

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	**Earthwork**	$	5,164,900
2	**Pavement Structural Section**	$	20,367,400
3	**Drainage**	$	1,737,900
4	**Specialty Items**	$	10,304,200
5	**Environmental**	$	1,120,100
6	**Traffic Items**	$	116,706,000
7	**Detours**	$	150,000
8	**Minor Items**	$	7,777,600
9	**Roadway Mobilization**	$	16,332,900
10	**Supplemental Work**	$	8,192,000
11	**State Furnished**	$	5,733,300
12	**Contingencies**	$	40,846,300
13	**Overhead**	$	10,644,768
	TOTAL ROADWAY ITEMS	**$**	**245,077,368**

Estimate Prepared By : _____

Name and Title Date Phone

Estimate Reviewed By : _____

Name and Title Date Phone

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)		Cost
160101	Clearing & Grubbing	AC	39	x	1,725	=	$67,275
170101	Develop Water Supply	LS	1	x	50,000	=	$50,000
190101	Roadway Excavation	CY	161,827	x	29	=	$4,628,252
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$0
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$0
192037	Structure Excavation (Retaining Wall)	CY		x		=	$0
193013	Structure Backfill (Retaining Wall)	CY		x		=	$0
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$0
194001	Ditch Excavation	CY		x		=	$0
198001	Impored Borrow	CY	25,413	x	17	=	$419,315
198007	Imported Material (Shoulder Backing)	TON		x		=	$0
XXXXXX	Some Item			x		=	$0

TOTAL EARTHWORK SECTION ITEMS	**$**	**5,164,900**

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
150771	Remove Asphalt Concrete Dike	LF		x		=	$	-
150860	Remove Base and Surfacing	CY		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	12,305	x	8	=	$	98,440
150854	Remove Concrete Pavement	CY	2,912	x	156	=	$	454,272
260201	Class 4 Aggregate Base	CY	22,254	x	61	=	$	1,346,367
250401	Class 4 Aggregate Subbase	CY	42,600	x	38	=	$	1,618,800
290201	Asphalt Treated Permeable Base	CY	15,896	x	160	=	$	2,543,360
365001	Sand Cover	TON		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
377501	Slurry Seal	TON		x		=	$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON		x		=	$	-
390136	Minor Hot Mix Asphalt	TON		x		=	$	-
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		=	$	-
393003	Geosynthetic Pavement Interlayer	SQYD		x		=	$	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Inden*	STA		x		=	$	-
394071	Place Hot Mix Asphalt Dike	LF		x		=	$	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		=	$	-
397005	Tack Coat	TON		x		=	$	-
400050	Continuously Reinfored Concrete Pavement	CY	47,687	x	300	=	$	14,306,100
401108	Replace Concrete Pavement (Rapid Strength	CY		x		=	$	-
404092	Seal Pavement Joint	LF		x		=	$	-
404094	Seal Longitudinal Isolation Joint	LF		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	SQYD		x		=	$	-
413115	Seal Existing Concrete Pavement Joint	LF		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
731502	Minor Concrete (Misc. Const)	CY		x		=	$	-
731530	Minor Concrete (Textured Paving)	SQFT		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS	**$**	**20,367,400**

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
150206	Abandon Culvert	LF		x		=	$	-
150805	Remove Culvert	LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
193114	Sand Backfill	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
510512	Minor Concrete (Box Culvert)	CY		x		=	$	-
510XXX	Culvert (Roadway Crossing)	EA		x		=	$	-
62XXXX	XXX" APC Pipe	LF		x		=	$	-
64XXXX	XXX" Plastic Pipe	LF		x		=	$	-
65XXXX	XXX" RCP Pipe	LF		x		=	$	-
66XXXX	XXX" CSP Pipe	LF		x		=	$	-
680905	Underdrain (6" Alternative)	LF	7,866	x	36	=	$	283,176
681103	Edge Drain (3" Plastic Pipe)	LF	69,269	x	21	=	$	1,454,649
69XXXX	XXX" Pipe Downdrain	LF		x		=	$	-
70XXXX	XXX" Pipe Inlet	LF		x		=	$	-
70XXXX	XXX" Pipe Riser	LF		x		=	$	-
70XXXX	XXX" Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
729010	Rock Slope Protection Fabric	SQYD		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Additional Drainage (Detention Base, etc)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL DRAINAGE ITEMS **$ 1,737,900**

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	30,000	=	$	30,000
150662	Remove Metal Beam Guard Railing	LF	61,156	x	15	=	$	886,762
150668	Remove Terminal Systems	EA		x		=	$	-
1532XX	Remove Concrete Barrier (25, 50 or 50C)	LF	3,110	x	16	=	$	49,760
153250	Remove Sound Wall	SQFT	0	x	25	=	$	-
150606	Remove Fence (BW)	LF		x		=	$	-
190110	Lead Compliance Plan	LS	1	x	18,000	=	$	18,000
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$	-
510060	Structural Concrete (Retaining Wall)	CY		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$	-
510XXX	Retaining Wall (MSE)	SQFT	39,520	x	85	=	$	3,359,200
XXXXXX	Sound Wall (On Pile, On Barrier or On Ret. Wall)	SQFT	0	x	40	=	$	-
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$	-
511048	Apply Anti-Graffiti Coating	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$	-
518002	Sound Wall (Masonry Block)	SQFT		x		=	$	-
520103	Bar Reinf. Steel (Retaining Wall)	LB		x		=	$	-
800007	Fence (BW)	LF		x		=	$	-
832001	Metal Beam Guard Railing	LF	52,594	x	47	=	$	2,445,621
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
83954X	Transition Railing *(Insert Type)*	EA		x		=	$	-
8395XX	Terminal System (Type CAT)	EA		x		=	$	-
8395XX	Alternative Flared Terminal System	EA	4	x	1,200	=	$	4,800
8395XX	End Anchor Assembly (*Insert Type*)	EA		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
839596	Crash Cushion *(G.R.E.A.T)*	EA		x		=	$	-
839701	Concrete Barrier *(50 or 60)*	LF	44,180	x	78	=	$	3,446,040
833128	Concrete Barrier *(25 Modify)*	LF	500	x	128	=	$	64,000
XXXXXX	Some Item			x		=	$	-

TOTAL SPECIALTY ITEMS **$ 10,304,200**

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
XXXXXX	Biological Mitigation	LS		x		=	$	-
071325	Temporary Reinforced Silt Fence	LF		x		=	$	-
XXXXXX	Hazardous Material Remediation	LS	1	x	45,000	=	$	45,000
XXXXXX	Permits	LS	1	x	45,000	=	$	45,000
071325	Temporary Fence (Type ESA)	LF		x		=	$	-

Subtotal Environmental *$ 90,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
200001	Highway Planting	ACRE		x		=	$	-
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-*	LF		x		=	$	-
20XXXX	Extend XXX" *(Insert Type)* Conduit	LF		x		=	$	-
201700	Imported Topsoil	CY		x		=	$	-
203015	Erosion Control	ACRE		x		=	$	-
203021	Fiber Rolls	LF		x		=	$	-
203026	Move In/ Move Out (Erosion Control)	EA		x		=	$	-
204099	Plant Establishment Work	LS		x		=	$	-
204101	Extend Plant Establishment (X Years)	LS		x		=	$	-
208000	Irrigation System	LS		x		=	$	-
208304	Water Meter	EA		x		=	$	-
209801	Maintenance Vehicle Pullout	EA		x		=	$	-
XXXXXX	Some Item							

Subtotal Landscape and Irrigation *$ -*

5C - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost
074016	Construction Site Management	LS	1	x	450,000	=	$	450,000
074017	Prepare WPCP	LS	1	x	10,000	=	$	10,000
074019	Prepare SWPPP	LS	1	x	10,000	=	$	10,000
074023	Temporary Erosion Control	ACRE	39	x	2,500	=	$	97,500
074027	Temporary Erosion Control Blanket	SQYD		x		=	$	-
074028	Temporary Fiber Roll	LF		x		=	$	-
074032	Temporary Concrete Washout Facility	EA		x		=	$	-
074033	Temporary Construction Entrance	EA		x		=	$	-
074035	Temporary Check Dam	LF		x		=	$	-
074037	Move In/ Move Out (Temp Erosion Control)	EA		x		=	$	-
074038	Temp. Drainage Inlet Protection	EA	210	x	60	=	$	12,600
XXXXXX	Site Job Management	LS	1	x	450,000	=	$	450,000
074042	Temporary Concrete Washout (Portable)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

Supplemental Work for NPDES

(These costs are not accounted in total here but under Supplemental Work on sheet 7 of 11).

074021	Water Pollution Control Maintenance Work*	LS	1	x	25,500	=	$	25,500
066596	Additional Water Pollution Control**	LS		x		=	$	-
066597	Storm Water Sampling and Analysis***	LS		x		=	$	-
XXXXXX	Some Item							

Subtotal NPDES (Without Supplemental Work) *$ 1,030,100*

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $ 1,120,100

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LB		x		=	$	-
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
56XXXX	Install Overhead Sign (Two Post)	EA	15	x	400,000	=	$	6,000,000
56XXXX	Install Overhead Sign (One Post)	EA	10	x	160,000	=	$	1,600,000
860090	Maintain Existing Traffic Management System	LS	1	x	900,000	=	$	900,000
860810	Inductive Loop Detectors	EA		x		=	$	-
86055X	Lighting & Sign Illumination	EA	253	x	4,000	=	$	1,012,000
8607XX	Interconnection Facilities	LS		x		=	$	-
8609XX	Traffic Traffic Monitoring Stations	LS	1	x	200,000	=	$	200,000
860XXX	Signals & Lighting	LS		x		=	$	-
860XXX	ITS Elements	LS		x		=	$	-
861100	Ramp Metering System (Location X)	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXXX	Ramp Terminal Intersection Improvement	LS	0	x	1,000,000	=	$	-
XXXXXX	Toll Equipment and System Integration (Capital)	LS	1	x	100,000,000	=	$	100,000,000
XXXXX	Some Item							

Subtotal Traffic Electrical *$ 109,712,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120090	Construction Area Signs	LS	1	x	900,000	=	$	900,000
150701	Remove Yellow Painted Traffic Stripe	LF	63,360	x	4	=	$	253,440
150710	Remove Traffic Stripe	LF	633,600	x	0.25	=	$	158,400
150713	Remove Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA	10	x	120	=	$	1,200
15075X	Remove Sign Structure	EA	15	x	20,000	=	$	300,000
15075X	Remove Sign Structure (On Bridge)	EA	8	x	5,000	=	$	40,000
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
566011	Roadside Sign (One Post)	EA	15	x	340	=	$	5,100
566012	Roadside Sign (Two Post)	EA	5	x	1,250	=	$	6,250
560XXX	Furnish Sign Panels	SQFT		x		=	$	-
560XXX	Install Sign Panels	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	450,000	=	$	450,000
840504	Thermoplastic Traffic Strip (4")	LF	633,600	x	0.50	=	$	316,800

Subtotal Traffic Signing and Striping *$ 2,431,190*

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	1	x	4,000,000	=	$	4,000,000
120120	Type III Barricade	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	LS	1	x	90,000	=	$	90,000
120159	Temporary Traffic Strip (Paint)	LS	1	x	90,000	=	$	90,000
12016X	Channelizer	EA		x		=	$	-
128650	Portable Changeable Message Signs	EA	10	x	10,000	=	$	100,000
129000	Temporary Railing (Type K)	LF	6,000	x	17	=	$	102,000
129100	Temp. Crash Cushion Module	EA	4	x	200	=	$	800
129099A	Traffic Plastic Drum	EA		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
XXXXXX	Misc. Items (Traffic Management Plan)	LS	1	x	180,000	=	$	180,000
XXXXXX	Some Item	LS		x		=	$	-

Subtotal Stage Construction and Traffic Handling *$ 4,562,800*

TOTAL TRAFFIC ITEMS **$ 116,706,000**

SECTION 7: DETOURS

Include constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
0713XX	Temporary Fence (Type X)	LF		x		=	$ -
07XXXX	Temporary Drainage	LS		x		=	$ -
120143	Temporary Pavement Delineation	LF		x		=	$ -
1286XX	Temporary Signals	EA		x		=	$ -
129000	Temporary Railing (Type K)	LF		x		=	$ -
190101	Roadway Excavation	CY		x		=	$ -
198001	Imported Borrow	CY		x		=	$ -
198050	Embankment	CY		x		=	$ -
250401	Class 4 Aggregate Subbase	CY		x		=	$ -
260201	Class 2 Aggregate Base	CY		x		=	$ -
390132	Hot Mix Asphalt (Type A)	TON		x		=	$ -
XXXXXX	Some Item	LS	1	x	$150,000	=	$ 150,000

TOTAL DETOURS **$ 150,000**

SUBTOTAL SECTIONS 1-7 $ 155,550,500

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items

ADA Items $ -

8B - Bike Path Items

Bike Path Items $ -

8C - Other Minor Items

Other Minor Items 5.0% $ 7,777,525

Total of Section 1-7 $ 155,550,500 x 5.0% = $ 7,777,525

TOTAL MINOR ITEMS **$ 7,777,600**

SECTIONS 9: MOBILIZATION

Item code							
999990	Total Section 1-8	$	163,328,100	x	10%	=	$16,332,810

TOTAL MOBILIZATION **$ 16,332,900**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066015	Federal Trainee Program	LS		x		=	$ -
066063	Traffic Management Plan - Public Information	LS		x		=	$ -
066090	Maintain Traffic	LS		x		=	$ -
066094	Value Analysis	LS		x		=	$ -
066204	Remove Rock & Debris	LS		x		=	$ -
066222	Locate Existing Cross-Over	LS		x		=	$ -
066670	Payment Adjustments For Price Index Fluctuations	LS		x		=	$ -
066700	Partnering	LS		x		=	$ -
066866	Operation of Existing Traffic Management System Eler	LS		x		=	$ -
066920	Dispute Review Board	LS		x		=	$ -
066XXX	Some Item	LS		x		=	$ -

*Cost of **NPDES** Supplemental Work specified in Section 5C* = $ 25,500

Total Section 1-8 $ 163,328,100 5% = $ 8,166,405

TOTAL SUPPLEMENTAL WORK **$ 8,192,000**

Note: Mobilization item will automatically calculate if working days are 50 or more. For Project less than 50 Working Days Mobilization is not required as a separate contract, however contract item prices should take into consideration mobilization as part of the price. If the building portion of the project is greater than 50% of the total project cost,

If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066063	Public Information	LS	0	x	$100,000	=	$0
066105	RE Office	LS	1	x	$400,000	=	$400,000
066803	Padlocks	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
066062A	COZEEP Expenses	LS		x		=	$0
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
XXXXXX	Toll Back Office System	LS	1	x	$1,700,000	=	$1,700,000
06684X	TMS Controller Assembly	LS	1	x	$2,000,000	=	$2,000,000
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
XXXXXX	Some Item						

Total Section 1-8	$	163,328,100	1%	=	$ 1,633,281

TOTAL STATE FURNISHED	**$5,733,300**

SECTION 12: TIME-RELATED OVERHEAD

Estimated Time-Releated Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity		Unit Price ($)		Cost	
			Total of All Contract Items Only				$ 177,412,800	(used to calculate TR
070018	Time-Related Overhead	$	177,412,800	X	6%	=	$10,644,768	

TOTAL TIME-RELATED OVERHEAD	**$10,644,768**

SECTION 13: CONTINGENCY

Total Section 1-12	$	204,231,068	x	20%	=	$40,846,214

TOTAL CONTINGENCY	**$40,846,300**

Note: TRO is a contract item if total project cost is (non-escalated) over $5 million AND 100 or more working days.
If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.
TRO calculated for you as percentage of the sum of all contract items only;
excluding mobilization, supplemental work, state furnished materials and expenses, and contingency.

II. STRUCTURE ITEMS

	Bridge 1	Bridge 2	Bridge 3
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	ALAMADEN UC	CAMDEN UC	OKA UC
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	50 LF	45 LF	33 LF
Total Bridge Length (Feet)	238 LF	210 LF	102 LF
Total Area (Square Feet)	11,900 SQFT	9,450 SQFT	3,366 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	None	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$3,570,000**	**$2,835,000**	**$1,009,800**

	Bridge 4	Bridge 5	Bridge 6
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	LOS GATOS CREEK BRIDGE	POLLARD UC	SAN TOMAS AQUINAS CREEK
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	29 LF	23 LF	23 LF
Total Bridge Length (Feet)	178 LF	196 LF	105 LF
Total Area (Square Feet)	5,162 SQFT	4,508 SQFT	2,415 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$1,548,600**	**$1,352,400**	**$724,500**

	Bridge 7	Bridge 8	Bridge 9
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	SARATOGA UC	SARATOGA CREEK BRIDGE	CALABAZAS CREEK BRG
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	23 LF	23 LF	22 LF
#REF!	192 LF	100 LF	156 LF
Total Area (Square Feet)	4,416 SQFT	2,300 SQFT	3,432 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH	**$1,324,800**	**$690,000**	**$1,029,600**

	Bridge 10
DATE OF ESTIMATE	Dec, 2019
Bridge Name	Pedestrian Bridge (Dalles Ave)
Bridge Number	
Structure Type	CIP/PS Box Girder
Width (Feet) [out to out]	0 LF
#REF!	370 LF
Total Area (Square Feet)	0 SQFT
Structure Depth (Feet)	LF
Footing Type (pile or spread)	Pile
Cost Per Square Foot	$300
COST OF EACH	**$0**

TOTAL COST OF STRUCTURES[1]	**14,084,700**

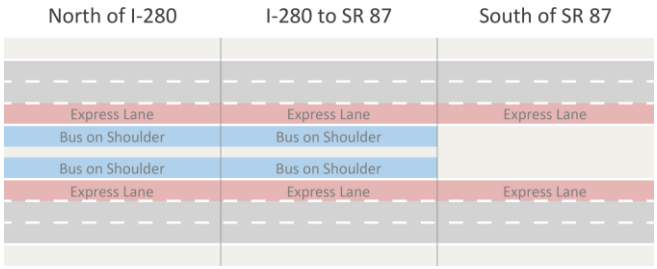
Estimate Prepared By: _____ _____

XXXXXXXXXXXXXXXX ------ Division of Structures | Date

[1]Structure's Estimate includes Overhead and Mobilization are based on 2019 CALTRAN's "COMPARATIVE BRIDGE COSTS".

Alternative 3-5: Long Bus on Median Shoulder

- Convert existing HOV lane in each direction from Bernal Road, near U.S. 101 in south San Jose to Moffett Boulevard, near U.S. 101 in Mountain View, a distance of 23.2 miles, to operate as a single express lane.
- Provide continuous access to express lane from the adjacent general-purpose lanes.
- Install toll infrastructure in median to support express lanes.
- Reconstruct concrete median barrier south of Santa Teresa Boulevard and north of Stelling Road to accommodate toll gantries and dynamic message signs.
- Widen paved median shoulder to 14 feet in both directions from Santa Teresa Boulevard to South Stelling Road (excepting structures) to provide continuous CHP enforcement area.
- Widen right-side shoulders to meet Highway Design Manual standards (10 feet). Relocate drainage inlets as needed to the outside edge of shoulder.
- Install double-luminaire mast arm lighting at 250- to 400-foot intervals from postmile (PM) 6.00 (Almaden Expressway) to PM 17.70 (Stevens Creek Boulevard) and from PM 18.86 (Homestead Road) to PM 23.44 (Moffett Boulevard.
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing.
- For Alternative 3-5, the median shoulder is assumed to be paved with full depth AC or PCC to provide a 12-foot-wide part-time travel lane and a total shoulder width of 14 feet where space permits (from Santa Teresa Boulevard to South Stelling Road, excepting structures).
- Widen nine bridge structures.
- Replace Dalles Avenue pedestrian bridge.
- Convert SR 85 interchange at El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration.



Alternative 3-5: Long Bus on Median Shoulder

Engineer Cost Estimate --- Alternative 3-5
Preliminary Project Study Report

Project ID: XXXXXX

Type of Estimate : Preliminary Project Study Report (Dec 2019)
Program Code : 04-XXXXX
Project Limits : From Hwy 101 Interchange in Santa Jose to South of Hwy 101 Interchange in Mt. View
Description: From PM 0.00 to PM 23.68
Scope : Widen the Existing Median Shoulder to Provide Enough Space to Accommodate the Bus Operations
Alternative : Alternative 3-5 Long Shoulder (Median)

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	249,916,432	$	334,851,400
STRUCTURE ITEMS	$	15,194,700	$	20,358,700
SUBTOTAL CONSTRUCTION COST	$	265,111,132	$	355,210,100
RIGHT OF WAY	$	-	$	-
TOTAL CAPITAL OUTLAY COST	$	265,112,000	$	355,211,000
PR/ED SUPPORT (3%)	$	7,954,000	$	10,657,000
PS&E SUPPORT (12%)	$	31,814,000	$	42,626,000
RIGHT OF WAY SUPPORT				
CONSTRUCTION SUPPORT (12%)	$	31,814,000	$	42,626,000
AGENCY SUPPORT (8%)	$	21,209,000	$	28,417,000
TOTAL CAPITAL OUTLAY SUPPORT COST*	$	92,791,000	$	124,326,000
TOTAL PROJECT COST	$	357,903,000	$	480,000,000

If Project has been programmed enter Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	12	/	2019
Estimated Date of Construction Start (Month/Year)	10	/	2023
Number of Working Days	1500		Working Days
Estimated Mid-Point of Construction (Month/Year)	10	/	2026
Number of Plant Establishment Days			Days

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section	Cost
1	Earthwork	$ 2,649,200
2	Pavement Structural Section	$ 26,118,200
3	Drainage	$ 903,300
4	Specialty Items	$ 6,877,200
5	Environmental	$ 2,246,400
6	Traffic Items	$ 119,586,600
7	Detours	$ 250,000
8	Minor Items	$ 7,931,600
9	Roadway Mobilization	$ 16,656,300
10	Supplemental Work	$ 8,373,700
11	State Furnished	$ 5,765,700
12	Contingencies	$ 41,652,800
13	Overhead	$ 10,905,432
	TOTAL ROADWAY ITEMS	**$ 249,916,432**

Estimate Prepared By : _____

Name and Title Date Phone

Estimate Reviewed By : _____

Name and Title Date Phone

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)		Cost
160101	Clearing & Grubbing	AC	47	x	1,725	=	$81,075
170101	Develop Water Supply	LS	1	x	50,000	=	$50,000
190101	Roadway Excavation	CY	73,547	x	29	=	$2,103,444
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$0
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$0
192037	Structure Excavation (Retaining Wall)	CY		x		=	$0
193013	Structure Backfill (Retaining Wall)	CY		x		=	$0
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$0
194001	Ditch Excavation	CY		x		=	$0
198001	Impored Borrow	CY	25,128	x	17	=	$414,612
198007	Imported Material (Shoulder Backing)	TON		x		=	$0
XXXXXX	Some Item			x		=	$0

TOTAL EARTHWORK SECTION ITEMS	**$**	**2,649,200**

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
150771	Remove Asphalt Concrete Dike	LF		x		=	$	-
150860	Remove Base and Surfacing	CY	31,388	x	12.5	=	$	392,350
153103	Cold Plane Asphalt Concrete Pavement	SQYD	0	x	8	=	$	-
150854	Remove Concrete Pavement	CY	21,723	x	156	=	$	3,388,788
260201	Class 4 Aggregate Base	CY	8,283	x	61	=	$	501,122
250401	Class 4 Aggregate Subbase	CY	15,565	x	38	=	$	591,470
290201	Asphalt Treated Permeable Base	CY	5,647	x	160	=	$	903,520
365001	Sand Cover	TON		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
377501	Slurry Seal	TON		x		=	$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON		x		=	$	-
390136	Minor Hot Mix Asphalt	TON		x		=	$	-
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		=	$	-
393003	Geosynthetic Pavement Interlayer	SQYD		x		=	$	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Inden*	STA		x		=	$	-
394071	Place Hot Mix Asphalt Dike	LF		x		=	$	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		=	$	-
397005	Tack Coat	TON		x		=	$	-
400050	Continuously Reinfored Concrete Pavement	CY	67,803	x	300	=	$	20,340,900
401108	Replace Concrete Pavement (Rapid Strength	CY		x		=	$	-
404092	Seal Pavement Joint	LF		x		=	$	-
404094	Seal Longitudinal Isolation Joint	LF		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	SQYD		x		=	$	-
413115	Seal Existing Concrete Pavement Joint	LF		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
731502	Minor Concrete (Misc. Const)	CY		x		=	$	-
731530	Minor Concrete (Textured Paving)	SQFT		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS	**$**	**26,118,200**

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
150206	Abandon Culvert	LF		x		=	$	-
150805	Remove Culvert	LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
193114	Sand Backfill	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
510512	Minor Concrete (Box Culvert)	CY		x		=	$	-
510XXX	Culvert (Roadway Crossing)	EA		x		=	$	-
62XXXX	XXX" APC Pipe	LF		x		=	$	-
64XXXX	XXX" Plastic Pipe	LF		x		=	$	-
65XXXX	XXX" RCP Pipe	LF		x		=	$	-
66XXXX	XXX" CSP Pipe	LF		x		=	$	-
680905	Underdrain (6" Alternative)	LF	12,881	x	36	=	$	463,716
681103	Edge Drain (3" Plastic Pipe)	LF	20,931	x	21	=	$	439,551
69XXXX	XXX" Pipe Downdrain	LF		x		=	$	-
70XXXX	XXX" Pipe Inlet	LF		x		=	$	-
70XXXX	XXX" Pipe Riser	LF		x		=	$	-
70XXXX	XXX" Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
729010	Rock Slope Protection Fabric	SQYD		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Additional Drainage (Detention Base, etc)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL DRAINAGE ITEMS	**$**	**903,300**

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	30,000	=	$	30,000
150662	Remove Metal Beam Guard Railing	LF	34,859	x	15	=	$	505,456
150668	Remove Terminal Systems	EA		x		=	$	-
1532XX	Remove Concrete Barrier (25, 50 or 50C)	LF	33,339	x	16	=	$	533,424
153250	Remove Sound Wall	SQFT	0	x	25	=	$	-
150606	Remove Fence (BW)	LF		x		=	$	-
190110	Lead Compliance Plan	LS	1	x	18,000	=	$	18,000
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$	-
510060	Structural Concrete (Retaining Wall)	CY		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$	-
510XXX	Retaining Wall (MSE)	SQFT	0	x	85	=	$	-
XXXXXX	Sound Wall (On Pile, On Barrier or On Ret. Wall)	SQFT	0	x	40	=	$	-
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$	-
511048	Apply Anti-Graffiti Coating	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$	-
518002	Sound Wall (Masonry Block)	SQFT		x		=	$	-
520103	Bar Reinf. Steel (Retaining Wall)	LB		x		=	$	-
800007	Fence (BW)	LF		x		=	$	-
832001	Metal Beam Guard Railing	LF	69,718	x	47	=	$	3,241,887
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
83954X	Transition Railing *(Insert Type)*	EA		x		=	$	-
8395XX	Terminal System (Type CAT)	EA		x		=	$	-
8395XX	Alternative Flared Terminal System	EA	0	x	1,200	=	$	-
8395XX	End Anchor Assembly (*Insert Type*)	EA		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
839596	Crash Cushion *(G.R.E.A.T)*	EA		x		=	$	-
839701	Concrete Barrier *(50 or 60)*	LF	31,884	x	78	=	$	2,486,952
833128	Concrete Barrier *(25 Modify)*	LF	480	x	128	=	$	61,440
XXXXXX	Some Item			x		=	$	-

TOTAL SPECIALTY ITEMS	**$**	**6,877,200**

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
XXXXXX	Biological Mitigation	LS		x		=	$	-
071325	Temporary Reinforced Silt Fence	LF		x		=	$	-
XXXXXX	Hazardous Material Remediation	LS	1	x	180,000	=	$	180,000
XXXXXX	Permits	LS	1	x	90,000	=	$	90,000
071325	Temporary Fence (Type ESA)	LF		x		=	$	-

Subtotal Environmental $ 270,000

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
200001	Highway Planting	ACRE		x		=	$	-
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-*	LF		x		=	$	-
20XXXX	Extend XXX" *(Insert Type)* Conduit	LF		x		=	$	-
201700	Imported Topsoil	CY		x		=	$	-
203015	Erosion Control	ACRE		x		=	$	-
203021	Fiber Rolls	LF		x		=	$	-
203026	Move In/ Move Out (Erosion Control)	EA		x		=	$	-
204099	Plant Establishment Work	LS		x		=	$	-
204101	Extend Plant Establishment (X Years)	LS		x		=	$	-
208000	Irrigation System	LS		x		=	$	-
208304	Water Meter	EA		x		=	$	-
209801	Maintenance Vehicle Pullout	EA		x		=	$	-
XXXXXX	Some Item							

Subtotal Landscape and Irrigation $ -

5C - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost
074016	Construction Site Management	LS	1	x	900,000	=	$	900,000
074017	Prepare WPCP	LS	1	x	20,000	=	$	20,000
074019	Prepare SWPPP	LS	1	x	20,000	=	$	20,000
074023	Temporary Erosion Control	ACRE	47	x	2,500	=	$	117,500
074027	Temporary Erosion Control Blanket	SQYD		x		=	$	-
074028	Temporary Fiber Roll	LF		x		=	$	-
074032	Temporary Concrete Washout Facility	EA		x		=	$	-
074033	Temporary Construction Entrance	EA		x		=	$	-
074035	Temporary Check Dam	LF		x		=	$	-
074037	Move In/ Move Out (Temp Erosion Control)	EA		x		=	$	-
074038	Temp. Drainage Inlet Protection	EA	315	x	60	=	$	18,900
XXXXXX	Site Job Management	LS	1	x	900,000	=	$	900,000
074042	Temporary Concrete Washout (Portable)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

Supplemental Work for NPDES

(These costs are not accounted in total here but under Supplemental Work on sheet 7 of 11).

074021	Water Pollution Control Maintenance Work*	LS	1	x	45,500	=	$	45,500
066596	Additional Water Pollution Control**	LS		x		=	$	-
066597	Storm Water Sampling and Analysis***	LS		x		=	$	-
XXXXXX	Some Item							

Subtotal NPDES (Without Supplemental Work) $ 1,976,400

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $ 2,246,400

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LB		x		=	$	-
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
56XXXX	Install Overhead Sign (Two Post)	EA	15	x	400,000	=	$	6,000,000
56XXXX	Install Overhead Sign (One Post)	EA	10	x	160,000	=	$	1,600,000
860090	Maintain Existing Traffic Management System	LS	1	x	900,000	=	$	900,000
860810	Inductive Loop Detectors	EA		x		=	$	-
86055X	Lighting & Sign Illumination	EA	378	x	4,000	=	$	1,512,000
8607XX	Interconnection Facilities	LS		x		=	$	-
8609XX	Traffic Traffic Monitoring Stations	LS	1	x	200,000	=	$	200,000
860XXX	Signals & Lighting	LS		x		=	$	-
860XXX	ITS Elements	LS		x		=	$	-
861100	Ramp Metering System (Location X)	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXXX	Ramp Terminal Intersection Improvement	LS	1	x	1,000,000	=	$	1,000,000
XXXXXX	Toll Equipment and System Integration (Capital)	LS	1	x	100,000,000	=	$	100,000,000
XXXXX	Some Item							

Subtotal Traffic Electrical *$ 111,212,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120090	Construction Area Signs	LS	1	x	900,000	=	$	900,000
150701	Remove Yellow Painted Traffic Stripe	LF	94,494	x	4	=	$	377,976
150710	Remove Traffic Stripe	LF	944,940	x	0.25	=	$	236,235
150713	Remove Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA	20	x	120	=	$	2,400
15075X	Remove Sign Structure	EA	30	x	20,000	=	$	600,000
15075X	Remove Sign Structure (On Bridge)	EA	8	x	5,000	=	$	40,000
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
566011	Roadside Sign (One Post)	EA	30	x	340	=	$	10,200
566012	Roadside Sign (Two Post)	EA	10	x	1,250	=	$	12,500
560XXX	Furnish Sign Panels	SQFT		x		=	$	-
560XXX	Install Sign Panels	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	900,000	=	$	900,000
840504	Thermoplastic Traffic Strip (4")	LF	944,940	x	0.50	=	$	472,470

Subtotal Traffic Signing and Striping *$ 3,551,781*

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	1	x	4,000,000	=	$	4,000,000
120120	Type III Barricade	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	LS	1	x	90,000	=	$	90,000
120159	Temporary Traffic Strip (Paint)	LS	1	x	90,000	=	$	90,000
12016X	Channelizer	EA		x		=	$	-
128650	Portable Changeable Message Signs	EA	18	x	10,000	=	$	180,000
129000	Temporary Railing (Type K)	LF	6,000	x	17	=	$	102,000
129100	Temp. Crash Cushion Module	EA	4	x	200	=	$	800
129099A	Traffic Plastic Drum	EA		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
XXXXXX	Misc. Items (Traffic Management Plan)	LS	1	x	360,000	=	$	360,000
XXXXXX	Some Item	LS		x		=	$	-

Subtotal Stage Construction and Traffic Handling *$ 4,822,800*

TOTAL TRAFFIC ITEMS **$ 119,586,600**

SECTION 7: DETOURS

Include constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
0713XX	Temporary Fence (Type X)	LF		x		=	$ -
07XXXX	Temporary Drainage	LS		x		=	$ -
120143	Temporary Pavement Delineation	LF		x		=	$ -
1286XX	Temporary Signals	EA		x		=	$ -
129000	Temporary Railing (Type K)	LF		x		=	$ -
190101	Roadway Excavation	CY		x		=	$ -
198001	Imported Borrow	CY		x		=	$ -
198050	Embankment	CY		x		=	$ -
250401	Class 4 Aggregate Subbase	CY		x		=	$ -
260201	Class 2 Aggregate Base	CY		x		=	$ -
390132	Hot Mix Asphalt (Type A)	TON		x		=	$ -
XXXXXX	Some Item	LS	1	x	$250,000	=	$ 250,000

TOTAL DETOURS **$ 250,000**

SUBTOTAL SECTIONS 1-7 $ 158,630,900

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items
ADA Items $ -

8B - Bike Path Items
Bike Path Items $ -

8C - Other Minor Items
Other Minor Items 5.0% $ 7,931,545

Total of Section 1-7 $ 158,630,900 x 5.0% = $ 7,931,545

TOTAL MINOR ITEMS **$ 7,931,600**

SECTIONS 9: MOBILIZATION

Item code							
999990	Total Section 1-8	$	166,562,500	x	10%	=	$16,656,250

TOTAL MOBILIZATION **$ 16,656,300**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066015	Federal Trainee Program	LS		x		=	$ -
066063	Traffic Management Plan - Public Information	LS		x		=	$ -
066090	Maintain Traffic	LS		x		=	$ -
066094	Value Analysis	LS		x		=	$ -
066204	Remove Rock & Debris	LS		x		=	$ -
066222	Locate Existing Cross-Over	LS		x		=	$ -
066670	Payment Adjustments For Price Index Fluctuations	LS		x		=	$ -
066700	Partnering	LS		x		=	$ -
066866	Operation of Existing Traffic Management System Eler	LS		x		=	$ -
066920	Dispute Review Board	LS		x		=	$ -
066XXX	Some Item	LS		x		=	$ -

*Cost of **NPDES** Supplemental Work specified in Section 5C* = $ 45,500

Total Section 1-8 $ 166,562,500 5% = $ 8,328,125

TOTAL SUPPLEMENTAL WORK **$ 8,373,700**

Note: Mobilization item will automatically calculate if working days are 50 or more. For Project less than 50 Working Days Mobilization is not required as a separate contract, however contract item prices should take into consideration mobilization as part of the price. If the building portion of the project is greater than 50% of the total project cost,

If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066063	Public Information	LS	0	x	$100,000	=	$0
066105	RE Office	LS	1	x	$400,000	=	$400,000
066803	Padlocks	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
066062A	COZEEP Expenses	LS		x		=	$0
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
XXXXXX	Toll Back Office System	LS	1	x	$1,700,000	=	$1,700,000
06684X	TMS Controller Assembly	LS	1	x	$2,000,000	=	$2,000,000
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
XXXXXX	Some Item						

Total Section 1-8	$	166,562,500	1%	= $	1,665,625

TOTAL STATE FURNISHED	**$5,765,700**

SECTION 12: TIME-RELATED OVERHEAD

Estimated Time-Releated Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity		Unit Price ($)		Cost	
			Total of All Contract Items Only				$ 181,757,200	(used to calculate TR
070018	Time-Related Overhead	$	181,757,200	X	6%	=	$10,905,432	

TOTAL TIME-RELATED OVERHEAD	**$10,905,432**

SECTION 13: CONTINGENCY

Total Section 1-12	$	208,263,632	x	20%	=	$41,652,727	

TOTAL CONTINGENCY	**$41,652,800**

Note: TRO is a contract item if total project cost is (non-escalated) over $5 million AND 100 or more working days.
If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.
TRO calculated for you as percentage of the sum of all contract items only;
excluding mobilization, supplemental work, state furnished materials and expenses, and contingency.

II. STRUCTURE ITEMS

	Bridge 1	Bridge 2	Bridge 3
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	ALAMADEN UC	CAMDEN UC	OKA UC
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	50 LF	45 LF	33 LF
Total Bridge Length (Feet)	238 LF	210 LF	102 LF
Total Area (Square Feet)	11,900 SQFT	9,450 SQFT	3,366 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	None	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$3,570,000**	**$2,835,000**	**$1,009,800**

	Bridge 4	Bridge 5	Bridge 6
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	LOS GATOS CREEK BRIDGE	POLLARD UC	SAN TOMAS AQUINAS CREEK
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	29 LF	23 LF	23 LF
Total Bridge Length (Feet)	178 LF	196 LF	105 LF
Total Area (Square Feet)	5,162 SQFT	4,508 SQFT	2,415 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$1,548,600**	**$1,352,400**	**$724,500**

	Bridge 7	Bridge 8	Bridge 9
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	SARATOGA UC	SARATOGA CREEK BRIDGE	CALABAZAS CREEK BRG
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	23 LF	23 LF	22 LF
#REF!	192 LF	100 LF	156 LF
Total Area (Square Feet)	4,416 SQFT	2,300 SQFT	3,432 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH	**$1,324,800**	**$690,000**	**$1,029,600**

	Bridge 10
DATE OF ESTIMATE	Dec, 2019
Bridge Name	Pedestrian Bridge (Dalles Ave)
Bridge Number	
Structure Type	CIP/PS Box Girder
Width (Feet) [out to out]	10 LF
#REF!	370 LF
Total Area (Square Feet)	3,700 SQFT
Structure Depth (Feet)	LF
Footing Type (pile or spread)	Pile
Cost Per Square Foot	$300
COST OF EACH	**$1,110,000**

TOTAL COST OF STRUCTURES[1]	**15,194,700**

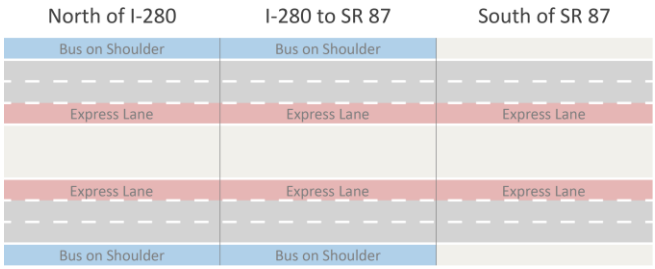
Estimate Prepared By: _____ _____

XXXXXXXXXXXXXXXX ------ Division of Structures | Date

[1]Structure's Estimate includes Overhead and Mobilization are based on 2019 CALTRAN's "COMPARATIVE BRIDGE COSTS".

Alternative 3-6: Long Bus on Right-side Shoulder

- Convert existing HOV lane in each direction from Bernal Road, near U.S. 101 in south San Jose to Moffett Boulevard, near U.S. 101 in Mountain View, a distance of 23.2 miles, to operate as a single express lane.
- Provide continuous access to express lane from the adjacent general-purpose lanes.
- Install toll infrastructure in median to support express lanes.
- Reconstruct concrete median barrier south of Santa Teresa Boulevard and north of Stelling Road to accommodate toll gantries and dynamic message signs.
- Widen paved median shoulder to 14 feet in both directions from Santa Teresa Boulevard to South Stelling Road (excepting structures) to provide continuous CHP enforcement area.
- Widen right-side shoulders to meet Highway Design Manual standards (10 feet). Relocate drainage inlets as needed to the outside edge of shoulder.
- Install double-luminaire mast arm lighting at 250- to 400-foot intervals from postmile (PM) 6.00 (Almaden Expressway) to PM 17.70 (Stevens Creek Boulevard) and from PM 18.86 (Homestead Road) to PM 23.44 (Moffett Boulevard).
- Install high mast lighting at SR 17 and I-280 interchanges as needed to supplement existing.
- For Alternative 3-6, the right-side shoulder is assumed to be paved with full depth AC or PCC to provide a 12-foot-wide part-time travel lane and a total width of 14 feet where space permits. In many to most cases, widening the right-side shoulders will involve widening the median shoulder with full depth PCC and relocating the lane markings and delineators. This will avoid the need for retaining the side slopes, reconstructing existing retaining walls and/or soundwalls.
- At structures, shoulders used by buses will be a minimum of 11.5 feet wide.
- Replace Dalles Avenue pedestrian bridge.
- Convert SR 85 interchange at El Camino Real from a cloverleaf Type L-10 ramp configuration to a spread diamond Type L-2 ramp configuration.



Alternative 3-6: Long Bus on Right-side Shoulder

Engineer Cost Estimate --- Alternative 3-6
Preliminary Project Study Report

Project ID: XXXXXX

Type of Estimate : Preliminary Project Study Report (Dec 2019)
Program Code : 04-XXXXX
Project Limits : From Hwy 101 Interchange in Santa Jose to South of Hwy 101 Interchange in Mt. View
Description: From PM 0.00 to PM 23.68
Scope : Widen the Right-Side Existing Shoulder to Provide Enough Space to Accommodate the Bus Operations
Alternative : Alternative 3-6 Long Shoulder (Right-Side)

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	247,871,504	$	332,111,500
STRUCTURE ITEMS	$	1,110,000	$	1,487,300
SUBTOTAL CONSTRUCTION COST	$	248,981,504	$	333,598,800
RIGHT OF WAY	$	-	$	-
TOTAL CAPITAL OUTLAY COST	$	248,982,000	$	333,599,000
PR/ED SUPPORT (3%)	$	7,470,000	$	10,008,000
PS&E SUPPORT (12%)	$	29,878,000	$	40,032,000
RIGHT OF WAY SUPPORT				
CONSTRUCTION SUPPORT (12%)	$	29,878,000	$	40,032,000
AGENCY SUPPORT (8%)	$	19,919,000	$	26,688,000
TOTAL CAPITAL OUTLAY SUPPORT COST*	$	87,145,000	$	116,760,000
TOTAL PROJECT COST	$	336,127,000	$	451,000,000

If Project has been programmed enter Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	12	/	2019
Estimated Date of Construction Start (Month/Year)	10	/	2023
Number of Working Days	1500		Working Days
Estimated Mid-Point of Construction (Month/Year)	10	/	2026
Number of Plant Establishment Days			Days

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	**Earthwork**	$	919,400
2	**Pavement Structural Section**	$	23,636,700
3	**Drainage**	$	903,300
4	**Specialty Items**	$	10,236,400
5	**Environmental**	$	2,238,900
6	**Traffic Items**	$	119,775,600
7	**Detours**	$	250,000
8	**Minor Items**	$	7,898,100
9	**Roadway Mobilization**	$	16,585,900
10	**Supplemental Work**	$	8,338,500
11	**State Furnished**	$	5,758,600
12	**Contingencies**	$	41,312,000
13	**Overhead**	$	10,018,104
	TOTAL ROADWAY ITEMS	**$**	**247,871,504**

Estimate Prepared By : _____

Name and Title Date Phone

Estimate Reviewed By : _____

Name and Title Date Phone

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)		Cost
160101	Clearing & Grubbing	AC	44	x	1,725	=	$75,900
170101	Develop Water Supply	LS	1	x	50,000	=	$50,000
190101	Roadway Excavation	CY	27,744	x	29	=	$793,478
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$0
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$0
192037	Structure Excavation (Retaining Wall)	CY		x		=	$0
193013	Structure Backfill (Retaining Wall)	CY		x		=	$0
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$0
194001	Ditch Excavation	CY		x		=	$0
198001	Impored Borrow	CY	0	x	17	=	$0
198007	Imported Material (Shoulder Backing)	TON		x		=	$0
XXXXXX	Some Item			x		=	$0

TOTAL EARTHWORK SECTION ITEMS	**$ 919,400**

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
150771	Remove Asphalt Concrete Dike	LF	176,952	x		=	$	-
150860	Remove Base and Surfacing	CY	0	x	12.5	=	$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	0	x	8	=	$	-
150854	Remove Concrete Pavement	CY	53,129	x	156	=	$	8,288,124
260201	Class 4 Aggregate Base	CY	305	x	61	=	$	18,453
250401	Class 4 Aggregate Subbase	CY	583	x	38	=	$	22,154
290201	Asphalt Treated Permeable Base	CY	218	x	160	=	$	34,880
365001	Sand Cover	TON		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
377501	Slurry Seal	TON		x		=	$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON		x		=	$	-
390136	Minor Hot Mix Asphalt	TON		x		=	$	-
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		=	$	-
393003	Geosynthetic Pavement Interlayer	SQYD		x		=	$	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Indent*	STA		x		=	$	-
394071	Place Hot Mix Asphalt Dike	LF	176,952	x		=	$	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		=	$	-
397005	Tack Coat	TON		x		=	$	-
400050	Continuously Reinfored Concrete Pavement	CY	50,910	x	300	=	$	15,273,000
401108	Replace Concrete Pavement (Rapid Strength	CY		x		=	$	-
404092	Seal Pavement Joint	LF		x		=	$	-
404094	Seal Longitudinal Isolation Joint	LF		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	SQYD		x		=	$	-
413115	Seal Existing Concrete Pavement Joint	LF		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
731502	Minor Concrete (Misc. Const)	CY		x		=	$	-
731530	Minor Concrete (Textured Paving)	SQFT		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS	**$ 23,636,700**

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
150206	Abandon Culvert	LF		x		=	$	-
150805	Remove Culvert	LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
193114	Sand Backfill	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
510512	Minor Concrete (Box Culvert)	CY		x		=	$	-
510XXX	Culvert (Roadway Crossing)	EA		x		=	$	-
62XXXX	XXX" APC Pipe	LF		x		=	$	-
64XXXX	XXX" Plastic Pipe	LF		x		=	$	-
65XXXX	XXX" RCP Pipe	LF		x		=	$	-
66XXXX	XXX" CSP Pipe	LF		x		=	$	-
680905	Underdrain (6" Alternative)	LF	12,881	x	36	=	$	463,716
681103	Edge Drain (3" Plastic Pipe)	LF	20,931	x	21	=	$	439,551
69XXXX	XXX" Pipe Downdrain	LF		x		=	$	-
70XXXX	XXX" Pipe Inlet	LF		x		=	$	-
70XXXX	XXX" Pipe Riser	LF		x		=	$	-
70XXXX	XXX" Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
729010	Rock Slope Protection Fabric	SQYD		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Additional Drainage (Detention Base, etc)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL DRAINAGE ITEMS	**$**	**903,300**

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	30,000	=	$	30,000
150662	Remove Metal Beam Guard Railing	LF	34,859	x	15	=	$	505,456
150668	Remove Terminal Systems	EA		x		=	$	-
1532XX	Remove Concrete Barrier (25, 50 or 50C)	LF	33,339	x	16	=	$	533,424
153250	Remove Sound Wall	SQFT	0	x	25	=	$	-
150606	Remove Fence (BW)	LF		x		=	$	-
190110	Lead Compliance Plan	LS	1	x	18,000	=	$	18,000
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$	-
510060	Structural Concrete (Retaining Wall)	CY		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$	-
510XXX	Retaining Wall (MSE)	SQFT	39,520	x	85	=	$	3,359,200
XXXXXX	Sound Wall (On Pile, On Barrier or On Ret. Wall)	SQFT	0	x	40	=	$	-
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$	-
511048	Apply Anti-Graffiti Coating	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$	-
518002	Sound Wall (Masonry Block)	SQFT		x		=	$	-
520103	Bar Reinf. Steel (Retaining Wall)	LB		x		=	$	-
800007	Fence (BW)	LF		x		=	$	-
832001	Metal Beam Guard Railing	LF	69,718	x	47	=	$	3,241,887
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
83954X	Transition Railing *(Insert Type)*	EA		x		=	$	-
8395XX	Terminal System (Type CAT)	EA		x		=	$	-
8395XX	Alternative Flared Terminal System	EA	0	x	1,200	=	$	-
8395XX	End Anchor Assembly (*Insert Type*)	EA		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
839596	Crash Cushion *(G.R.E.A.T)*	EA		x		=	$	-
839701	Concrete Barrier *(50 or 60)*	LF	31,884	x	78	=	$	2,486,952
833128	Concrete Barrier *(25 Modify)*	LF	480	x	128	=	$	61,440
XXXXXX	Some Item			x		=	$	-

TOTAL SPECIALTY ITEMS	**$**	**10,236,400**

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
XXXXXX	Biological Mitigation	LS		x		=	$	-
071325	Temporary Reinforced Silt Fence	LF		x		=	$	-
XXXXXX	Hazardous Material Remediation	LS	1	x	180,000	=	$	180,000
XXXXXX	Permits	LS	1	x	90,000	=	$	90,000
071325	Temporary Fence (Type ESA)	LF		x		=	$	-

Subtotal Environmental *$ 270,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
200001	Highway Planting	ACRE		x		=	$	-
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-*	LF		x		=	$	-
20XXXX	Extend XXX" *(Insert Type)* Conduit	LF		x		=	$	-
201700	Imported Topsoil	CY		x		=	$	-
203015	Erosion Control	ACRE		x		=	$	-
203021	Fiber Rolls	LF		x		=	$	-
203026	Move In/ Move Out (Erosion Control)	EA		x		=	$	-
204099	Plant Establishment Work	LS		x		=	$	-
204101	Extend Plant Establishment (X Years)	LS		x		=	$	-
208000	Irrigation System	LS		x		=	$	-
208304	Water Meter	EA		x		=	$	-
209801	Maintenance Vehicle Pullout	EA		x		=	$	-
XXXXXX	Some Item							

Subtotal Landscape and Irrigation *$ -*

5C - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost
074016	Construction Site Management	LS	1	x	900,000	=	$	900,000
074017	Prepare WPCP	LS	1	x	20,000	=	$	20,000
074019	Prepare SWPPP	LS	1	x	20,000	=	$	20,000
074023	Temporary Erosion Control	ACRE	44	x	2,500	=	$	110,000
074027	Temporary Erosion Control Blanket	SQYD		x		=	$	-
074028	Temporary Fiber Roll	LF		x		=	$	-
074032	Temporary Concrete Washout Facility	EA		x		=	$	-
074033	Temporary Construction Entrance	EA		x		=	$	-
074035	Temporary Check Dam	LF		x		=	$	-
074037	Move In/ Move Out (Temp Erosion Control)	EA		x		=	$	-
074038	Temp. Drainage Inlet Protection	EA	315	x	60	=	$	18,900
XXXXXX	Site Job Management	LS	1	x	900,000	=	$	900,000
074042	Temporary Concrete Washout (Portable)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

Supplemental Work for NPDES

(These costs are not accounted in total here but under Supplemental Work on sheet 7 of 11).

074021	Water Pollution Control Maintenance Work*	LS	1	x	45,500	=	$	45,500
066596	Additional Water Pollution Control**	LS		x		=	$	-
066597	Storm Water Sampling and Analysis***	LS		x		=	$	-
XXXXXX	Some Item							

Subtotal NPDES (Without Supplemental Work) *$ 1,968,900*

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $ 2,238,900

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LB		x		=	$	-
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
56XXXX	Install Overhead Sign (Two Post)	EA	15	x	400,000	=	$	6,000,000
56XXXX	Install Overhead Sign (One Post)	EA	10	x	160,000	=	$	1,600,000
860090	Maintain Existing Traffic Management System	LS	1	x	900,000	=	$	900,000
860810	Inductive Loop Detectors	EA		x		=	$	-
86055X	Lighting & Sign Illumination	EA	378	x	4,000	=	$	1,512,000
8607XX	Interconnection Facilities	LS		x		=	$	-
8609XX	Traffic Traffic Monitoring Stations	LS	1	x	200,000	=	$	200,000
860XXX	Signals & Lighting	LS		x		=	$	-
860XXX	ITS Elements	LS		x		=	$	-
861100	Ramp Metering System	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXXX	Ramp Terminal Intersection Improvement	LS	1	x	1,000,000	=	$	1,000,000
XXXXXX	Toll Equipment and System Integration (Capital)	LS	1	x	100,000,000	=	$	100,000,000
XXXXXX	Some Item							

Subtotal Traffic Electrical *$ 111,212,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120090	Construction Area Signs	LS	1	x	900,000	=	$	900,000
150701	Remove Yellow Painted Traffic Stripe	LF	94,494	x	4	=	$	377,976
150710	Remove Traffic Stripe	LF	944,940	x	0.25	=	$	236,235
150713	Remove Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA	20	x	120	=	$	2,400
15075X	Remove Sign Structure	EA	30	x	20,000	=	$	600,000
15075X	Remove Sign Structure (On Bridge)	EA	8	x	5,000	=	$	40,000
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
566011	Roadside Sign (One Post)	EA	30	x	340	=	$	10,200
566012	Roadside Sign (Two Post)	EA	10	x	1,250	=	$	12,500
560XXX	Furnish Sign Panels	SQFT		x		=	$	-
560XXX	Install Sign Panels	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	900,000	=	$	900,000
840504	Thermoplastic Traffic Strip (4")	LF	1,322,916	x	0.50	=	$	661,458

Subtotal Traffic Signing and Striping *$ 3,740,769*

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	1	x	4,000,000	=	$	4,000,000
120120	Type III Barricade	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	LS	1	x	90,000	=	$	90,000
120159	Temporary Traffic Strip (Paint)	LS	1	x	90,000	=	$	90,000
12016X	Channelizer	EA		x		=	$	-
128650	Portable Changeable Message Signs	EA	18	x	10,000	=	$	180,000
129000	Temporary Railing (Type K)	LF	6,000	x	17	=	$	102,000
129100	Temp. Crash Cushion Module	EA	4	x	200	=	$	800
129099A	Traffic Plastic Drum	EA		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
XXXXXX	Misc. Items (Traffic Management Plan)	LS	1	x	360,000	=	$	360,000
XXXXXX	Some Item	LS		x		=	$	-

Subtotal Stage Construction and Traffic Handling *$ 4,822,800*

TOTAL TRAFFIC ITEMS **$ 119,775,600**

SECTION 7: DETOURS

Include constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
0713XX	Temporary Fence (Type X)	LF		x		=	$ -
07XXXX	Temporary Drainage	LS		x		=	$ -
120143	Temporary Pavement Delineation	LF		x		=	$ -
1286XX	Temporary Signals	EA		x		=	$ -
129000	Temporary Railing (Type K)	LF		x		=	$ -
190101	Roadway Excavation	CY		x		=	$ -
198001	Imported Borrow	CY		x		=	$ -
198050	Embankment	CY		x		=	$ -
250401	Class 4 Aggregate Subbase	CY		x		=	$ -
260201	Class 2 Aggregate Base	CY		x		=	$ -
390132	Hot Mix Asphalt (Type A)	TON		x		=	$ -
XXXXXX	Some Item	LS	1	x	$250,000	=	$ 250,000

TOTAL DETOURS **$ 250,000**

SUBTOTAL SECTIONS 1-7 $ 157,960,300

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items

ADA Items $ -

8B - Bike Path Items

Bike Path Items $ -

8C - Other Minor Items

Other Minor Items 5.0% $ 7,898,015

Total of Section 1-7 $ 157,960,300 x 5.0% = $ 7,898,015

TOTAL MINOR ITEMS **$ 7,898,100**

SECTIONS 9: MOBILIZATION

Item code							
999990	Total Section 1-8	$	165,858,400	x	10%	=	$ 16,585,840

TOTAL MOBILIZATION **$ 16,585,900**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066015	Federal Trainee Program	LS		x		=	$ -
066063	Traffic Management Plan - Public Information	LS		x		=	$ -
066090	Maintain Traffic	LS		x		=	$ -
066094	Value Analysis	LS		x		=	$ -
066204	Remove Rock & Debris	LS		x		=	$ -
066222	Locate Existing Cross-Over	LS		x		=	$ -
066670	Payment Adjustments For Price Index Fluctuations	LS		x		=	$ -
066700	Partnering	LS		x		=	$ -
066866	Operation of Existing Traffic Management System Eler	LS		x		=	$ -
066920	Dispute Review Board	LS		x		=	$ -
066XXX	Some Item	LS		x		=	$ -

*Cost of **NPDES** Supplemental Work specified in Section 5C* = $ 45,500

Total Section 1-8 $ 165,858,400 5% = $ 8,292,920

TOTAL SUPPLEMENTAL WORK **$ 8,338,500**

Note: Mobilization item will automatically calculate if working days are 50 or more. For Project less than 50 Working Days Mobilization is not required as a separate contract, however contract item prices should take into consideration mobilization as part of the price. If the building portion of the project is greater than 50% of the total project cost,

If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066063	Public Information	LS	0	x	$100,000	=	$0
066105	RE Office	LS	1	x	$400,000	=	$400,000
066803	Padlocks	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
066062A	COZEEP Expenses	LS		x		=	$0
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
XXXXXX	Toll Back Office System	LS	1	x	$1,700,000	=	$1,700,000
06684X	TMS Controller Assembly	LS	1	x	$2,000,000	=	$2,000,000
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
XXXXXX	Some Item						

Total Section 1-8	$	165,858,400	1%	=	$ 1,658,584

TOTAL STATE FURNISHED	**$5,758,600**

SECTION 12: TIME-RELATED OVERHEAD

Estimated Time-Releated Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity		Unit Price ($)		Cost	
			Total of All Contract Items Only				$ 166,968,400	(used to calculate TR
070018	Time-Related Overhead	$	166,968,400	X	6%	=	$10,018,104	

TOTAL TIME-RELATED OVERHEAD	**$10,018,104**

SECTION 13: CONTINGENCY

Total Section 1-12	$	206,559,504	x	20%	=	$41,311,901

TOTAL CONTINGENCY	**$41,312,000**

Note: TRO is a contract item if total project cost is (non-escalated) over $5 million AND 100 or more working days.
If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.
TRO calculated for you as percentage of the sum of all contract items only;
excluding mobilization, supplemental work, state furnished materials and expenses, and contingency.

II. STRUCTURE ITEMS

	Bridge 1	Bridge 2	Bridge 3
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	ALAMADEN UC	CAMDEN UC	OKA UC
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	0 LF	0 LF	0 LF
Total Bridge Length (Feet)	238 LF	210 LF	102 LF
Total Area (Square Feet)	0 SQFT	0 SQFT	0 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	None	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$0**	**$0**	**$0**

	Bridge 4	Bridge 5	Bridge 6
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	LOS GATOS CREEK BRIDGE	POLLARD UC	SAN TOMAS AQUINAS CREEK
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	0 LF	0 LF	0 LF
Total Bridge Length (Feet)	178 LF	196 LF	105 LF
Total Area (Square Feet)	0 SQFT	0 SQFT	0 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH STRUCTURE	**$0**	**$0**	**$0**

	Bridge 7	Bridge 8	Bridge 9
DATE OF ESTIMATE	Dec, 2019	Dec, 2019	Dec, 2019
Bridge Name	SARATOGA UC	SARATOGA CREEK BRIDGE	CALABAZAS CREEK BRG
Bridge Number			
Structure Type	CIP/PS Box Girder	CIP/PS Box Girder	CIP/PS Box Girder
Width (Feet) [out to out]	0 LF	0 LF	0 LF
#REF!	192 LF	100 LF	156 LF
Total Area (Square Feet)	0 SQFT	0 SQFT	0 SQFT
Structure Depth (Feet)	LF	LF	LF
Footing Type (pile or spread)	Pile	Pile	Pile
Cost Per Square Foot	$300	$300	$300
COST OF EACH	**$0**	**$0**	**$0**

	Bridge 10		
DATE OF ESTIMATE	Dec, 2019		
Bridge Name	Pedestrian Bridge (Dalles Ave)		
Bridge Number			
Structure Type	CIP/PS Box Girder		
Width (Feet) [out to out]	10 LF		
#REF!	370 LF		
Total Area (Square Feet)	3,700 SQFT		
Structure Depth (Feet)	LF		
Footing Type (pile or spread)	Pile		
Cost Per Square Foot	$300		
COST OF EACH	**$1,110,000**		
TOTAL COST OF STRUCTURES[1]			**1,110,000**

Estimate Prepared By: _____ _____

XXXXXXXXXXXXXXXX ------ Division of Structures | Date

[1]Structure's Estimate includes Overhead and Mobilization are based on 2019 CALTRAN's "COMPARATIVE BRIDGE COSTS".

Capital Cost Estimates for Stations

- Summary of Conceptual Capital Costs
- Median Crossover Station
- Median Split Platform Station
- Side Platform Station
- Additional SR 85 Widening for Median Crossover Station at Bascom Avenue
- Additional SR 85 Widening for Split Platform Station at Saratoga Avenue
- Additional SR 85 Widening for Median Crossover Station at Stevens Creek Boulevard
- Additional SR 85 Widening for Split Platform Station at El Camino Real

Station Configurations and Summary of Conceptual Capital Costs ($, millions)

Alternative		Bascom Avenue	Saratoga Avenue	Stevens Creek Boulevard	El Camino Real	Total Capital Cost	
						Current	Escalated
1-1	No Build	—	—	—	—	$ 0	$ 0
1-2	HOV to Express Lane Conversion	—	—	—	—	$ 0	$ 0
2-1	Express Lanes Project	—	—	—	—	$ 0	$ 0
2-2	Long Express Lanes Project	—	—	—	—	$ 0	$ 0
3-1	Long Transit Lane (Median Adjacent Lane)	Crossover $10.01	Split $12.24	Crossover $10.05	Split $12.96	$45.26	$60.68
3-2	Long Transit Lane (Right-side Lane)	Side $ 2.45	Ramps $ 1.65	NB ramp SB side $ 2.05	Side $ 2.45	$ 8.60	$11.53
3-3	Long Transit Lane (Hybrid)	TBD	TBD	TBD	TBD	TBD	TBD
3-4	Short Transit Lane	Crossover $10.01	Split $12.24	Crossover $10.05	Ramps $ 1.65	$33.95	$45.52
3-5	Long Shoulder (Median)	Crossover $10.01	Split $12.24	Crossover $10.05	Split $12.96	$45.26	$60.68
3-6	Long Shoulder (Right-side)	Side $ 2.45	Ramps $ 1.65	NB ramp SB side $ 2.05	Side $ 2.45	$ 8.60	$11.53

Notes:

Crossover = Median crossover station
Split = Median split platform station
Side = Side platform station
Ramps = Platforms along off/on ramp

Parsons Transportation Group

SR85 BRT Stations
Estimate of Probable Construction Cost

SUMMARY REPORT

Estimate Date: **12/16/19** ; *Rev. No.* ***01***
Client:
Estimator **C. Gidlof**
Checked By: **B Scales**
Doc Scope Date: **12/01/19**

LEVEL DESCRIPTION	TOTAL
1 SR85 BRT Stations	**$42,891,904**
A Construction	**$42,891,904**
02 Station Cost	**$42,891,904**
A Bascom Avenue - Median Crossover Station (2 stations)	**$8,808,777**
1 Construction	**$6,525,020**
03 Roadway	$1,884,972
001 Site Preparation	$412,711
002 Excavation	$249,605
004 Site Civil/Mechanical Utilities	$65,343
006 Paving	$1,157,313
Station	$4,640,048
Median Station	$2,750,936
Station Apputanances	$711,539
Elevator/Vertical	$1,177,573
B PR/ED Support 3%	**$195,751**
C PS&E Support 12%	**$783,002**
D Construction Support 12%	**$783,002**
E Agency Support 8%	**$522,002**
B Stevens Creek Boulevard - Median Crossover Station (2 stations)	**$8,808,777**
1 Construction	**$6,525,020**
03 Roadway	$1,884,972
001 Site Preparation	$412,711
002 Excavation	$249,605
004 Site Civil/Mechanical Utilities	$65,343
006 Paving	$1,157,313
Station	$4,640,048
Median Station	$2,750,936
Station Apputanances	$711,539
Elevator/Vertical	$1,177,573
B PR/ED Support 3%	**$195,751**
C PS&E Support 12%	**$783,002**
D Construction Support 12%	**$783,002**
E Agency Support 8%	**$522,002**
C Saratoga Ave - Median Split Platform Station (2 stations)	**$11,412,137**
1 Construction	**$8,453,435**
03 Roadway 2 x 187' x 36'x 2 ea PCC	$1,023,330
001 Site Preparation	$355,450
002 Excavation	$44,243
004 Site Civil/Mechanical Utilities	$136,480
005 Site Electrical Utilities	$89,585
006 Concrete Paving 2 x 187' x 36' x 2 ea (allow 187'/2 before & after)	$353,109
007 Landscaping	$44,463
Station	$7,430,105
Split Platform Station 187' x 14-20'	$2,367,418
Walkway (2 ea)	$3,273,600
Station Apputanances	$611,514

SUMMARY REPORT

Estimate Date: **12/16/19** ; *Rev. No.* ***01***
Client:
Estimator **C. Gidlof**
Checked By: **B Scales**
Doc Scope Date: **12/01/19**

LEVEL DESCRIPTION	TOTAL
Elevator/Vertical	$1,177,573
B PR/ED Support 3%	**$253,603**
C PS&E Support 12%	**$1,014,412**
D Construction Support 12%	**$1,014,412**
E Agency Support 8%	**$676,275**
D El Camino Real - Median Split Platform Station (2 stations)	**$11,412,137**
1 Construction	**$8,453,435**
03 Roadway 2 x 187' x 36'x 2 ea PCC	$1,023,330
001 Site Preparation	$355,450
002 Excavation	$44,243
004 Site Civil/Mechanical Utilities	$136,480
005 Site Electrical Utilities	$89,585
006 Concrete Paving 2 x 187' x 36' x 2 ea (allow 187'/2 before & after)	$353,109
007 Landscaping	$44,463
Station	$7,430,105
Split Platform Station 187' x 14-20'	$2,367,418
Walkway (2 ea)	$3,273,600
Station Apputanances	$611,514
Elevator/Vertical	$1,177,573
B PR/ED Support 3%	**$253,603**
C PS&E Support 12%	**$1,014,412**
D Construction Support 12%	**$1,014,412**
E Agency Support 8%	**$676,275**
Side Station Alternate (2 stations)	**$2,450,077**
Construction	**$1,814,872**
Side Station	$896,996
Station Apputanances	$323,443
Furniture/Signage	$109,754
Electrical & Lighting	$106,950
Concrete Accessories	$48,659
Other Station Costs	$58,080
Elevator/Vertical	$594,433
STRUCTURAL SLAB ON GRADE 15'x 15'	$364,546
BASEMENT EXCAVATION	$5,506
BASEMENT WALLS 15' x 15' x 3' x 2	$28,658
STAIR CONSTRUCTION	$35,871
MISCELLANEOUS METALS (4 x 15' x 2)	$20,841
CONVEYING SYSTEMS	$139,010
B PR/ED Support 3%	**$54,446**
C PS&E Support 12%	**$217,785**
D Construction Support 12%	**$217,785**
E Agency Support 8%	**$145,190**

Engineer Cost Estimate --- Bascom Ave CrossOver Station Extra
Preliminary Project Study Report

Project ID: XXXXXX

Type of Estimate : Preliminary Project Study Report (Dec 2019)
Program Code : 04-XXXXX
Project Limits : From Hwy 101 Interchange in Santa Jose to South of Hwy 101 Interchange in Mt. View
Description: From PM 0.00 to PM 23.68
Scope : Construct Extra SR 85 Highway Widening for Crossover Station at Bascom Ave
Alternative : Alternative 3-1 or 3-5

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	886,600		
STRUCTURE ITEMS	$	-	$	-
SUBTOTAL CONSTRUCTION COST	$	886,600		
RIGHT OF WAY	$	-	$	-
TOTAL CAPITAL OUTLAY COST	$	887,000		
PR/ED SUPPORT (3%)	$	27,000		
PS&E SUPPORT (12%)	$	107,000		
RIGHT OF WAY SUPPORT				
CONSTRUCTION SUPPORT (12%)	$	107,000		
AGENCY SUPPORT (8%)	$	71,000		
TOTAL CAPITAL OUTLAY SUPPORT COST*	$	312,000		
TOTAL PROJECT COST	$	1,199,000		

If Project has been programmed enter Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	12	/	2019
Estimated Date of Construction Start (Month/Year)	10	/	2023
Number of Working Days	90		Working Days
Estimated Mid-Point of Construction (Month/Year)	12	/	2023
Number of Plant Establishment Days			Days

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	Earthwork	$	31,000
2	Pavement Structural Section	$	346,700
3	Drainage	$	-
4	Specialty Items	$	272,700
5	Environmental	$	-
6	Traffic Items	$	13,300
7	Detours	$	-
8	Minor Items	$	33,200
9	Roadway Mobilization	$	-
10	Supplemental Work	$	34,900
11	State Furnished	$	7,000
12	Contingencies	$	147,800
13	Overhead	$	-
	TOTAL ROADWAY ITEMS	**$**	**886,600**

Estimate Prepared By : _____

Name and Title Date Phone

Estimate Reviewed By : _____

Name and Title Date Phone

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)		Cost
160101	Clearing & Grubbing	AC	0.8	x	1,725	=	$1,725
170101	Develop Water Supply	LS	1	x	3,000	=	$3,000
190101	Roadway Excavation	CY	200	x	29	=	$5,720
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$0
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$0
192037	Structure Excavation (Retaining Wall)	CY		x		=	$0
193013	Structure Backfill (Retaining Wall)	CY		x		=	$0
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$0
194001	Ditch Excavation	CY		x		=	$0
198001	Impored Borrow	CY	1,241	x	17	=	$20,477
198007	Imported Material (Shoulder Backing)	TON		x		=	$0
XXXXXX	Some Item			x		=	$0

TOTAL EARTHWORK SECTION ITEMS	**$**	**31,000**

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
150771	Remove Asphalt Concrete Dike	LF		x		=	$	-
150860	Remove Base and Surfacing	CY		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	0	x	8	=	$	-
150854	Remove Concrete Pavement	CY	0	x	156	=	$	-
260201	Class 4 Aggregate Base	CY	680	x	61	=	$	41,140
250401	Class 4 Aggregate Subbase	CY	237	x	38	=	$	9,006
290201	Asphalt Treated Permeable Base	CY	74	x	160	=	$	11,840
365001	Sand Cover	TON		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
377501	Slurry Seal	TON		x		=	$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON		x		=	$	-
390136	Minor Hot Mix Asphalt	TON		x		=	$	-
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		=	$	-
393003	Geosynthetic Pavement Interlayer	SQYD		x		=	$	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Indent*	STA		x		=	$	-
394071	Place Hot Mix Asphalt Dike	LF		x		=	$	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		=	$	-
397005	Tack Coat	TON		x		=	$	-
400050	Continuously Reinfored Concrete Pavement	CY	506	x	300	=	$	151,800
401108	Replace Concrete Pavement (Rapid Strength	CY		x		=	$	-
404092	Seal Pavement Joint	LF		x		=	$	-
404094	Seal Longitudinal Isolation Joint	LF		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	SQYD		x		=	$	-
413115	Seal Existing Concrete Pavement Joint	LF		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
731502	Minor Concrete (Misc. Const)	CY		x		=	$	-
730010	Minor Concrete (Curb)	LF	2,768	x	48	=	$	132,864
731530	Minor Concrete (Textured Paving)	SQFT		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS	**$**	**346,700**

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
150206	Abandon Culvert	LF		x		=	$	-
150805	Remove Culvert	LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
193114	Sand Backfill	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
510512	Minor Concrete (Box Culvert)	CY		x		=	$	-
510XXX	Culvert (Roadway Crossing)	EA		x		=	$	-
62XXXX	XXX" APC Pipe	LF		x		=	$	-
64XXXX	XXX" Plastic Pipe	LF		x		=	$	-
65XXXX	XXX" RCP Pipe	LF		x		=	$	-
66XXXX	XXX" CSP Pipe	LF		x		=	$	-
680905	Underdrain (6" Alternative)	LF	0	x	36	=	$	-
681103	Edge Drain (3" Plastic Pipe)	LF	0	x	21	=	$	-
69XXXX	XXX" Pipe Downdrain	LF		x		=	$	-
70XXXX	XXX" Pipe Inlet	LF		x		=	$	-
70XXXX	XXX" Pipe Riser	LF		x		=	$	-
70XXXX	XXX" Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
729010	Rock Slope Protection Fabric	SQYD		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Additional Drainage (Detention Base, etc)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL DRAINAGE ITEMS **$** **-**

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	0	x	30,000	=	$	-
150662	Remove Metal Beam Guard Railing	LF	0	x	15	=	$	-
150668	Remove Terminal Systems	EA		x		=	$	-
1532XX	Remove Concrete Barrier (25, 50 or 50C)	LF	0	x	16	=	$	-
153250	Remove Sound Wall	SQFT	0	x	25	=	$	-
150606	Remove Fence (BW)	LF		x		=	$	-
190110	Lead Compliance Plan	LS	0	x	18,000	=	$	-
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$	-
510060	Structural Concrete (Retaining Wall)	CY		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$	-
510XXX	Retaining Wall (MSE)	SQFT	0	x	85	=	$	-
XXXXXX	Sound Wall (On Pile, On Barrier or On Ret. Wall)	SQFT	0	x	40	=	$	-
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$	-
511048	Apply Anti-Graffiti Coating	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$	-
518002	Sound Wall (Masonry Block)	SQFT		x		=	$	-
520103	Bar Reinf. Steel (Retaining Wall)	LB		x		=	$	-
800007	Fence (BW)	LF		x		=	$	-
832001	Metal Beam Guard Railing	LF	0	x	47	=	$	-
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
83954X	Transition Railing *(Insert Type)*	EA		x		=	$	-
8395XX	Terminal System (Type CAT)	EA		x		=	$	-
8395XX	Alternative Flared Terminal System	EA	0	x	1,200	=	$	-
8395XX	End Anchor Assembly (*Insert Type*)	EA		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
839596	Crash Cushion *(G.R.E.A.T)*	EA		x		=	$	-
839701	Concrete Barrier *(50 or 60)*	LF	3,495	x	78	=	$	272,610
833128	Concrete Barrier *(25 Modify)*	LF	0	x	128	=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL SPECIALTY ITEMS **$** **272,700**

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)		Cost
XXXXXX	Biological Mitigation	LS		x		= $	-
071325	Temporary Reinforced Silt Fence	LF		x		= $	-
XXXXXX	Hazardous Material Remediation	LS	0	x	45,000	= $	-
XXXXXX	Permits	LS	0	x	45,000	= $	-
071325	Temporary Fence (Type ESA)	LF		x		= $	-

Subtotal Environmental $ -

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)		Cost
200001	Highway Planting	ACRE		x		= $	-
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-*	LF		x		= $	-
20XXXX	Extend XXX" *(Insert Type)* Conduit	LF		x		= $	-
201700	Imported Topsoil	CY		x		= $	-
203015	Erosion Control	ACRE		x		= $	-
203021	Fiber Rolls	LF		x		= $	-
203026	Move In/ Move Out (Erosion Control)	EA		x		= $	-
204099	Plant Establishment Work	LS		x		= $	-
204101	Extend Plant Establishment (X Years)	LS		x		= $	-
208000	Irrigation System	LS		x		= $	-
208304	Water Meter	EA		x		= $	-
209801	Maintenance Vehicle Pullout	EA		x		= $	-
XXXXXX	Some Item						

Subtotal Landscape and Irrigation $ -

5C - NPDES

Item code		Unit	Quantity		Unit Price ($)		Cost
074016	Construction Site Management	LS	0	x	450,000	= $	-
074017	Prepare WPCP	LS	0	x	10,000	= $	-
074019	Prepare SWPPP	LS	0	x	10,000	= $	-
074023	Temporary Erosion Control	ACRE	0	x	2,500	= $	-
074027	Temporary Erosion Control Blanket	SQYD		x		= $	-
074028	Temporary Fiber Roll	LF		x		= $	-
074032	Temporary Concrete Washout Facility	EA		x		= $	-
074033	Temporary Construction Entrance	EA		x		= $	-
074035	Temporary Check Dam	LF		x		= $	-
074037	Move In/ Move Out (Temp Erosion Control)	EA		x		= $	-
074038	Temp. Drainage Inlet Protection	EA	0	x	60	= $	-
XXXXXX	Site Job Management	LS	0	x	450,000	= $	-
074042	Temporary Concrete Washout (Portable)	LS		x		= $	-
XXXXXX	Some Item			x		= $	-

Supplemental Work for NPDES

(These costs are not accounted in total here but under Supplemental Work on sheet 7 of 11).

074021	Water Pollution Control Maintenance Work*	LS	0	x	25,500	= $	-
066596	Additional Water Pollution Control**	LS		x		= $	-
066597	Storm Water Sampling and Analysis***	LS		x		= $	-
XXXXXX	Some Item						

Subtotal NPDES (Without Supplemental Work) $ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $ -

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LB		x		=	$	-
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
56XXXX	Install Overhead Sign (Two Post)	EA	0	x	400,000	=	$	-
56XXXX	Install Overhead Sign (One Post)	EA	0	x	160,000	=	$	-
860090	Maintain Existing Traffic Management System	LS	0	x	900,000	=	$	-
860810	Inductive Loop Detectors	EA		x		=	$	-
86055X	Lighting & Sign Illumination	EA	0	x	4,000	=	$	-
8607XX	Interconnection Facilities	LS		x		=	$	-
8609XX	Traffic Traffic Monitoring Stations	LS	0	x	200,000	=	$	-
860XXX	Signals & Lighting	LS		x		=	$	-
860XXX	ITS Elements	LS		x		=	$	-
861100	Ramp Metering System (Location X)	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXXX	Ramp Terminal Intersection Improvement	LS	0	x	1,000,000	=	$	-
XXXXXX	Toll Equipment and System Integration (Capital)	LS	0	x	100,000,000	=	$	-
XXXXX	Some Item							

Subtotal Traffic Electrical $ -

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120090	Construction Area Signs	LS	0	x	900,000	=	$	-
150701	Remove Yellow Painted Traffic Stripe	LF	0	x	4	=	$	-
150710	Remove Traffic Stripe	LF	0	x	0.25	=	$	-
150713	Remove Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA	0	x	120	=	$	-
15075X	Remove Sign Structure	EA	0	x	20,000	=	$	-
15075X	Remove Sign Structure (On Bridge)	EA	0	x	5,000	=	$	-
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
566011	Roadside Sign (One Post)	EA	0	x	340	=	$	-
566012	Roadside Sign (Two Post)	EA	0	x	1,250	=	$	-
560XXX	Furnish Sign Panels	SQFT		x		=	$	-
560XXX	Install Sign Panels	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	10,000	=	$	10,000
840504	Thermoplastic Traffic Strip (4")	LF	6,600	x	0.50	=	$	3,300

Subtotal Traffic Signing and Striping $ 13,300

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	0	x	4,000,000	=	$	-
120120	Type III Barricade	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	LS	0	x	90,000	=	$	-
120159	Temporary Traffic Strip (Paint)	LS	0	x	90,000	=	$	-
12016X	Channelizer	EA		x		=	$	-
128650	Portable Changeable Message Signs	EA	0	x	10,000	=	$	-
129000	Temporary Railing (Type K)	LF	0	x	17	=	$	-
129100	Temp. Crash Cushion Module	EA	0	x	200	=	$	-
129099A	Traffic Plastic Drum	EA		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
XXXXXX	Misc. Items (Traffic Management Plan)	LS	0	x	180,000	=	$	-
XXXXXX	Some Item	LS		x		=	$	-

Subtotal Stage Construction and Traffic Handling $ -

TOTAL TRAFFIC ITEMS **$ 13,300**

SECTION 7: DETOURS

Include constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
0713XX	Temporary Fence (Type X)	LF		x		= $	-
07XXXX	Temporary Drainage	LS		x		= $	-
120143	Temporary Pavement Delineation	LF		x		= $	-
1286XX	Temporary Signals	EA		x		= $	-
129000	Temporary Railing (Type K)	LF		x		= $	-
190101	Roadway Excavation	CY		x		= $	-
198001	Imported Borrow	CY		x		= $	-
198050	Embankment	CY		x		= $	-
250401	Class 4 Aggregate Subbase	CY		x		= $	-
260201	Class 2 Aggregate Base	CY		x		= $	-
390132	Hot Mix Asphalt (Type A)	TON		x		= $	-
XXXXXX	Some Item	LS	0	x	$150,000	= $	-

TOTAL DETOURS	**$**	**-**
SUBTOTAL SECTIONS 1-7	$	663,700

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items									
	ADA Items						$	-	
8B - Bike Path Items									
	Bike Path Items						$	-	
8C - Other Minor Items									
	Other Minor Items				5.0%		$	33,185	
	Total of Section 1-7	$	663,700	x	5.0%	=	$	33,185	

TOTAL MINOR ITEMS	**$**	**33,200**

SECTIONS 9: MOBILIZATION

Item code								
999990	Total Section 1-8	$	696,900	x	0%	= $	-	

TOTAL MOBILIZATION	**$**	**-**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066015	Federal Trainee Program	LS		x		= $	-
066063	Traffic Management Plan - Public Information	LS		x		= $	-
066090	Maintain Traffic	LS		x		= $	-
066094	Value Analysis	LS		x		= $	-
066204	Remove Rock & Debris	LS		x		= $	-
066222	Locate Existing Cross-Over	LS		x		= $	-
066670	Payment Adjustments For Price Index Fluctuations	LS		x		= $	-
066700	Partnering	LS		x		= $	-
066866	Operation of Existing Traffic Management System Eler	LS		x		= $	-
066920	Dispute Review Board	LS		x		= $	-
066XXX	Some Item	LS		x		= $	-
	*Cost of **NPDES** Supplemental Work specified in Section 5C*					= $	-
	Total Section 1-8	$	696,900		5%	= $	34,845

TOTAL SUPPLEMENTAL WORK	**$**	**34,900**

Note: Mobilization item will automatically calculate if working days are 50 or more. For Project less than 50 Working Days Mobilization is not required as a separate contract, however contract item prices should take into consideration mobilization as part of the price. If the building portion of the project is greater than 50% of the total project cost,

If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066063	Public Information	LS	0	x	$100,000	=	$0
066105	RE Office	LS	0	x	$400,000	=	$0
066803	Padlocks	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
066062A	COZEEP Expenses	LS		x		=	$0
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
XXXXXX	Toll Back Office System	LS	0	x	$1,700,000	=	$0
06684X	TMS Controller Assembly	LS	0	x	$2,000,000	=	$0
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
XXXXXX	Some Item						

Total Section 1-8	$	696,900	1%	=	$	6,969

TOTAL STATE FURNISHED $7,000

SECTION 12: TIME-RELATED OVERHEAD

Estimated Time-Releated Overhead (TRO) Percentage (0% to 10%) = 0%

Item code		Unit	Quantity		Unit Price ($)		Cost	
			Total of All Contract Items Only			$	696,900	(used to calculate TR
070018	Time-Related Overhead	$	696,900	X	0%	=	$0	

TOTAL TIME-RELATED OVERHEAD $0

SECTION 13: CONTINGENCY

Total Section 1-12	$	738,800	x	20%	=	$147,760

TOTAL CONTINGENCY $147,800

Note: TRO is a contract item if total project cost is (non-escalated) over $5 million AND 100 or more working days.
If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.
TRO calculated for you as percentage of the sum of all contract items only;
excluding mobilization, supplemental work, state furnished materials and expenses, and contingency.

Engineer Cost Estimate --- Saratoga Ave Split Station Extra
Preliminary Project Study Report

Project ID: XXXXXX

Type of Estimate : Preliminary Project Study Report (Dec 2019)
Program Code : 04-XXXXX
Project Limits : From Hwy 101 Interchange in Santa Jose to South of Hwy 101 Interchange in Mt. View
Description: From PM 0.00 to PM 23.68
Scope : Construct Extra SR 85 Highway Widening for Split Station at Saratoga Ave
Alternative : Alternative 3-1 or 3-5

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	611,900		
STRUCTURE ITEMS	$	-	$	-
SUBTOTAL CONSTRUCTION COST	$	611,900		
RIGHT OF WAY	$	-	$	-
TOTAL CAPITAL OUTLAY COST	$	612,000		
PR/ED SUPPORT (3%)	$	19,000		
PS&E SUPPORT (12%)	$	74,000		
RIGHT OF WAY SUPPORT				
CONSTRUCTION SUPPORT (12%)	$	74,000		
AGENCY SUPPORT (8%)	$	49,000		
TOTAL CAPITAL OUTLAY SUPPORT COST*	$	216,000		
TOTAL PROJECT COST	$	828,000		

If Project has been programmed enter Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	12	/	2019
Estimated Date of Construction Start (Month/Year)	10	/	2023
Number of Working Days	90		Working Days
Estimated Mid-Point of Construction (Month/Year)	12	/	2023
Number of Plant Establishment Days			Days

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	Earthwork	$	17,900
2	Pavement Structural Section	$	186,900
3	Drainage	$	-
4	Specialty Items	$	240,700
5	Environmental	$	-
6	Traffic Items	$	12,500
7	Detours	$	-
8	Minor Items	$	22,900
9	Roadway Mobilization	$	-
10	Supplemental Work	$	24,100
11	State Furnished	$	4,900
12	Contingencies	$	102,000
13	Overhead	$	-
	TOTAL ROADWAY ITEMS	**$**	**611,900**

Estimate Prepared By : _____

Name and Title Date Phone

Estimate Reviewed By : _____

Name and Title Date Phone

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)		Cost
160101	Clearing & Grubbing	AC	0.3	x	1,725	=	$0
170101	Develop Water Supply	LS	1	x	3,000	=	$3,000
190101	Roadway Excavation	CY	200	x	29	=	$5,720
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$0
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$0
192037	Structure Excavation (Retaining Wall)	CY		x		=	$0
193013	Structure Backfill (Retaining Wall)	CY		x		=	$0
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$0
194001	Ditch Excavation	CY		x		=	$0
198001	Impored Borrow	CY	553	x	17	=	$9,125
198007	Imported Material (Shoulder Backing)	TON		x		=	$0
XXXXXX	Some Item			x		=	$0

TOTAL EARTHWORK SECTION ITEMS	**$**	**17,900**

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
150771	Remove Asphalt Concrete Dike	LF		x		=	$	-
150860	Remove Base and Surfacing	CY		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	0	x	8	=	$	-
150854	Remove Concrete Pavement	CY	0	x	156	=	$	-
260201	Class 4 Aggregate Base	CY	387	x	61	=	$	23,414
250401	Class 4 Aggregate Subbase	CY	443	x	38	=	$	16,834
290201	Asphalt Treated Permeable Base	CY	138	x	160	=	$	22,080
365001	Sand Cover	TON		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
377501	Slurry Seal	TON		x		=	$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON		x		=	$	-
390136	Minor Hot Mix Asphalt	TON		x		=	$	-
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		=	$	-
393003	Geosynthetic Pavement Interlayer	SQYD		x		=	$	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Inden*	STA		x		=	$	-
394071	Place Hot Mix Asphalt Dike	LF		x		=	$	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		=	$	-
397005	Tack Coat	TON		x		=	$	-
400050	Continuously Reinfored Concrete Pavement	CY	415	x	300	=	$	124,500
401108	Replace Concrete Pavement (Rapid Strength	CY		x		=	$	-
404092	Seal Pavement Joint	LF		x		=	$	-
404094	Seal Longitudinal Isolation Joint	LF		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	SQYD		x		=	$	-
413115	Seal Existing Concrete Pavement Joint	LF		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
731502	Minor Concrete (Misc. Const)	CY		x		=	$	-
731530	Minor Concrete (Textured Paving)	SQFT		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS	**$**	**186,900**

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
150206	Abandon Culvert	LF		x		=	$	-
150805	Remove Culvert	LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
193114	Sand Backfill	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
510512	Minor Concrete (Box Culvert)	CY		x		=	$	-
510XXX	Culvert (Roadway Crossing)	EA		x		=	$	-
62XXXX	XXX" APC Pipe	LF		x		=	$	-
64XXXX	XXX" Plastic Pipe	LF		x		=	$	-
65XXXX	XXX" RCP Pipe	LF		x		=	$	-
66XXXX	XXX" CSP Pipe	LF		x		=	$	-
680905	Underdrain (6" Alternative)	LF	0	x	36	=	$	-
681103	Edge Drain (3" Plastic Pipe)	LF	0	x	21	=	$	-
69XXXX	XXX" Pipe Downdrain	LF		x		=	$	-
70XXXX	XXX" Pipe Inlet	LF		x		=	$	-
70XXXX	XXX" Pipe Riser	LF		x		=	$	-
70XXXX	XXX" Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
729010	Rock Slope Protection Fabric	SQYD		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Additional Drainage (Detention Base, etc)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL DRAINAGE ITEMS **$ -**

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	0	x	30,000	=	$	-
150662	Remove Metal Beam Guard Railing	LF	0	x	15	=	$	-
150668	Remove Terminal Systems	EA		x		=	$	-
1532XX	Remove Concrete Barrier (25, 50 or 50C)	LF	0	x	16	=	$	-
153250	Remove Sound Wall	SQFT	0	x	25	=	$	-
150606	Remove Fence (BW)	LF		x		=	$	-
190110	Lead Compliance Plan	LS	0	x	18,000	=	$	-
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$	-
510060	Structural Concrete (Retaining Wall)	CY		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$	-
510XXX	Retaining Wall (MSE)	SQFT	0	x	85	=	$	-
XXXXXX	Sound Wall (On Pile, On Barrier or On Ret. Wall)	SQFT	0	x	40	=	$	-
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$	-
511048	Apply Anti-Graffiti Coating	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$	-
518002	Sound Wall (Masonry Block)	SQFT		x		=	$	-
520103	Bar Reinf. Steel (Retaining Wall)	LB		x		=	$	-
800007	Fence (BW)	LF		x		=	$	-
832001	Metal Beam Guard Railing	LF	0	x	47	=	$	-
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
83954X	Transition Railing *(Insert Type)*	EA		x		=	$	-
8395XX	Terminal System (Type CAT)	EA		x		=	$	-
8395XX	Alternative Flared Terminal System	EA	0	x	1,200	=	$	-
8395XX	End Anchor Assembly (*Insert Type*)	EA		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
839596	Crash Cushion *(G.R.E.A.T)*	EA		x		=	$	-
839701	Concrete Barrier *(50 or 60)*	LF	3,085	x	78	=	$	240,630
833128	Concrete Barrier *(25 Modify)*	LF	0	x	128	=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL SPECIALTY ITEMS **$ 240,700**

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)		Cost
XXXXXX	Biological Mitigation	LS		x		= $	-
071325	Temporary Reinforced Silt Fence	LF		x		= $	-
XXXXXX	Hazardous Material Remediation	LS	0	x	45,000	= $	-
XXXXXX	Permits	LS	0	x	45,000	= $	-
071325	Temporary Fence (Type ESA)	LF		x		= $	-

Subtotal Environmental $ -

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)		Cost
200001	Highway Planting	ACRE		x		= $	-
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-*	LF		x		= $	-
20XXXX	Extend XXX" *(Insert Type)* Conduit	LF		x		= $	-
201700	Imported Topsoil	CY		x		= $	-
203015	Erosion Control	ACRE		x		= $	-
203021	Fiber Rolls	LF		x		= $	-
203026	Move In/ Move Out (Erosion Control)	EA		x		= $	-
204099	Plant Establishment Work	LS		x		= $	-
204101	Extend Plant Establishment (X Years)	LS		x		= $	-
208000	Irrigation System	LS		x		= $	-
208304	Water Meter	EA		x		= $	-
209801	Maintenance Vehicle Pullout	EA		x		= $	-
XXXXXX	Some Item						

Subtotal Landscape and Irrigation $ -

5C - NPDES

Item code		Unit	Quantity		Unit Price ($)		Cost
074016	Construction Site Management	LS	0	x	450,000	= $	-
074017	Prepare WPCP	LS	0	x	10,000	= $	-
074019	Prepare SWPPP	LS	0	x	10,000	= $	-
074023	Temporary Erosion Control	ACRE	0	x	2,500	= $	-
074027	Temporary Erosion Control Blanket	SQYD		x		= $	-
074028	Temporary Fiber Roll	LF		x		= $	-
074032	Temporary Concrete Washout Facility	EA		x		= $	-
074033	Temporary Construction Entrance	EA		x		= $	-
074035	Temporary Check Dam	LF		x		= $	-
074037	Move In/ Move Out (Temp Erosion Control)	EA		x		= $	-
074038	Temp. Drainage Inlet Protection	EA	0	x	60	= $	-
XXXXXX	Site Job Management	LS	0	x	450,000	= $	-
074042	Temporary Concrete Washout (Portable)	LS		x		= $	-
XXXXXX	Some Item			x		= $	-

Supplemental Work for NPDES

(These costs are not accounted in total here but under Supplemental Work on sheet 7 of 11).

074021	Water Pollution Control Maintenance Work*	LS	0	x	25,500	= $	-
066596	Additional Water Pollution Control**	LS		x		= $	-
066597	Storm Water Sampling and Analysis***	LS		x		= $	-
XXXXXX	Some Item						

Subtotal NPDES (Without Supplemental Work) $ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $ -

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LB		x		=	$	-
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
56XXXX	Install Overhead Sign (Two Post)	EA	0	x	400,000	=	$	-
56XXXX	Install Overhead Sign (One Post)	EA	0	x	160,000	=	$	-
860090	Maintain Existing Traffic Management System	LS	0	x	900,000	=	$	-
860810	Inductive Loop Detectors	EA		x		=	$	-
86055X	Lighting & Sign Illumination	EA	0	x	4,000	=	$	-
8607XX	Interconnection Facilities	LS		x		=	$	-
8609XX	Traffic Traffic Monitoring Stations	LS	0	x	200,000	=	$	-
860XXX	Signals & Lighting	LS		x		=	$	-
860XXX	ITS Elements	LS		x		=	$	-
861100	Ramp Metering System (Location X)	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXXX	Ramp Terminal Intersection Improvement	LS	0	x	1,000,000	=	$	-
XXXXXX	Toll Equipment and System Integration (Capital)	LS	0	x	100,000,000	=	$	-
XXXXX	Some Item							

Subtotal Traffic Electrical $ -

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120090	Construction Area Signs	LS	0	x	900,000	=	$	-
150701	Remove Yellow Painted Traffic Stripe	LF	0	x	4	=	$	-
150710	Remove Traffic Stripe	LF	0	x	0.25	=	$	-
150713	Remove Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA	0	x	120	=	$	-
15075X	Remove Sign Structure	EA	0	x	20,000	=	$	-
15075X	Remove Sign Structure (On Bridge)	EA	0	x	5,000	=	$	-
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
566011	Roadside Sign (One Post)	EA	0	x	340	=	$	-
566012	Roadside Sign (Two Post)	EA	0	x	1,250	=	$	-
560XXX	Furnish Sign Panels	SQFT		x		=	$	-
560XXX	Install Sign Panels	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	10,000	=	$	10,000
840504	Thermoplastic Traffic Strip (4")	LF	5,000	x	0.50	=	$	2,500

Subtotal Traffic Signing and Striping $ 12,500

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	0	x	4,000,000	=	$	-
120120	Type III Barricade	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	LS	0	x	90,000	=	$	-
120159	Temporary Traffic Strip (Paint)	LS	0	x	90,000	=	$	-
12016X	Channelizer	EA		x		=	$	-
128650	Portable Changeable Message Signs	EA	0	x	10,000	=	$	-
129000	Temporary Railing (Type K)	LF	0	x	17	=	$	-
129100	Temp. Crash Cushion Module	EA	0	x	200	=	$	-
129099A	Traffic Plastic Drum	EA		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
XXXXXX	Misc. Items (Traffic Management Plan)	LS	0	x	180,000	=	$	-
XXXXXX	Some Item	LS		x		=	$	-

Subtotal Stage Construction and Traffic Handling $ -

TOTAL TRAFFIC ITEMS **$ 12,500**

SECTION 7: DETOURS

Include constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
0713XX	Temporary Fence (Type X)	LF		x		= $	-
07XXXX	Temporary Drainage	LS		x		= $	-
120143	Temporary Pavement Delineation	LF		x		= $	-
1286XX	Temporary Signals	EA		x		= $	-
129000	Temporary Railing (Type K)	LF		x		= $	-
190101	Roadway Excavation	CY		x		= $	-
198001	Imported Borrow	CY		x		= $	-
198050	Embankment	CY		x		= $	-
250401	Class 4 Aggregate Subbase	CY		x		= $	-
260201	Class 2 Aggregate Base	CY		x		= $	-
390132	Hot Mix Asphalt (Type A)	TON		x		= $	-
XXXXXX	Some Item	LS	0	x	$150,000	= $	-

TOTAL DETOURS	**$**	**-**
SUBTOTAL SECTIONS 1-7	$	458,000

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items									
	ADA Items						$	-	
8B - Bike Path Items									
	Bike Path Items						$	-	
8C - Other Minor Items									
	Other Minor Items				5.0%		$	22,900	
	Total of Section 1-7	$	458,000	x	5.0%	=	$	22,900	

TOTAL MINOR ITEMS	**$**	**22,900**

SECTIONS 9: MOBILIZATION

Item code								
999990	Total Section 1-8	$	480,900	x	0%	= $	-	

TOTAL MOBILIZATION	**$**	**-**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066015	Federal Trainee Program	LS		x		= $	-
066063	Traffic Management Plan - Public Information	LS		x		= $	-
066090	Maintain Traffic	LS		x		= $	-
066094	Value Analysis	LS		x		= $	-
066204	Remove Rock & Debris	LS		x		= $	-
066222	Locate Existing Cross-Over	LS		x		= $	-
066670	Payment Adjustments For Price Index Fluctuations	LS		x		= $	-
066700	Partnering	LS		x		= $	-
066866	Operation of Existing Traffic Management System Eler	LS		x		= $	-
066920	Dispute Review Board	LS		x		= $	-
066XXX	Some Item	LS		x		= $	-
	*Cost of **NPDES** Supplemental Work specified in Section 5C*					= $	-
	Total Section 1-8	$	480,900		5%	= $	24,045

TOTAL SUPPLEMENTAL WORK	**$**	**24,100**

Note: Mobilization item will automatically calculate if working days are 50 or more. For Project less than 50 Working Days Mobilization is not required as a separate contract, however contract item prices should take into consideration mobilization as part of the price. If the building portion of the project is greater than 50% of the total project cost,

If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066063	Public Information	LS	0	x	$100,000	=	$0
066105	RE Office	LS	0	x	$400,000	=	$0
066803	Padlocks	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
066062A	COZEEP Expenses	LS		x		=	$0
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
XXXXXX	Toll Back Office System	LS	0	x	$1,700,000	=	$0
06684X	TMS Controller Assembly	LS	0	x	$2,000,000	=	$0
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
XXXXXX	Some Item						

Total Section 1-8	$	480,900	1%	=	$	4,809

TOTAL STATE FURNISHED $4,900

SECTION 12: TIME-RELATED OVERHEAD

Estimated Time-Releated Overhead (TRO) Percentage (0% to 10%) = 0%

Item code		Unit	Quantity		Unit Price ($)		Cost	
			Total of All Contract Items Only			$	480,900	(used to calculate TR
070018	Time-Related Overhead	$	480,900	X	0%	=	$0	

TOTAL TIME-RELATED OVERHEAD $0

SECTION 13: CONTINGENCY

Total Section 1-12	$	509,900	x	20%	=	$101,980

TOTAL CONTINGENCY $102,000

Note: TRO is a contract item if total project cost is (non-escalated) over $5 million AND 100 or more working days.
If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.
TRO calculated for you as percentage of the sum of all contract items only;
excluding mobilization, supplemental work, state furnished materials and expenses, and contingency.

Engineer Cost Estimate --- Stevens Creek Blvd CrossOver Station Extra
Preliminary Project Study Report

Project ID: XXXXXX

Type of Estimate : Preliminary Project Study Report (Dec 2019)
Program Code : 04-XXXXX
Project Limits : From Hwy 101 Interchange in Santa Jose to South of Hwy 101 Interchange in Mt. View
Description: From PM 0.00 to PM 23.68
Scope : Construct Extra SR 85 Highway Widening for Crossover Station at Stevens Creek Blvd
Alternative : Alternative 3-1 or 3-5

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	914,800		
STRUCTURE ITEMS	$	-	$	-
SUBTOTAL CONSTRUCTION COST	$	914,800		
RIGHT OF WAY	$	-	$	-
TOTAL CAPITAL OUTLAY COST	$	915,000		
PR/ED SUPPORT (3%)	$	28,000		
PS&E SUPPORT (12%)	$	110,000		
RIGHT OF WAY SUPPORT				
CONSTRUCTION SUPPORT (12%)	$	110,000		
AGENCY SUPPORT (8%)	$	74,000		
TOTAL CAPITAL OUTLAY SUPPORT COST*	$	322,000		
TOTAL PROJECT COST	$	1,237,000		

If Project has been programmed enter Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	12	/	2019
Estimated Date of Construction Start (Month/Year)	10	/	2023
Number of Working Days	90		Working Days
Estimated Mid-Point of Construction (Month/Year)	12	/	2023
Number of Plant Establishment Days			Days

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	Earthwork	$	25,000
2	Pavement Structural Section	$	293,000
3	Drainage	$	-
4	Specialty Items	$	352,000
5	Environmental	$	-
6	Traffic Items	$	14,800
7	Detours	$	-
8	Minor Items	$	34,300
9	Roadway Mobilization	$	-
10	Supplemental Work	$	36,000
11	State Furnished	$	7,200
12	Contingencies	$	152,500
13	Overhead	$	-
	TOTAL ROADWAY ITEMS	**$**	**914,800**

Estimate Prepared By : _____

Name and Title Date Phone

Estimate Reviewed By : _____

Name and Title Date Phone

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)		Cost
160101	Clearing & Grubbing	AC	0.6	x	1,725	=	$1,725
170101	Develop Water Supply	LS	1	x	3,000	=	$3,000
190101	Roadway Excavation	CY	150	x	29	=	$4,290
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$0
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$0
192037	Structure Excavation (Retaining Wall)	CY		x		=	$0
193013	Structure Backfill (Retaining Wall)	CY		x		=	$0
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$0
194001	Ditch Excavation	CY		x		=	$0
198001	Impored Borrow	CY	963	x	17	=	$15,890
198007	Imported Material (Shoulder Backing)	TON		x		=	$0
XXXXXX	Some Item			x		=	$0

TOTAL EARTHWORK SECTION ITEMS	$	25,000

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
150771	Remove Asphalt Concrete Dike	LF		x		=	$	-
150860	Remove Base and Surfacing	CY		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	0	x	8	=	$	-
150854	Remove Concrete Pavement	CY	0	x	156	=	$	-
260201	Class 4 Aggregate Base	CY	525	x	61	=	$	31,763
250401	Class 4 Aggregate Subbase	CY	175	x	38	=	$	6,650
290201	Asphalt Treated Permeable Base	CY	55	x	160	=	$	8,800
365001	Sand Cover	TON		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
377501	Slurry Seal	TON		x		=	$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON		x		=	$	-
390136	Minor Hot Mix Asphalt	TON		x		=	$	-
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		=	$	-
393003	Geosynthetic Pavement Interlayer	SQYD		x		=	$	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Indent*	STA		x		=	$	-
394071	Place Hot Mix Asphalt Dike	LF		x		=	$	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		=	$	-
397005	Tack Coat	TON		x		=	$	-
400050	Continuously Reinfored Concrete Pavement	CY	387	x	300	=	$	116,100
401108	Replace Concrete Pavement (Rapid Strength	CY		x		=	$	-
404092	Seal Pavement Joint	LF		x		=	$	-
404094	Seal Longitudinal Isolation Joint	LF		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	SQYD		x		=	$	-
413115	Seal Existing Concrete Pavement Joint	LF		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
731502	Minor Concrete (Misc. Const)	CY		x		=	$	-
730010	Minor Concrete (Curb)	LF	2,700	x	48	=	$	129,600
731530	Minor Concrete (Textured Paving)	SQFT		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS	$	293,000

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
150206	Abandon Culvert	LF		x		=	$	-
150805	Remove Culvert	LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
193114	Sand Backfill	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
510512	Minor Concrete (Box Culvert)	CY		x		=	$	-
510XXX	Culvert (Roadway Crossing)	EA		x		=	$	-
62XXXX	XXX" APC Pipe	LF		x		=	$	-
64XXXX	XXX" Plastic Pipe	LF		x		=	$	-
65XXXX	XXX" RCP Pipe	LF		x		=	$	-
66XXXX	XXX" CSP Pipe	LF		x		=	$	-
680905	Underdrain (6" Alternative)	LF	0	x	36	=	$	-
681103	Edge Drain (3" Plastic Pipe)	LF	0	x	21	=	$	-
69XXXX	XXX" Pipe Downdrain	LF		x		=	$	-
70XXXX	XXX" Pipe Inlet	LF		x		=	$	-
70XXXX	XXX" Pipe Riser	LF		x		=	$	-
70XXXX	XXX" Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
729010	Rock Slope Protection Fabric	SQYD		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Additional Drainage (Detention Base, etc)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL DRAINAGE ITEMS **$ -**

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	0	x	30,000	=	$	-
150662	Remove Metal Beam Guard Railing	LF	0	x	15	=	$	-
150668	Remove Terminal Systems	EA		x		=	$	-
1532XX	Remove Concrete Barrier (25, 50 or 50C)	LF	0	x	16	=	$	-
153250	Remove Sound Wall	SQFT	0	x	25	=	$	-
150606	Remove Fence (BW)	LF		x		=	$	-
190110	Lead Compliance Plan	LS	0	x	18,000	=	$	-
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$	-
510060	Structural Concrete (Retaining Wall)	CY		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$	-
510XXX	Retaining Wall (MSE)	SQFT	0	x	85	=	$	-
XXXXXX	Sound Wall (On Pile, On Barrier or On Ret. Wall)	SQFT	0	x	40	=	$	-
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$	-
511048	Apply Anti-Graffiti Coating	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$	-
518002	Sound Wall (Masonry Block)	SQFT		x		=	$	-
520103	Bar Reinf. Steel (Retaining Wall)	LB		x		=	$	-
800007	Fence (BW)	LF		x		=	$	-
832001	Metal Beam Guard Railing	LF	0	x	47	=	$	-
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
83954X	Transition Railing *(Insert Type)*	EA		x		=	$	-
8395XX	Terminal System (Type CAT)	EA		x		=	$	-
8395XX	Alternative Flared Terminal System	EA	0	x	1,200	=	$	-
8395XX	End Anchor Assembly (*Insert Type*)	EA		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
839596	Crash Cushion *(G.R.E.A.T)*	EA		x		=	$	-
839701	Concrete Barrier *(50 or 60)*	LF	4,512	x	78	=	$	351,936
833128	Concrete Barrier *(25 Modify)*	LF	0	x	128	=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL SPECIALTY ITEMS **$ 352,000**

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)		Cost
XXXXXX	Biological Mitigation	LS		x		= $	-
071325	Temporary Reinforced Silt Fence	LF		x		= $	-
XXXXXX	Hazardous Material Remediation	LS	0	x	45,000	= $	-
XXXXXX	Permits	LS	0	x	45,000	= $	-
071325	Temporary Fence (Type ESA)	LF		x		= $	-

Subtotal Environmental $ -

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)		Cost
200001	Highway Planting	ACRE		x		= $	-
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-*	LF		x		= $	-
20XXXX	Extend XXX" *(Insert Type)* Conduit	LF		x		= $	-
201700	Imported Topsoil	CY		x		= $	-
203015	Erosion Control	ACRE		x		= $	-
203021	Fiber Rolls	LF		x		= $	-
203026	Move In/ Move Out (Erosion Control)	EA		x		= $	-
204099	Plant Establishment Work	LS		x		= $	-
204101	Extend Plant Establishment (X Years)	LS		x		= $	-
208000	Irrigation System	LS		x		= $	-
208304	Water Meter	EA		x		= $	-
209801	Maintenance Vehicle Pullout	EA		x		= $	-
XXXXXX	Some Item						

Subtotal Landscape and Irrigation $ -

5C - NPDES

Item code		Unit	Quantity		Unit Price ($)		Cost
074016	Construction Site Management	LS	0	x	450,000	= $	-
074017	Prepare WPCP	LS	0	x	10,000	= $	-
074019	Prepare SWPPP	LS	0	x	10,000	= $	-
074023	Temporary Erosion Control	ACRE	0	x	2,500	= $	-
074027	Temporary Erosion Control Blanket	SQYD		x		= $	-
074028	Temporary Fiber Roll	LF		x		= $	-
074032	Temporary Concrete Washout Facility	EA		x		= $	-
074033	Temporary Construction Entrance	EA		x		= $	-
074035	Temporary Check Dam	LF		x		= $	-
074037	Move In/ Move Out (Temp Erosion Control)	EA		x		= $	-
074038	Temp. Drainage Inlet Protection	EA	0	x	60	= $	-
XXXXXX	Site Job Management	LS	0	x	450,000	= $	-
074042	Temporary Concrete Washout (Portable)	LS		x		= $	-
XXXXXX	Some Item			x		= $	-

Supplemental Work for NPDES

(These costs are not accounted in total here but under Supplemental Work on sheet 7 of 11).

074021	Water Pollution Control Maintenance Work*	LS	0	x	25,500	= $	-
066596	Additional Water Pollution Control**	LS		x		= $	-
066597	Storm Water Sampling and Analysis***	LS		x		= $	-
XXXXXX	Some Item						

Subtotal NPDES (Without Supplemental Work) $ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $ -

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LB		x		=	$	-
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
56XXXX	Install Overhead Sign (Two Post)	EA	0	x	400,000	=	$	-
56XXXX	Install Overhead Sign (One Post)	EA	0	x	160,000	=	$	-
860090	Maintain Existing Traffic Management System	LS	0	x	900,000	=	$	-
860810	Inductive Loop Detectors	EA		x		=	$	-
86055X	Lighting & Sign Illumination	EA	0	x	4,000	=	$	-
8607XX	Interconnection Facilities	LS		x		=	$	-
8609XX	Traffic Traffic Monitoring Stations	LS	0	x	200,000	=	$	-
860XXX	Signals & Lighting	LS		x		=	$	-
860XXX	ITS Elements	LS		x		=	$	-
861100	Ramp Metering System (Location X)	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXXX	Ramp Terminal Intersection Improvement	LS	0	x	1,000,000	=	$	-
XXXXXX	Toll Equipment and System Integration (Capital)	LS	0	x	100,000,000	=	$	-
XXXXX	Some Item							

Subtotal Traffic Electrical $ -

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120090	Construction Area Signs	LS	0	x	900,000	=	$	-
150701	Remove Yellow Painted Traffic Stripe	LF	0	x	4	=	$	-
150710	Remove Traffic Stripe	LF	0	x	0.25	=	$	-
150713	Remove Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA	0	x	120	=	$	-
15075X	Remove Sign Structure	EA	0	x	20,000	=	$	-
15075X	Remove Sign Structure (On Bridge)	EA	0	x	5,000	=	$	-
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
566011	Roadside Sign (One Post)	EA	0	x	340	=	$	-
566012	Roadside Sign (Two Post)	EA	0	x	1,250	=	$	-
560XXX	Furnish Sign Panels	SQFT		x		=	$	-
560XXX	Install Sign Panels	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	10,000	=	$	10,000
840504	Thermoplastic Traffic Strip (4")	LF	9,450	x	0.50	=	$	4,725

Subtotal Traffic Signing and Striping $ 14,725

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	0	x	4,000,000	=	$	-
120120	Type III Barricade	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	LS	0	x	90,000	=	$	-
120159	Temporary Traffic Strip (Paint)	LS	0	x	90,000	=	$	-
12016X	Channelizer	EA		x		=	$	-
128650	Portable Changeable Message Signs	EA	0	x	10,000	=	$	-
129000	Temporary Railing (Type K)	LF	0	x	17	=	$	-
129100	Temp. Crash Cushion Module	EA	0	x	200	=	$	-
129099A	Traffic Plastic Drum	EA		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
XXXXXX	Misc. Items (Traffic Management Plan)	LS	0	x	180,000	=	$	-
XXXXXX	Some Item	LS		x		=	$	-

Subtotal Stage Construction and Traffic Handling $ -

TOTAL TRAFFIC ITEMS **$ 14,800**

SECTION 7: DETOURS

Include constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
0713XX	Temporary Fence (Type X)	LF		x		= $	-
07XXXX	Temporary Drainage	LS		x		= $	-
120143	Temporary Pavement Delineation	LF		x		= $	-
1286XX	Temporary Signals	EA		x		= $	-
129000	Temporary Railing (Type K)	LF		x		= $	-
190101	Roadway Excavation	CY		x		= $	-
198001	Imported Borrow	CY		x		= $	-
198050	Embankment	CY		x		= $	-
250401	Class 4 Aggregate Subbase	CY		x		= $	-
260201	Class 2 Aggregate Base	CY		x		= $	-
390132	Hot Mix Asphalt (Type A)	TON		x		= $	-
XXXXXX	Some Item	LS	0	x	$150,000	= $	-

TOTAL DETOURS	**$**	**-**
SUBTOTAL SECTIONS 1-7	$	684,800

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items									
	ADA Items						$	-	
8B - Bike Path Items									
	Bike Path Items						$	-	
8C - Other Minor Items									
	Other Minor Items				5.0%		$	34,240	
	Total of Section 1-7	$	684,800	x	5.0%	=	$	34,240	

TOTAL MINOR ITEMS	**$**	**34,300**

SECTIONS 9: MOBILIZATION

Item code								
999990	Total Section 1-8	$	719,100	x	0%	=	$	-

TOTAL MOBILIZATION	**$**	**-**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066015	Federal Trainee Program	LS		x		= $	-
066063	Traffic Management Plan - Public Information	LS		x		= $	-
066090	Maintain Traffic	LS		x		= $	-
066094	Value Analysis	LS		x		= $	-
066204	Remove Rock & Debris	LS		x		= $	-
066222	Locate Existing Cross-Over	LS		x		= $	-
066670	Payment Adjustments For Price Index Fluctuations	LS		x		= $	-
066700	Partnering	LS		x		= $	-
066866	Operation of Existing Traffic Management System Eler	LS		x		= $	-
066920	Dispute Review Board	LS		x		= $	-
066XXX	Some Item	LS		x		= $	-
	*Cost of **NPDES** Supplemental Work specified in Section 5C*					= $	-
	Total Section 1-8	$	719,100		5%	= $	35,955

TOTAL SUPPLEMENTAL WORK	**$**	**36,000**

Note: Mobilization item will automatically calculate if working days are 50 or more. For Project less than 50 Working Days Mobilization is not required as a separate contract, however contract item prices should take into consideration mobilization as part of the price. If the building portion of the project is greater than 50% of the total project cost,

If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066063	Public Information	LS	0	x	$100,000	=	$0
066105	RE Office	LS	0	x	$400,000	=	$0
066803	Padlocks	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
066062A	COZEEP Expenses	LS		x		=	$0
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
XXXXXX	Toll Back Office System	LS	0	x	$1,700,000	=	$0
06684X	TMS Controller Assembly	LS	0	x	$2,000,000	=	$0
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
XXXXXX	Some Item						

Total Section 1-8	$	719,100	1%	=	$	7,191

TOTAL STATE FURNISHED $7,200

SECTION 12: TIME-RELATED OVERHEAD

Estimated Time-Releated Overhead (TRO) Percentage (0% to 10%) = 0%

Item code		Unit	Quantity		Unit Price ($)		Cost	
			Total of All Contract Items Only			$	719,100	(used to calculate TR
070018	Time-Related Overhead	$	719,100	X	0%	=	$0	

TOTAL TIME-RELATED OVERHEAD $0

SECTION 13: CONTINGENCY

Total Section 1-12	$	762,300	x	20%	=	$152,460

TOTAL CONTINGENCY $152,500

Note: TRO is a contract item if total project cost is (non-escalated) over $5 million AND 100 or more working days.
If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.
TRO calculated for you as percentage of the sum of all contract items only;
excluding mobilization, supplemental work, state furnished materials and expenses, and contingency.

Engineer Cost Estimate --- El Camino Real Split Station Extra
Preliminary Project Study Report

Project ID: XXXXXX

Type of Estimate : Preliminary Project Study Report (Dec 2019)
Program Code : 04-XXXXX
Project Limits : From Hwy 101 Interchange in Santa Jose to South of Hwy 101 Interchange in Mt. View
Description: From PM 0.00 to PM 23.68
Scope : Construct Extra SR 85 Highway Widening for Split Station at El Camino Real
Alternative : Alternative 3-1 or 3-5

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	1,149,000		
STRUCTURE ITEMS	$	-	$	-
SUBTOTAL CONSTRUCTION COST	$	1,149,000		
RIGHT OF WAY	$	-	$	-
TOTAL CAPITAL OUTLAY COST	$	1,149,000		
PR/ED SUPPORT (3%)	$	35,000		
PS&E SUPPORT (12%)	$	138,000		
RIGHT OF WAY SUPPORT				
CONSTRUCTION SUPPORT (12%)	$	138,000		
AGENCY SUPPORT (8%)	$	92,000		
TOTAL CAPITAL OUTLAY SUPPORT COST*	$	403,000		
TOTAL PROJECT COST	$	1,552,000		

If Project has been programmed enter Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	12	/	2019
Estimated Date of Construction Start (Month/Year)	10	/	2023
Number of Working Days	90		Working Days
Estimated Mid-Point of Construction (Month/Year)	12	/	2023
Number of Plant Establishment Days			Days

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	Earthwork	$	42,600
2	Pavement Structural Section	$	599,000
3	Drainage	$	-
4	Specialty Items	$	206,000
5	Environmental	$	-
6	Traffic Items	$	12,500
7	Detours	$	-
8	Minor Items	$	43,100
9	Roadway Mobilization	$	-
10	Supplemental Work	$	45,200
11	State Furnished	$	9,100
12	Contingencies	$	191,500
13	Overhead	$	-
	TOTAL ROADWAY ITEMS	**$**	**1,149,000**

Estimate Prepared By : _____

Name and Title Date Phone

Estimate Reviewed By : _____

Name and Title Date Phone

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)		Cost
160101	Clearing & Grubbing	AC	1.1	x	1,725	=	$1,725
170101	Develop Water Supply	LS	1	x	3,000	=	$3,000
190101	Roadway Excavation	CY	300	x	29	=	$8,580
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$0
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$0
192037	Structure Excavation (Retaining Wall)	CY		x		=	$0
193013	Structure Backfill (Retaining Wall)	CY		x		=	$0
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$0
194001	Ditch Excavation	CY		x		=	$0
198001	Impored Borrow	CY	1,774	x	17	=	$29,271
198007	Imported Material (Shoulder Backing)	TON		x		=	$0
XXXXXX	Some Item			x		=	$0

TOTAL EARTHWORK SECTION ITEMS	**$**	**42,600**

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
150771	Remove Asphalt Concrete Dike	LF		x		=	$	-
150860	Remove Base and Surfacing	CY		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	0	x	8	=	$	-
150854	Remove Concrete Pavement	CY	0	x	156	=	$	-
260201	Class 4 Aggregate Base	CY	1,242	x	61	=	$	75,141
250401	Class 4 Aggregate Subbase	CY	1,419	x	38	=	$	53,922
290201	Asphalt Treated Permeable Base	CY	443	x	160	=	$	70,880
365001	Sand Cover	TON		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
377501	Slurry Seal	TON		x		=	$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON		x		=	$	-
390136	Minor Hot Mix Asphalt	TON		x		=	$	-
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		=	$	-
393003	Geosynthetic Pavement Interlayer	SQYD		x		=	$	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Inden*	STA		x		=	$	-
394071	Place Hot Mix Asphalt Dike	LF		x		=	$	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		=	$	-
397005	Tack Coat	TON		x		=	$	-
400050	Continuously Reinfored Concrete Pavement	CY	1,330	x	300	=	$	399,000
401108	Replace Concrete Pavement (Rapid Strength	CY		x		=	$	-
404092	Seal Pavement Joint	LF		x		=	$	-
404094	Seal Longitudinal Isolation Joint	LF		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	SQYD		x		=	$	-
413115	Seal Existing Concrete Pavement Joint	LF		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
731502	Minor Concrete (Misc. Const)	CY		x		=	$	-
731530	Minor Concrete (Textured Paving)	SQFT		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS	**$**	**599,000**

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
150206	Abandon Culvert	LF		x		=	$	-
150805	Remove Culvert	LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
193114	Sand Backfill	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
510512	Minor Concrete (Box Culvert)	CY		x		=	$	-
510XXX	Culvert (Roadway Crossing)	EA		x		=	$	-
62XXXX	XXX" APC Pipe	LF		x		=	$	-
64XXXX	XXX" Plastic Pipe	LF		x		=	$	-
65XXXX	XXX" RCP Pipe	LF		x		=	$	-
66XXXX	XXX" CSP Pipe	LF		x		=	$	-
680905	Underdrain (6" Alternative)	LF	0	x	36	=	$	-
681103	Edge Drain (3" Plastic Pipe)	LF	0	x	21	=	$	-
69XXXX	XXX" Pipe Downdrain	LF		x		=	$	-
70XXXX	XXX" Pipe Inlet	LF		x		=	$	-
70XXXX	XXX" Pipe Riser	LF		x		=	$	-
70XXXX	XXX" Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
729010	Rock Slope Protection Fabric	SQYD		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Additional Drainage (Detention Base, etc)	LS		x		=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL DRAINAGE ITEMS **$ -**

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	0	x	30,000	=	$	-
150662	Remove Metal Beam Guard Railing	LF	0	x	15	=	$	-
150668	Remove Terminal Systems	EA		x		=	$	-
1532XX	Remove Concrete Barrier (25, 50 or 50C)	LF	0	x	16	=	$	-
153250	Remove Sound Wall	SQFT	0	x	25	=	$	-
150606	Remove Fence (BW)	LF		x		=	$	-
190110	Lead Compliance Plan	LS	0	x	18,000	=	$	-
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$	-
510060	Structural Concrete (Retaining Wall)	CY		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$	-
510XXX	Retaining Wall (MSE)	SQFT	0	x	85	=	$	-
XXXXXX	Sound Wall (On Pile, On Barrier or On Ret. Wall)	SQFT	0	x	40	=	$	-
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$	-
511048	Apply Anti-Graffiti Coating	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$	-
518002	Sound Wall (Masonry Block)	SQFT		x		=	$	-
520103	Bar Reinf. Steel (Retaining Wall)	LB		x		=	$	-
800007	Fence (BW)	LF		x		=	$	-
832001	Metal Beam Guard Railing	LF	0	x	47	=	$	-
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
83954X	Transition Railing *(Insert Type)*	EA		x		=	$	-
8395XX	Terminal System (Type CAT)	EA		x		=	$	-
8395XX	Alternative Flared Terminal System	EA	0	x	1,200	=	$	-
8395XX	End Anchor Assembly (*Insert Type*)	EA		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
839596	Crash Cushion *(G.R.E.A.T)*	EA		x		=	$	-
839701	Concrete Barrier *(50 or 60)*	LF	2,640	x	78	=	$	205,920
833128	Concrete Barrier *(25 Modify)*	LF	0	x	128	=	$	-
XXXXXX	Some Item			x		=	$	-

TOTAL SPECIALTY ITEMS **$ 206,000**

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)		Cost
XXXXXX	Biological Mitigation	LS		x		= $	-
071325	Temporary Reinforced Silt Fence	LF		x		= $	-
XXXXXX	Hazardous Material Remediation	LS	0	x	45,000	= $	-
XXXXXX	Permits	LS	0	x	45,000	= $	-
071325	Temporary Fence (Type ESA)	LF		x		= $	-

Subtotal Environmental $ -

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)		Cost
200001	Highway Planting	ACRE		x		= $	-
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-*	LF		x		= $	-
20XXXX	Extend XXX" *(Insert Type)* Conduit	LF		x		= $	-
201700	Imported Topsoil	CY		x		= $	-
203015	Erosion Control	ACRE		x		= $	-
203021	Fiber Rolls	LF		x		= $	-
203026	Move In/ Move Out (Erosion Control)	EA		x		= $	-
204099	Plant Establishment Work	LS		x		= $	-
204101	Extend Plant Establishment (X Years)	LS		x		= $	-
208000	Irrigation System	LS		x		= $	-
208304	Water Meter	EA		x		= $	-
209801	Maintenance Vehicle Pullout	EA		x		= $	-
XXXXXX	Some Item						

Subtotal Landscape and Irrigation $ -

5C - NPDES

Item code		Unit	Quantity		Unit Price ($)		Cost
074016	Construction Site Management	LS	0	x	450,000	= $	-
074017	Prepare WPCP	LS	0	x	10,000	= $	-
074019	Prepare SWPPP	LS	0	x	10,000	= $	-
074023	Temporary Erosion Control	ACRE	0	x	2,500	= $	-
074027	Temporary Erosion Control Blanket	SQYD		x		= $	-
074028	Temporary Fiber Roll	LF		x		= $	-
074032	Temporary Concrete Washout Facility	EA		x		= $	-
074033	Temporary Construction Entrance	EA		x		= $	-
074035	Temporary Check Dam	LF		x		= $	-
074037	Move In/ Move Out (Temp Erosion Control)	EA		x		= $	-
074038	Temp. Drainage Inlet Protection	EA	0	x	60	= $	-
XXXXXX	Site Job Management	LS	0	x	450,000	= $	-
074042	Temporary Concrete Washout (Portable)	LS		x		= $	-
XXXXXX	Some Item			x		= $	-

Supplemental Work for NPDES

(These costs are not accounted in total here but under Supplemental Work on sheet 7 of 11).

074021	Water Pollution Control Maintenance Work*	LS	0	x	25,500	= $	-
066596	Additional Water Pollution Control**	LS		x		= $	-
066597	Storm Water Sampling and Analysis***	LS		x		= $	-
XXXXXX	Some Item						

Subtotal NPDES (Without Supplemental Work) $ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $ -

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LB		x		=	$	-
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
56XXXX	Install Overhead Sign (Two Post)	EA	0	x	400,000	=	$	-
56XXXX	Install Overhead Sign (One Post)	EA	0	x	160,000	=	$	-
860090	Maintain Existing Traffic Management System	LS	0	x	900,000	=	$	-
860810	Inductive Loop Detectors	EA		x		=	$	-
86055X	Lighting & Sign Illumination	EA	0	x	4,000	=	$	-
8607XX	Interconnection Facilities	LS		x		=	$	-
8609XX	Traffic Traffic Monitoring Stations	LS	0	x	200,000	=	$	-
860XXX	Signals & Lighting	LS		x		=	$	-
860XXX	ITS Elements	LS		x		=	$	-
861100	Ramp Metering System (Location X)	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXXX	Ramp Terminal Intersection Improvement	LS	0	x	1,000,000	=	$	-
XXXXXX	Toll Equipment and System Integration (Capital)	LS	0	x	100,000,000	=	$	-
XXXXX	Some Item							

Subtotal Traffic Electrical $ -

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120090	Construction Area Signs	LS	0	x	900,000	=	$	-
150701	Remove Yellow Painted Traffic Stripe	LF	0	x	4	=	$	-
150710	Remove Traffic Stripe	LF	0	x	0.25	=	$	-
150713	Remove Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA	0	x	120	=	$	-
15075X	Remove Sign Structure	EA	0	x	20,000	=	$	-
15075X	Remove Sign Structure (On Bridge)	EA	0	x	5,000	=	$	-
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
566011	Roadside Sign (One Post)	EA	0	x	340	=	$	-
566012	Roadside Sign (Two Post)	EA	0	x	1,250	=	$	-
560XXX	Furnish Sign Panels	SQFT		x		=	$	-
560XXX	Install Sign Panels	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	10,000	=	$	10,000
840504	Thermoplastic Traffic Strip (4")	LF	5,000	x	0.50	=	$	2,500

Subtotal Traffic Signing and Striping $ 12,500

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	0	x	4,000,000	=	$	-
120120	Type III Barricade	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	LS	0	x	90,000	=	$	-
120159	Temporary Traffic Strip (Paint)	LS	0	x	90,000	=	$	-
12016X	Channelizer	EA		x		=	$	-
128650	Portable Changeable Message Signs	EA	0	x	10,000	=	$	-
129000	Temporary Railing (Type K)	LF	0	x	17	=	$	-
129100	Temp. Crash Cushion Module	EA	0	x	200	=	$	-
129099A	Traffic Plastic Drum	EA		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
XXXXXX	Misc. Items (Traffic Management Plan)	LS	0	x	180,000	=	$	-
XXXXXX	Some Item	LS		x		=	$	-

Subtotal Stage Construction and Traffic Handling $ -

TOTAL TRAFFIC ITEMS **$ 12,500**

SECTION 7: DETOURS

Include constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
0713XX	Temporary Fence (Type X)	LF		x		= $	-
07XXXX	Temporary Drainage	LS		x		= $	-
120143	Temporary Pavement Delineation	LF		x		= $	-
1286XX	Temporary Signals	EA		x		= $	-
129000	Temporary Railing (Type K)	LF		x		= $	-
190101	Roadway Excavation	CY		x		= $	-
198001	Imported Borrow	CY		x		= $	-
198050	Embankment	CY		x		= $	-
250401	Class 4 Aggregate Subbase	CY		x		= $	-
260201	Class 2 Aggregate Base	CY		x		= $	-
390132	Hot Mix Asphalt (Type A)	TON		x		= $	-
XXXXXX	Some Item	LS	0	x	$150,000	= $	-

TOTAL DETOURS	**$**	**-**
SUBTOTAL SECTIONS 1-7	$	860,100

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items									
	ADA Items						$	-	
8B - Bike Path Items									
	Bike Path Items						$	-	
8C - Other Minor Items									
	Other Minor Items				5.0%		$	43,005	
	Total of Section 1-7	$	860,100	x	5.0%	=	$	43,005	

TOTAL MINOR ITEMS	**$**	**43,100**

SECTIONS 9: MOBILIZATION

Item code								
999990	Total Section 1-8	$	903,200	x	0%	= $	-	

TOTAL MOBILIZATION	**$**	**-**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066015	Federal Trainee Program	LS		x		= $	-
066063	Traffic Management Plan - Public Information	LS		x		= $	-
066090	Maintain Traffic	LS		x		= $	-
066094	Value Analysis	LS		x		= $	-
066204	Remove Rock & Debris	LS		x		= $	-
066222	Locate Existing Cross-Over	LS		x		= $	-
066670	Payment Adjustments For Price Index Fluctuations	LS		x		= $	-
066700	Partnering	LS		x		= $	-
066866	Operation of Existing Traffic Management System Eler	LS		x		= $	-
066920	Dispute Review Board	LS		x		= $	-
066XXX	Some Item	LS		x		= $	-
	*Cost of **NPDES** Supplemental Work specified in Section 5C*					= $	-
	Total Section 1-8	$	903,200		5%	= $	45,160

TOTAL SUPPLEMENTAL WORK	**$**	**45,200**

Note: Mobilization item will automatically calculate if working days are 50 or more. For Project less than 50 Working Days Mobilization is not required as a separate contract, however contract item prices should take into consideration mobilization as part of the price. If the building portion of the project is greater than 50% of the total project cost,

If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066063	Public Information	LS	0	x	$100,000	=	$0
066105	RE Office	LS	0	x	$400,000	=	$0
066803	Padlocks	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
066062A	COZEEP Expenses	LS		x		=	$0
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
XXXXXX	Toll Back Office System	LS	0	x	$1,700,000	=	$0
06684X	TMS Controller Assembly	LS	0	x	$2,000,000	=	$0
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
XXXXXX	Some Item						

Total Section 1-8	$	903,200	1%	=	$	9,032

TOTAL STATE FURNISHED $9,100

SECTION 12: TIME-RELATED OVERHEAD

Estimated Time-Releated Overhead (TRO) Percentage (0% to 10%) = 0%

Item code		Unit	Quantity		Unit Price ($)		Cost	
			Total of All Contract Items Only			$	903,200	(used to calculate TR
070018	Time-Related Overhead	$	903,200	X	0%	=	$0	

TOTAL TIME-RELATED OVERHEAD $0

SECTION 13: CONTINGENCY

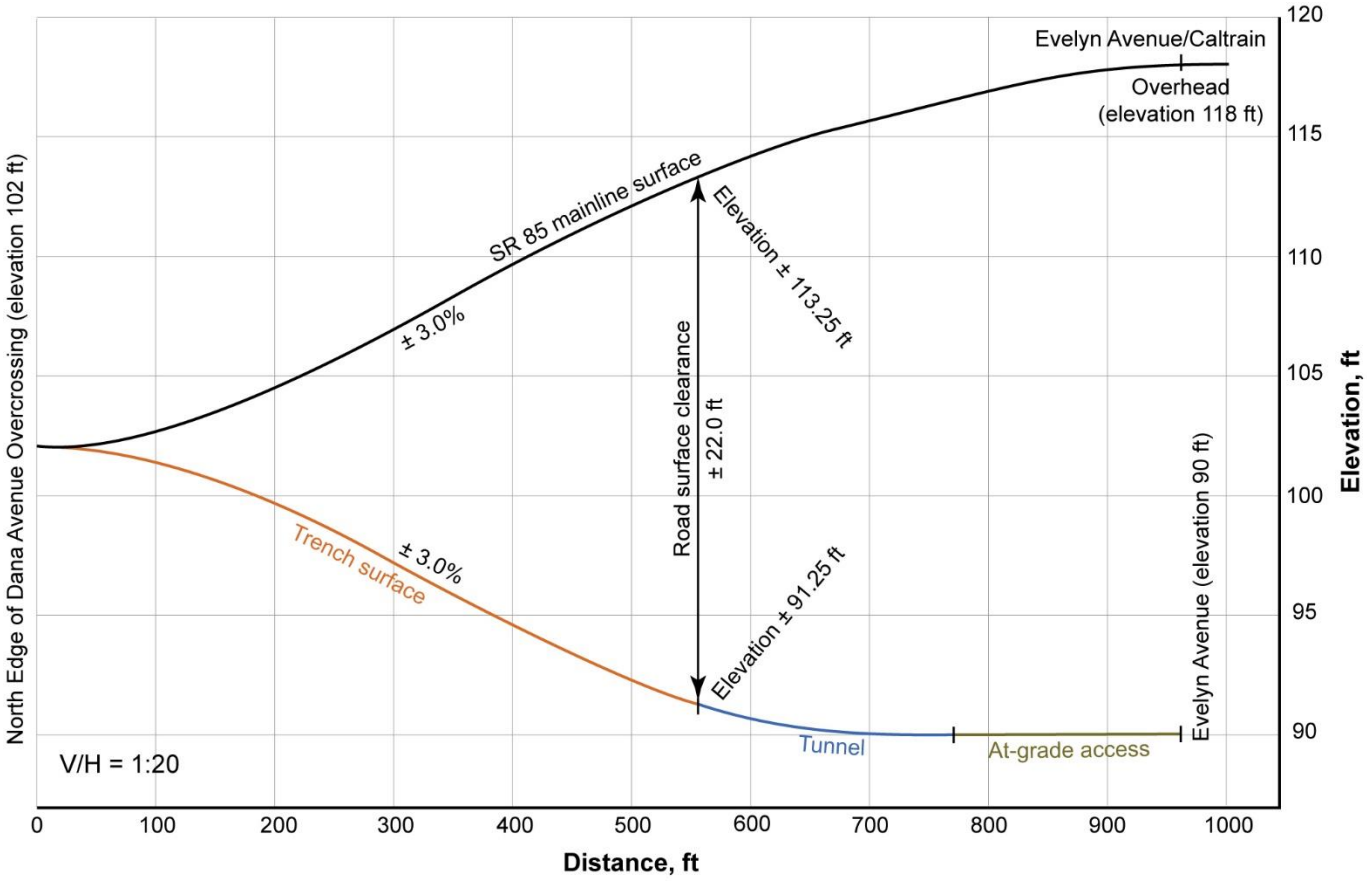
Total Section 1-12	$	957,500	x	20%	=	$191,500

TOTAL CONTINGENCY $191,500

Note: TRO is a contract item if total project cost is (non-escalated) over $5 million AND 100 or more working days.
If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.
TRO calculated for you as percentage of the sum of all contract items only;
excluding mobilization, supplemental work, state furnished materials and expenses, and contingency.

Optional Item

- Alternatives 3-1 and 3-5: Median direct-connector ramp from Dana Street to Evelyn Avenue
- Trench = 550 feet long × 28 feet wide
- Tunnel = 190 feet long × 28 feet high
- Surface ramp = 258 feet × 28 feet wide
- Retaining wall for surface ramp = 145 feet long × 15 feet (average) high



Note: See Figure 3 (Part 1—Proposed Engineering Features) for Conceptual Alignment Plan

PARSONS

SR85 Drop Ramp & Tunnel
Estimate of Probable Construction Cost

SUMMARY REPORT
SHOWING UNIT PRICE

Estimate Date: **12/12/19** ; *Rev. No.* ***01***
Client:
Estimator **C. Gidlof**
Checked By: **B Scales**
Doc Scope Date: **12/01/19**

LEVEL DESCRIPTION	QTY	U/M	UNIT PRICE	TOTAL COST
1 SR85 Drop Ramp & Box Tunnel	**1**	**L.S.**	**$8,470,580.29**	**8,470,580**
A Construction	***1***	***L.S.***	*$6,274,503.89*	***6,274,504***
01 Indirect Cost	**4**	**Mo**	$222,691.14	**890,765**
00100 Mobilization & Initial Expense	1	L.S.	$64,673.42	64,673
0001 Contract Mobilization	1	L.S.	$15,073.42	15,073
0002 Permits	1	L.S.	$20,026.67	20,027
0003 Insurance & Bonds	1	L.S.	$29,573.33	29,573
01 Bonds	1	L.S.	$19,520.00	19,520
02 Insurance	1	L.S.	$10,053.33	10,053
00105 Contract Job Cost	4	Mo	$196,522.78	786,091
0001 Project Home Office	4	MO.	$26,724.00	106,896
0002 Contract Vehicles	4	Mo	$9,000.00	36,000
0003 Site Supervisory & Emergency	4	M0	$74,205.60	296,822
0004 Field Office	4	Mo	$5,133.33	20,533
0005 Construction Equipment (General Use)	4	Mo	$45,228.33	180,913
01 Construction Vehicles	4	Mo	$2,550.00	10,200
02 Temporary Storage	4	Mo	$150.00	600
03 Temporary Roads & Parking	1	L.S.	$7,140.00	7,140
04 Project Site Cleaning	4	Mo	$3,310.00	13,240
05 Other	4	Mo	$5,000.00	20,000
06 Equipment Schedule less Crew Eqpt	1	LS	$129,733.33	129,733
0006 Site Operating (Facility Eqmt.)	4	Mo	$10,191.11	40,764
01 Trailers	4	Mo	$3,844.45	15,378
02 Office Equipment	1	L.S.	$18,080.00	18,080
03 Mail & Couriers	4	Mo	$650.00	2,600
04 Communication	1	L.S.	$4,706.67	4,707
0007 Temporary Facilities @ Constr. Site	4	Mo	$2,675.00	10,700
01 Water	4	Mo	$875.00	3,500
02 Toilets & Sanitary Sewers	4	Mo	$1,050.00	4,200
03 Electric	4	Mo	$750.00	3,000
0008 Personnel Health & Safety	4	Mo	$7,484.33	29,937
0009 Contract Environmental Control & Cleanup	4	Mo	$8,681.07	34,724
0010 Miscellaneous contract Activities	4	Mo	$7,200.00	28,800
00120 Demoblization	1	L.S.	$40,000.00	40,000
0001 Demobilization	1	L.S.	$40,000.00	40,000
02 Direct Cost	**1**	**L.S.**	$5,383,739.33	**5,383,739**
01 Trench	15,400	SF	$199.46	3,071,645
001 Site Preparation	1,711	SY	$85.25	145,863
01 Site Clearing	1,711	SY	$11.00	18,821
02 Site Grading & Earthwork	1,711	SY	$66.00	112,926
03 Site Cleanup	1,711	SY	$8.25	14,116
002 Excavation	6,274	B.C.Y	$33.66	211,213
01 Bulk Excavation	6,274	B.C.Y	$8.76	54,942
02 Haul Off Site	6,274	B.C.Y.	$24.91	156,272
003 Trench Construction	1,711	SY	$1,403.97	2,402,190
01 Sheet Pile Shoring	12,100	SF	$67.62	818,193
02 Concrete	1,752	CY	$554.31	971,147
001 Base Slab 18"	15,400	S.F.	$15.55	239,474
002 Wall 22' Tall	896	CY	$816.60	731,673
03 Rebar 250 lb/CY	438,000	LB	$1.32	578,160
04 Concrete Pump	1,752	C.Y.	$19.80	34,690
004 Site Civil/Mechanical Utilities	1,711	SY	$117.26	200,624
01 Water Supply and Distribution Systems	1	LS	$74,993.37	74,993

SR85 Drop Ramp & Tunnel
Estimate of Probable Construction Cost

SUMMARY REPORT
SHOWING UNIT PRICE

Estimate Date: **12/12/19** ; *Rev. No.* ***01***
Client:
Estimator **C. Gidlof**
Checked By: **B Scales**
Doc Scope Date: **12/01/19**

LEVEL DESCRIPTION	QTY	U/M	UNIT PRICE	TOTAL COST
001 Water	550	L.F.	$136.35	74,993
01 Water Supply Distribution	550	L.F.	$93.84	51,613
02 Fire Hydrants	10	EA	$2,338.04	23,380
02 Oil/Water Separators	550	LF	$62.11	34,163
001 New Oil/Water Separator	1	EA	$34,162.52	34,163
03 Storm Drainage	550	LF	$166.30	91,468
001 Structures/Inlets	10	EA	$4,061.87	40,619
002 24" Storm Drain	550	L.F.	$65.30	35,913
003 12" Storm Drain	550	L.F.	$27.16	14,936
005 Site Electrical Utilities	15,400	S.F.	$7.26	111,755
01 Elec / Tel Service Entrance	1	L.S.	$91,668.30	91,668
001 Electrical Service Entrance Conduits	1	L.S.	$63,604.64	63,605
002 Duct Banks	161	LF	$174.31	28,064
02 Exterior Lighting	1	L.S.	$15,137.14	15,137
001 Exterior Lighting Fixtures and Controls	1	L.S.	$13,097.74	13,098
002 Special Security Lighting Systems	1	L.S.	$2,039.40	2,039
03 Exterior Communications and Alarm Systems	1	L.S.	$4,950.00	4,950
02 Box Tunnel	5,600	SF	$303.09	1,697,283
001 Box Installation	1	Mo	$214,792.75	214,793
002 Excavation	4,563	B.C.Y	$33.66	153,613
01 Bulk Excavation	4,563	B.C.Y	$8.76	39,958
02 Haul Off Site	4,563	B.C.Y.	$24.91	113,654
003 Precast Concrete Box	1,274	CY	$1,043.07	1,328,877
01 Concrete	1,274	CY	$693.27	883,232
001 Wall 22' Tall	652	CY	$1,020.75	665,528
002 Base Slab 18"	5,600	S.F.	$19.44	108,852
003 Roof 18"	5,600	S.F.	$19.44	108,852
02 Rebar	318,500	LB	$1.32	420,420
03 Concrete Pump	1,274	C.Y.	$19.80	25,225
03 Drop Ramp	809	SY	$759.96	614,812
001 Site Preparation	809	SY	$85.25	68,967
01 Site Clearing	809	SY	$11.00	8,899
02 Site Grading & Earthwork	809	SY	$66.00	53,394
03 Site Cleanup	809	SY	$8.25	6,674
002 Excavation	4,044	B.C.Y	$33.66	136,141
01 Bulk Excavation	4,044	BCY	$8.76	35,414
02 Haul Off Site	4,044	B.C.Y.	$24.91	100,727
003 Retaining Wall	2,175	SF	$110.69	240,752
01 Sheet Pile Shoring	2,175	SF	$45.80	99,617
02 Wall 15' Tall (Avg)	121	CY	$816.60	98,809
03 Rebar	30,250	LB	$1.32	39,930
04 Concrete Pump	121	C.Y.	$19.80	2,396
004 Site Civil/Mechanical Utilities	809	SY	$54.82	44,347
01 Storm Drainage	260	LF	$170.57	44,347
001 Structures/Inlets	5	EA	$4,061.87	20,309
002 24" Storm Drain	260	L.F.	$65.30	16,977
003 12" Storm Drain	260	L.F.	$27.16	7,061
005 Site Electrical Utilities	7,280	S.F.	$2.08	15,137
01 Exterior Lighting	1	L.S.	$15,137.14	15,137
001 Exterior Lighting Fixtures and Controls	1	L.S.	$13,097.74	13,098
002 Special Security Lighting Systems	1	L.S.	$2,039.40	2,039
006 Paving	809	SY	$95.33	77,124
007 Landscaping	7,280	S.F.	$4.44	32,344
B PR/ED Support 3%	***1***	***LS***	*$188,235.12*	***188,235***
C PS&E Support 12%	***1***	***LS***	*$752,940.48*	***752,940***

PARSONS

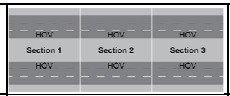
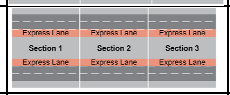
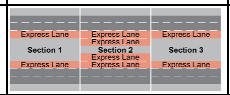
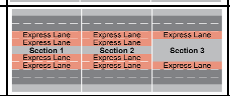
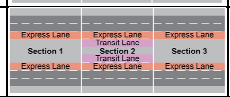
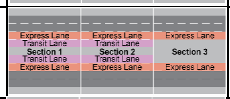
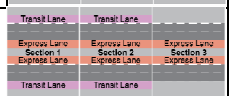
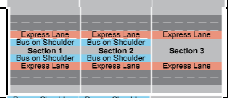
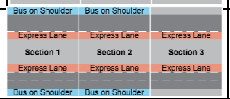
SR85 Drop Ramp & Tunnel
Estimate of Probable Construction Cost

SUMMARY REPORT
SHOWING UNIT PRICE

Estimate Date: **12/12/19** ; *Rev. No.* ***01***
Client:
Estimator **C. Gidlof**
Checked By: **B Scales**
Doc Scope Date: **12/01/19**

LEVEL DESCRIPTION	QTY	U/M	UNIT PRICE	TOTAL COST
D Construction Support 12%	***1***	***LS***	*$752,940.48*	***752,940***
E Agency Support 8%	***1***	***LS***	*$501,960.32*	***501,960***

SR 85 Transit Study Construction Cost Matrix (cost in millions of 2020 dollars)

Alternative				Option	Express Lane Conversion			EL Camino	Right Shoulder			Median			Stations					Sub Total	Contingency (20%)	Total Construction Cost	Support Costs (35%)	Total Project Cost
					Section 1	Section 2	Section 3	Real Interchange	Section 1	Section 2	Section 3	Secton 1	Section 2	Section 3	Mountain View	El Camino Real	Stevens Creek	Saratoga	Bascom					
Existing	1-1		No Change	1																				
				2				$16.7												$16.7	$3.3	$20.0	$7.0	**$27.0**
Express Lanes	2-1		HOV To Express Lane		$15.8	$47.3	$19.3													$82.3	$16.5	$98.7	$34.5	**$133.2**
	2-2		Short Dual Express Lane		$15.8	$47.3	$19.3						$40.0							$122.3	$24.5	$146.7	$51.3	**$198.0**
	2-3		Long Dual Express Lane		$15.8	$47.3	$19.3	$16.7				$27.0	$40.0							$166.0	$33.2	$199.1	$69.7	**$268.8**
Transit Lanes	3-1		Short Median Transit Lane	1	$15.8	$47.3	$19.3						$40.0				$10.0	$12.0	$10.0	$154.3	$30.9	$185.1	$64.8	**$249.9**
				2	$15.8	$47.3	$19.3						$40.0				$10.0	$12.0	$10.0	$154.3	$30.9	$185.1	$64.8	**$249.9**
	3-2		Long Median Transit Lane	1	$15.8	$47.3	$19.3	$16.7				$27.0	$40.0		$7.0	$12.5	$10.0	$12.0	$10.0	$217.5	$43.5	$260.9	$91.3	**$352.3**
				2	$15.8	$47.3	$19.3	$16.7				$27.0	$40.0		$7.0	$12.5	$10.0	$12.0	$10.0	$217.5	$43.5	$260.9	$91.3	**$352.3**
	3-3		Right Side Transit Lane	1	$15.8	$47.3	$19.3	$16.7	$35.0	$55.0						$7.5	$7.5	$7.5	$7.5	$219.0	$43.8	$262.7	$92.0	**$354.7**
				2	$15.8	$47.3	$19.3	$16.7	$35.0	$55.0										$189.0	$37.8	$226.7	$79.4	**$306.1**
Bus On Shoulder	4-1		Median Bus On Shoulder	1	$15.8	$47.3	$19.3	$16.7				$22.4	$33.2		$7.0	$12.5	$10.0	$12.0	$10.0	$206.1	$41.2	$247.3	$86.5	**$333.8**
				2	$15.8	$47.3	$19.3	$16.7				$22.4	$33.2		$7.0	$12.5	$10.0	$12.0	$10.0	$206.1	$41.2	$247.3	$86.5	**$333.8**
	4-2		Right Side Bus On Shoulder	1	$15.8	$47.3	$19.3	$16.7	$22.4	$35.2						$7.5	$7.5	$7.5	$7.5	$186.6	$37.3	$223.9	$78.4	**$302.2**
				2	$15.8	$47.3	$19.3	$16.7	$22.4	$35.2										$156.6	$31.3	$187.9	$65.8	**$253.6**