

SANTA CRUZ COUNTY REGIONAL TRANSPORTATION COMMISSION

APPENDIX A: BACKGROUND DOCUMENTS REVIEW



BACKGROUND DOCUMENTS REVIEW

1. County Capital Improvement Program

The County Capital Improvement Program (CIP), developed to address elements of the County General Plan, is a 5-year financing implementation plan for capital improvement projects within the unincorporated County. Each improvement program includes project description and background, impact to operations, estimated project costs and funding sources.

The projects in Highway 9/ SLV Plan area includes replacement of the San Lorenzo Way Bridge and construction of sidewalks, bike lanes, and a new bridge on Graham Hill Road from East Zayante Road to Roaring Camp.

2. County General Plan

The County General Plan is a comprehensive, long-range guide for land use planning decisions in the county's unincorporated areas. The General Plan provides policy goals and objectives to inform the physical development of San Lorenzo Valley. The Land Use Element expresses potential traffic impacts and changes to the residential and scenic road setting from development on Highway 9. Future development should enhance the scenic view from Highway 9 and joint development and use of parking facilities out of view of Highway 9 is encouraged where feasible.

The Circulation Element is included as part of Santa Cruz County's General Plan. The element describes the existing transportation network and proposes transportation routes, corridors, and other local transportation facilities including bicycle and pedestrian improvements. Planned improvements identified in the Circulation Element include shoulder widening and construction of left turn pockets from Graham Hill Road to Alba Road. Additionally, the intersection of Highway 9/Glen Arbor Road/ Mill Street was considered for signalization in the Circulation Element. Since the adoption of the element, a signal has been installed at this location.

3. Highway 9 San Lorenzo Valley Complete Streets Corridor Plan (2019) (Highway 9/SLV Plan)

The Highway 9 San Lorenzo Valley Complete Streets Corridor Plan was adopted in response growing community demands for an enhanced active transportation network on Highway 9. Input from the community through surveys and workshops was utilized to create a vision, guiding principles, and strategies to improve the movement of community members and visitors in San Lorenzo Valley. Priorities identified in the plan improve safety for pedestrians, bicyclists, and motorists; improve access to SLV Schools Complex, businesses, residences, and transit; and improve traffic operations throughout Highway 9.

Notable projects include improvements to Glen Arbor bicycle and pedestrian connection and to traffic choke points, such as at the SLV Schools Complex and at Highway 9/Graham Hill Road. Projects immediate to the SLV Schools Complex include creating safe pedestrian and bicycle connection to the campus from Felton and Ben Lomond and improving campus access and traffic flow for traffic traveling past the campus.

4. Caltrans Project Initiation Documents (PID) for following:

- a. 05-1M400 Caltrans State Route 9 Felton Safety Improvements (Anticipated Draft Environmental Document expected July 2022 and construction start in October 2024)

The Caltrans PID 05-1M550 is supported by analysis of crash data to identify deficiencies in pedestrian access and facilities between Graham Hill Road and the San Lorenzo Valley High School. Multiple pedestrian related collisions have occurred within the most recent 5 years, including 2 fatal collisions. The project proposes to construct a sidewalk from the San Lorenzo High School to the intersection of Highway 9/Graham Hill Road on the southbound side of Highway 9. Additional pedestrian facilities improvements including pedestrian gap closures, crossings, and new sidewalks. Further, bicycle facilities considered include striping and signage to clearly indicate the existing Class III bike route. The PID further details the improvements at specific locations, the construction cost estimate, and the project delivery schedule.

- b. 05-1M550 Caltrans Complete Streets effort for all projects in Highway 9/SLV Plan

The 05-1M550 Caltrans Complete Streets was developed to improve multimodal use of the Highway 9 corridor by providing additional shoulder space for bicycle and pedestrians where feasible, improve bus stops, installing Class III bike routes and Class II bike lanes, installing sidewalks, installing multi-use paths, installing and enhancing crosswalks, and enhancing parking. The project consists of six segments on Highway 9 — Segment 2 contains the SLV Schools Complex from Graham Hill Road to Glen Arbor Road. The purpose for Segment 2 is to:

- Provide pedestrian and bicycle connections from Felton to SLV Schools Complex.
- Provide pedestrian and bicycle connection from Glen Arbor neighborhoods to SLV Schools Complex.
- Improve vehicle and transit circulation at SLV Schools Complex in coordination with the school circulation plan.

The proposed sidewalk along Highway 9 will require retaining wall and tree removal to connect the SLV High School and Elementary School entrances. Further partnership between SCCRTC and the school district will conclude with additional circulation solutions to address school and community concerns.

- c. 05-1K890 Caltrans Capital Preventative Maintenance (CAPM)

05-1K890 is a Capital Preventative Maintenance PID for repaving Highway 9 from Santa Cruz through Felton, which will incorporate many of the Complete Streets elements identified in the Hwy9/SLV Plan. Efforts in proximity to the SLV Schools Complex include roadway restriping and construction of a multiuse path and viaducts. The project closely aligns with the SLV Complete Streets Corridor to ensure continuous facilities along Highway 9.

5. San Lorenzo Valley Trail Feasibility Study (2006)

In 2006, County of Santa Cruz Public Works conducted a feasibility study of trails along the San Lorenzo Valley/Highway 9 corridor between Santa Cruz and Boulder Creek. The study evaluates existing conditions and opportunities for alternative routes to prepare improvement plans and cost estimates for the most feasible routes.

The recommended trail route from Felton north to Boulder Creek is the Highway 9 right-of-way. In order to enhance pedestrian and bicycle access along Highway 9, it is essential for improvements to address physical constraints, Caltrans design standards, and securing approval for facilities in the state right-of-way. Improvement concepts include several bypass alignments via Cooper Street, El Solyo Heights Drive, and Hacienda Way where the width of Highway 9 is inadequate for sidewalks and bicycle lanes.

6. Felton and Ben Lomond Town Plans

The Felton and Ben Lomond Town Plans were developed through a series of community workshops to identify needs for services and improvements and to establish guidelines for future public and private development in proximity to the town centers. Parallel goals between the Town Plans include improving the pedestrian environment, enhancing pedestrian and traffic safety, improving access to centers of social and commercial activity, and preserving the rural character of Felton and Ben Lomond.

The Town Plans proposed opportunities for improvements on Highway 9 as it relates to:

- Facilitating on-street parking efficiency.
- Improving middle turning lanes for access to businesses and to reduce congestion along Highway 9.
- Enhancing pedestrian safety and amenities through the development of crosswalks, pedestrian islands, continuous sidewalks, and increased landscaping.
- Managing the design of future development fronting Highway 9 such as reducing curb cuts to decrease conflicts at private driveways and Highway 9.
- Improving drainage on Highway 9.

7. Draft Santa Cruz County Active Transportation Plan

The Santa Cruz County Active Transportation Plan focuses on enhancing pedestrian and bicycle facilities in urbanized areas of unincorporated Santa Cruz County to encourage walking and biking for daily trips and recreation. Input from the community was utilized to identify transportation needs and opportunities. The goals and policies of the plan adopts Vision Zero strategies that seeks to eliminate severe traffic injuries and fatalities and promote active and shared modes of transportation. Recommendations in the plan were designed with complete street principles to support the safety and comfort of all roadway users. The plan provides development strategies, funding sources, and implementation and maintenance guidelines for future active transportation projects in the county.

A comprehensive list of future bicycle and pedestrian projects on county roadways includes projects from the Highway 9 San Lorenzo Valley Complete Streets Corridor Plan. This includes improvements at Glen Arbor Road, Hacienda Way, Graham Hill Road, and Fall Creek trail entrance.

8. Draft Caltrans District 5 Active Transportation Plan

The District 5 Active Transportation Plan aligns with the statewide bicycle and pedestrian plan and is part of a comprehensive planning process to identify locations with walking and bicycling needs along and across the State Highway System in Caltrans District 5. The Active Transportation Plan provides goals, priorities, and next steps for local and regional jurisdictions and stakeholders to identify projects, select improvements, and obtain project funding.

The plan identifies Highway 9, which serves as an intercommunity rural connector between Ben Lomond and Felton, as a priority area. Walking and bicycling needs along Highway 9 includes sidewalk gaps, pavement condition, sidewalks along higher-speed highways, stressful pedestrian crossings, and accessible crossings.

9. Santa Cruz METRO Short Range Transit Plan (2014)

The Santa CRUZ METRO Short Range Transit Plan (S RTP) assesses the strengths and weaknesses of the existing service design for fixed-routes and the Paratransit services and forecast future financial and capital needs. The plan provides a comprehensive review of transit services to ensure the bus network keeps up with demand, address the diversity of needs, and is sustainable. Input from the public and stakeholders was utilized to understand travel characteristics and needs. The S RTP includes short- and longer-range recommendations to provide a roadmap for the next five years for METRO. The S RTP provides a framework to address METRO's service needs for board members and METRO staff to identify which strategies to implement.

Route 33 and 34 operate only during the SLVUSD school term. As a result of low boardings per revenue hour and boardings per trip, the S RTP identify both routes to perform below

systemwide averages. Route 33 serves primarily as a local feeder to bring passengers from SLVHS and the Zayante Creek Market & Deli to Felton Faire, where transfers are available. Similarly, Route 34 is a feeder service from the SLV Schools Complex to transfers at Felton Faire. In addition to a low-density service area, Route 34 has a higher operating cost than local routes due to the distance from Santa Cruz. The SRTP proposes Route 34 to be a flexible or dial-a-ride service rather than a fixed-route service. Route 35 also services the San Lorenzo Valley and is the third largest route in the METRO system with the lowest boarding activity along the Glen Arbor detour. Route 35 provides supplemental weekday service, primarily during the SLVHS school term around bell times.

10. Santa Cruz METRO Comprehensive Operational Analysis (2016)

The Comprehensive Operational Analysis examines the transport service system-wide to provide overview of the existing METRO network, identify current successes and challenges in the service area, and present opportunities for maintaining and increasing ridership. The result from the evaluation contributes to the development of service alternatives and recommendations.

The Santa Cruz METRO provides three routes in San Lorenzo Valley: Route 33, 34, and 35. Routes 33 and 34 only operate when San Lorenzo Valley schools are in session. The two routes have low ridership counts, carrying 18 and 5 passengers respectively over two trips each. Currently these routes are operating with a smaller bus, but they may be candidates for conversion to a vanpool-type service as the routes operate in hilly terrain and do not carry significant passenger loads. Route 35 primarily operates from Santa Cruz to Scotts Valley and the San Lorenzo Valley. Due to low ridership north of Boulder Creek, limited services on each branch are considered to save resources.

11. Santa Cruz METRO Unmet Transit and Paratransit Needs List (2021)

In 2021, Santa Cruz METRO developed the Unmet Transit and Paratransit Needs List to evaluate programs and projects that address gaps or absences of ongoing of services, supplement of existing services, and the safety and comfort of all transit users. The Unmet Transit and Paratransit Needs List ranks the prioritization of need, goals, and strategies for transit services and pedestrian and bicycle connections to transit stops.

SANTA CRUZ COUNTY REGIONAL TRANSPORTATION COMMISSION

APPENDIX B: PROJECT FACT SHEETS





PROJECT FACT SHEET

July 2022

San Lorenzo Valley Schools Complex Circulation & Access Study

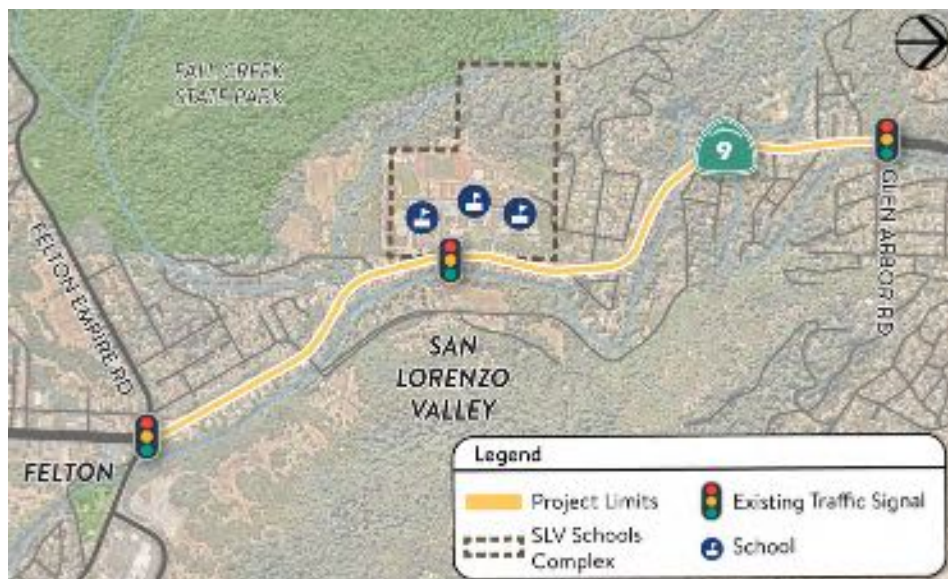
Project Description

The San Lorenzo Valley Schools Complex Circulation & Access Study (SLV Schools Access Study) seeks to improve access to the San Lorenzo Valley High School, Middle School, and Elementary School (SLV Schools). The SLV Schools Access Study will build upon the 2019 Highway 9/San Lorenzo Valley Complete Streets Corridor Plan (SLV Plan).

The SLV Schools Access Study covers three priority projects in the SLV Plan (projects #9, 10, and 11). The SLV Plan is a community-based plan, developed based on evaluation of existing corridor conditions, physical and regulatory constraints, and public outreach efforts to identify the needs of the community.

The study will work with Caltrans staff already evaluating opportunities to improve walking and cycling along Highway 9 between Felton and the SLV Schools in their 05-1M400 Safety Project, to align improvements at the SLV Schools with any Caltrans-led improvements along Highway 9 to the south.

In partnership with San Lorenzo Valley community members, the study is led by Santa Cruz County Regional Transportation Commission (RTC) and funded by state planning grants leveraged by Measure D, with additional funding support provided by San Lorenzo Valley Unified School District. Collaboration also includes representatives from the County of Santa Cruz, Santa Cruz Metropolitan Transit District (METRO), and Caltrans.



Project Highlights

- ▶ The project will build upon the 2019 Highway 9/San Lorenzo Valley Complete Streets Corridor Plan (SLV Plan).
- ▶ The project aims to improve access by walking, bicycling, transit, and car.
- ▶ In addition to improving circulation into and within the SLV Schools, the project will look to improve traffic flow along Highway 9 for non-school traffic.
- ▶ RTC recorded a public workshop hosted on June 8, 2022, and surveys were developed for public and school-related stakeholders. Input provided helps identify needs and consider potential improvements. Additional public outreach is planned as the project advances.

Project Schedule

PHASE	2022		
	SPRING	SUMMER	FALL
Public Engagement			
Existing Conditions			
Needs Analysis			
Engineering Concepts			
Next Steps			
Summary Report			



PROJECT FACT SHEET

December 2022

San Lorenzo Valley Schools Complex Circulation & Access Study

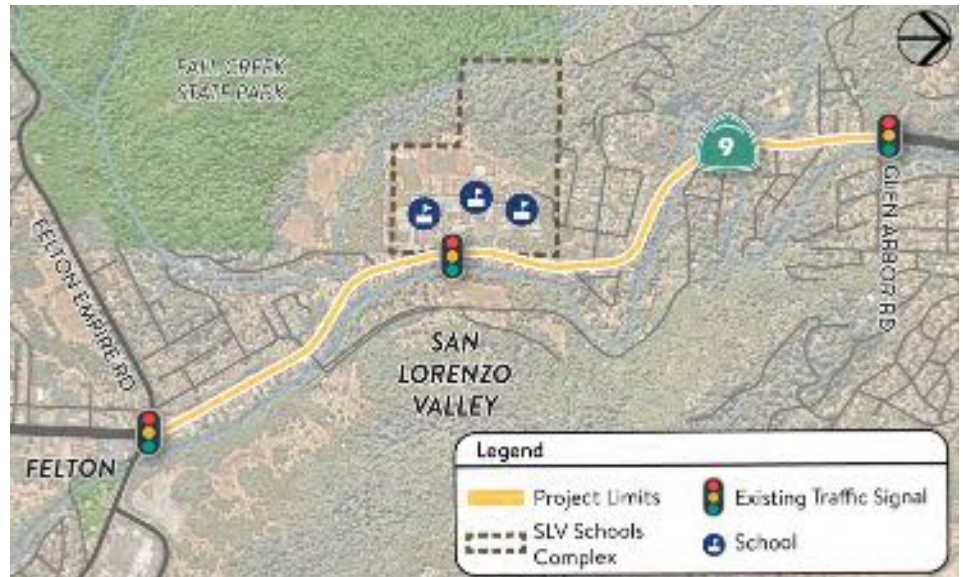
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The SLV Schools Access Study covers four priority projects in the SLV Plan (projects #9, 10, 11, and 12). The SLV Plan is a community-based plan, developed based on evaluation of existing corridor conditions, physical and regulatory constraints, and public outreach efforts to identify the needs of the community.

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- ▶ In addition to improving circulation into and within the SLV Schools, the project will look to improve traffic flow along Highway 9 for non-school traffic.
- ▶ RTC hosted public workshops on June 8, November 2, and November 3, 2022, and surveys were developed for public and school-related stakeholders. Input provided helps identify needs and consider potential improvements. Additional public outreach is planned as the project advances.

Project Schedule

PHASE	2022			
	SPRING	SUMMER	FALL	WINTER
Initial Public Engagement				
Draft Engineering Concepts				
Fall Public Engagement				
Engineering Concept Revisions				
Next Steps				
Summary Report				

Stay Involved! Community members are encouraged to stay involved and sign up to receive periodic updates on SLV plan implementation and projects in the corridor by visiting <https://sccrtc.org/slvplan>, emailing slvprogram@sccrtc.org, or by calling 831-460-3200.

SANTA CRUZ COUNTY REGIONAL TRANSPORTATION COMMISSION

APPENDIX C: ENGAGEMENT MATERIALS



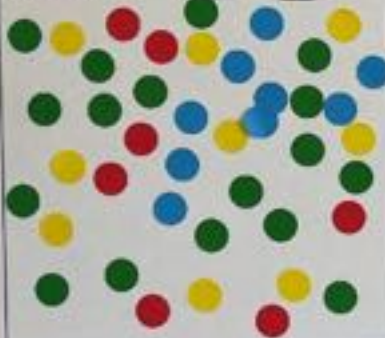
APPENDIX C CONTENTS

PAGES	CONTENT
1-2	Result Boards from SLV Elementary School Student Engagement Activity
3-5	Questions in Middle and High School Student Survey
6-8	Questions in SLV Faculty Survey
9-12	Questions in Parent/Public Survey
13-37	June 9, 2022, Virtual Public Workshop Presentation
38-56	November 2, 2022, Virtual Public Workshop Presentation
57-75	November 3, 2022, Presentation Slides
76-90	Result Boards from November 3, 2022, Workshop

WHAT KIND OF SNEAKER ARE YOU?

Place Sticker Under Your Favorite Choice

Running
Sneaker



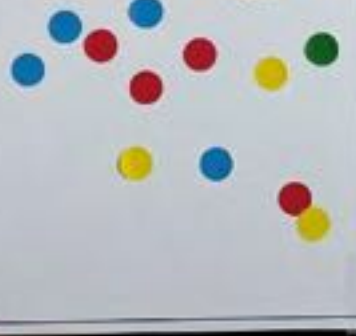
Skate
Sneaker



Casual
Sneaker



Fashion
Sneaker



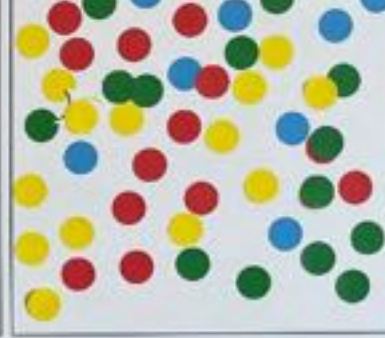
WHAT KIND OF BIKE ARE YOU?

Place Sticker Under Your Favorite Choice

Road
Bike



Mountain
Bike



Town
Bike



Beach
Cruiser



HOW I GOT TO SCHOOL TODAY

Place Sticker Under How You Arrived to School

I Walked
to School



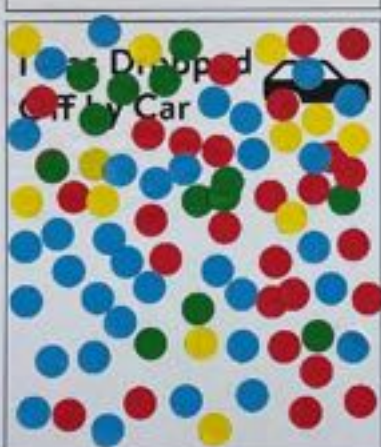
I Biked
to School



I Took the
School Bus



I Was Dropped
Off by Car



HOW I WILL GO HOME TODAY

Place Sticker Under How You Will Leave School

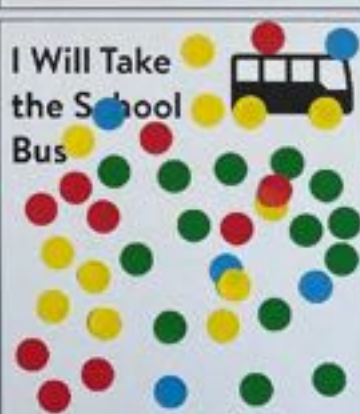
I Will Walk
Home



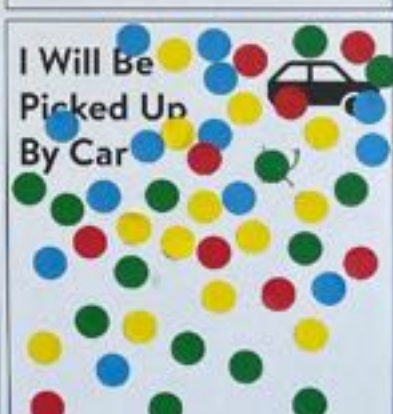
I Will Bike
Home



I Will Take
the School
Bus



I Will Be
Picked Up
By Car



SLV Schools Access Study: Middle/High School Survey

The SLV Schools Access Study is a project to improve access to the San Lorenzo Valley High School, Middle School, and Elementary School. The project will develop design options to enhance safety for all travel modes on Highway 9 and the schools' drop-off/pick-up zones, including people walking, bicycling, riding the bus, and driving.

Input from students is an important aspect of the project development process because they frequently travel throughout the campus area. We want to hear details from you about how, where, and why you choose to travel between school and other areas of the San Lorenzo Valley.

* Required

1. What grade are you in? *

- ☐ 6th
- ☐ 7th
- ☐ 8th
- ☐ 9th
- ☐ 10th
- ☐ 11th
- ☐ 12th

Arriving to School Campus

The following 3 questions are related to how you arrive at school in the morning.

2. How do you arrive to school in the morning? *

- ☐ Walk
- ☐ Bike, scooter, or other wheeled device
- ☐ Santa Cruz METRO Bus
- ☐ School District Bus
- ☐ Drive myself
- ☐ Drop off by car at the school campus
- ☐ Drop off by car near the school campus
- ☐ Other

3. Are you carpooling to school in the morning? *

- ☐ No, I am dropped off alone
- ☐ Yes, I am dropped off with people in my family (siblings, cousins, etc.)
- ☐ Yes, I am dropped off with people outside my family (neighbors, friends, etc.)

4. What transportation challenges do you face when arriving on school campus? *

Leaving School Campus

The following 4 questions are related to how you leave school campus in the afternoon

5. How do you leave school in the afternoon? *

- ☐ Walk
- ☐ Bike, scooter, or other wheeled device
- ☐ Santa Cruz METRO Bus
- ☐ School District Bus
- ☐ Drive myself
- ☐ Pick up by car at the school campus
- ☐ Pick up by car near the school campus
- ☐ Other

6. Are you carpooling from school in the afternoon? *

- ☐ No, I am picked-up alone
- ☐ Yes, I am picked-up with people in my family (siblings, cousins, etc.)
- ☐ Yes, I am picked-up with people outside my family (neighbors, friends, etc.)

7. What are transportation challenges do you face when leaving the school campus? *

8. Where do you travel to after school? *

- ☐ North towards Glen Arbor Road
- ☐ South towards Graham Hill Road
- ☐ Other

School Campus and Other Destinations

The following two questions will help prioritize connections between school campus area and other local

9. Would you walk or bike between school and these locations if there was a trail or dedicated path connecting with the school? *

	No	Maybe	Yes	I don't know where this is
Home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Downtown Felton	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fall Creek Drive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felton Empire Road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Glen Arbor Road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Where do you live in comparison to campus? *

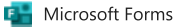
- ☐ North of Glenn Arbor Road Signal
- ☐ Between Felton and Glenn Arbor Road
- ☐ Past Felton Empire Road-Graham Hill Road Signal

Final Question

Please provide any opinions related to walking, bicycling, riding the bus, travel by motor vehicle and

11. What types of transportation improvements would you like to see around the school campus? *

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SLV School Circulation & Access Study: Faculty Survey

Please answer five questions related to **issues**, and five questions related to **solutions** for the following modes: personal vehicles, bicyclists, pedestrians, school district busses, and Santa Cruz Metro busses.

* This form will record your name, please fill your name.

1. What is your association with the school?

- ☐ Administrative Staff
- ☐ Teacher
- ☐ Campus/Yard Duty
- ☐ District Bus Driver
- ☐ Metro Bus Driver

☐

Other

Key Issues

Please tell us about key issues; such as compliance with rules, bottlenecks, safety hazards, etc.

2. What are the key issues related to school circulation and access for **personal vehicles**?

3. What are the key issues related to school circulation and access for **bicyclists**?

4. What are the key issues related to school circulation and access for **pedestrians**?

5. What are the key issues related to school circulation and access for **school district busses**?

6. What are the key issues related to school circulation and access for **Santa Cruz Metro busses**?

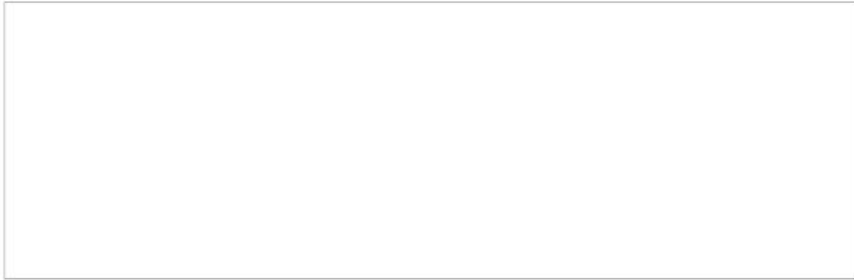
Solutions

Please tell us about solutions, such as remote drop off locations, limiting vehicles access to campus, pedestrian-only zones, etc.

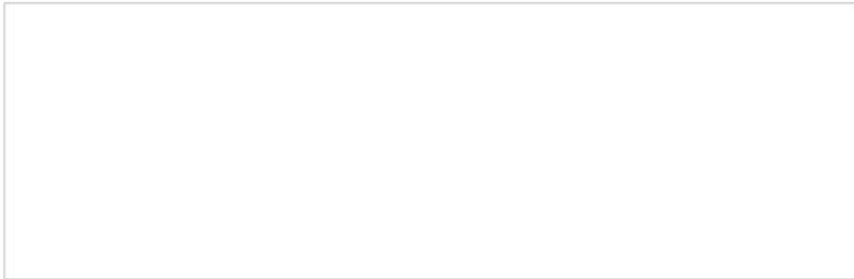
7. What types of solutions do you see possible for **personal vehicles**?

8. What types of solutions do you see possible for **bicyclists**?

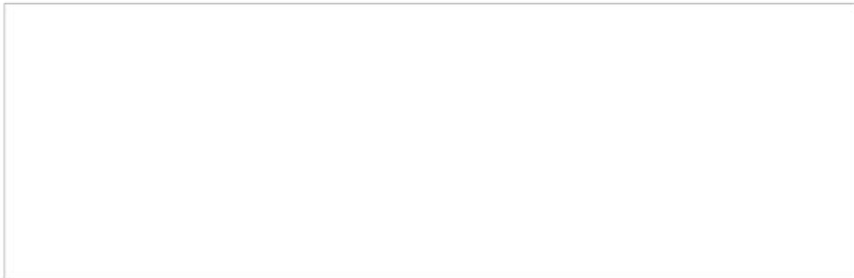
9. What types of solutions do you see possible for **pedestrians**?




10. What types of solutions do you see possible for **school district busses**?



11. What types of solutions do you see possible for **Santa Cruz Metro busses**?



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 Microsoft Forms

SLV Schools Access Study: Public Survey



The San Lorenzo Valley Schools Complex Circulation & Access Study (SLV Schools Access Study) seeks to improve access to the San Lorenzo Valley High School, Middle School, and Elementary School (SLV Schools Complex). The SLV Schools Access Study will build upon the 2019 Highway 9/San Lorenzo Valley Complete Streets Corridor Plan (SLV Plan) and aims to improve access by walking, bicycling, transit, and car. The study will also look to improve traffic flow along Highway 9 for non-school traffic.

The SLV Schools Access Study covers three priority projects in the SLV Plan (projects #9, 10, and 11). The SLV Plan is a community-based plan, developed based on evaluation of existing corridor conditions, physical and regulatory constraints, and public outreach efforts to identify the needs of the community. With extensive input from surveys, focus groups, and at public meetings from 2017 to 2019 the SLV Plan was adopted June 27, 2019. With the primary goal of increasing safety for users of Highway 9 and connecting county roads to by improving facilities for all modes of transportation on the corridor, the SLV Plan also prioritized actions to address key transportation challenges.

In partnership with San Lorenzo Valley community members, the study is led by Santa Cruz County Regional Transportation Commission (RTC) and funded by state planning grants leveraged by Measure D, with additional funding support provided by San Lorenzo Valley Unified School District.

Tell Us About You

1

Did you participate in engagement activities associated with development of the Hwy 9/SLV Plan?

- ☐ Yes
- ☐ No

2


What are your reasons to travel on Highway 9?

- ☐ Work Commute
- ☐ Access to Schools
- ☐ Access to Shopping
- ☐ Business Related
- ☐ Other

3

What are the challenges you experience while traveling on Highway 9?

4



Caltrans recently added Rectangular Rapid Flashing Beacons (RRFB's) at crosswalks along Highway 9. Have the new RRFB's helped improve conditions for people crossing the roadway?

- ☐ Yes
- ☐ No
- ☐ Other

Potential Improvements

5

Which of the following policies or solutions would you like explored further near the 3 SLV schools (SLV Elementary, Middle, and High School):

- ☐ Improve **campus entrances** for walking and pedestrian crossing facilities.
- ☐ Addition of sidewalks for walking **on Highway 9**.
- ☐ Shoulder improvements for bicycling **on Highway 9**.
- ☐ Addition of path for walking **on school campus** next to Highway 9.
- ☐ Improved district bus and transit bus only areas **on school campus**.
- ☐ Improved transit bus stops **on Highway 9**.
- ☐ Designation of remote pick-up/drop-off locations **near school campus** where students would walk the remaining short distance.
- ☐ More car drop-off areas **at school entrances** in exchange for less parking.
- ☐ Restrictions on the volume of students driving to the High School campus.
- ☐ **Combine** traffic circulation for Elementary & High School pick-up/drop-off zones and parking lots.
- ☐ **Separate** traffic circulation for Elementary & High School pick-up/drop-off zones and parking lots.
- ☐ **Separate** student-driver traffic from parent/guardian pick-up traffic exiting the campus in the afternoon.
- ☐ Modification of traffic signal operations **at the High School Driveway** (more green time, etc.).
- ☐ Restrict turning traffic **at the High School Driveway** to create exit-only lanes.
- ☐ Add right-turn pockets **on Highway 9** into school driveways.
- ☐ Improved traffic access **on El Solyo Drive and Hacienda Way** to access the Middle School.
- ☐ New car access point **on School Campus** onto Highway 9.
- ☐ Other

6

Do you have a child who is a student at SLV Elementary School, SLV Middle School, or SLV High School?

- ☐ Yes
- ☐ No

School Parent/Guardian Questions

7

Which school does your child (children) currently attend? (select multiple answers for multiple children, only)

- ☐ Pre-school
- ☐ Kindergarden
- ☐ Elementary School
- ☐ Middle School
- ☐ High School

8

How often do you travel between multiple pick-up/drop-off zones in a single trip?

- ☐ Daily
- ☐ Several times a week
- ☐ Once a week
- ☐ Once a month
- ☐ Never

9

What are challenges within the school pick-up/drop-off area?

10

What challenges limit the use of School District buses and/or Santa Cruz METRO bus service?

11

What challenges would you like improved to allow your student/child to walk or bicycle to school alone?

12

What challenges would you like improved to allow your student/child to walk or bicycle to school within a group of students?

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SLV SCHOOLS COMPLEX
▶▶▶ ACCESS STUDY



SLV Schools Circulation and Access Study

Virtual Community Workshop

Thursday June 9, 2022

6:00 – 7:30 PM

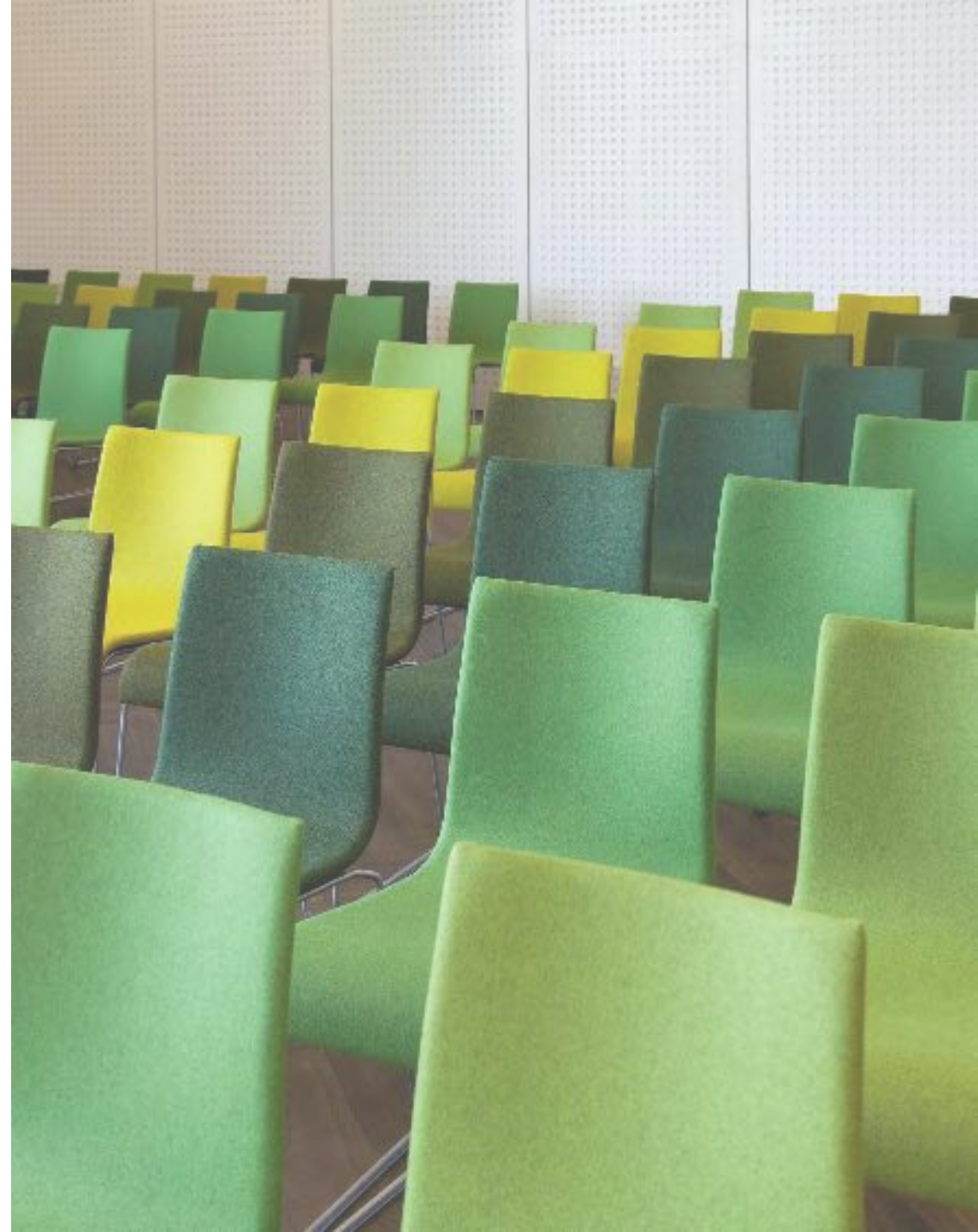


Virtual Meeting Guidelines

This meeting is being recorded.

Questions

- ☐ There will be a dedicated Q&A Session at the end of the workshop.
- ☐ If you have any questions during the meeting, type them into the chat box (visible to co-hosts)
- ☐ Disruptions may warrant removal from the meeting.



Agenda

- Welcome & Introduction (RTC)
- Completed and Ongoing Projects in SLV (Caltrans & Consultant)
- Project Background, Goals, and Schedule
- SLV Schools Access Study Existing Conditions & Potential Improvements
- Q&A Forum
- Next Steps



Completed Projects and Ongoing Projects in the SLV Complete Streets Corridor Program



Completed Projects

In December 2020 Caltrans completed safety upgrades funded by Measure D leveraged grants to five Highway 9 crosswalks.

Rectangular Rapid Flashing Beacons (RRFB's) were installed at:

1. Redwood Drive/Henry Cowell Entrance
2. Felton Midblock Crossing at Wild Roots
3. SLV Elementary
4. Lazy Woods Road
5. Clear Creek Road/Brookdale Post Office



Completed Projects

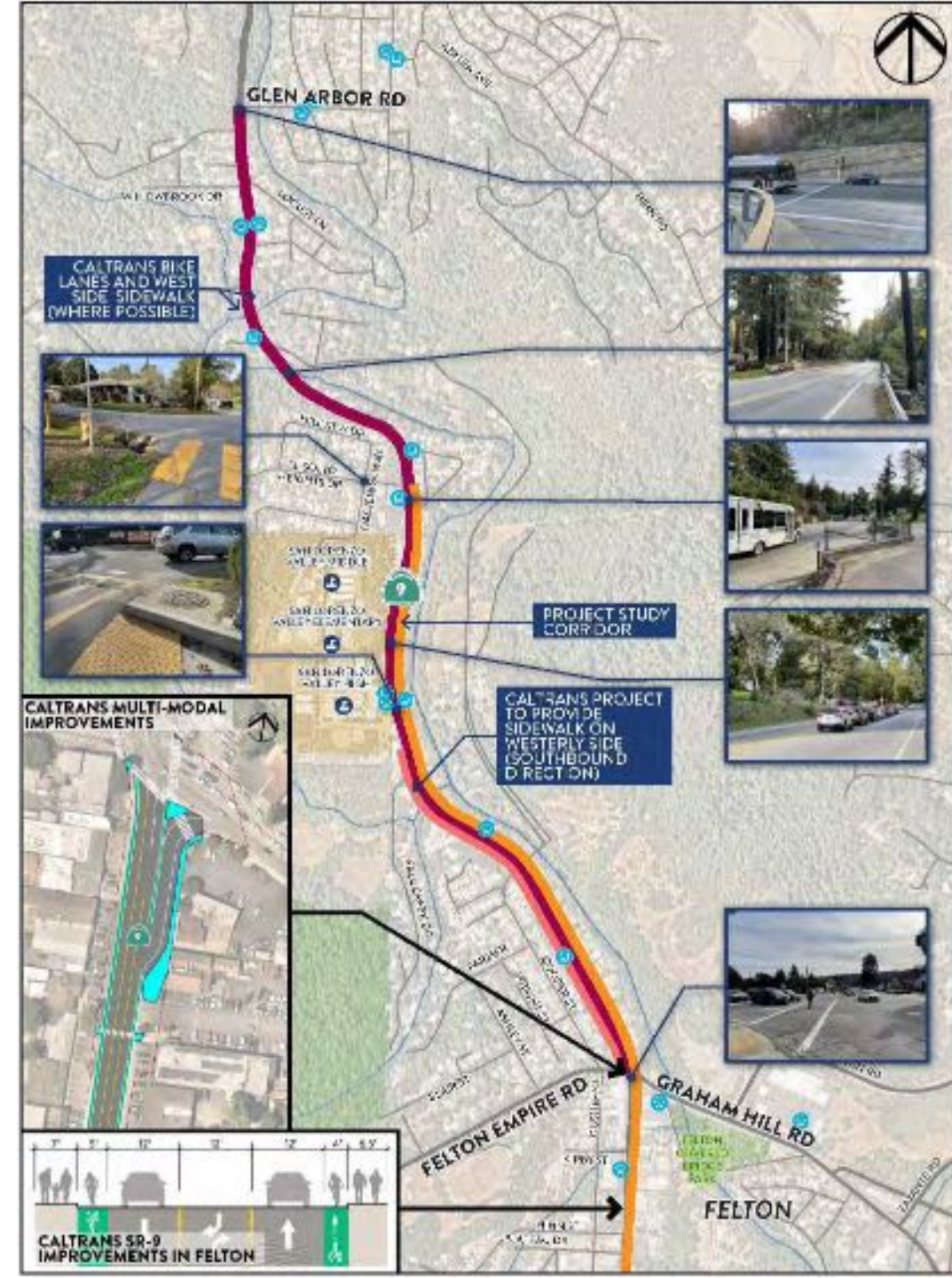
County of Santa Cruz and RTC:

1. Installed alternative route signage along Fall Creek Drive and Clearview Place parallel routes to Felton.
2. Repaved spot locations along these alternative routes using funding from Measure D.



Ongoing Projects

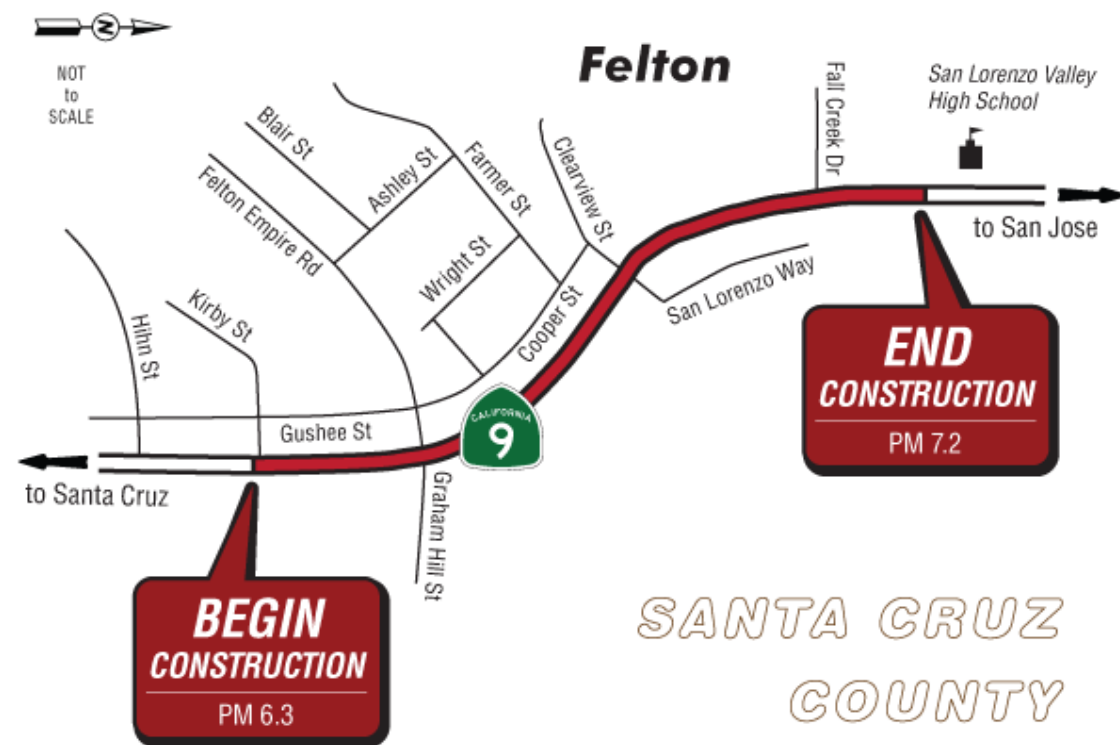
- SLV Schools Access Study
- State Route 9 Felton Safety Improvements
- Caltrans SR-9 Multimodal Improvements in Felton
- Boulder Creek Complete Streets Improvements (*not shown on map*)



Ongoing Projects

State Route 9 Felton Safety Improvements

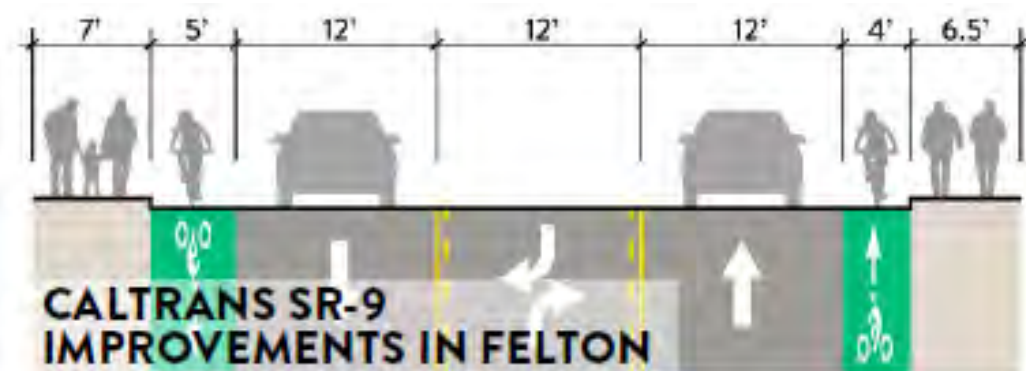
- Construct a sidewalk from the San Lorenzo Valley High School toward the Highway 9/Graham Hill Road intersection on the southbound side of Route 9.
- Signage and/or rapid flashing pedestrian beacon improvements will be evaluated for the project.
- Design details will be further evaluated during the (PA/ED) Project Approval and Environmental Document phase of the project.
- Caltrans Project ID: 05-1M400



Ongoing Projects

Caltrans SR-9 Multimodal Improvements in Felton

- Capital Preventative Maintenance (CAPM) PID for repaving Highway 9 from Santa Cruz through Felton.
- Will incorporate many of the Complete Streets elements identified in the Hwy9/SLV Plan including sidewalks, bike lanes, and a center turning lane.
- Caltrans Project ID: 05-1K890



Ongoing Projects

Boulder Creek Complete Streets Improvements

- Boulder Creek Complete Streets (SLV Plan Projects 23-26) have been identified as another high priority set of projects. Though further design and funding is needed, improvements could include:
 - Improved and expanded sidewalks
 - Curb extension “bulb outs” at crosswalks
 - Center landscape islands
 - Parking and bike improvements
 - Potential stop control at Bear Creek Road
- RTC has applied/is applying for multiple funding sources for this high priority project package



SLV Schools Access Study Project Background, Goals, and Schedule



Project Partners

In partnership with San Lorenzo Valley community members, the study is

- Led by Santa Cruz County Regional Transportation Commission (RTC)
- Funded by state planning grants, Measure D, and San Lorenzo Valley Unified School District.

Additional Agency Partners include:

- Caltrans
- County of Santa Cruz
- Santa Cruz Metropolitan Transit District (METRO).

**Santa Cruz
Regional
Transportation
Commission
(RTC)**

Project Lead



**San Lorenzo
Valley Unified
School District
(SLVUSD)**

Project
Team



**County of Santa
Cruz (County)**

Collaborator



**Santa Cruz
Metropolitan
Transportation
District (METRO)**

Collaborator



**California
Department of
Transportation
(Caltrans)**

Collaborator



SLV Community

Input &
Feedback



**Mark Thomas
(MT)**

Consultant



**Fehr & Peers
(F&P)**

Consultant



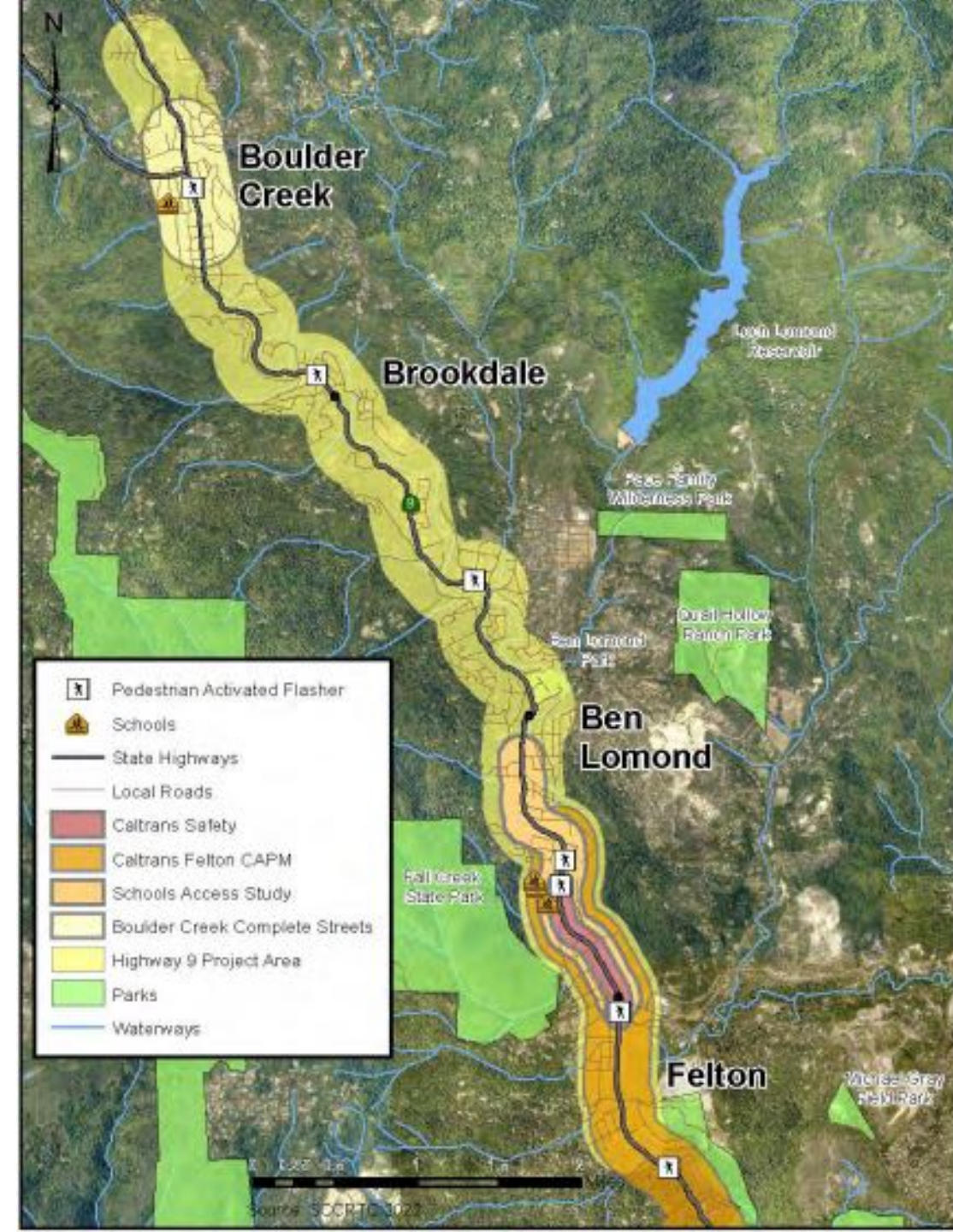
Project Background and Goals – 2019 Plan

The 2019 Highway 9/San Lorenzo Valley Complete Streets Corridor Plan (2019 SLV Plan) goals included:

- Enhance safety along Highway 9 and connecting county roads
- Better bike and pedestrian access to town centers
- Improve transportation facilities

The 2019 SLV Plan included extensive input between 2017 & 2019 including:

- Surveys
- Focus group meetings
- Public meetings



Project Background and Goals – School Study

The SLV Schools Access Study will:

- Build upon four high-priority projects in the 2019 SLV Plan (Projects 9-12)
- Review traffic operations at 3 schools:
 - SLV High School
 - SLV Middle School
 - SLV Elementary School
- Identify improvements for school access by walking, bicycling, transit, and car.
- Evaluate potential changes to school circulation and parking.
- Improve traffic flow along Highway 9 for non-school traffic.



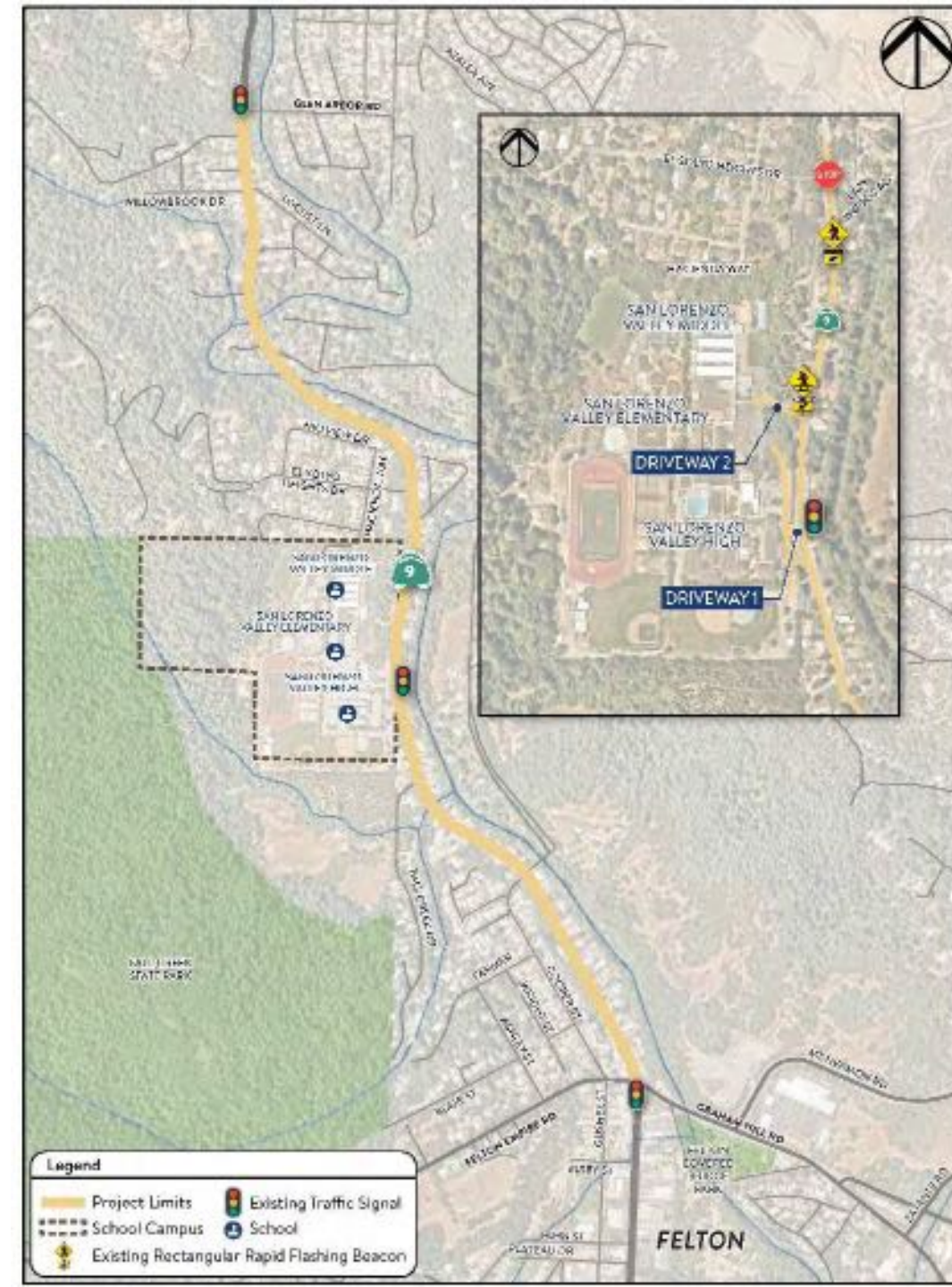
Project Background and Goals

The SLV Schools Access Study project area includes:

- Highway 9 between the south intersection with Glen Arbor Road and Graham Hill Road (Caltrans Post Mile (PM) 6.46 to 8.11)
- Site access and circulation at the three SLV schools.

The SLV Schools Access Study will:

- Collaborate with Caltrans staff
- Account for Caltrans plans for west side sidewalk between schools and Felton (05-1M400 Safety Project)
- Coordinate improvements at the Schools Complex with Caltrans project ideas



Project Schedule

Phase	2022		
	Spring	Summer	Fall
Public Engagement			
Existing Conditions			
Needs Analysis			
Engineering Concepts			
Next Steps			
Summary Report			

Academic Year 21-22

Academic Year 22-23

SLV Schools Access Study Potential Improvements

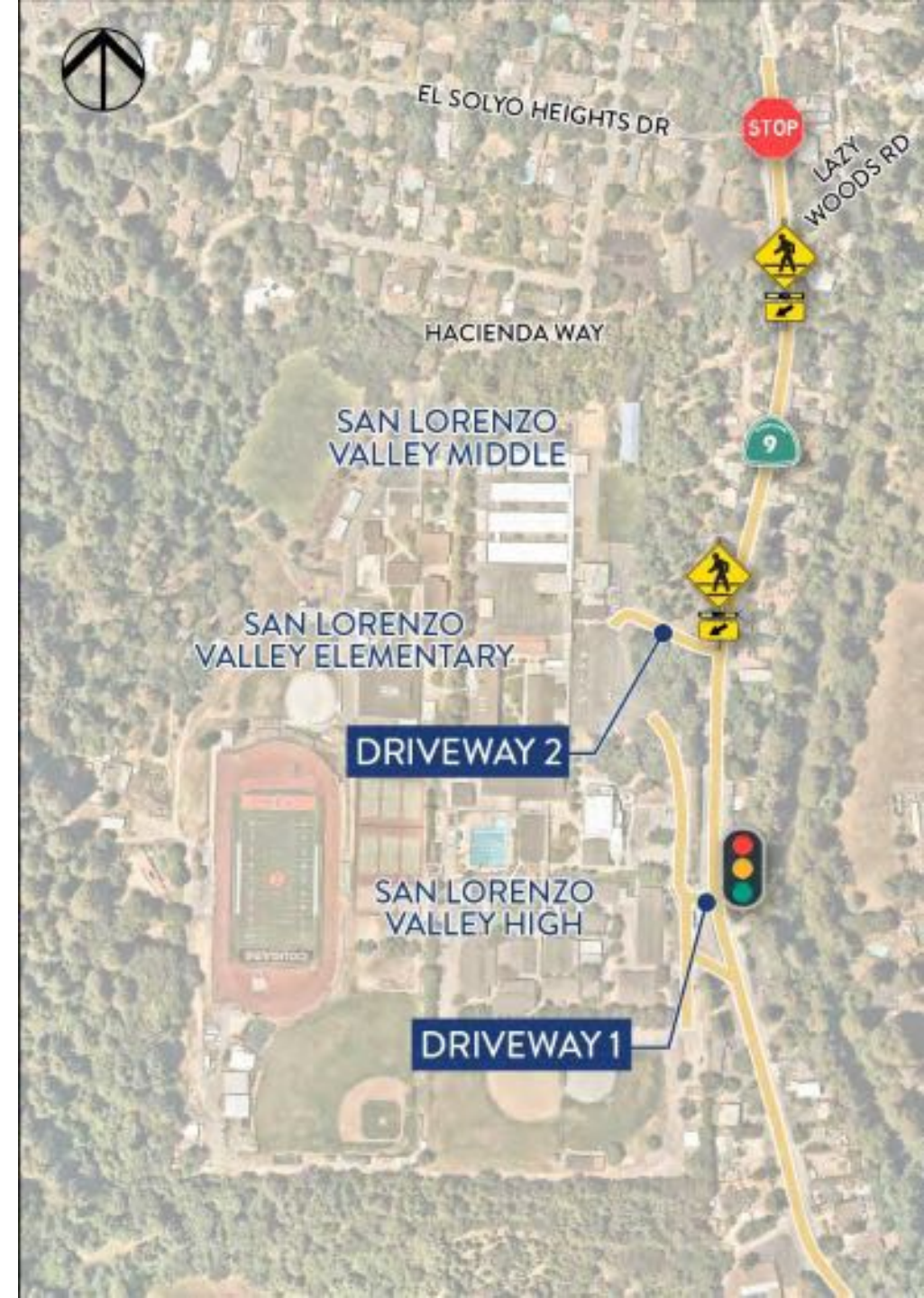


SLV Schools Access Study

Existing Conditions

Traffic Patterns and Safety

- Roughly similar levels of traffic at Driveway 1, Driveway 2 and El Solyo Heights Drive
 - Though Driveway 1 (High School Entrance) has slightly higher traffic than the other two intersections
- About 60% of school traffic comes from & then returns toward Felton
- 49 injury collisions reported along Highway 9 in the study area (between the south intersection with Glen Arbor Road and Graham Hill Road) between 2015-2019
 - One pedestrian fatality
 - Three total pedestrian crashes



SLV Schools Access Study Potential Improvements

Pedestrian and Bicycle Improvements

- ☐ Improve pedestrian facilities at school entrances.
- ☐ Add sidewalks on Highway 9 to Felton and Glen Arbor.
- ☐ Shoulder bike improvements on Highway 9 to Felton and Glen Arbor.
- ☐ Pedestrian connection between high school and elementary school entrances.

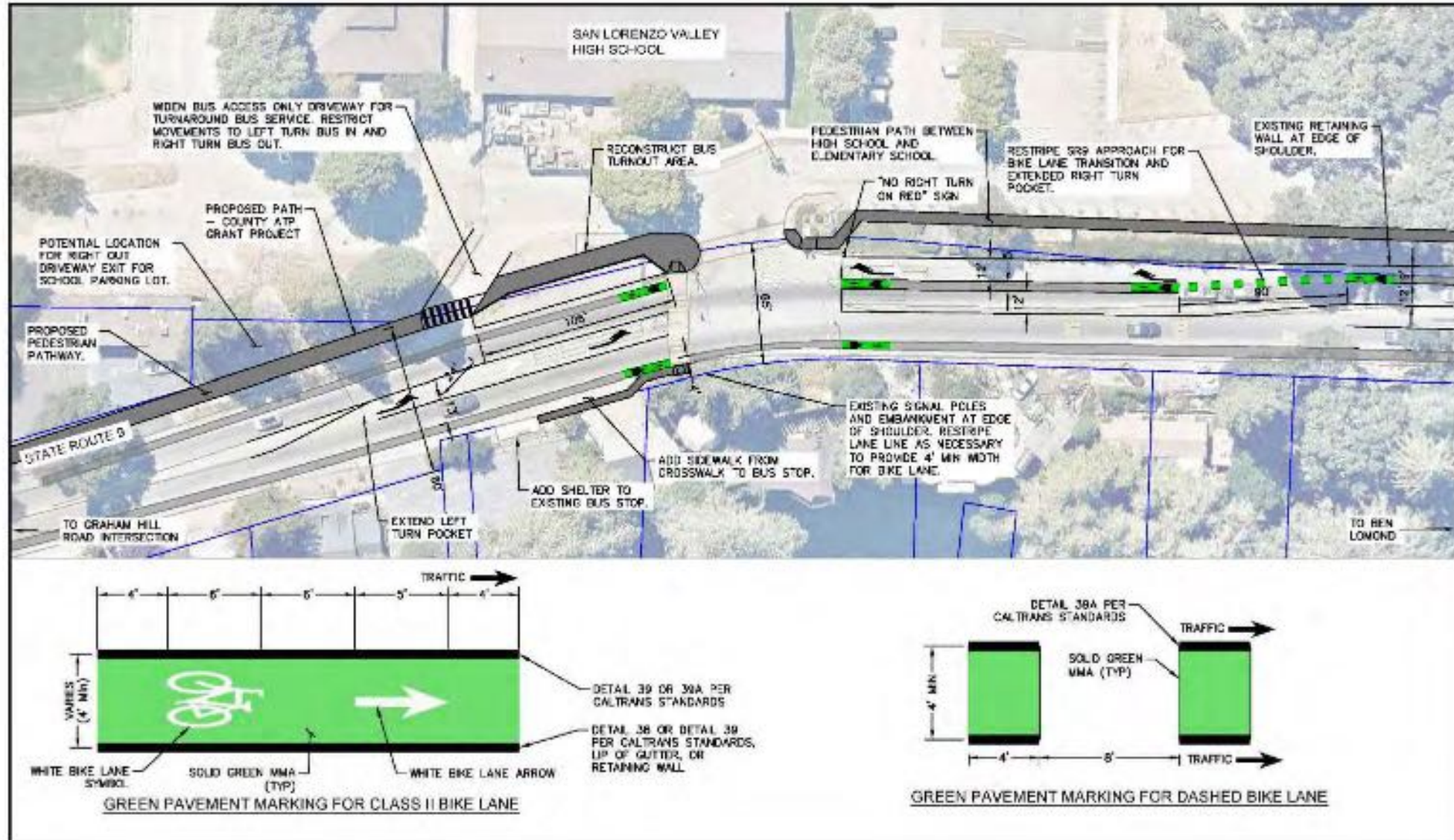
School Bus and Transit Improvements

- ☐ Improved bus only areas within Schools.
- ☐ Improved METRO stops.
- ☐ Remote pick-up/drop-off locations near the Schools.

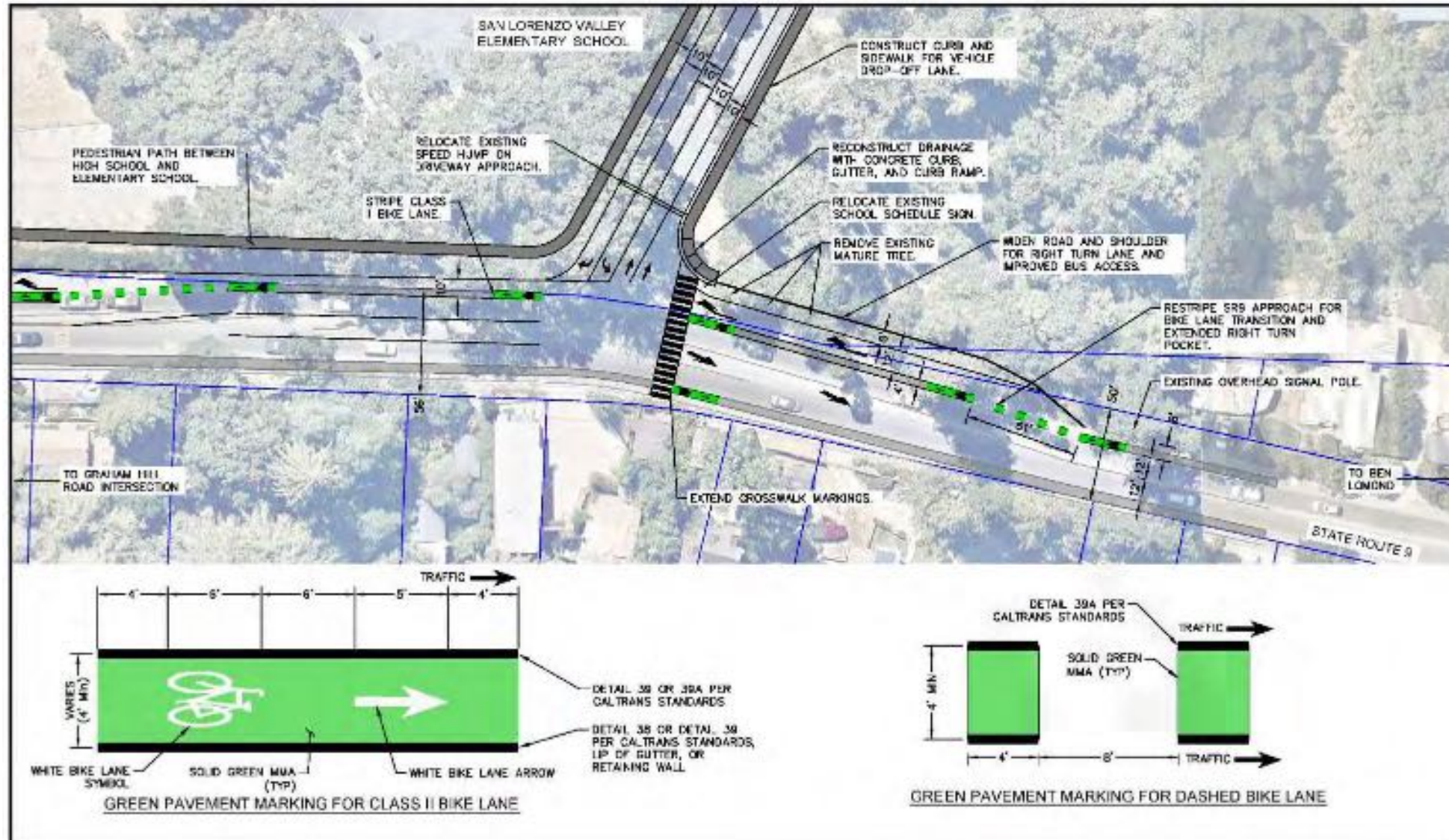
Personal Vehicle Improvements

- ☐ More designated car drop-off areas on school property.
- ☐ Reduce volume of students driving to High School.
- ☐ Improve traffic circulation between Elementary & High School.
- ☐ Modification of traffic signal operations.
- ☐ Add right-turn pockets on Highway 9 into schools.
- ☐ Improve traffic access on El Solyo Heights Drive.
- ☐ New car access point from schools to Highway 9.

Improvement Ideas from SLV Plan



Improvement Ideas from SLV Plan



Next Steps

The project team is collecting feedback on transportation challenges and opportunities surrounding the SLV Schools Complex:

Public Survey

Take the Survey here or on the SLV Plan website below:



Project Website / Join the Email List

Visit the website and sign up for notifications:

<https://sccrtc.org/slvplan>



**Add your Questions,
Concerns, and Ideas into the
Zoom Chat Box for Discussion**



Next Steps

Summer 2022

- Review Public Survey Results
- Advance Engineering Concepts
- Refine Concepts with Project Partners

Fall 2022

- Solicit Public Feedback on Project Concepts
- Finalize Summary Report with Actions

Additional Questions and Follow-up

Contact Paul Martin

pmartin@markthomas.com



SLV SCHOOLS COMPLEX
▶▶▶ ACCESS STUDY



Draft Concepts for the SLV Schools Access Study

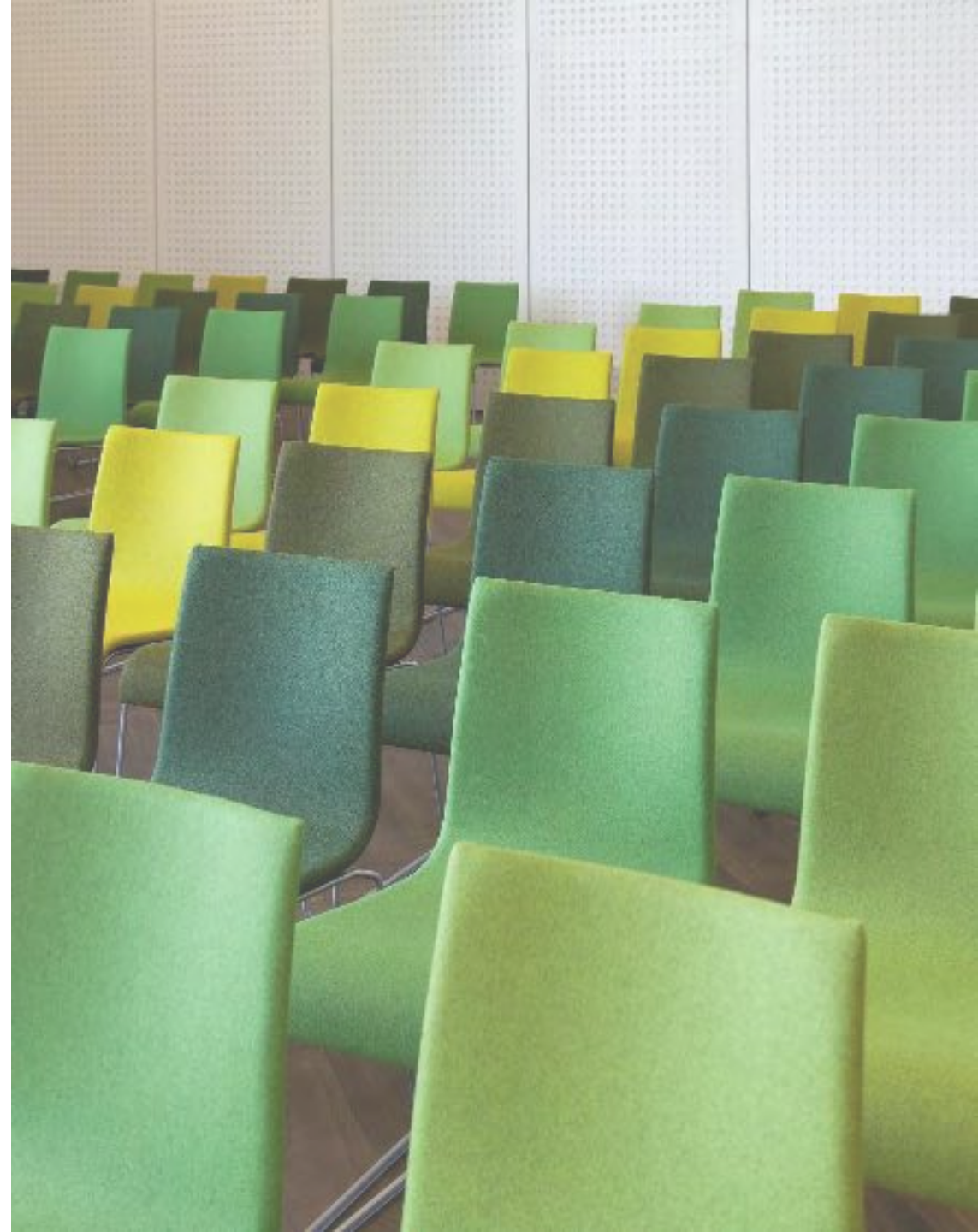
Community Workshop

Wednesday, November 2, 2022



Agenda

- Felton Pedestrian Safety Project Status Update by Caltrans
- Project Background
- Public Engagement
- Engineering Concepts
- Phasing Plan
- Collaboration
- Next Steps and Action Items
- Question & Answer



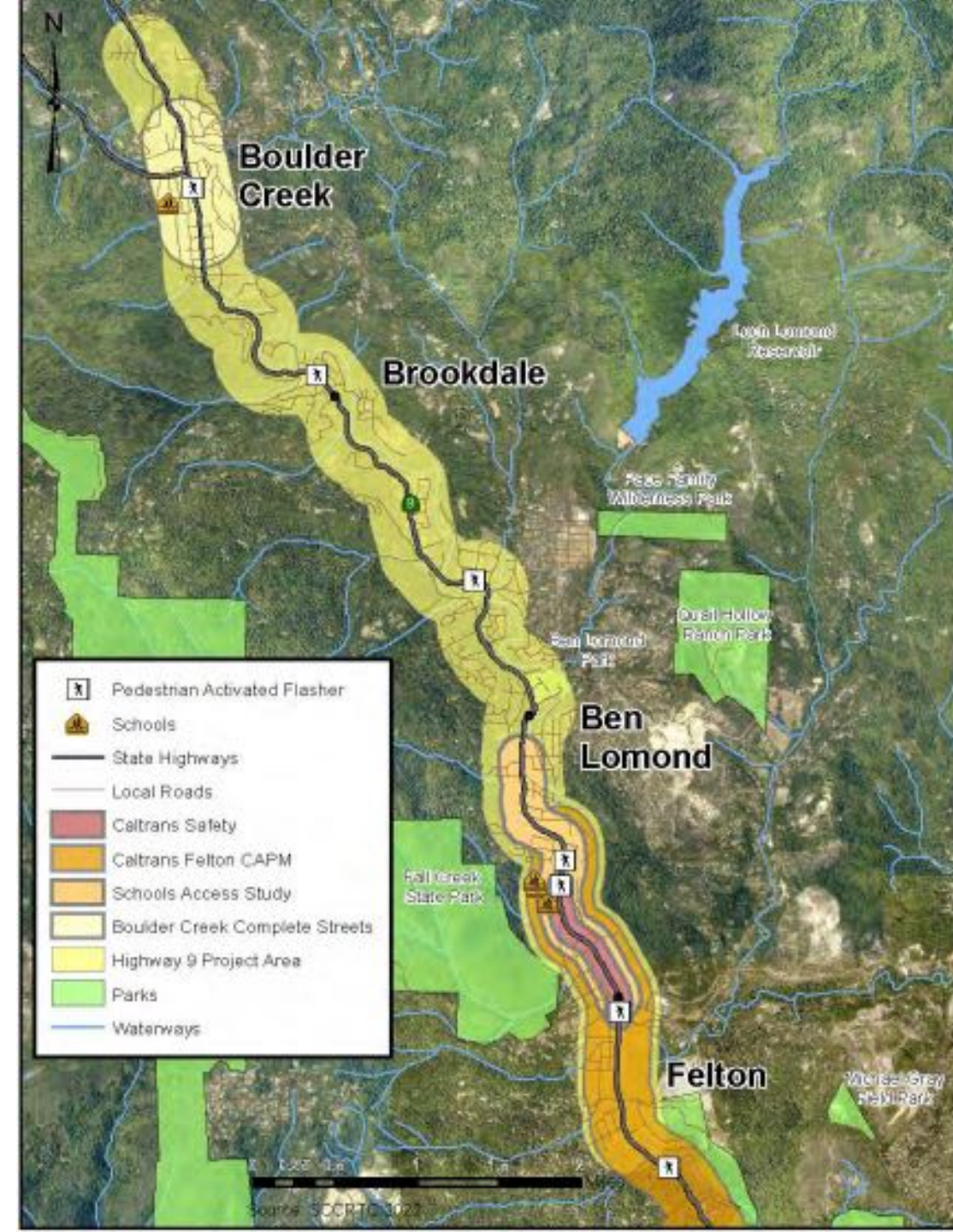
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- Enhance safety for all users along Highway 9 and connecting county roads
- Improve bike and pedestrian access to and within town centers and schools
- Improve multimodal transit access

The SLV Plan included extensive input between 2017 & 2019 including:

- Surveys
- Focus group meetings
- Public meetings



Project Background and Goals – School Study

The SLV Schools Access Study will:

- Build upon projects 9, 10, 11, and 12 in the SLV Plan
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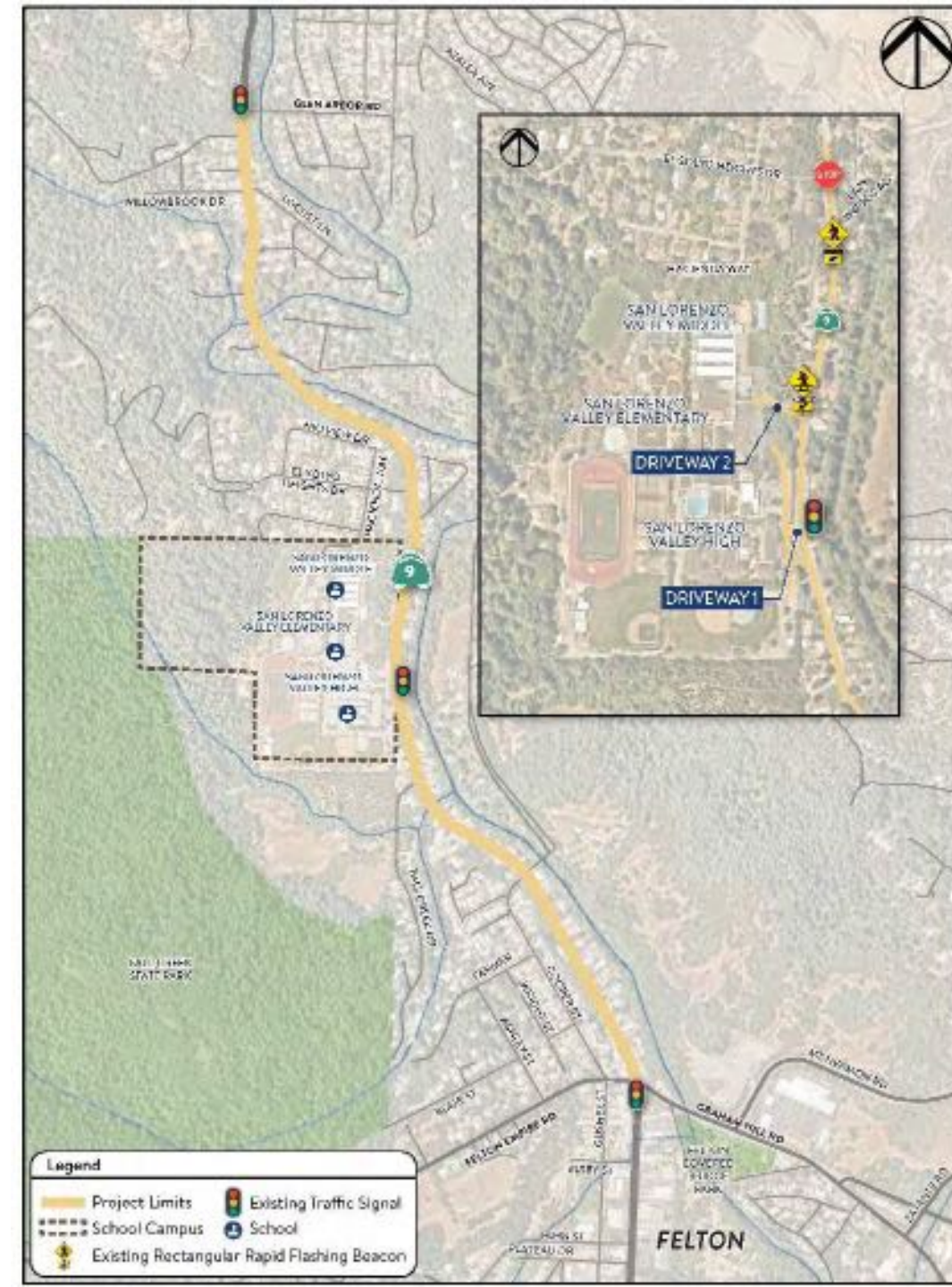
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Recent Public Engagement Activities

- Elementary School Input
 - May 23, 2022
 - 113 Student Participants
- Middle/High School Survey
 - May 17 to June 1, 2022
 - 105 Student/Parent Participants
- School Staff Survey
 - May 25 to June 5, 2022
 - 21 Staff Participants
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 - May 25 to June 30, 2022
 - 201 Participants

1

Did you participate in the 2017-2019 community engagement activities associated with development of the SLV Plan?

9

Highway 9
San Lorenzo Valley
Complete Streets
Corridor Plan



2019



☐ Yes
☐ No
☐ Unsure

Challenges

Please tell us about challenges you have observed; such as compliance with rules, bottlenecks, safety hazards, etc.

2. What are the challenges related to school circulation and access for **personal cars**?

Enter your answer

3. What are the challenges related to school circulation and access for **bicycles**?

Enter your answer

Recent Engagement Feedback

- Response concerns received:
 1. Need improved access between Highway 9 and SLV school campuses;
 2. Lack of walking and bicycling facilities;
 3. Congestion during student pick-up and drop-off.
- Some favored policies and solutions:
 1. Sidewalks on Highway 9 from the South (Felton);
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 3. Shoulder improvements for bicycling on Highway 9 from the South (Felton).



Recent Engagement Feedback

- SLV parents support additional bus service and enhancing stop amenities.
- Students are interested in enhancing walking and bicycling near campus.
- Staff are interested in separation between bus/transit vehicles and passenger vehicles.
- Dedicated space for walking and bicycling is highly favored.



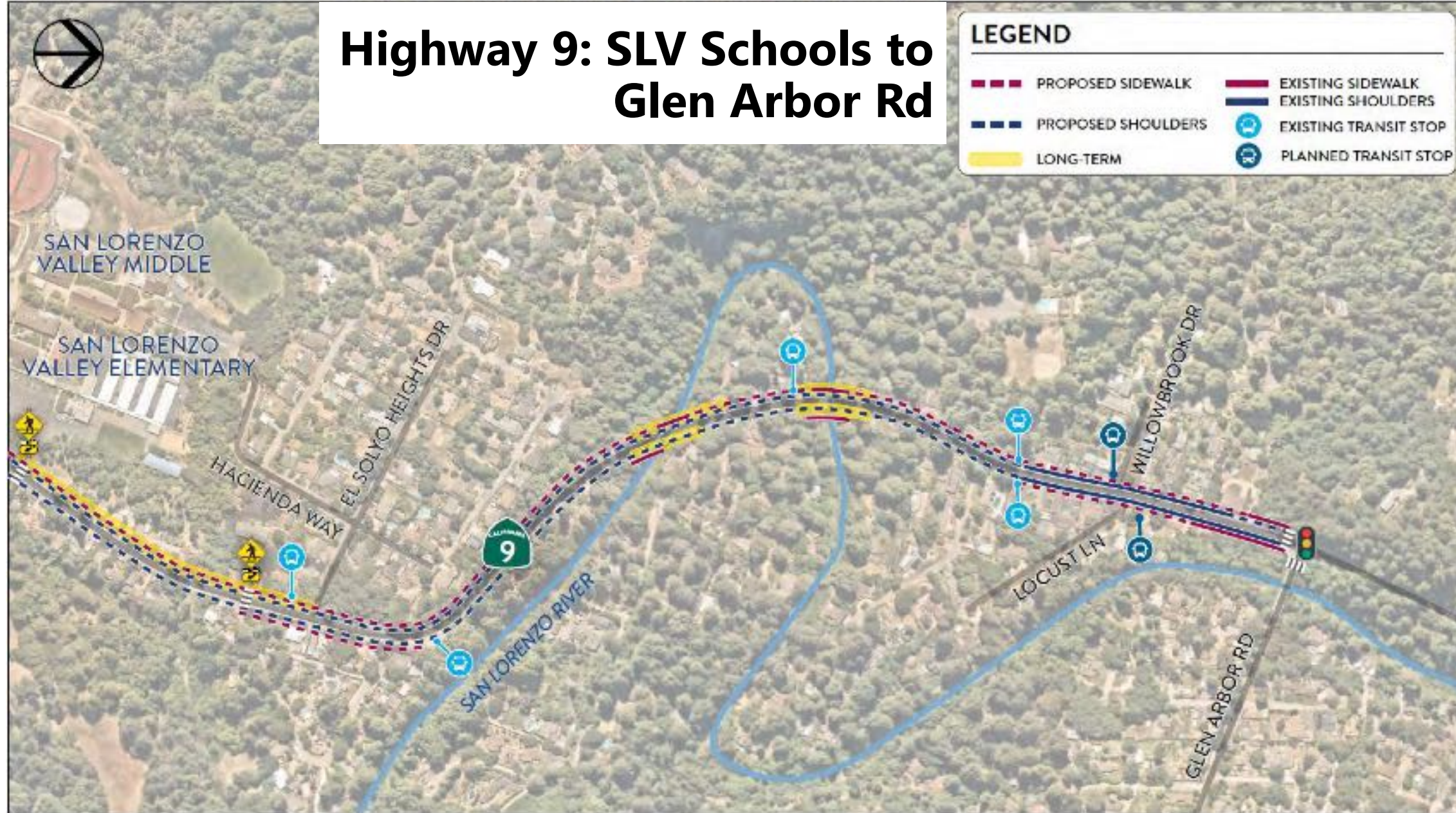
Highway 9: Graham Hill Rd to SLV Schools



Highway 9: SLV Schools to Glen Arbor Rd

LEGEND

- | | | | |
|---|--------------------|---|-----------------------|
|  | PROPOSED SIDEWALK |  | EXISTING SIDEWALK |
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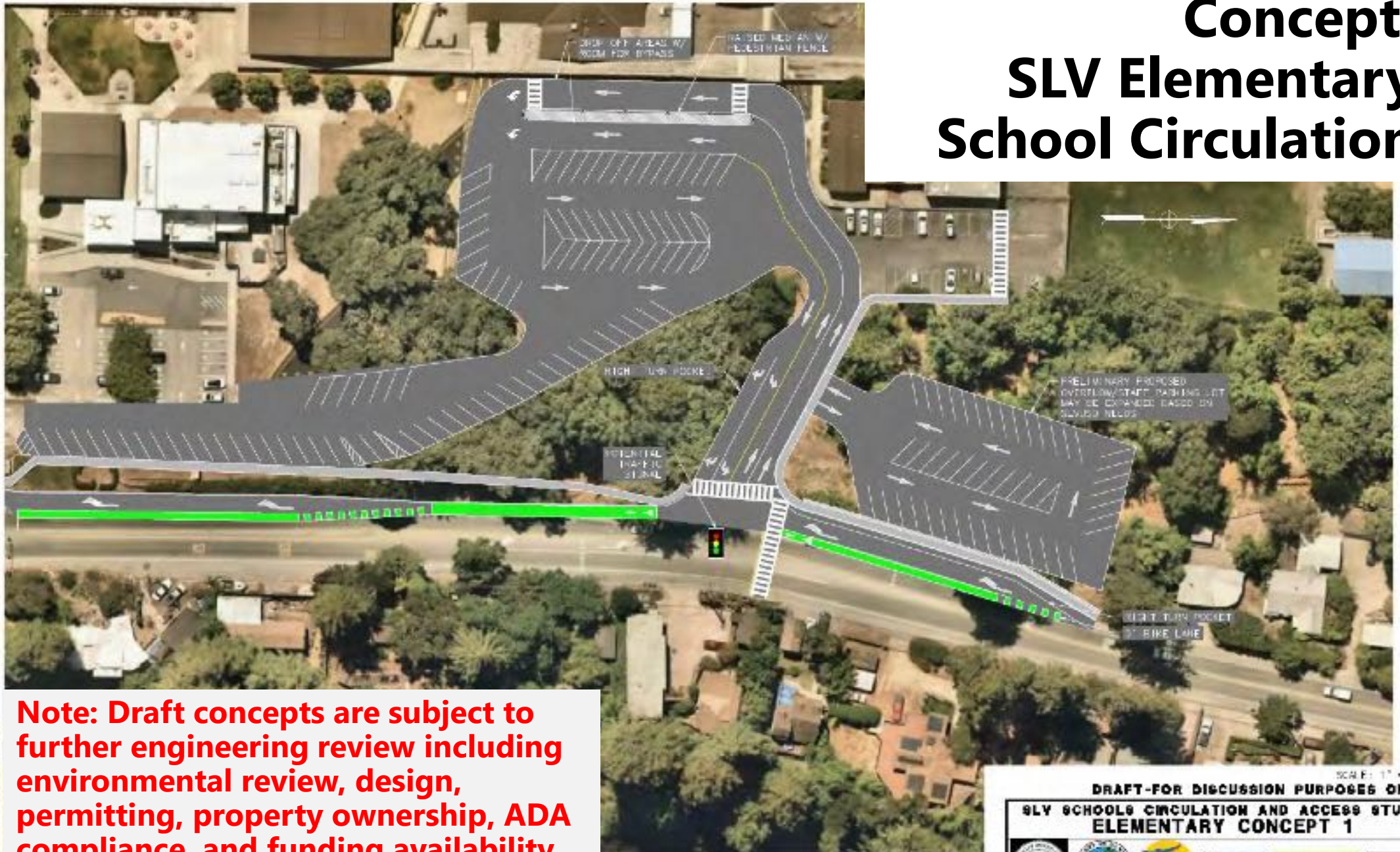


Concept: SLV Middle School Circulation

Note: Draft concepts are subject to further engineering review including environmental review, design, permitting, property ownership, ADA compliance, and funding availability.



Concept: SLV Elementary School Circulation



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Concept: SLV High School Circulation

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Access Design Features

- Mobility recommendations focused on serving people of all ages and abilities.
 - Youth and Older Adults
 - People with Disabilities
 - People with Strollers
- Recommended Design Features
 - ADA Ramps
 - Connection to Transit Stops
 - Uninterrupted Routes



Schedule and Phasing Plan

- Draft Schedule to Advance Concepts
 - Near Term,
 - Medium Term, or
 - Long Term.
- Identify lead agency/organization
- Identify opportunities where engineering solutions can be bundled with existing roadwork programming.

Phasing Plan Elements:

Schedule

Estimated Total Project Costs

Cost by Project Phase

Cost by Year

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Collaborative Funding Pursuits

- Partner agency & public collaboration positions for competitive grant pursuits.
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Public



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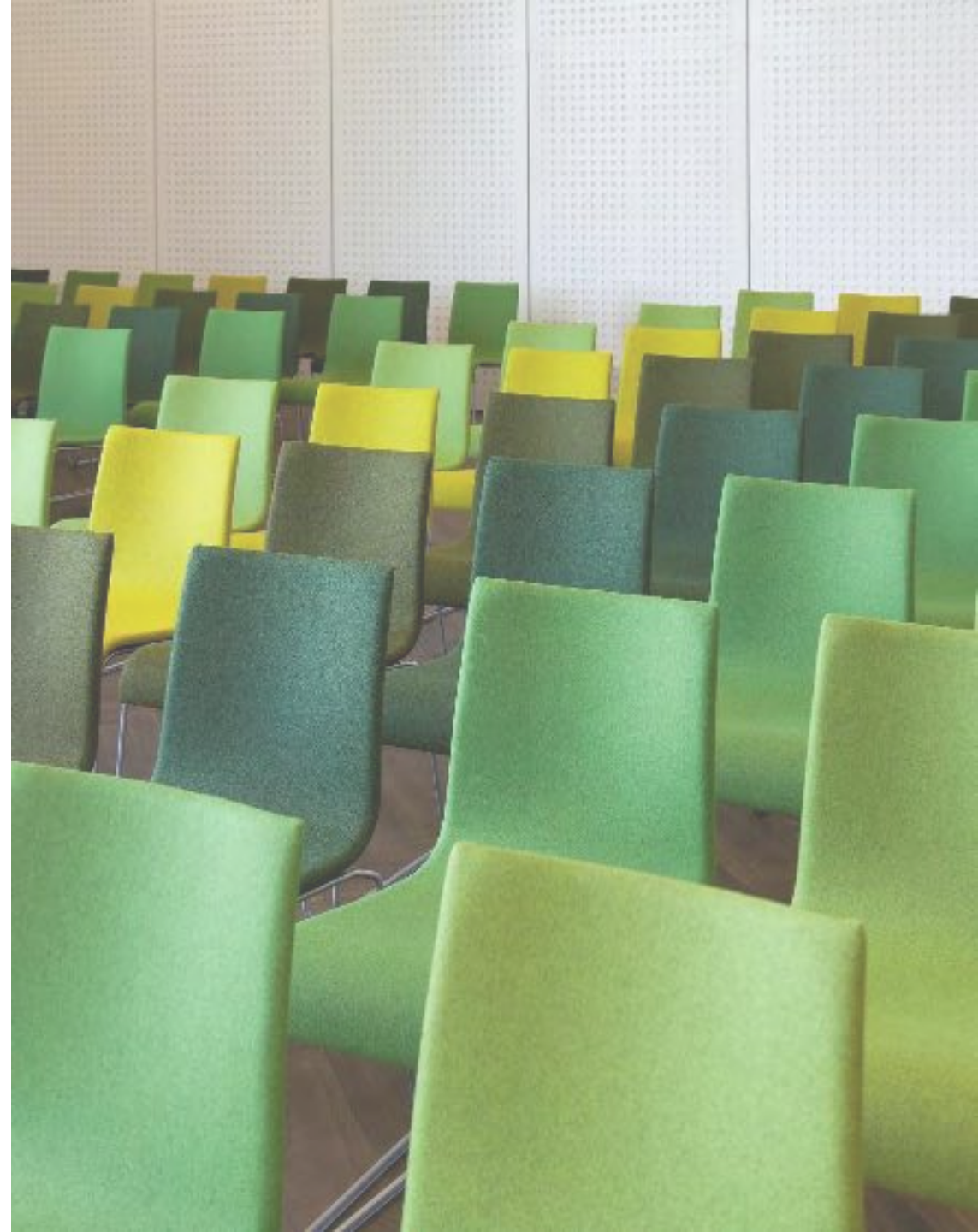
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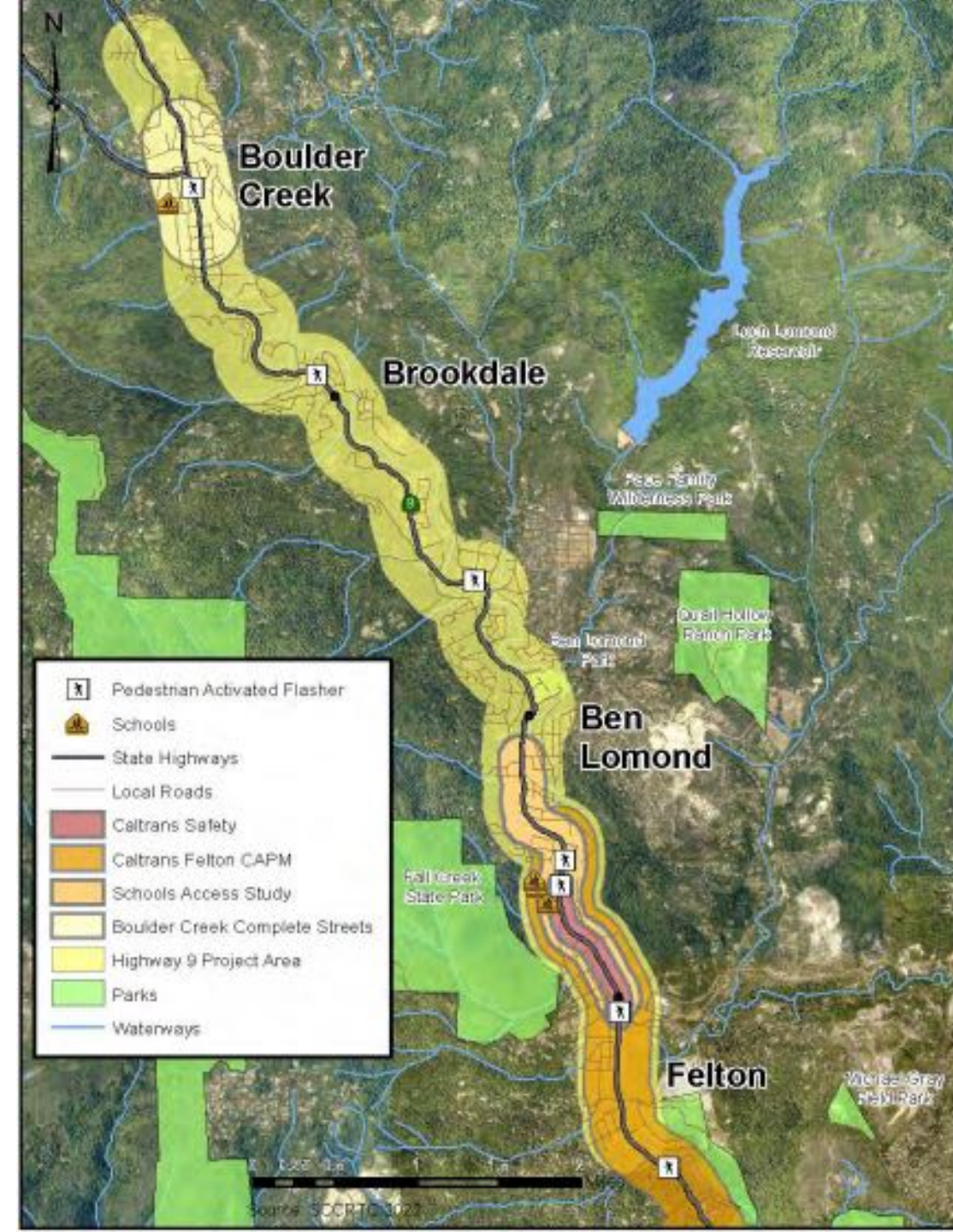
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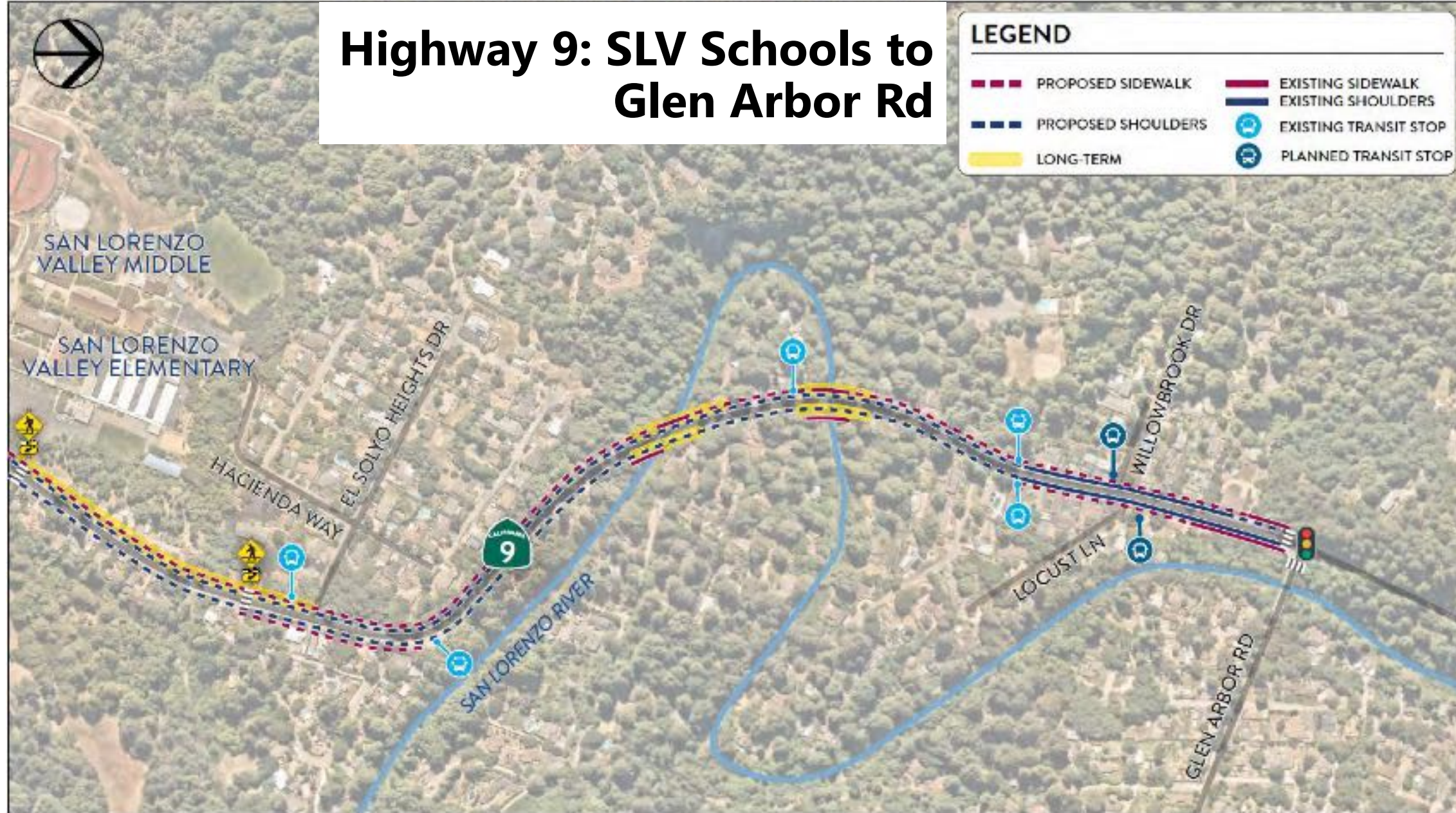
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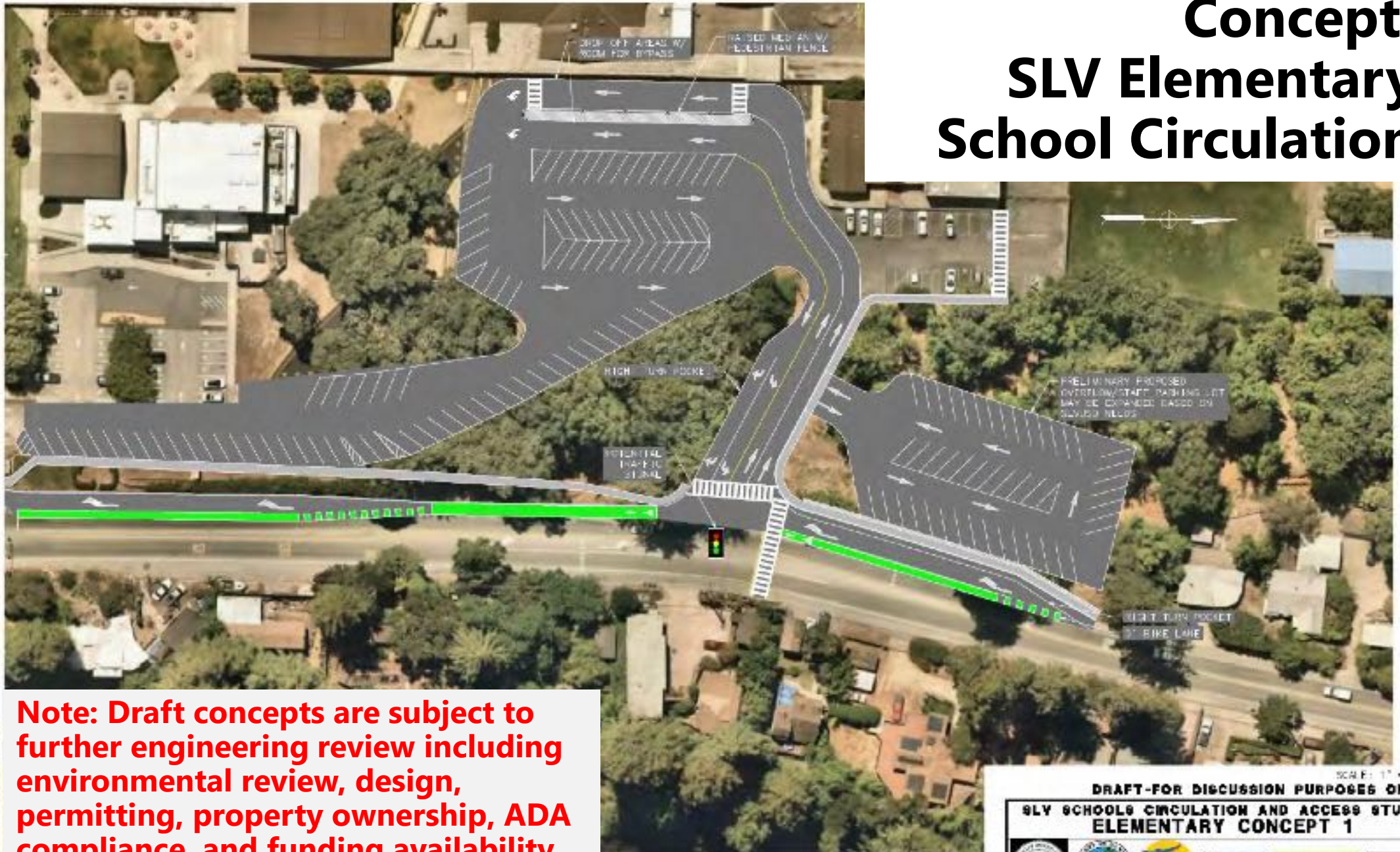


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Next Steps and Action Items

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3. Continue Stakeholder Presentations
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Please Visit the Boards Tonight and Provide Input

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slvprogram@sccrtc.org

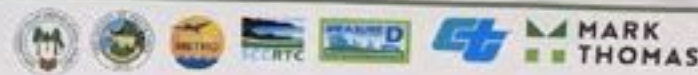
Contacts:

SCCRTC Contact: Brianna Goodman

Mark Thomas Contact: Paul Martin



WELCOME



PROJECT OVERVIEW



PROJECT LIMITS

The SLV Schools Access Project includes Highway 9 between Glen Arbor and Graham Hill Road, and access to/from SLV Elementary, Middle, and High Schools (SLV Schools).

PROJECT DESCRIPTION

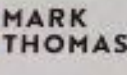
The project will build upon the 2019 Highway 9/San Lorenzo Valley Complete Streets Corridor Plan, and aims to improve access by walking, bicycling, transit, and car. In addition to improving circulation into and within the SLV Schools, the project will look to improve traffic flow along Highway 9 for non-school traffic.

PROJECT BENEFITS

Project benefits may include, but are not limited to: safety improvements, reduced traffic congestion, and enhanced travel for transit riders, pedestrians, bicyclists, wheelchairs, and other mobility devices, expanding universal access for Americans with disabilities.



PHASE	2022			2023
	SPRING	SUMMER	FALL	WINTER
Public Engagement				
Existing Conditions				
Needs Analysis				
Engineering Concepts				
Next Steps				
Summary Report				



STEPS TO FUTURE IMPLEMENTATION



NEXT STEPS AND ACTION ITEMS

1. Advance Engineering Concepts
2. Refine Concepts with Project Partners
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PHASING PLAN ELEMENTS

- Schedule
- Estimated Total Project Costs
- Cost by Project Phase
- Costs by Year
- Potential Funding Sources

PROJECT PARTNER AGENCIES/STAKEHOLDERS

- Santa Cruz County Regional Transportation Commission (SCCRTC)
- San Lorenzo Unified School District (SLVUSD)
- County of Santa Cruz (DWP)
- Santa Cruz Metropolitan Transit District (METRO)
- California Department of Transportation (Caltrans)
- San Lorenzo Valley Community (Public)



MARK
THOMAS

HIGHWAY 9 SOUTH

GIVE US YOUR
FEEDBACK

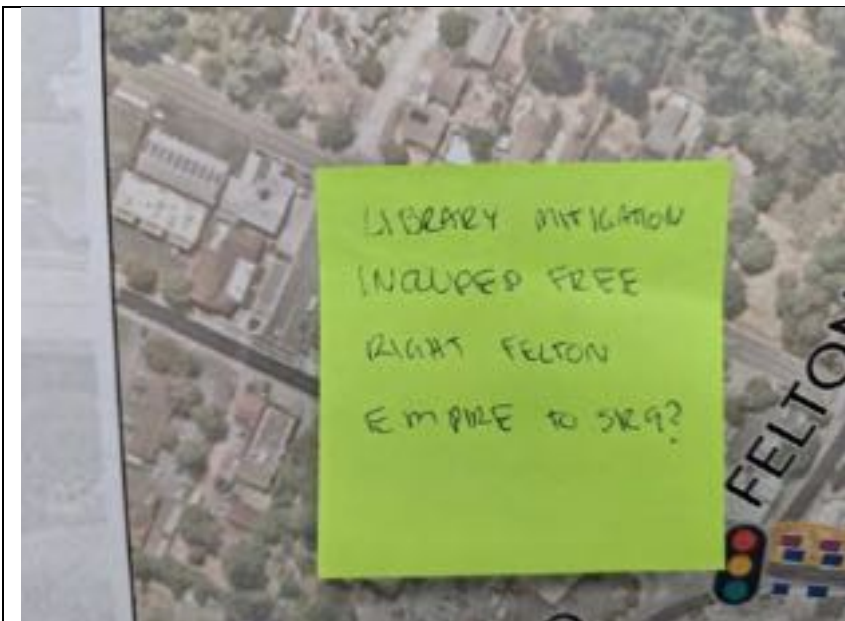
VOTE BY
STICKER

SEV SCHOOLS COMPLEX
1111 ACCESS STUDY



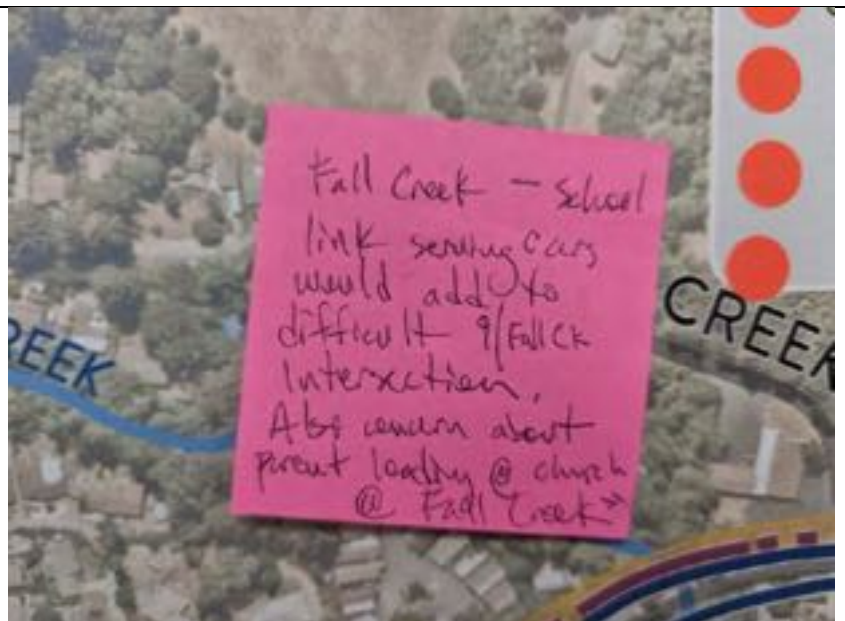
Draft concepts are subject to change based on subsequent environmental review, engineering design, permitting, property ownership review, and funding availability. Potential traffic signal or roundabout subject to traffic study in future design phase per Caltrans requirements.





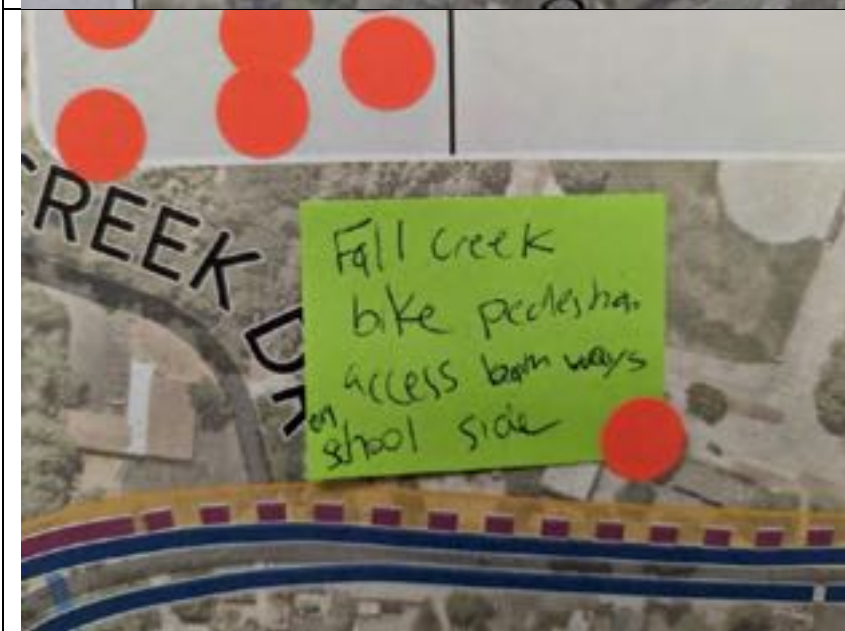
A yellow sticky note is placed on an aerial map showing a residential neighborhood. The note is centered over a street labeled 'FELTON'. The text on the note is handwritten in black ink.

LIBRARY MITIGATION
INCLUDED FREE
RIGHT FELTON
EMPHASE TO SR 9?



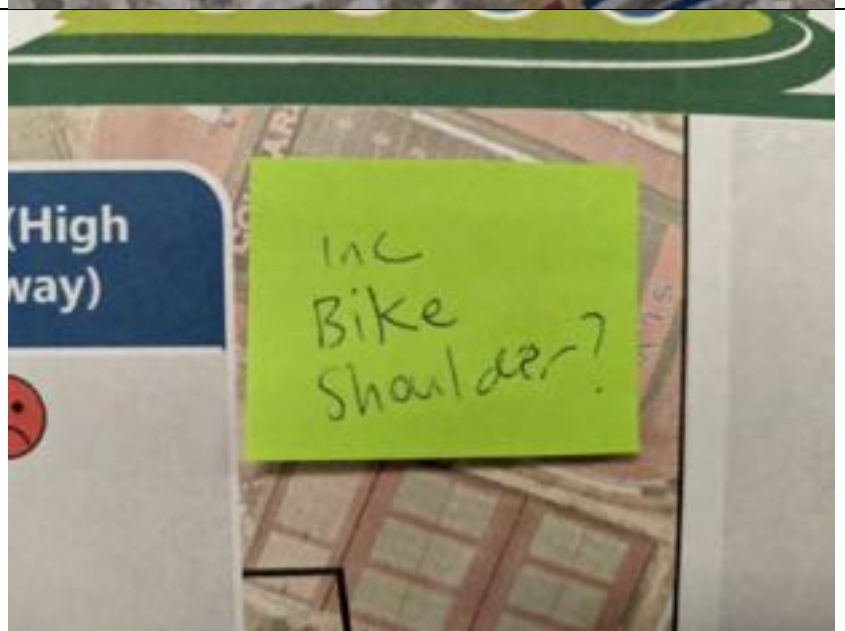
A pink sticky note is placed on an aerial map showing a residential neighborhood. The note is centered over a street labeled 'FALL CREEK'. The text on the note is handwritten in black ink.

Fall Creek - School
link sending cars
would add to
difficult 9/Fall Creek
Intersection.
Also concern about
parent loading @ church
@ Fall Creek



A yellow sticky note is placed on an aerial map showing a residential neighborhood. The note is centered over a street labeled 'FALL CREEK'. The text on the note is handwritten in black ink.

Fall Creek
bike pedestrian
access both ways
school side



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inc
Bike
Shoulder?

SLV ELEMENTARY SCHOOL

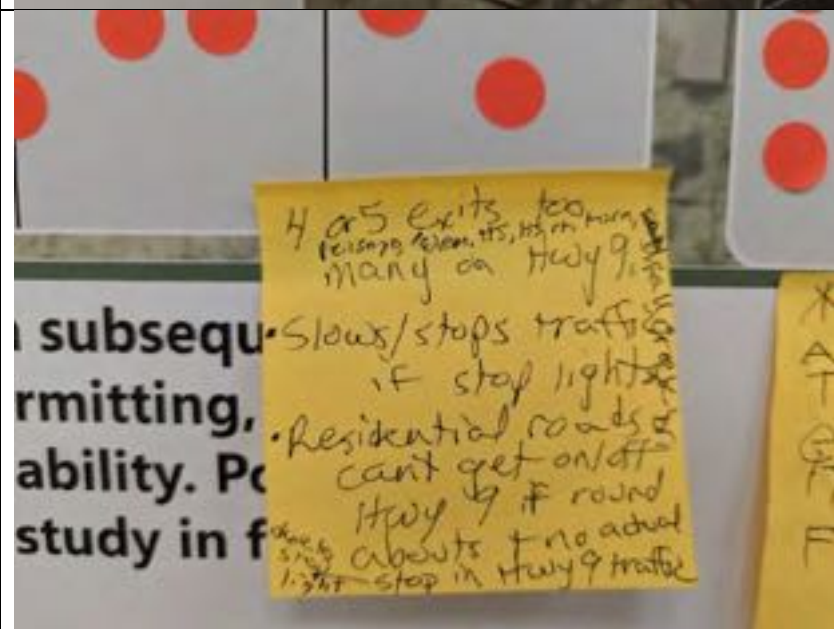
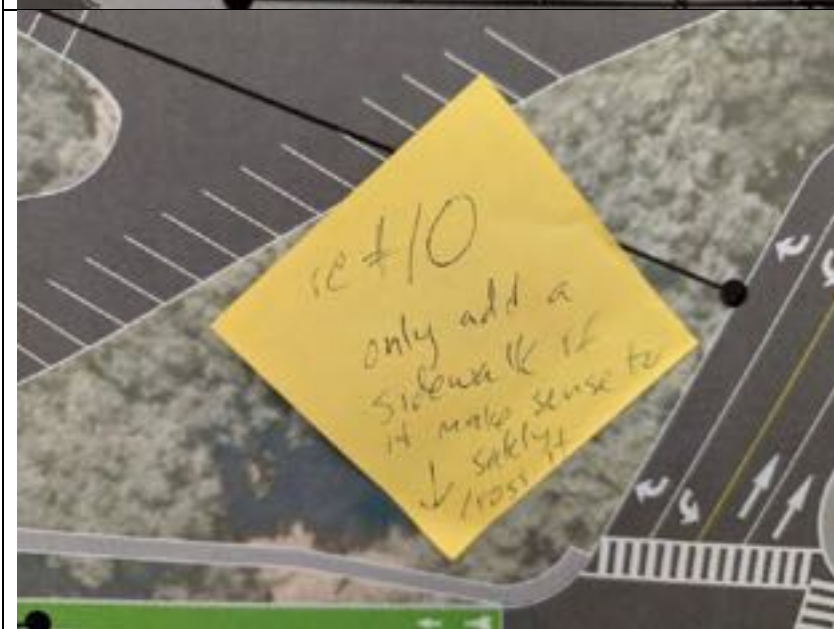
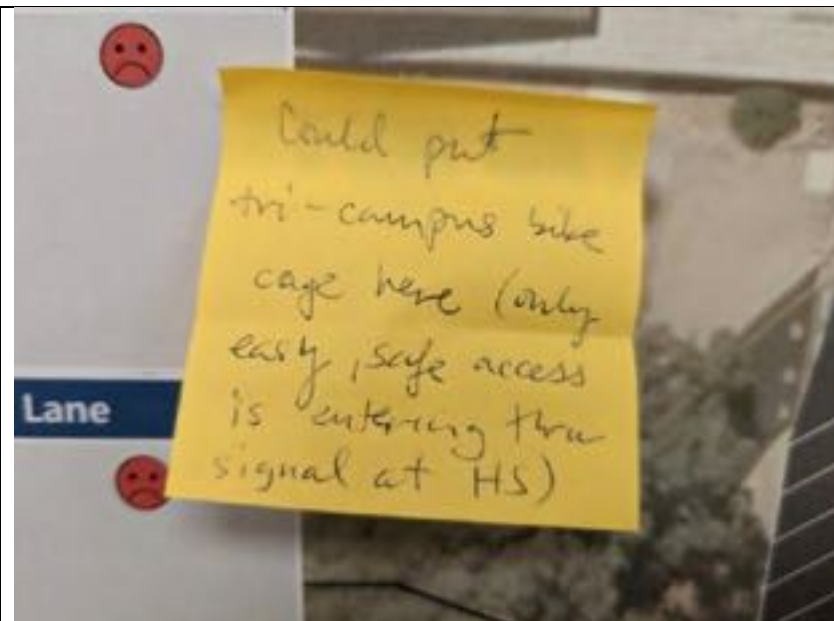
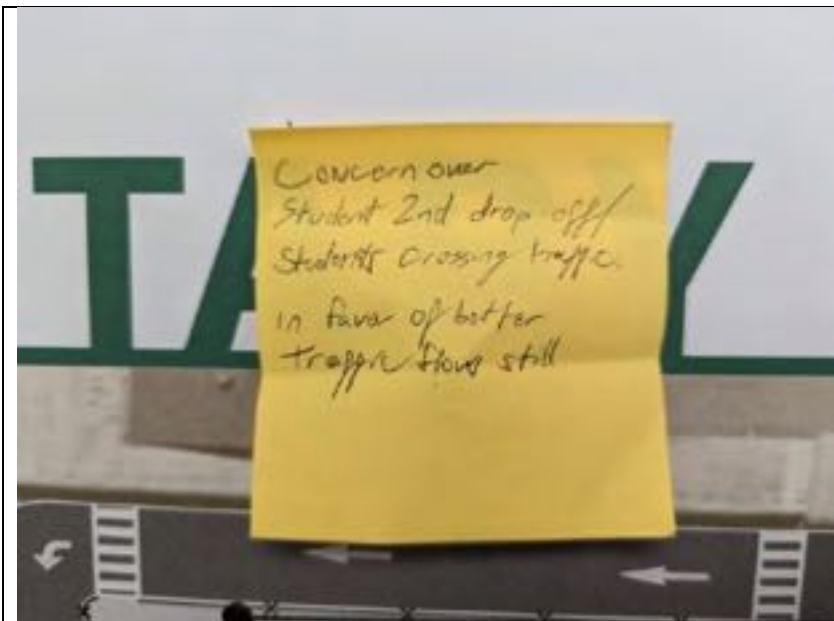
SLV SCHOOLS COMPLEX
ACCESS STUDY

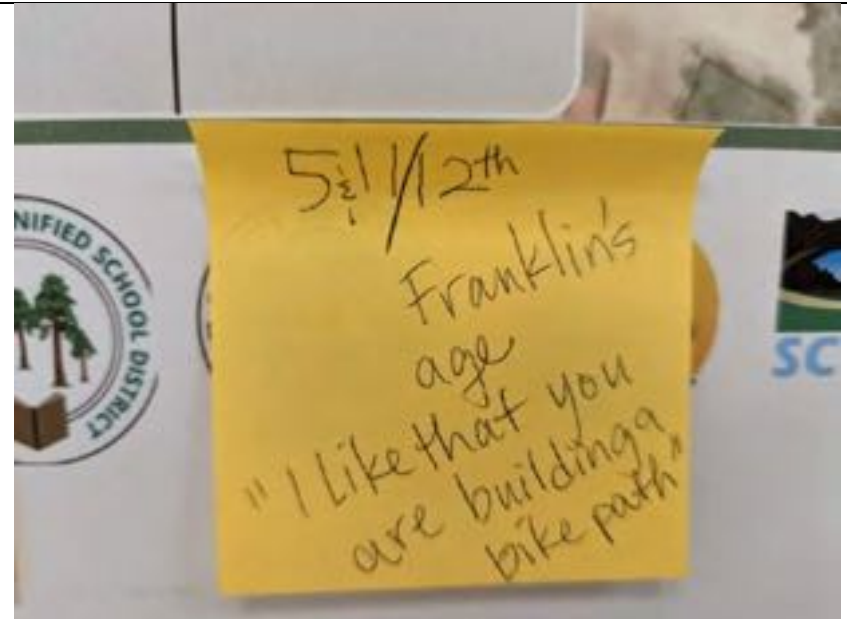
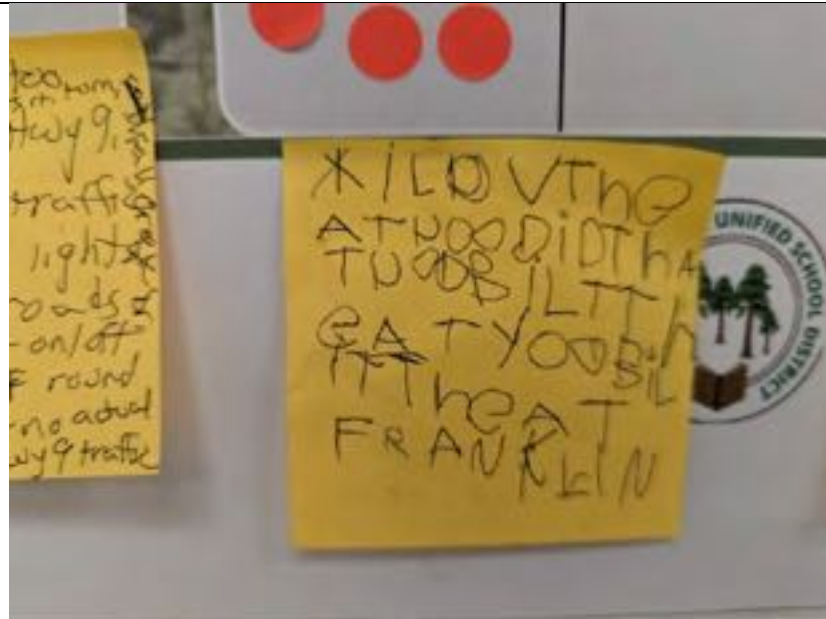


Draft concepts are subject to change based on subsequent environmental review, design, permitting, property ownership requirements, and funding availability. Potential traffic signal or roundabout subject to traffic study in final design phase per Caltrans requirements.



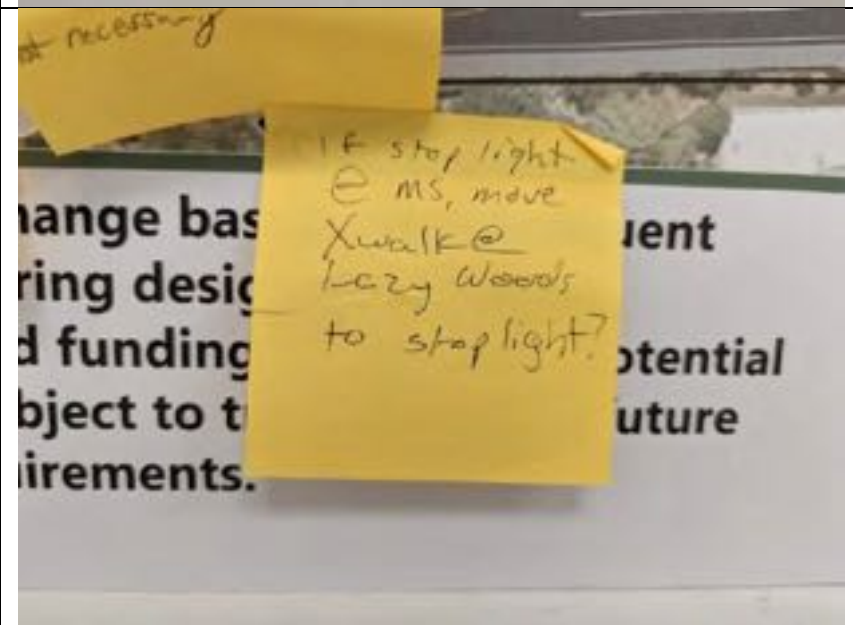
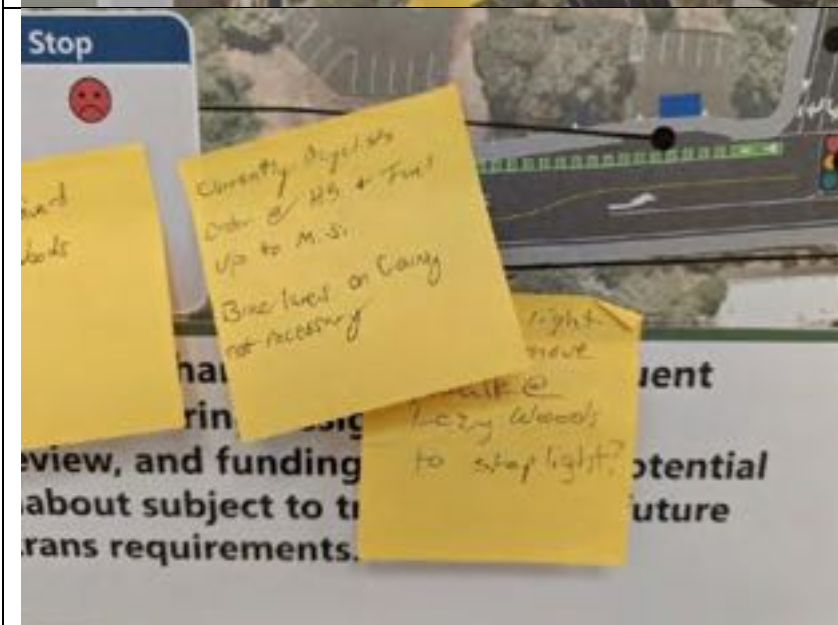
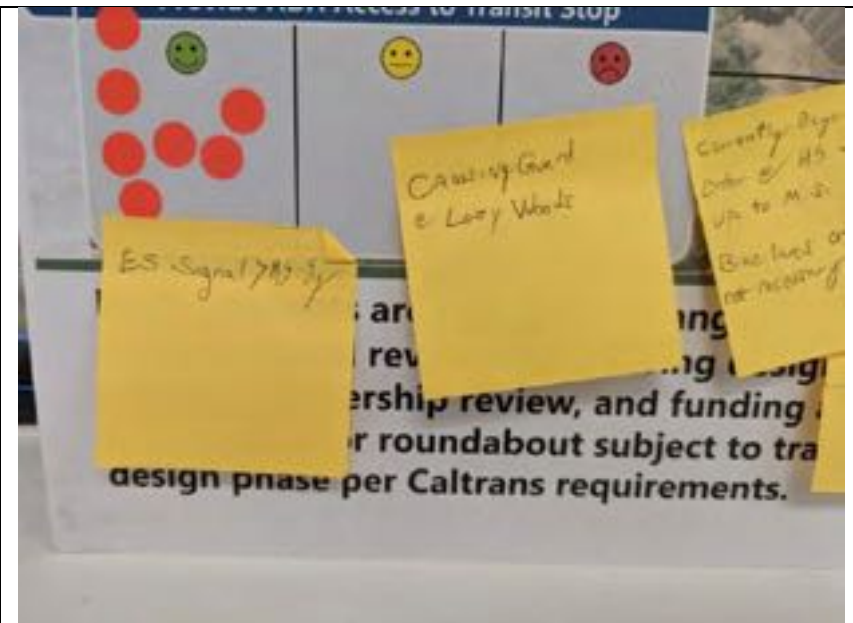
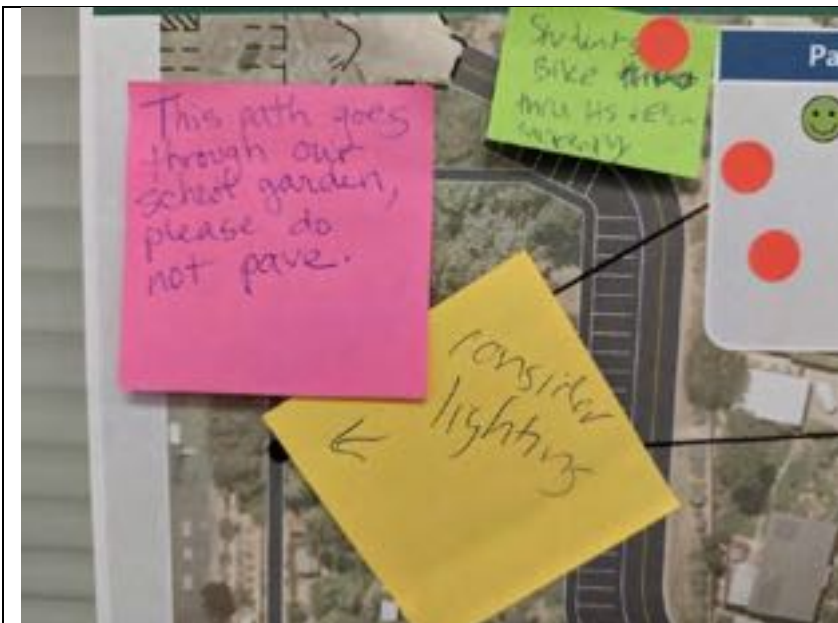
MARK THOMAS

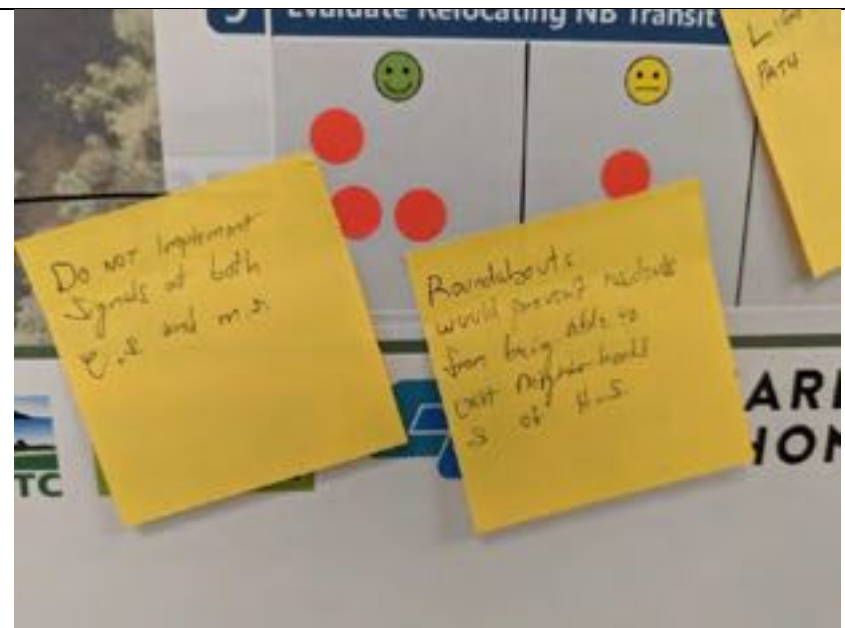
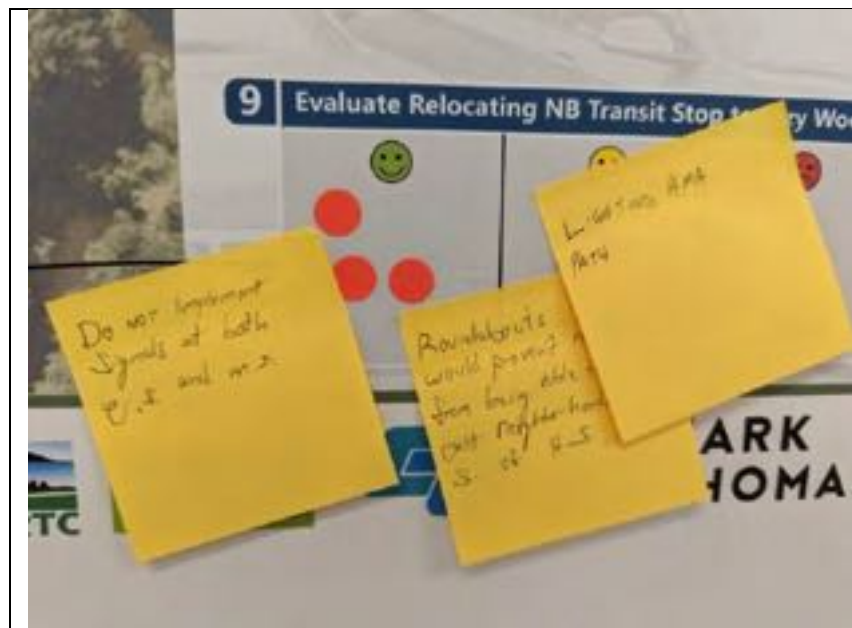




**GIVE US YOUR
FEEDBACK**







SLV HIGH SCHOOL

GIVE US YOUR
FEEDBACK

VOTE BY
STICKER

SLV SCHOOLS COMPLEX
ACCESS STUDY

2 Designate "Bus Only" Travel Lanes



3 Add Street



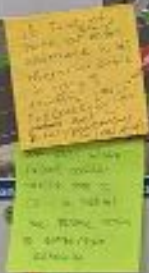
Designate to One-way Car Travel



5 Widens for Additional Car Parking



1 Redesign Driveway and Add "Right-Turn" Lanes



6 Add



7 Add Sidewalk to Elementary School Driveway

7 Add Sidewalk to Elementary School Driveway



9 Provide Continuous Bike Lane/Shoulder



8 Improve Sidewalk on Northland Highway 1



10 Mainline Right-Turn Pocket



Draft concepts are subject to change based on subsequent environmental review, engineering design, permitting, property ownership review, and funding availability. Potential traffic signal or roundabout subject to traffic study in future design phase per Caltrans requirements.



MARK
THOMAS

Garage in
Fall Creek
in blue
print

1st floor
turn at Metro
entrance to HS
there is a break
in Hwy 9
for Fall Creek Dr. to
Fall Creek Dr. to
Fall Creek Dr. to
Fall Creek Dr. to

6 Enhance
Campus &
the park area
C. L. L. L. L.
C. L. L. L. L.

Love sidewalk
on West side
of Hwy 9
from Graham
Hill to the
Schools.

MEASURE
Moving Santa Cruz Co.



will need to
replace student
parking spots.

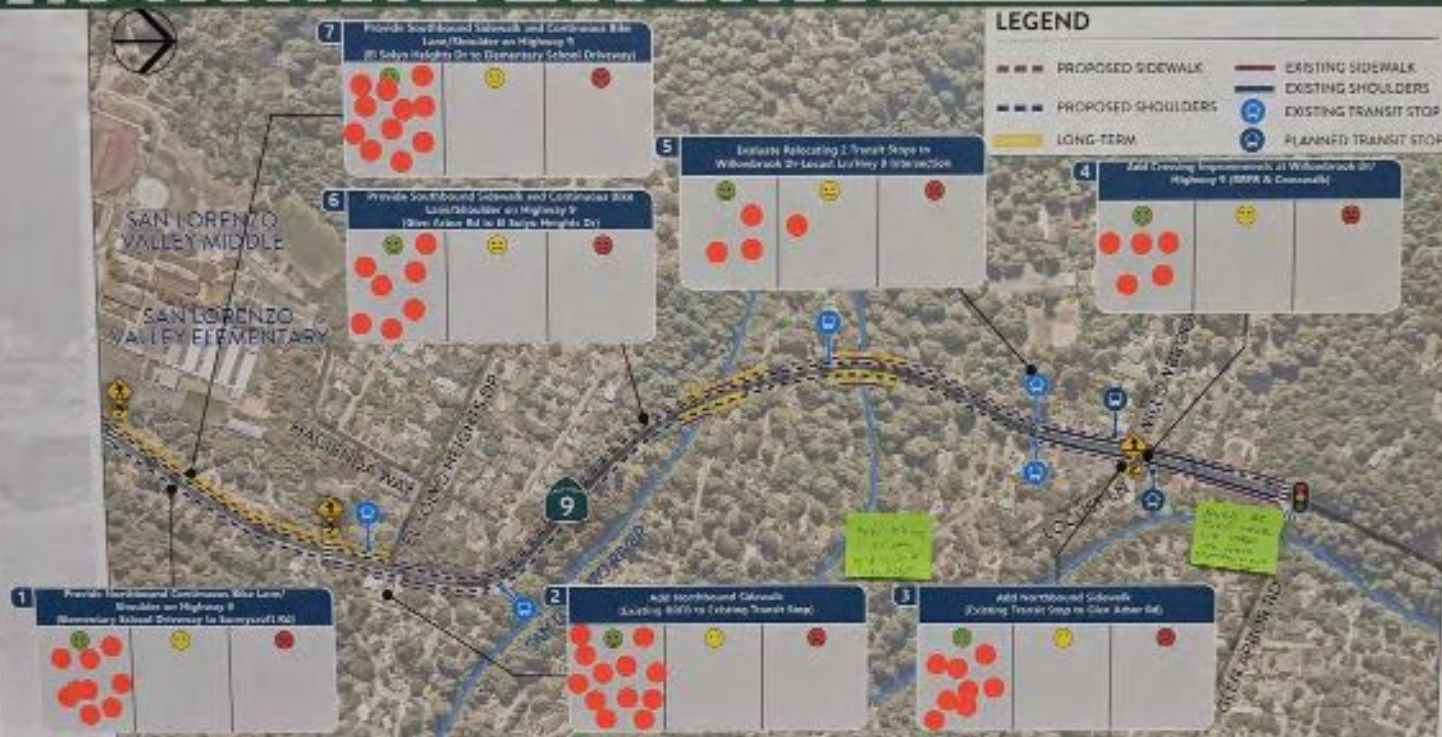
Concern over added
Student parking zone.
It will better utilize space
but it will also take out
Student parking spots.

HIGHWAY 9 NORTH

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FEEDBACK

NOTE BY
STICKER

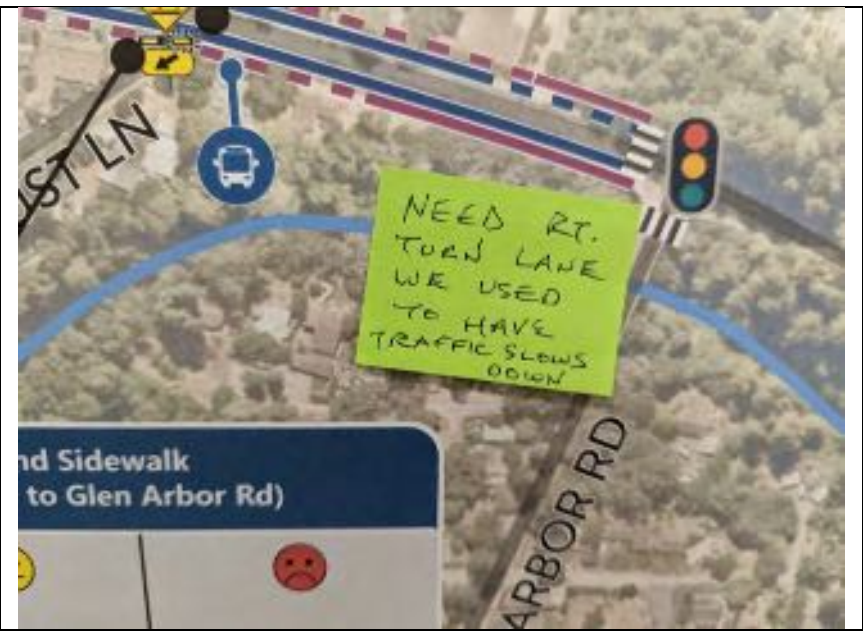
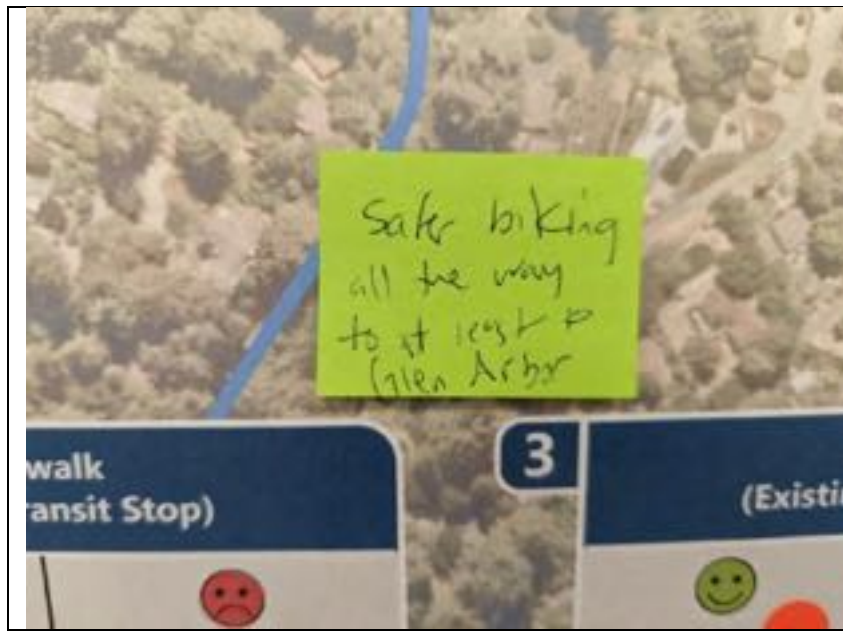
SIX SCHOOLS COMPLEX
ACCESS STUDY



Draft concepts are subject to change based on subsequent environmental review, engineering design, permitting, property ownership review, and funding availability. Potential traffic signal or roundabout subject to traffic study in future design phase per Caltrans requirements.



MARK
THOMAS



SANTA CRUZ COUNTY REGIONAL TRANSPORTATION COMMISSION

APPENDIX D: TRAFFIC ANALYSES



Memorandum

Date: September 27, 2022
To: Brianna Goodman, Santa Cruz County Regional Transportation Commission
From: Matt Haynes, Robert Brown, and Kaitlyn Kong, Fehr & Peers
Subject: **Existing Circulation Conditions**

SJ22-2159

This memorandum summarizes existing site conditions and circulation patterns for the San Lorenzo Valley (SLV) Schools Complex in Felton, California.

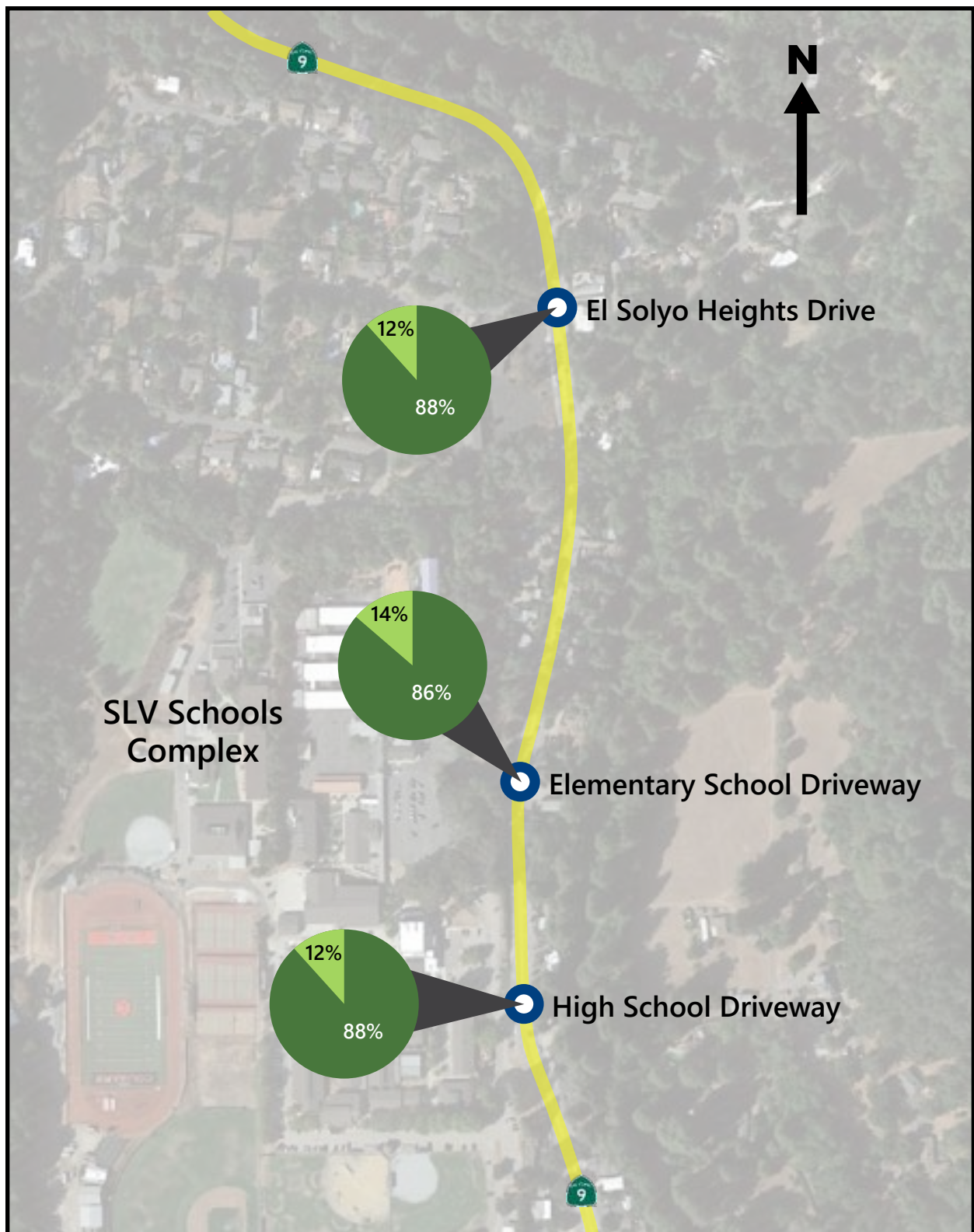
Study Area

The SLV Schools Complex is located immediately west of State Route (SR) 9 in Felton, California, and includes numerous buildings, recreational fields, and parking lots which serve SLV Elementary School, Middle School, and High School.

Access to campus parking lots is made via the following intersections:

1. SR 9 and SLV High School Driveway
2. SR 9 and SLV Elementary School Driveway
3. SR 9 and El Solyo Heights Drive

The intersection of SR 9 and the SLV High School Driveway is signalized. The other two intersections are side-street stop controlled. The intersection of SR 9 and El Solyo Heights Drive does not directly connect to the SLV Schools Complex. Instead, drivers travelling to or from the SLV Middle School parking lot on the north of campus access it through a residential neighborhood along El Solyo Heights Drive and Hacienda Way. **Figures 1 and 2** show the percentages of school-related trips compared to SR 9 pass-by trips during the AM peak hour (7:30-8:30 AM) and PM peak hour (2:15-3:15 PM – coinciding with school dismissal times) at the three intersections listed above. The PM peak hour at these intersections is earlier in the day than an average intersection due to higher traffic volumes associated with early afternoon school pick-up times. Total traffic volumes drop by approximately 10% during typical afternoon commute times (4:00-6:00 PM) when compared to the after-school peak hour.



Percentage of SR 9 vehicles

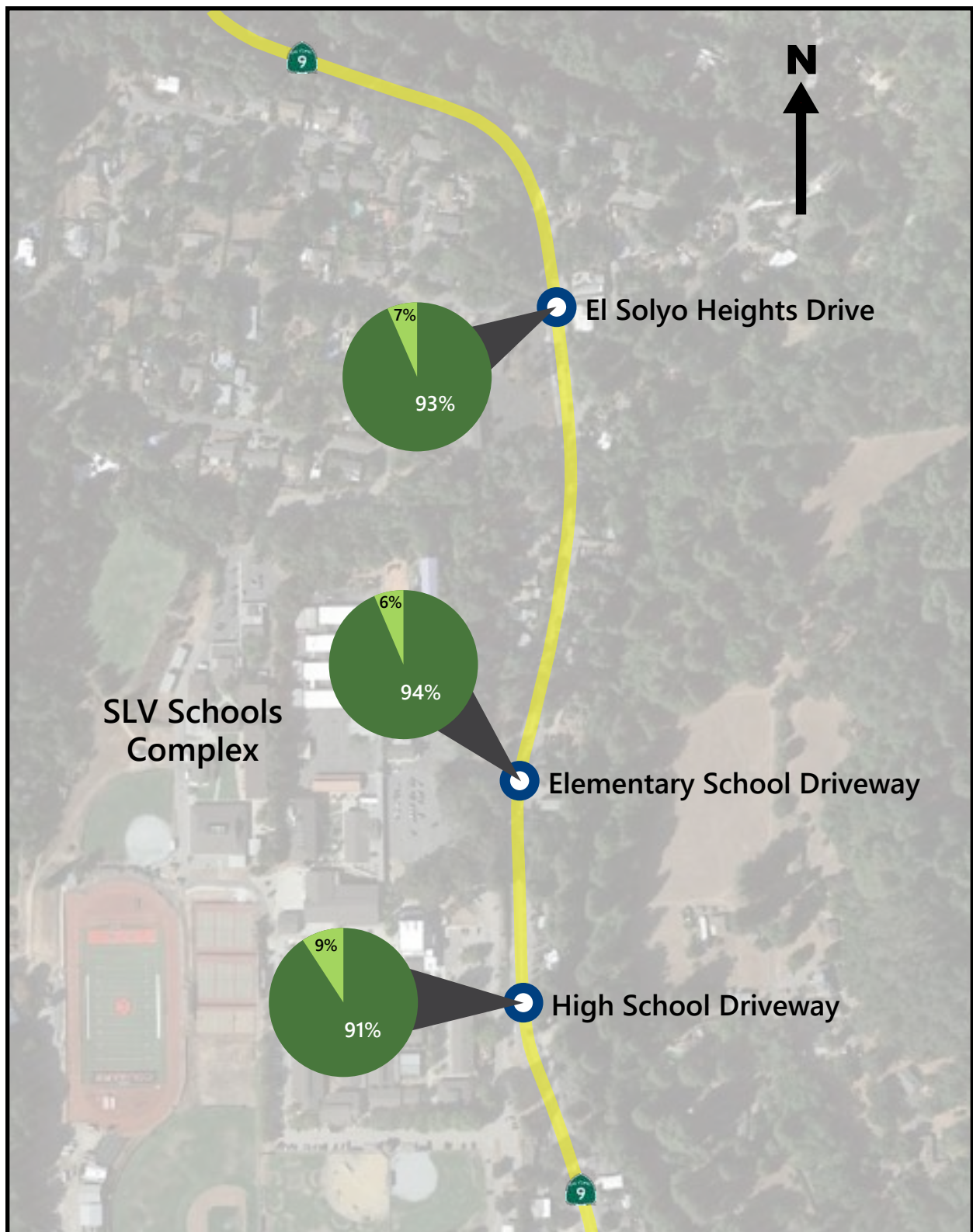
Percentage of school traffic

Note: Volumes are from 7:30 AM to 8:30 AM

Figure 1

SLV Schools Complex Circulation and Access Study
Existing Circulation Conditions
AM Peak Hour Roadway Volumes





Percentage of SR 9 vehicles

Percentage of school traffic

Note: Volumes are from 2:15 PM to 3:15 PM

Figure 2

SLV Schools Complex Circulation and Access Study
Existing Circulation Conditions
PM Peak Hour Roadway Volumes





Mode Split

Students travel to and from the SLV Schools Complex using a variety of modes. A majority of students are driven by parents to school. Many others ride school buses or are high schoolers that drive their own personal vehicles to and from campus. The school offers on-site parking permits to high school students. School buses have dedicated routes in and out of school parking lots for student drop-off and pick-up. While most parents drop students off on-campus in designated locations across the Complex parking lots, some parents also pick up and drop off students off-campus. For instance, Castelli's Deli Café, a restaurant west of SR-9 approximately 400 feet south of the SLV High School Driveway, is a popular location for parent pick-up and drop-off.

A smaller portion of students also take public transit or walk to campus. The San Lorenzo Valley Unified School District (SLVUSD) purchases Santa Cruz METRO bus passes for middle and high school students who apply through their schools' administrative offices. During field observations in the week of May 23, 2022, a total of approximately 50 students were seen disembarking Santa Cruz METRO buses near the SLV High School Driveway in the morning. Similar numbers of students were observed boarding Santa Cruz METRO buses in the afternoon after school. Students were also seen walking to or from campus along SR 9. However, as discussed above, some of these students may have been picked up or dropped off in nearby parking lots or side streets instead of walking directly to or from their homes.

Very few students were observed riding bicycles to or from campus. Given the high vehicle speeds and limited bicycle infrastructure on SR 9 and on surrounding roads, students are likely less comfortable cycling to and from school. However, based on an analysis of student home location data, there is high potential demand for increased walking and biking access to the SLV Schools Complex. Based on student enrollment data during the 2022-2023 school year for the 3 schools located on the SLV Schools Complex, of 1,632 students, 299 (about 18%) lived within 1 mile of campus, and 890 (about 55%) lived within 2 miles of campus. With the addition of improved biking and pedestrian facilities, many of these students may choose to travel to and from school by walking or cycling.

Roadway Conditions

SR 9 provides regional access to the SLV Schools Complex. El Solyo Heights Drive and Hacienda Way provide local site access via neighborhood roads. Each facility is described below in detail.

SR 9 is a north-south undivided highway located immediately east of the SLV Schools Complex with 1 travel lane in each direction. According to Caltrans 2020 traffic volume data, annual average daily traffic on SR 9 is 13,000 vehicles per day. The Highway Capacity Manual (HCM) establishes methodologies for calculating the level of service (LOS) for highway segments based on daily volumes and facility classifications. LOS is a letter rating from A to F representing the



amount of vehicle delay to expect for a roadway facility or intersection. A high letter rating (e.g., an A) represents very low levels of delay, while a low letter rating represents high levels of delay (or even a complete breakdown of traffic, where demand exceeds capacity and vehicles move very slowly). Based on the annual average daily traffic on SR 9 and its classification as a 2-lane highway, the peak hour LOS on SR 9 is LOS D. The SR 9 speed limit near the SLV Schools Complex is 35 mph during regular hours and 25 mph when children are present during typical school pick-up and drop-off times.

El Solyo Heights Drive and Hacienda Way are both two-lane roadways north of the SLV Schools Complex which provide access to the SLV Middle School parking lot from SR 9. They are classified as local roads with posted speed limits of 25 mph.

There are three main access points to the SLV Schools Complex from SR 9: the signalized High School Driveway intersection to the south, the side-street stop-controlled Elementary School Driveway intersection east of the center of campus, and the side-street stop-controlled El Solyo Heights Drive intersection north of campus. El Solyo Heights Drive provides access to SLV Middle School, as well as a minor residential area north of the SLV Schools Complex. During school pick-up and drop-off periods, queues form on SR 9 near these intersections as school buses, parents, and student drivers turn into and out of these access points.

Most vehicle traffic on SR 9 near the SLV Schools Complex is through traffic; based on May 2022 counts, during peak AM and PM hours, about 75-85% of vehicles do not turn into or out of SLV Schools driveways or access roads.

During the AM peak hour, school traffic at the Elementary School Driveway intersection and the El Solyo Heights Drive intersection has an approximately even split of inbound and outbound traffic. In contrast, 60% of vehicles using the High School Driveway are inbound, and 40% are outbound. This imbalance is due to the proportion of high school students driving and parking their personal vehicles at school. Overall, the total number of AM peak hour school trips are split roughly evenly between the three access points. In addition, across all three intersections during the AM peak hour, approximately 60% of school traffic on SR 9 is coming from the north and 40% from the south.

During the PM peak hour, approximately 60% of school traffic is outbound and 40% is inbound at all three school access points. Overall, approximately 45% of school trips during the PM peak hour use the High School Driveway, and the remaining 55% of school trips are split evenly between the Elementary School Driveway and El Solyo Heights Drive access point. Across all three intersections during the PM peak hour, approximately 45% of school traffic on SR 9 is coming from the north and 55% from the south.

Based on typical pick-up and drop-off times for the SLV Schools Complex, the AM and PM vehicle trip peaks associated with student pick-up and drop-off roughly align with the AM and PM peaks



of vehicle trips on SR-9. Student pick-up and drop-off times are staggered for different grade levels to allow for lower peak volumes and less congestion.

Bicycle and Pedestrian Conditions

Pedestrian facilities near the SLV Schools Complex are comprised of sidewalks and crosswalks. Sidewalks are infrequent along SR 9; except for the Fall Creek Bridge south of the Schools Complex, nearly all portions of SR 9 near the SLV Schools Complex have narrow shoulders with no sidewalks.

Bus transit stops along SR 9 in this area are paved but do not connect to any additional paved sidewalks. An unpaved walking path along the west side of SR 9 connects the SLV High School Driveway with a commercial area south of the SLV Schools Complex. Sidewalks are also absent on El Solyo Drive and Hacienda Way.

There are 3 marked pedestrian crossings across SR 9 near the SLV Schools Complex. There is one marked pedestrian crossing across SR 9 in front of the Trinity Bible Church 200 feet south of its intersection with El Solyo Heights Drive, one pedestrian crossing on SR 9 across the north leg at its intersection with the SLV Elementary School Driveway, and one ADA-compliant pedestrian crossing at the intersection of SR 9 and the SLV High School Driveway (there is also an additional marked crossing across the driveway at this location). The Trinity Bible Church crosswalk and the SLV Elementary School Driveway crosswalk both include Rectangular Rapid-Flashing Beacons. The SLV High School Driveway is signalized with a controlled pedestrian crossing.

Current existing pedestrian facilities include access to the SLV School Complex via the Fall Creek trails directly west and south of the campus. These trails connect to other neighborhoods and local roads and provide routes that do not intersect with SR 9.

Transit Conditions

Bus services in Felton, CA are operated by the Santa Cruz Metropolitan Transit District (METRO). There are two bus stops at the intersection of SR 9 and the SLV High School Driveway and two bus stops near the intersection of SR 9 and El Solyo Heights Drive. The only bus line that serves these bus stops is METRO Highway 9/Scotts Valley Route 35. Weekday routes (Monday to Friday) run from 6:53 AM to 11:26 PM with a headway of 32 minutes. Weekend routes (Saturday to Sunday) run from 8:44 AM to 10:59 PM with a headway of 65 minutes. SLV High School provides 31-day passes for \$48 and 15-ride passes for \$27 for Santa Cruz METRO buses and free passes to students with financial need. Santa Cruz METRO also has an ongoing pilot program where youth ride free.



SLV School Buses

The SLV Schools Complex also serves students with SLVUSD buses. During student pick-up and drop-off periods, these buses access the Elementary School parking lot via the Elementary School Driveway, circulate through parking lots, and exit via the High School Driveway after picking up or dropping off students. Due to sharp corners, narrow lanes, and high parking lot congestion during AM and PM peak hours, school buses face circulation issues during student pick-up and drop-off. SLV Schools teachers and administrators typically direct traffic in these parking lots during student pick-up and drop-off to improve circulation and help manage congestion.

SLV Schools Complex Circulation

The SLV Elementary School, Middle School, and High School are each accessed by separate driveways or roadways connected to SR 9. During weekday mornings and afternoons when school is in session, motorists enter campus via these access points, move to established student pick-up or drop-off points, and exit the SLV Schools Complex (typically via the same access point used for entry). Student drivers will also bring their vehicles to campus and park in designated student parking spaces near the High School sports fields to the south of campus. The Elementary School and High School parking lots are connected.

SLV High School Driveway

At the SLV High School Driveway, northbound vehicles on SR 9 can turn left onto campus via an approximately 125 foot left turn pocket, and southbound vehicles can turn right onto campus via an approximately 100 foot right turn pocket. During field observations, queues from these turn pockets almost spilled back and blocked through traffic on SR 9 during the AM peak hour. Eastbound vehicles turning left or right onto SR 9 from this driveway have a left turn and right turn lane at this intersection. Due to the placement of nearby school buildings and adjacent fenced yards, the west leg of this intersection is heavily curved to the north and south where it connects to two SLV High School parking lots. Vehicles approaching the intersection from the northern parking lot must yield to vehicles coming from the southern parking lot, and vehicles approaching from either lot have limited space to queue.

School buses leave the SLV Schools Complex via this signalized intersection. School bus drivers have difficulty navigating in and out of the complex when there are no school staffers to help direct traffic. There are narrow lanes in the High School parking lots which do not allow for passing zones between buses and vehicles. Morning inbound traffic volumes for the high school driveway are approximately 280 vehicles for the peak hour and afternoon outbound traffic volumes are approximately 230 vehicles.

Certain northbound Santa Cruz METRO buses enter the SLV Schools Complex via a bus-only driveway located approximately 100 feet south of the High School Driveway intersection. These



buses turn left into the bus-only driveway, immediately turn right to reach a bus stop located on the SLV Schools Complex property, and finally turn left out of the High School Driveway to continue north on SR 9. This bus-only driveway is restricted to northbound Santa Cruz METRO buses and does not serve any traffic exiting the SLV Schools Complex.

SLV Elementary School Driveway

At the SLV Elementary School Driveway, northbound vehicles on SR 9 can turn left onto campus via an approximately 100 foot left turn pocket. The SLV Elementary School Driveway has a dedicated outbound left turn lane and right turn lane. Eastbound vehicles turning left onto SR 9 from the Driveway have an approximately 50 foot acceleration lane on SR 9 to reduce merging conflicts with northbound vehicles.

In field observations, the Elementary School Driveway can have tight left and right turning radii causing blocks and halting the traffic flow. School bus drivers have difficulty navigating in and out of the Complex when there are no school staffers to help direct traffic. Vehicles making right turns into the driveway from SR 9 southbound traffic make hard stops before turning and vehicles making left turns into the driveway from northbound traffic become stacked waiting for the chance to turn into the elementary school. Morning inbound traffic volumes for the Elementary School Driveway are approximately 270 vehicles for the peak hour and afternoon outbound traffic volumes are approximately 150 vehicles.

SR 9 and El Solyo Heights Drive

At the intersection of SR 9 and El Solyo Heights Drive, northbound vehicles on SR 9 can turn left via an approximately 100 foot left turn pocket. Eastbound vehicles turning left onto northbound SR 9 from El Solyo Heights Drive have an approximately 75 foot acceleration lane on SR 9 to reduce merging conflicts with northbound vehicles. Field observations indicate that vehicles get backed up in both directions on SR 9 during peak hours. Morning inbound traffic volumes at El Solyo Heights Drive are approximately 200 vehicles for the peak hour and afternoon outbound traffic volumes are approximately 140 vehicles.

Signalization

Currently, of the three intersections on SR 9 which provide access to the SLV Schools Complex, only the High School Driveway intersection is signalized. The other two intersections, the Elementary School Driveway and El Solyo Heights Drive, are unsignalized, with stop signs controlling side-street access to SR 9.

Using the traffic counts and lane geometries observed at these three intersections, a Synchro traffic analysis network was built to assess the existing intersection LOS. As noted above, LOS is a letter rating from A to F representing the amount of vehicle delay to expect for a roadway facility



or intersection (where a rating of LOS A indicates very low levels of delay, and a rating of LOS F indicates very high levels of delay).

Under current conditions, the signalized High School Driveway intersection operates at LOS C during the AM peak hour and LOS B during the PM peak hour. Both unsignalized intersections operate at LOS F during both the AM peak hour and the PM peak hour. LOS for a side-street stop-controlled intersection is measured based on the average delay for vehicles entering the intersection from the side-street. Due to a combination of high speeds and volumes on SR 9 and high demand for eastbound left turns from the side-streets, average delay is very high, resulting in the lowest possible grade of LOS F.

A second Synchro network was built to assess how LOS would change if the Elementary School Driveway and El Solyo Heights Drive intersections were both signalized in addition to the existing signal at the High School Driveway intersection. After updating the signalization for these intersections in Synchro and optimizing the signal timing based on existing traffic counts, the LOS improved at both intersections. The intersection of SR 9 and the Elementary School Driveway would operate at LOS C in both the AM and PM peak hours. The intersection of SR 9 and El Solyo Heights Drive would operate at LOS D in the AM peak hour and LOS C in the PM peak hour. These improvements indicate a significant drop in average delay for vehicles entering SR 9 from the side-street, because eastbound movements would have their own protected phase. Through traffic on SR 9 would experience some delay due to signalization, but this would partially be offset by a reduction in overall traffic queuing in the Schools Complex area. **Table 1** below compares the existing LOS at the three SLV Schools Complex intersections with the potential future LOS that would result from signalizing the Elementary School Driveway and El Solyo Heights Drive intersections.

Table 1: Intersection LOS Summary

Intersection	Existing LOS ¹	Signalized LOS ²
SR 9 & El Solyo Heights Drive	F (AM) F (PM)	D (AM) C (PM)
SR 9 & Elementary School Driveway	F (AM) F (PM)	C (AM) C (PM)
SR 9 & High School Driveway	C (AM) B (PM)	C (AM) B (PM)

Notes:

1. AM = morning peak hour (7:30-8:30 AM), PM = afternoon peak hour (2:15-3:15 PM).
2. The existing SR 9 & High School Driveway intersection is already signalized.

Source: Highway Capacity Manual, Transportation Research Board, 2016.



In addition to lowering delay and improving performance at the two unsignalized intersections, constructing traffic signals would have other potential benefits, listed below:

- Pedestrians wishing to cross SR 9 in these locations could have a signalized pedestrian phase to cross SR 9 more safely.
- School buses, which typically exit the SLV Schools Complex at the High School Driveway signal under current conditions, would have much less difficulty turning onto SR 9 from any of the three intersections.
- Bike access and safety could be improved in the intersection redesign.

Under existing conditions, the High School Driveway and Elementary School Driveway are approximately 500 feet apart. An analysis of 95th percentile queue lengths (a measure of the theoretical vehicle queue length which would only be exceeded 5% of the time during the peak hour) at these two intersections with full signalization indicates that a queue of vehicles waiting at one intersection could occasionally grow long enough to “spill back” to the other intersection. Queue spillback causes congestion and increases the risks of collisions at an effected intersection. In this case, signal coordination along the SR 9 corridor would be appropriate to address this issue. Coordinated signals are electronically connected to one another, and their signal phases are designed to move vehicles smoothly between adjacent intersections and prevent long spillback queues. If the other intersections providing access to the SLV Schools Complex were to be signalized, connecting this corridor of intersections together as a coordinated system would improve traffic operations and safety.

Parking and Curb Space

There are several parking lots across the SLV Schools Complex for use by teachers, students, administrators, and visitors. As mentioned previously, high school students are able to obtain on-campus parking permits for personal vehicles.

The parking lot on the southern edge of the Complex, which can be accessed by turning left immediately after entering the High School Driveway, has 201 parking spaces for vehicles (including 7 ADA parking spaces) and wraps around several buildings associated with SLV High School. A second northern parking lot near the High School is accessed by turning right after entering the High School Driveway and holds 69 parking spaces (2 ADA). This parking lot connects to a third parking lot where Elementary School pick-up and drop-off occurs. This parking lot holds 89 parking spaces (3 ADA). The Middle School parking lot, accessed via El Solvo Heights Drive and Hacienda Way, holds 39 parking spaces (3 ADA, 1 reserved) and also hosts Middle School pick-up and drop-off. **Attachment A** shows the locations and total supply of parking spaces for the SLV Schools Complex.

The northern High School parking lot, which is used by parents for pick-up and drop-off in front of the Performing Arts Center, has about 75 feet of usable curb space for loading and unloading



students. During site observations, some parents were also observed turning into the southern High School parking lot and dropping students in the middle of the parking lot, away from any established curbs for pick-up or drop-off. The Elementary School parking lot has approximately 150 feet of usable curb space for loading and unloading students. The Middle School parking lot has approximately 100 feet of usable curb space for student pick-up and drop-off.

Collision Data

A five-year history (January 1, 2015 to December 31, 2019) of reported collision data in the study area was obtained from the Statewide Integrated Traffic Records System (SWITRS) and evaluated for this collision data analysis.

Table 2 below shows a summary of these collision data for several segments of SR 9 within the study area limits. Only injury and fatal collisions are shown, though research suggests many non-injury collisions go unreported. Within this timeframe, there are 49 total reported crashes across these roadway segments, 11 of which occurred between El Solvo Heights drive and the High School Driveway. Of the reported crashes, the most common collision types are rear-end collisions, hit objects, and sideswipes.

Table 2: Collision Data Summary

Facilities	Number of Injuries	Number of Fatalities	Total	Crash Type	Number of Pedestrians Involved	Number of Cyclists Involved
SR 9 between Glen Arbor Road and Willow Brook Drive	8	0	8	Rear End (6) Broadside (1) Sideswipe (1)	0	0
SR 9 between Willow Brook Drive and El Solvo Heights Drive	9	0	9	Rear End (2) Sideswipe (3) Hit Object (3) Head-On (1)	0	0
SR 9 & El Solvo Heights Drive Intersection	3	0	3	Rear End (1) Broadside (1) Pedestrian (1)	1	0
SR 9 between El Solvo Heights Drive and Elementary School Driveway	4	0	4	Rear End (3) Sideswipe (1)	0	0
SR 9 & Elementary School Driveway Intersection	1	0	1	Rear End (1)	0	0
SR 9 between Elementary School Driveway and High School Driveway	1	0	1	Rear End (1)	0	0



Table 2: Collision Data Summary

Facilities	Number of Injuries	Number of Fatalities	Total	Crash Type	Number of Pedestrians involved	Number of Cyclists Involved
SR 9 & High School Driveway Intersection	1	0	1	Rear End (1)	0	0
SR 9 between High School Driveway and Cooper Road	11	0	11	Rear End (3) Broadside (1) Sideswipe (2) Hit Object (3) Head-On (1) Pedestrian (1)	1	0
SR 9 between Cooper Road and Graham Hill Road	10	1	11	Rear End (4) Broadside (1) Sideswipe (1) Hit Object (3) Head-On (1) Pedestrian (1)	1	0

*Notes: Intersections associated with the SLV Schools Complex are highlighted in green.
Source: TIMS/SWITRS, January 2015 through December 2019. Data pulled June 2022.*

Attachment B also shows a heatmap of reported SR 9 vehicle collisions between January 2016 and December 2021. Areas with a higher rate of incidents involving pedestrians and cyclists are highlighted.

Parking Area	General	Accessible	Reserved	Grand Total
SLV Elementary School	86	3	0	89
SLV Middle School	36	3	1	39
SLV High School	66	2	0	69
SLVHS Ballfields	194	7	0	201
Community Bridges	6	0	0	6
Grand Total	360	15	1	404





Memorandum

Date: January 20, 2023
To: Paul Martin; Mark Thomas
From: Matt Haynes and Robert Brown; Fehr & Peers
Subject: **San Lorenzo Valley Schools Complex Preliminary Signal Warrant Evaluation**

SJ22-2159

This memorandum evaluates California Manual on Uniform Traffic Control Devices (CA MUTCD) signal warrants for two intersections associated with the San Lorenzo Valley (SLV) Schools Complex located along State Route 9 (SR 9) in Felton, California.

Site Context and Background

There are currently three intersections on SR 9 that serve the SLV Schools Complex, listed from the south to the north: the High School Driveway, the Elementary School Driveway, and El Solyo Heights Drive. These intersections provide direct access to the SLV High School, Elementary School, and Middle School, respectively and are located between Caltrans Postmile 7 and 8. Currently, only the High School Driveway intersection with SR 9 is signalized. The Elementary School Driveway and El Solyo Heights Drive intersections are side-street stop controlled. Drivers traveling eastbound from the SLV Schools Complex and turning either right or left onto SR 9 must stop at these two intersections and wait for gaps in traffic before proceeding.

During typical school pick-up and drop-off hours, there are many vehicles entering and exiting the SLV Schools Complex at all three intersections on SR 9. These peak hours coincide with high traffic volumes on SR 9. As a result, drivers typically experience high delay turning onto SR 9 from the unsignalized Elementary School Driveway and El Solyo Heights Drive intersections. These delays cause backups within the SLV Schools Complex, which slows internal circulation for drivers, pedestrians, and cyclists. Long delays also encourage risky behaviors as motorists will attempt turns without an adequate gap, causing other motorists to reactively slow in order to avoid a collision.

As part of the ongoing SLV Schools Campus Circulation and Access Study (the Project), several possible strategies are being considered to help improve circulation within the SLV Schools



Complex. One potential improvement that has been identified is the installation of a traffic signal at one or both of the unsignalized intersections associated with the SLV Schools Complex. We recognize Caltrans policy requires consideration of a roundabout if a new traffic signal is evaluated. This memorandum is focused only on the evaluation of the CA MUTCD signal warrants for the Elementary School Driveway and El Solyo Heights Drive intersections with SR 9. Future analysis can address the feasibility or applicability of a roundabout if the warrants are satisfied for a traffic signal.

Signal Warrants

Signal warrants are performed as part of “the investigation of the need for a traffic control signal”, and they should “include an analysis of factors related to the existing operation and safety at the study location and the potential to improve these conditions” (2014 CA MUTCD Revision 6, March 2021). Additionally, “the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal,” and only serves as supporting evidence for the need of a signalized intersection.

There are nine traffic signal warrants in total, but each warrant can only be applied in certain cases depending on the site context. As a preliminary evaluation, this memorandum focuses on Warrant 2 (Four-Hour Vehicular Volume) and Warrant 3 (Peak Hour Vehicular Volume) for both the Elementary School Driveway and El Solyo Heights Driveway intersections with SR 9. Several other warrants are discussed qualitatively.

Warrant 2: Four-Hour Vehicular Volume

According to the CA MUTCD, “the [Warrant 2] Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic signal.” Warrant 2 is met if, for at least 4 hours of an average day, the vehicles per hour on the major street (as a total of both approaches) and the vehicles per hour on the minor street approach are both high enough to fall above a graphic curve included in CA MUTCD Figure 4C-1 and 4C-2.

Warrant 3: Peak Hour Vehicular Volume

Similarly, “the [Warrant 3] Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour on an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. This signal warrant shall be applied only in unusual cases, such as ... facilities that attract or discharge large numbers of vehicles over a short time.” Given the high concentration of traffic volumes associated with school pick-up and drop-off, this warrant was deemed appropriate for evaluation. Like Warrant 2, Warrant 3 is met if the number of vehicles per hour on the major and minor street approaches are high enough to fall above a graphic curve, which is included in CA MUTCD Figure 4C-3 and 4C-4.



Under both warrants, the satisfaction criteria change if “the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 35 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000.” In this case, both intersections are present near two isolated communities in the Santa Cruz Mountains, Ben Lomond (with a population of about 7,400) and Felton (with a population of about 4,500). As a result, this reduction was applied for both warrants.

Elementary School Driveway and SR 9 Intersection

The intersection of the Elementary School Driveway and SR 9 is a side-street stop controlled intersection, where eastbound drivers exiting the SLV Schools Complex must stop before turning either right or left onto SR 9. The Elementary School Driveway approach has one left turn lane with a short 50-foot right turn pocket. The southbound SR 9 approach is one through lane, and the northbound SR 9 approach is one through lane with a 150-foot left turn pocket. Drivers turning left from the Elementary School Driveway onto northbound SR 9 enter an approximately 50-foot center receiving lane before merging into traffic.

Table 1: Elementary School Driveway Volumes and Warrants

Time Period	SR 9 (major approach)		Total Major Approach Volume	Elementary School Driveway (minor approach)	Meets Warrant 2?	Meets Warrant 3?
	SB Approach	NB Approach				
AM Hours						
7:00 AM – 8:00 AM	923	530	1,453	111	Yes	Yes
8:00 AM – 9:00 AM	861	533	1,394	145	Yes	Yes
PM Hours						
2:00 PM – 3:00 PM	782	869	1,651	102	Yes	Yes
3:00 PM – 4:00 PM	751	957	1,708	98	Yes	Yes
4:00 PM – 5:00 PM	720	1,005	1,725	48	No	No
5:00 PM – 6:00 PM	601	1,079	1,680	26	No	No
Overall Warrant Met?					Yes	Yes

Source: Fehr & Peers, 2022; CA MUTCD 2014, Rev 6, March 2021.

Of the six hours from the available traffic counts, four hours satisfied both Warrant 2 and Warrant 3. Therefore, both warrants were satisfied overall for the Elementary School Driveway. This indicates that minor street traffic in this location may experience enough delay and difficulty entering the major street to justify the implementation of a traffic signal.



El Solyo Heights Drive and SR 9 Intersection

The intersection of El Solyo Heights Drive and SR 9 is a side-street stop controlled intersection, where eastbound drivers exiting the San Lorenzo Valley Middle School or the residential neighborhood north of the SLV Schools Complex must stop before turning either right or left onto SR 9. The El Solyo Heights Drive approach has one lane with no turn pockets. The southbound SR 9 approach is one through lane, and the northbound SR 9 approach is one through lane with a 100-foot left turn pocket. Drivers turning left from El Solyo Heights Drive onto northbound SR 9 enter an approximately 50-foot center receiving lane before merging into traffic.

Table 2: El Solyo Heights Drive Volumes and Warrants

Time Period	SR 9 (major approach)		Total Major Approach Volume	El Solyo Heights Drive (minor approach)	Meets Warrant 2?	Meets Warrant 3?
	SB Approach	NB Approach				
AM Hours						
7:00 AM – 8:00 AM	951	465	1,416	117	Yes	Yes
8:00 AM – 9:00 AM	788	511	1,299	125	Yes	Yes
PM Hours						
2:00 PM – 3:00 PM	761	849	1,610	111	Yes	Yes
3:00 PM – 4:00 PM	707	950	1,657	78	Yes	Yes
4:00 PM – 5:00 PM	692	992	1,684	67	Yes	No
5:00 PM – 6:00 PM	577	1,094	1,671	43	No	No
Overall Warrant Met?					Yes	Yes

Source: Fehr & Peers, 2022; CA MUTCD 2014, Rev 6, March 2021.

Of the six hours from the available traffic counts, five hours satisfied Warrant 2 and four hours satisfied Warrant 3. Therefore, both warrants were satisfied overall for the Elementary School Driveway. This indicates that minor street traffic in this location may experience enough delay and difficulty entering the major street to justify the implementation of a traffic signal.

Other Warrants

Of the remaining seven warrants, three are potentially applicable to the above intersections. Warrant 1 relates to eight-hour vehicular traffic volumes, but sufficient traffic data was not available to evaluate whether this warrant is met. Warrant 4 relates to pedestrian volumes. However, pedestrian demand across SR 9 at these locations was observed to be low, so this warrant is not likely to be met. Warrant 5 relates to school crossings. This warrant would only be met if there are greater than 20 schoolchildren crossing SR 9 during any peak hour. Because the



available traffic counts indicate that zero pedestrians crossed SR 9 at both intersections during all six observed hours (and pedestrian crossing demand was observed to be low to nonexistent during site observations), it is unlikely that this warrant would be met.

Signalization Benefits

In addition to the warrant analysis, an operations analysis was performed to understand how the implementation of traffic signals at these locations could change intersection level of service (abbreviated as LOS, level of service is a letter rating from A to F representing the amount of vehicle delay expected for a roadway facility or intersection, where a grade of LOS A indicates very low levels of delay, and a grade of LOS F indicates very high levels of delay). A Synchro software network was built using the observed traffic counts and lane geometries at the three SLV Schools intersections on SR 9.

Under current conditions, the signalized High School Driveway intersection operates at LOS C during the AM peak hour and LOS B during the PM peak hour (which corresponds to afternoon school dismissal times). Both unsignalized intersections operate at LOS F during both the AM peak hour and the PM peak hour. LOS for a side-street stop-controlled intersection is measured based on the average delay for vehicles entering the intersection from the side-street. Due to a combination of high speeds and volumes on SR 9 and high demand for eastbound left turns from the side-streets, average delay is very high, resulting in the lowest possible grade of LOS F.

A second Synchro network was built to assess how LOS would change if either or both the Elementary School Driveway and El Solyo Heights Drive intersections were signalized in addition to the existing signal at the High School Driveway intersection. After updating the signalization for these intersections in Synchro and optimizing the signal timing based on existing traffic counts, the LOS improved at both intersections.

When signalized, the intersection of SR 9 and the Elementary School Driveway would operate at LOS C in both the AM and PM peak hours. When signalized, the intersection of SR 9 and El Solyo Heights Drive would operate at LOS D in the AM peak hour and LOS C in the PM peak hour. These improvements indicate a significant drop in average delay for vehicles entering SR 9 from the side-street, because eastbound movements would have their own dedicated traffic signal phase that assigns right-of-way. **Table 3** below compares the existing LOS at the three SLV Schools Complex intersections with the potential future LOS that would result from signalizing the Elementary School Driveway and El Solyo Heights Drive intersections.



Table 3: El Solyo Heights Drive Volumes and Warrants

Intersection	Existing LOS ¹	Signalized LOS ²
SR 9 & El Solyo Heights Drive	F (AM) F (PM)	D (AM) C (PM)
SR 9 & Elementary School Driveway	F (AM) F (PM)	C (AM) C (PM)
SR 9 & High School Driveway	C (AM) B (PM)	C (AM) B (PM)

Notes:

1. AM = morning peak hour (7:30-8:30 AM), PM = afternoon peak hour (2:15-3:15 PM)

2. The existing SR 9 & High School Driveway is already signalized.

Source: Fehr & Peers, 2022; Highway Capacity Manual, Transportation Research Board, 2016.

In addition to lowering delay and improving performance at the two unsignalized intersections, implementation of traffic signals would have other potential benefits, listed below:

- Pedestrians wishing to cross SR 9 in these locations could have a signalized pedestrian phase to cross SR 9 safely and comfortably.
- Bicyclists wishing to enter/exit the Elementary School Driveway or El Solyo Heights Drive neighborhood could utilize the push button for a pedestrian phase and cross in the crosswalk without having to move into the left-turn lane. This improvement can help facilitate cyclist travel and minimize contra-flow cycling activity on SR 9.
- School buses, which typically exit the SLV Schools Complex at the High School Driveway signal under current conditions, would have much less difficulty turning onto SR 9 from any of the three intersections.
- Bicycle access and safety could be improved in the intersection redesign.
- The signalization of the Elementary School Driveway can reduce the burden at the southerly High School Driveway/SR 9 intersection where many motorists use the signal to make turns onto SR 9. Providing signals at both intersections allows an overflow location to make left-turns onto SR 9.

Under existing conditions, the High School Driveway and Elementary School Driveway are approximately 500 feet apart. An analysis of 95th percentile queue lengths (a measure of the theoretical vehicle queue length which would only be exceeded 5% of the time during the peak hour) at these two intersections with full signalization indicates that a queue of vehicles waiting at one intersection could occasionally grow long enough to “spill back” to the other intersection. Queue spillback causes congestion and increases the risks of collision at an affected intersection. In this case, signal coordination along the SR 9 corridor would be appropriate to address this issue. Coordinated signals are electronically connected to one another, and their signal phases are designed to move vehicles smoothly between adjacent intersections and prevent long spillback



queues. If the other intersections providing access to the SLV Schools Complex were to be signalized, connecting this corridor of intersections together as a coordinated system would improve traffic operations and safety.

Conclusion

Based on this evaluation, two signal warrants were satisfied for both unsignalized intersections. This means that traffic signals may be appropriate at either or both locations. Given the unique characteristics of these intersections and their interaction with the SLV Schools Complex, traffic signals could reduce delay for drivers during student pick-up and drop-off while also improving internal circulation on campus.

However, this analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the entire set of warrants should be investigated based on field-measured traffic data and a thorough study of traffic and roadway conditions by an experienced engineer. Furthermore, the decision to install a signal should not be based solely upon warrants, since the installation of signals can sometimes lead to certain types of collisions. As the jurisdiction responsible for SR 9, Caltrans should undertake regular monitoring of actual traffic conditions and collision data, and timely re-evaluation of the full set of warrants in order to prioritize and program intersections for signalization.

Other factors, like the distances between adjacent intersections, may also require further investigation. In this case, the Elementary School Driveway intersection is approximately 500 feet north of the signalized High School Driveway, and El Solyo Heights Drive is approximately 1,100 feet north of the Elementary School Driveway. Given the proximity of the three intersections, we recommend synchronization through a coordinated signal system if signalization occurs.

As noted, the signalization of the two intersections also provides multimodal benefits to transit buses entering and exiting the schools, and facilitates safe and comfortable crossing of SR 9 for people walking and cycling.

Though this analysis shows that LOS would be improved if signals were implemented in both locations, a detailed engineering study would be necessary to confirm if a traffic signal is an appropriate treatment at either of these intersections. We therefore recommend that Caltrans proceed with further evaluating future intersection control at these two locations.

Intersection:	SR-9 (NB/SB) & SLV High School Entrance (EB)											
Peak AM Hour:	7:30 AM - 8:30 AM											
	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Vehicle volumes	129	854	0	0	0	0	0	589	151	98	0	74
Bike volumes	0	1	0	0	0	0	0	0	0	0	0	0
Peak PM Hour:	2:15 PM - 3:15 PM											
	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Vehicle volumes	61	801	0	0	0	0	0	822	78	181	0	101
Bike volumes	0	1	0	0	0	0	0	0	0	0	0	0

Intersection:	SR-9 (NB/SB) & SLV Elementary School Entrance (EB) & Residential Driveway (WB)											
Peak AM Hour:	7:30 AM - 8:30 AM											
	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Vehicle volumes	121	819	0	0	0	0	0	522	148	164	0	69
Bike volumes	0	1	0	0	0	0	0	0	0	0	0	0
Peak PM Hour:	2:15 PM - 3:15 PM											
	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Vehicle volumes	38	770	0	0	1	1	0	883	48	97	0	56
Bike volumes	0	1	0	0	0	0	0	6	0	0	0	0

Intersection:	SR-9 (NB/SB) & El Solyo Heights Dr (EB) & Residential Driveway (WB)											
Peak AM Hour:	7:30 AM - 8:30 AM											
	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Vehicle volumes	116	793	0	0	0	0	0	501	86	126	0	68
Bike volumes	1	0	0	0	0	0	0	0	0	1	0	1
Peak PM Hour:	2:15 PM - 3:15 PM											
	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Vehicle volumes	41	721	0	1	0	0	0	871	58	81	0	59
Bike volumes	1	1	0	0	0	0	0	4	0	0	0	1

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File Name : 1AM FINAL
Site Code : 00000001
Start Date : 5/3/2022
Page No : 1

Groups Printed- Lights - Buses - Trucks

	SR-9 Southbound					Westbound					SR-9 Northbound					SLV HIGH SCHOOL ENTRANCE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	16	146	0	0	162	0	0	0	0	0	0	62	8	0	70	6	0	11	0	17	249
07:15 AM	41	202	0	0	243	0	0	0	0	0	0	86	30	0	116	11	0	10	0	21	380
07:30 AM	66	194	0	0	260	0	0	0	0	0	0	146	53	4	203	25	0	23	0	48	511
07:45 AM	44	182	0	0	226	0	0	0	0	0	0	161	57	1	219	41	0	28	0	69	514
Total	167	724	0	0	891	0	0	0	0	0	0	455	148	5	608	83	0	72	0	155	1654
08:00 AM	10	228	0	0	238	0	0	0	0	0	0	160	32	0	192	18	0	13	0	31	461
08:15 AM	9	250	0	0	259	0	0	0	0	0	0	122	9	0	131	14	0	10	0	24	414
08:30 AM	7	231	0	0	238	0	0	0	0	0	0	110	8	0	118	9	0	6	0	15	371
08:45 AM	3	165	0	0	168	0	0	0	0	0	0	106	7	0	113	9	0	2	0	11	292
Total	29	874	0	0	903	0	0	0	0	0	0	498	56	0	554	50	0	31	0	81	1538
Grand Total	196	1598	0	0	1794	0	0	0	0	0	0	953	204	5	1162	133	0	103	0	236	3192
Apprch %	10.9	89.1	0	0		0	0	0	0		0	82	17.6	0.4		56.4	0	43.6	0		
Total %	6.1	50.1	0	0	56.2	0	0	0	0	0	0	29.9	6.4	0.2	36.4	4.2	0	3.2	0	7.4	
Lights	196	1552	0	0	1748	0	0	0	0	0	0	890	203	5	1098	131	0	97	0	228	3074
% Lights	100	97.1	0	0	97.4	0	0	0	0	0	0	93.4	99.5	100	94.5	98.5	0	94.2	0	96.6	96.3
Buses	0	10	0	0	10	0	0	0	0	0	0	11	0	0	11	2	0	6	0	8	29
% Buses	0	0.6	0	0	0.6	0	0	0	0	0	0	1.2	0	0	0.9	1.5	0	5.8	0	3.4	0.9
Trucks	0	36	0	0	36	0	0	0	0	0	0	52	1	0	53	0	0	0	0	0	89
% Trucks	0	2.3	0	0	2	0	0	0	0	0	0	5.5	0.5	0	4.6	0	0	0	0	0	2.8

	SR-9 Southbound				Westbound				SR-9 Northbound				SLV HIGH SCHOOL ENTRANCE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	66	194	0	260	0	0	0	0	0	146	53	199	25	0	23	48	507
07:45 AM	44	182	0	226	0	0	0	0	0	161	57	218	41	0	28	69	513
08:00 AM	10	228	0	238	0	0	0	0	0	160	32	192	18	0	13	31	461
08:15 AM	9	250	0	259	0	0	0	0	0	122	9	131	14	0	10	24	414
Total Volume	129	854	0	983	0	0	0	0	0	589	151	740	98	0	74	172	1895
% App. Total	13.1	86.9	0		0	0	0		0	79.6	20.4		57	0	43		
PHF	.489	.854	.000	.945	.000	.000	.000	.000	.000	.915	.662	.849	.598	.000	.661	.623	.923

Traffic Data Service

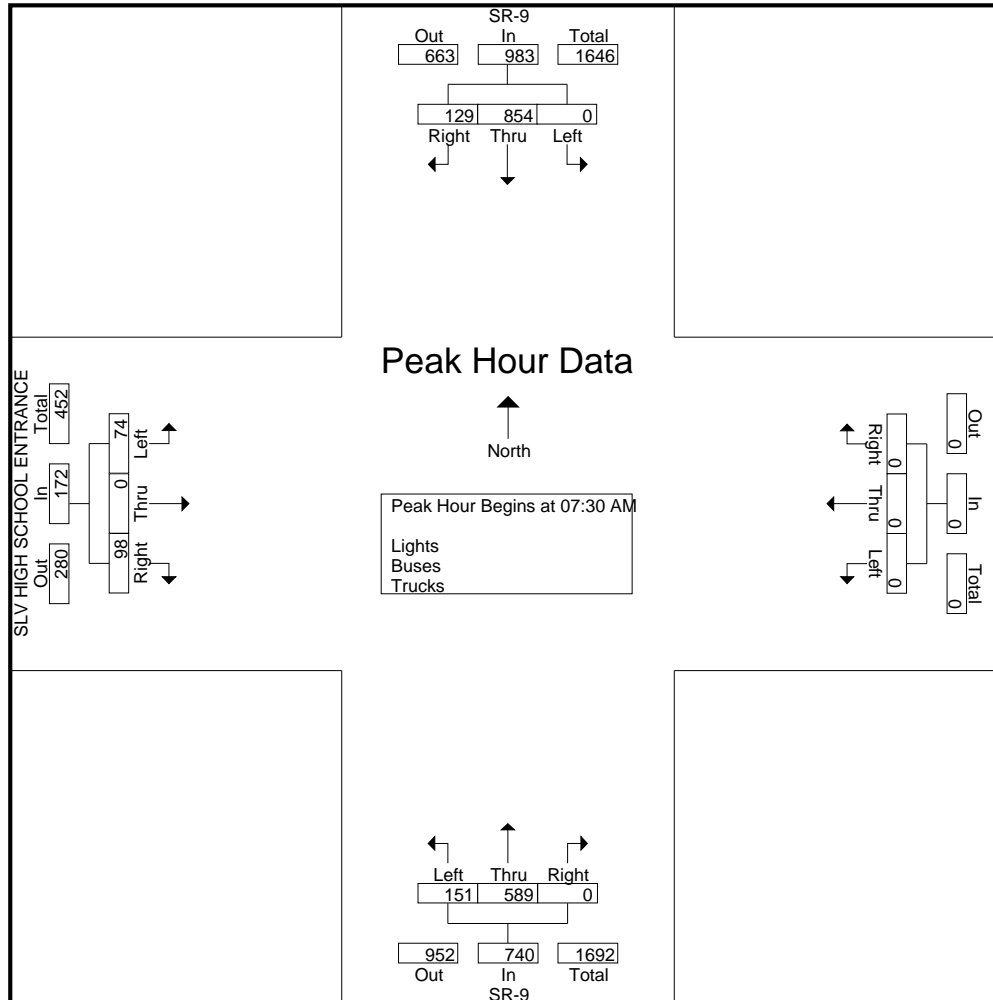
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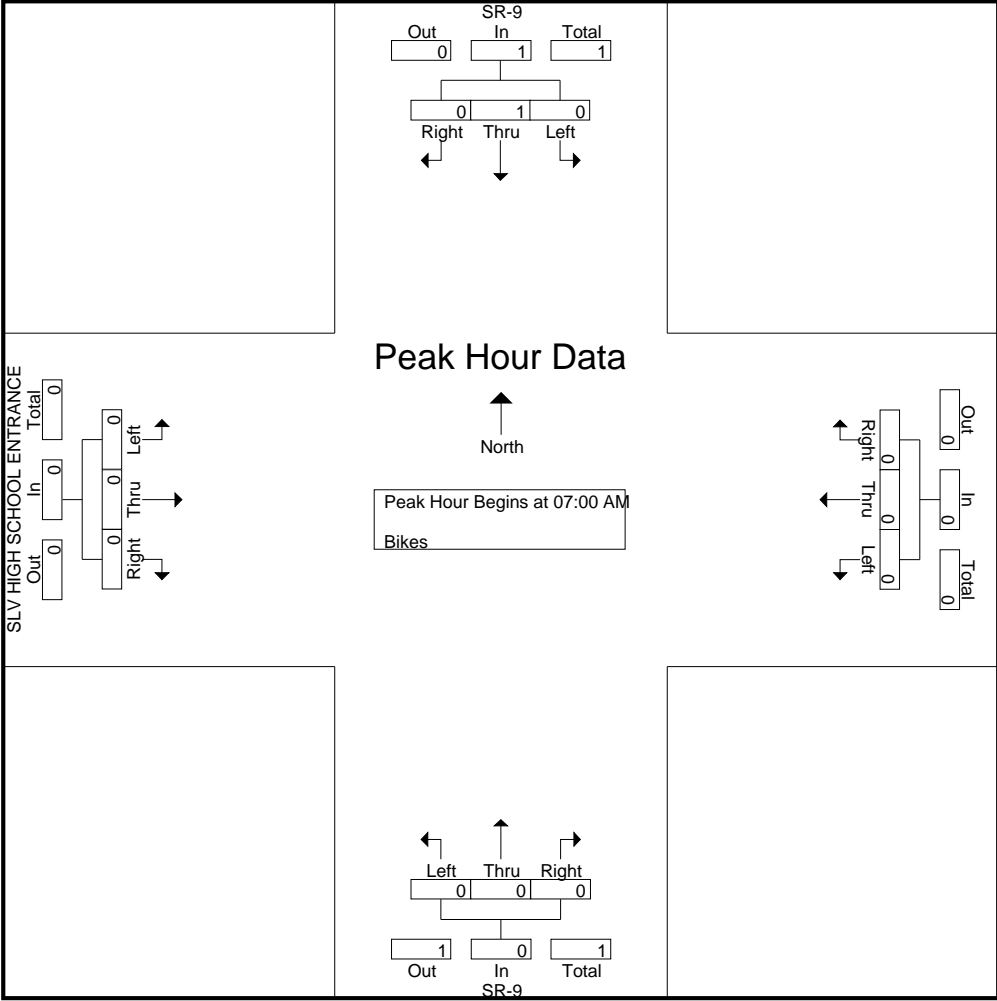
Groups Printed- Bikes

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File Name : 1PM FINAL
Site Code : 00000001
Start Date : 5/3/2022
Page No : 1

Groups Printed- Lights - Buses - Trucks

	SR-9 Southbound					Westbound					SR-9 Northbound					SLV HIGH SCHOOL ENTRANCE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
02:00 PM	12	152	0	0	164	0	0	0	0	0	0	186	23	0	209	5	0	2	0	7	380
02:15 PM	16	188	0	0	204	0	0	0	0	0	0	187	19	0	206	44	0	19	0	63	473
02:30 PM	19	208	0	0	227	0	0	0	0	0	0	214	11	2	227	36	0	16	0	52	506
02:45 PM	8	193	0	0	201	0	0	0	0	0	0	207	23	1	231	41	0	38	0	79	511
Total	55	741	0	0	796	0	0	0	0	0	0	794	76	3	873	126	0	75	0	201	1870
03:00 PM	18	212	0	0	230	0	0	0	0	0	0	214	25	4	243	60	0	28	0	88	561
03:15 PM	6	167	0	0	173	0	0	0	0	0	0	223	28	4	255	26	0	6	0	32	460
03:30 PM	5	174	0	0	179	0	0	0	0	0	0	217	46	3	266	26	0	12	0	38	483
03:45 PM	15	195	0	0	210	0	0	0	0	0	0	216	25	2	243	27	0	7	0	34	487
Total	44	748	0	0	792	0	0	0	0	0	0	870	124	13	1007	139	0	53	0	192	1991
04:00 PM	14	183	0	0	197	0	0	0	0	0	0	234	24	3	261	16	0	14	0	30	488
04:15 PM	12	166	0	0	178	0	0	0	0	0	0	229	20	1	250	13	0	7	0	20	448
04:30 PM	14	186	0	0	200	0	0	0	0	0	0	258	19	0	277	10	0	4	0	14	491
04:45 PM	11	152	0	0	163	0	0	0	0	0	0	256	24	1	281	12	0	3	1	16	460
Total	51	687	0	0	738	0	0	0	0	0	0	977	87	5	1069	51	0	28	1	80	1887
05:00 PM	14	167	0	0	181	0	0	0	0	0	0	260	25	1	286	21	0	8	0	29	496
05:15 PM	12	156	0	0	168	0	0	0	0	0	0	269	29	1	299	13	0	23	0	36	503
05:30 PM	11	130	0	0	141	0	0	0	0	0	0	268	26	3	297	36	0	6	0	42	480
05:45 PM	6	111	0	0	117	0	0	0	0	0	0	247	5	0	252	18	0	6	0	24	393
Total	43	564	0	0	607	0	0	0	0	0	0	1044	85	5	1134	88	0	43	0	131	1872
Grand Total	193	2740	0	0	2933	0	0	0	0	0	0	3685	372	26	4083	404	0	199	1	604	7620
Apprch %	6.6	93.4	0	0		0	0	0	0		0	90.3	9.1	0.6		66.9	0	32.9	0.2		
Total %	2.5	36	0	0	38.5	0	0	0	0	0	0	48.4	4.9	0.3	53.6	5.3	0	2.6	0	7.9	
Lights	193	2669	0	0	2862	0	0	0	0	0	0	3630	372	26	4028	400	0	191	1	592	7482
% Lights	100	97.4	0	0	97.6	0	0	0	0	0	0	98.5	100	100	98.7	99	0	96	100	98	98.2
Buses	0	16	0	0	16	0	0	0	0	0	0	15	0	0	15	4	0	8	0	12	43
% Buses	0	0.6	0	0	0.5	0	0	0	0	0	0	0.4	0	0	0.4	1	0	4	0	2	0.6
Trucks	0	55	0	0	55	0	0	0	0	0	0	40	0	0	40	0	0	0	0	0	95
% Trucks	0	2	0	0	1.9	0	0	0	0	0	0	1.1	0	0	1	0	0	0	0	0	1.2

	SR-9 Southbound				Westbound				SR-9 Northbound				SLV HIGH SCHOOL ENTRANCE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:15 PM																	
02:15 PM	16	188	0	204	0	0	0	0	0	187	19	206	44	0	19	63	473
02:30 PM	19	208	0	227	0	0	0	0	0	214	11	225	36	0	16	52	504
02:45 PM	8	193	0	201	0	0	0	0	0	207	23	230	41	0	38	79	510
03:00 PM	18	212	0	230	0	0	0	0	0	214	25	239	60	0	28	88	557
Total Volume	61	801	0	862	0	0	0	0	0	822	78	900	181	0	101	282	2044
% App. Total	7.1	92.9	0		0	0	0		0	91.3	8.7		64.2	0	35.8		
PHF	.803	.945	.000	.937	.000	.000	.000	.000	.000	.960	.780	.941	.754	.000	.664	.801	.917

Traffic Data Service

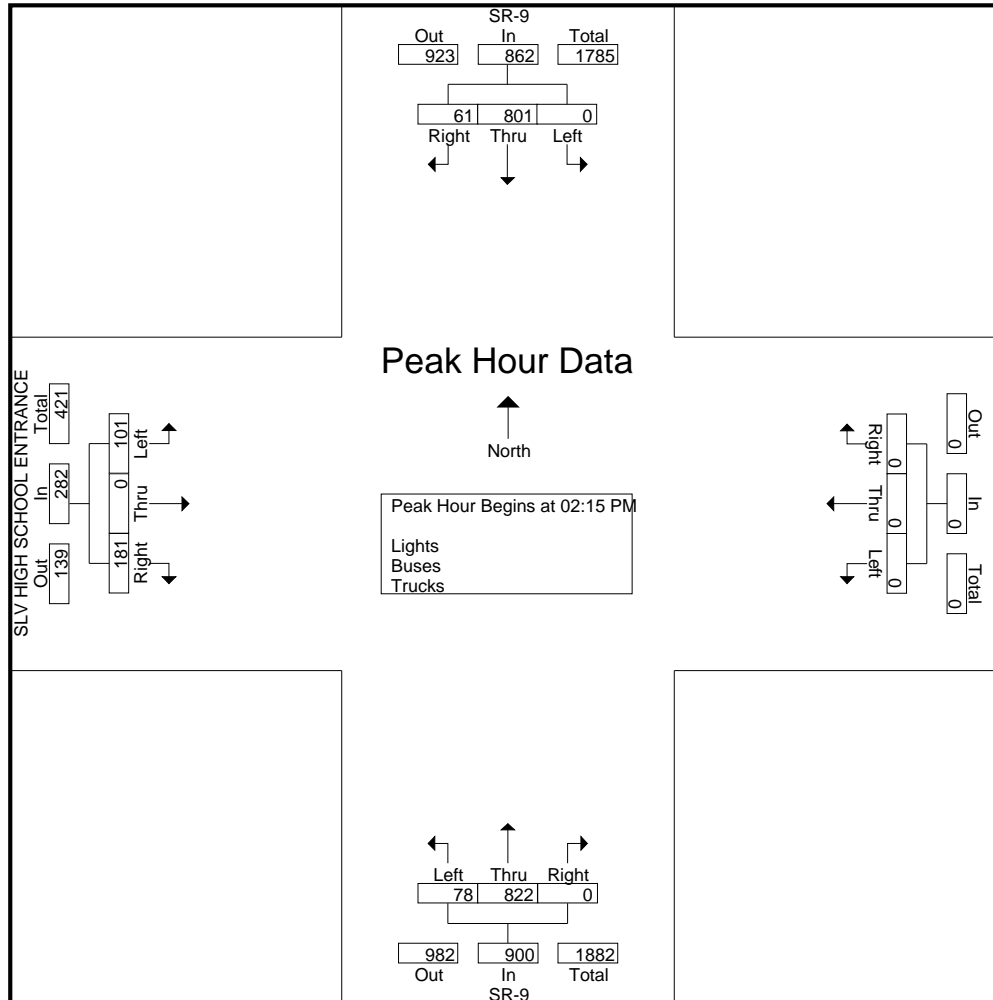
San Jose, CA
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File Name : 1PM FINAL

Site Code : 00000001

Start Date : 5/3/2022

Page No : 2



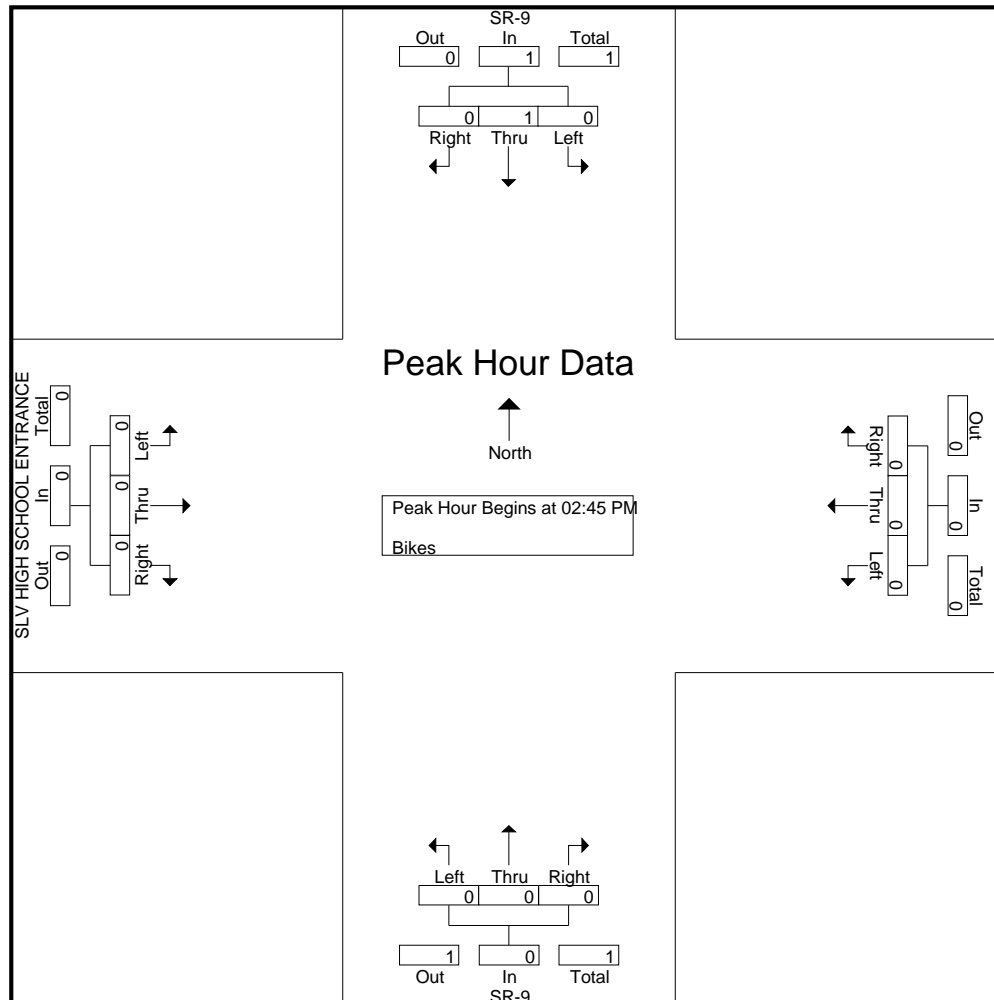
San Jose, CA
(408) 622-4787
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Groups Printed- Bikes

[illegible]

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tdsbay@cs.com

File Name : 2AM FINAL
Site Code : 00000002
Start Date : 5/3/2022
Page No : 1

Groups Printed- Lights - Buses - Trucks

	SR-9 Southbound					DRIVEWAY Westbound					SR-9 Northbound					SLV ELEMENTARY SCHOOL ENTRANCE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	3	170	0	0	173	0	0	0	0	0	0	71	3	0	74	1	0	3	0	4	251
07:15 AM	25	238	0	0	263	0	0	0	0	0	0	85	11	0	96	5	0	2	0	7	366
07:30 AM	39	234	0	0	273	0	0	0	0	0	0	140	29	0	169	29	0	13	0	42	484
07:45 AM	32	182	0	0	214	0	0	0	0	0	0	137	54	0	191	43	0	15	0	58	463
Total	99	824	0	0	923	0	0	0	0	0	0	433	97	0	530	78	0	33	0	111	1564
08:00 AM	40	178	0	0	218	0	0	0	0	0	0	121	52	0	173	57	0	26	0	83	474
08:15 AM	10	225	0	0	235	0	0	0	0	0	0	124	13	0	137	35	0	15	0	50	422
08:30 AM	6	223	0	0	229	0	0	0	0	0	0	108	4	0	112	5	0	0	0	5	346
08:45 AM	3	176	0	0	179	0	0	0	0	0	0	108	3	0	111	1	0	6	0	7	297
Total	59	802	0	0	861	0	0	0	0	0	0	461	72	0	533	98	0	47	0	145	1539
Grand Total	158	1626	0	0	1784	0	0	0	0	0	0	894	169	0	1063	176	0	80	0	256	3103
Apprch %	8.9	91.1	0	0		0	0	0	0		0	84.1	15.9	0		68.8	0	31.2	0		
Total %	5.1	52.4	0	0	57.5	0	0	0	0	0	0	28.8	5.4	0	34.3	5.7	0	2.6	0	8.3	
Lights	153	1579	0	0	1732	0	0	0	0	0	0	831	165	0	996	176	0	78	0	254	2982
% Lights	96.8	97.1	0	0	97.1	0	0	0	0	0	0	93	97.6	0	93.7	100	0	97.5	0	99.2	96.1
Buses	4	10	0	0	14	0	0	0	0	0	0	13	4	0	17	0	0	1	0	1	32
% Buses	2.5	0.6	0	0	0.8	0	0	0	0	0	0	1.5	2.4	0	1.6	0	0	1.2	0	0.4	1
Trucks	1	37	0	0	38	0	0	0	0	0	0	50	0	0	50	0	0	1	0	1	89
% Trucks	0.6	2.3	0	0	2.1	0	0	0	0	0	0	5.6	0	0	4.7	0	0	1.2	0	0.4	2.9

	SR-9 Southbound				DRIVEWAY Westbound				SR-9 Northbound				SLV ELEMENTARY SCHOOL ENTRANCE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	39	234	0	273	0	0	0	0	0	140	29	169	29	0	13	42	484
07:45 AM	32	182	0	214	0	0	0	0	0	137	54	191	43	0	15	58	463
08:00 AM	40	178	0	218	0	0	0	0	0	121	52	173	57	0	26	83	474
08:15 AM	10	225	0	235	0	0	0	0	0	124	13	137	35	0	15	50	422
Total Volume	121	819	0	940	0	0	0	0	0	522	148	670	164	0	69	233	1843
% App. Total	12.9	87.1	0		0	0	0		0	77.9	22.1		70.4	0	29.6		
PHF	.756	.875	.000	.861	.000	.000	.000	.000	.000	.932	.685	.877	.719	.000	.663	.702	.952

Traffic Data Service

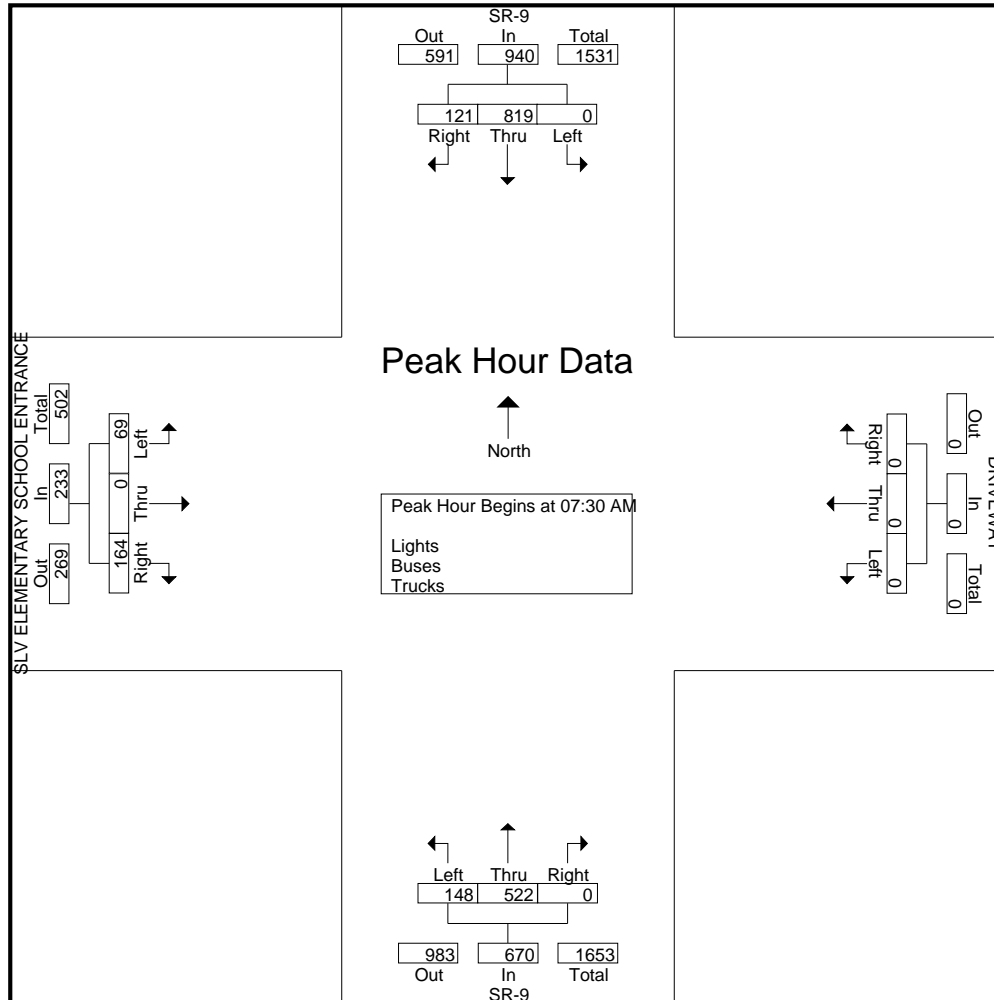
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File Name : 2AM FINAL

Site Code : 00000002

Start Date : 5/3/2022

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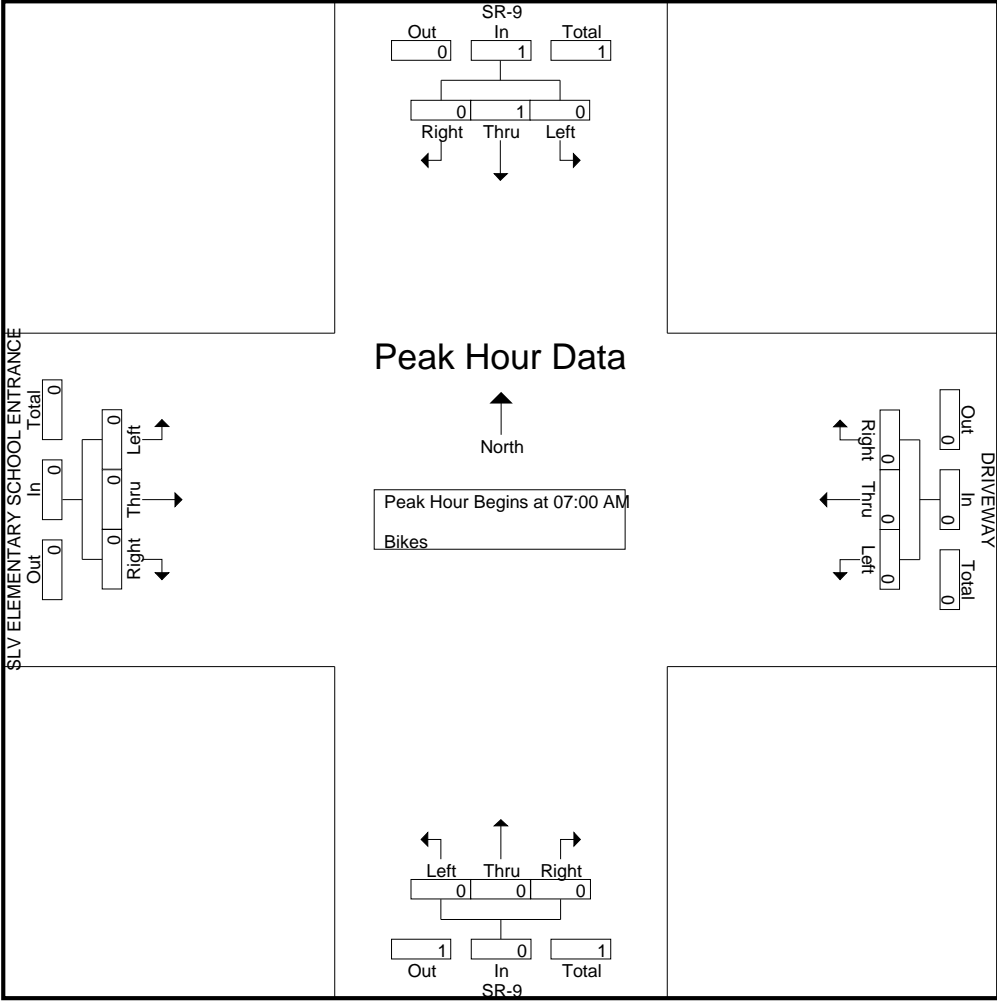
Groups Printed- Bikes

[illegible]

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Site Code : 00000002
Start Date : 5/3/2022
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File Name : 2PM FINAL
Site Code : 00000002
Start Date : 5/3/2022
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Groups Printed- Lights - Buses - Trucks

	SR-9 Southbound					DRIVEWAY Westbound					SR-9 Northbound					SLV ELEMENTARY SCHOOL ENTRANCE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
02:00 PM	10	161	0	0	171	0	0	0	0	0	0	175	9	0	184	5	0	2	0	7	362
02:15 PM	7	195	0	0	202	0	0	1	0	1	0	194	18	0	212	19	0	12	0	31	446
02:30 PM	16	203	0	0	219	0	1	0	0	1	0	225	5	0	230	12	0	3	0	15	465
02:45 PM	9	181	0	0	190	0	0	0	0	0	0	232	11	0	243	29	0	20	0	49	482
Total	42	740	0	0	782	0	1	1	0	2	0	826	43	0	869	65	0	37	0	102	1755
03:00 PM	6	191	0	0	197	0	0	0	0	0	0	232	14	0	246	37	0	21	0	58	501
03:15 PM	5	158	0	0	163	0	0	0	0	0	1	235	5	0	241	15	0	5	0	20	424
03:30 PM	1	183	0	0	184	0	0	0	1	1	0	236	2	0	238	7	0	4	0	11	434
03:45 PM	7	200	0	0	207	0	0	0	0	0	0	224	8	0	232	8	0	1	0	9	448
Total	19	732	0	0	751	0	0	0	1	1	1	927	29	0	957	67	0	31	0	98	1807
04:00 PM	6	183	0	0	189	0	0	0	2	2	1	235	12	0	248	17	0	9	0	26	465
04:15 PM	5	158	0	0	163	0	0	0	0	0	0	233	1	0	234	7	0	4	0	11	408
04:30 PM	3	200	0	0	203	0	0	0	2	2	0	258	3	0	261	4	0	1	0	5	471
04:45 PM	4	161	0	0	165	0	0	0	2	2	0	259	3	0	262	3	0	2	1	6	435
Total	18	702	0	0	720	0	0	0	6	6	1	985	19	0	1005	31	0	16	1	48	1779
05:00 PM	5	176	0	0	181	0	0	0	0	0	0	262	1	0	263	3	0	2	0	5	449
05:15 PM	7	177	0	0	184	0	0	0	0	0	0	289	5	0	294	6	0	2	0	8	486
05:30 PM	3	117	0	0	120	0	0	0	0	0	0	271	2	0	273	8	0	1	0	9	402
05:45 PM	3	113	0	0	116	0	0	0	0	0	0	248	1	0	249	1	0	3	0	4	369
Total	18	583	0	0	601	0	0	0	0	0	0	1070	9	0	1079	18	0	8	0	26	1706
Grand Total	97	2757	0	0	2854	0	1	1	7	9	2	3808	100	0	3910	181	0	92	1	274	7047
Apprch %	3.4	96.6	0	0		0	11.1	11.1	77.8		0.1	97.4	2.6	0		66.1	0	33.6	0.4		
Total %	1.4	39.1	0	0	40.5	0	0	0	0.1	0.1	0	54	1.4	0	55.5	2.6	0	1.3	0	3.9	
Lights	91	2682	0	0	2773	0	0	1	7	8	2	3744	99	0	3845	181	0	92	1	274	6900
% Lights	93.8	97.3	0	0	97.2	0	0	100	100	88.9	100	98.3	99	0	98.3	100	0	100	100	100	97.9
Buses	6	16	0	0	22	0	0	0	0	0	0	22	1	0	23	0	0	0	0	0	45
% Buses	6.2	0.6	0	0	0.8	0	0	0	0	0	0	0.6	1	0	0.6	0	0	0	0	0	0.6
Trucks	0	59	0	0	59	0	1	0	0	1	0	42	0	0	42	0	0	0	0	0	102
% Trucks	0	2.1	0	0	2.1	0	100	0	0	11.1	0	1.1	0	0	1.1	0	0	0	0	0	1.4

	SR-9 Southbound				DRIVEWAY Westbound				SR-9 Northbound				SLV ELEMENTARY SCHOOL ENTRANCE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:15 PM																	
02:15 PM	7	195	0	202	0	0	1	1	0	194	18	212	19	0	12	31	446
02:30 PM	16	203	0	219	0	1	0	1	0	225	5	230	12	0	3	15	465
02:45 PM	9	181	0	190	0	0	0	0	0	232	11	243	29	0	20	49	482
03:00 PM	6	191	0	197	0	0	0	0	0	232	14	246	37	0	21	58	501
Total Volume	38	770	0	808	0	1	1	2	0	883	48	931	97	0	56	153	1894
% App. Total	4.7	95.3	0		0	50	50		0	94.8	5.2		63.4	0	36.6		
PHF	.594	.948	.000	.922	.000	.250	.250	.500	.000	.952	.667	.946	.655	.000	.667	.659	.945

Traffic Data Service

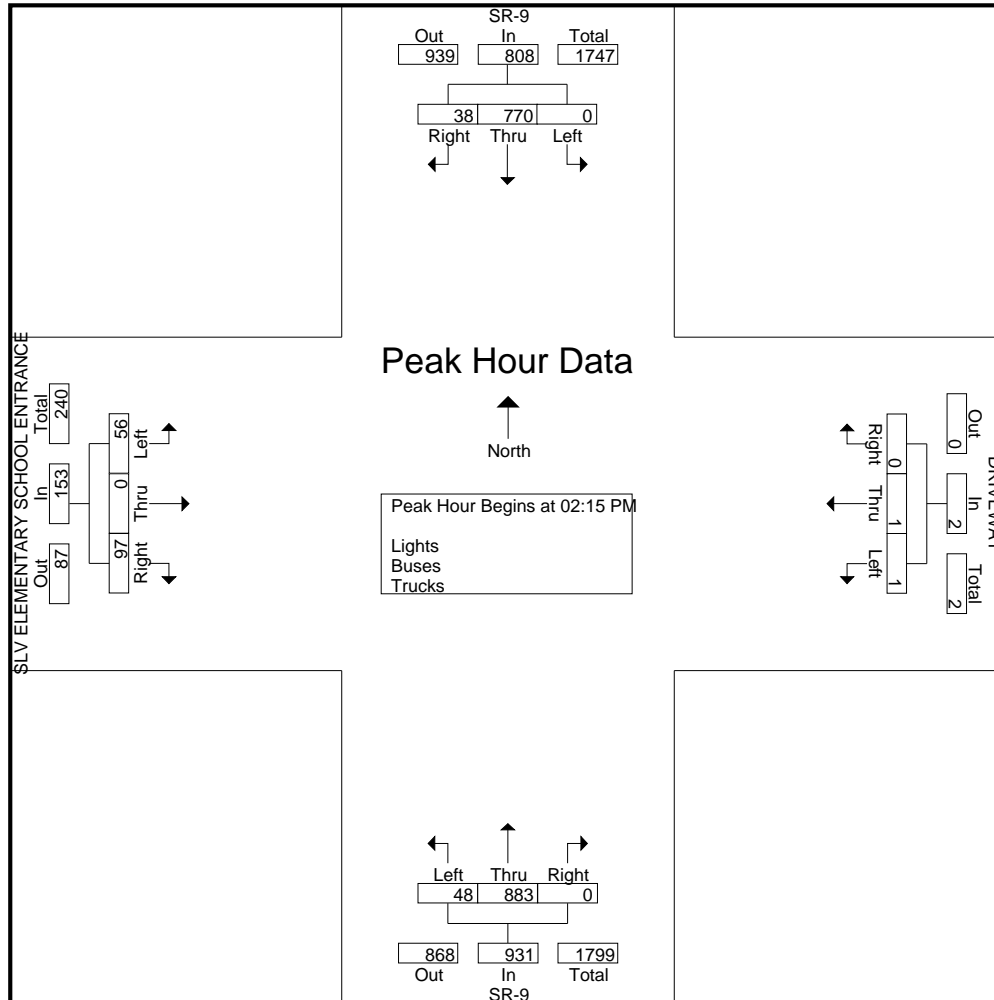
San Jose, CA
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File Name : 2PM FINAL

Site Code : 00000002

Start Date : 5/3/2022

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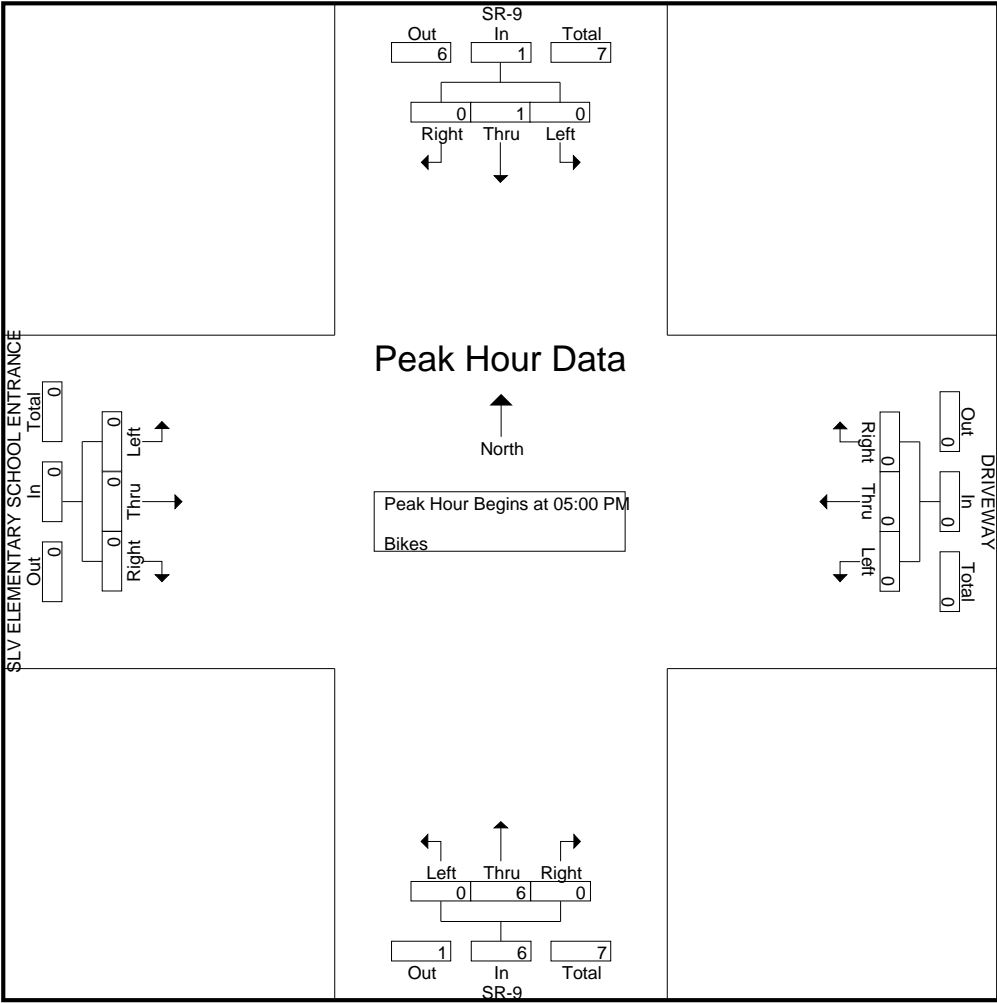
Groups Printed- Bikes

	SR-9 Southbound				DRIVEWAY Westbound				SR-9 Northbound				SLV ELEMENTARY SCHOOL ENTRANCE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	5
Total Volume	0	1	0	1	0	0	0	0	0	6	0	6	0	0	0	0	7
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.300	.000	.300	.000	.000	.000	.000	.350

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File Name : 3AM FINAL
Site Code : 00000003
Start Date : 5/3/2022
Page No : 1

Groups Printed- Lights - Buses - Trucks

	SR-9 Southbound					DRIVEWAY Westbound					SR-9 Northbound					EL SOLYO HEIGHTS DR Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	3	164	0	0	167	0	0	0	0	0	0	72	2	0	74	9	0	0	0	9	250
07:15 AM	10	260	0	0	270	0	0	0	0	0	0	80	8	0	88	8	0	5	0	13	371
07:30 AM	32	248	0	0	280	0	0	0	0	0	0	131	18	0	149	19	0	11	0	30	459
07:45 AM	43	191	0	0	234	0	0	0	0	0	0	118	36	0	154	35	0	30	0	65	453
Total	88	863	0	0	951	0	0	0	0	0	0	401	64	0	465	71	0	46	0	117	1533
08:00 AM	28	169	0	0	197	0	0	0	0	0	0	128	22	0	150	34	0	16	0	50	397
08:15 AM	13	185	0	0	198	0	0	0	0	0	0	124	10	0	134	38	0	11	0	49	381
08:30 AM	1	213	0	0	214	0	0	0	0	0	0	110	4	0	114	12	0	4	0	16	344
08:45 AM	6	173	0	0	179	0	0	0	0	0	0	111	2	0	113	8	0	2	0	10	302
Total	48	740	0	0	788	0	0	0	0	0	0	473	38	0	511	92	0	33	0	125	1424
Grand Total	136	1603	0	0	1739	0	0	0	0	0	0	874	102	0	976	163	0	79	0	242	2957
Apprch %	7.8	92.2	0	0		0	0	0	0		0	89.5	10.5	0		67.4	0	32.6	0		
Total %	4.6	54.2	0	0	58.8	0	0	0	0	0	0	29.6	3.4	0	33	5.5	0	2.7	0	8.2	
Lights	136	1549	0	0	1685	0	0	0	0	0	0	812	101	0	913	163	0	79	0	242	2840
% Lights	100	96.6	0	0	96.9	0	0	0	0	0	0	92.9	99	0	93.5	100	0	100	0	100	96
Buses	0	14	0	0	14	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	28
% Buses	0	0.9	0	0	0.8	0	0	0	0	0	0	1.6	0	0	1.4	0	0	0	0	0	0.9
Trucks	0	40	0	0	40	0	0	0	0	0	0	48	1	0	49	0	0	0	0	0	89
% Trucks	0	2.5	0	0	2.3	0	0	0	0	0	0	5.5	1	0	5	0	0	0	0	0	3

	SR-9 Southbound				DRIVEWAY Westbound				SR-9 Northbound				EL SOLYO HEIGHTS DR Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	32	248	0	280	0	0	0	0	0	131	18	149	19	0	11	30	459
07:45 AM	43	191	0	234	0	0	0	0	0	118	36	154	35	0	30	65	453
08:00 AM	28	169	0	197	0	0	0	0	0	128	22	150	34	0	16	50	397
08:15 AM	13	185	0	198	0	0	0	0	0	124	10	134	38	0	11	49	381
Total Volume	116	793	0	909	0	0	0	0	0	501	86	587	126	0	68	194	1690
% App. Total	12.8	87.2	0		0	0	0		0	85.3	14.7		64.9	0	35.1		
PHF	.674	.799	.000	.812	.000	.000	.000	.000	.000	.956	.597	.953	.829	.000	.567	.746	.920

Traffic Data Service

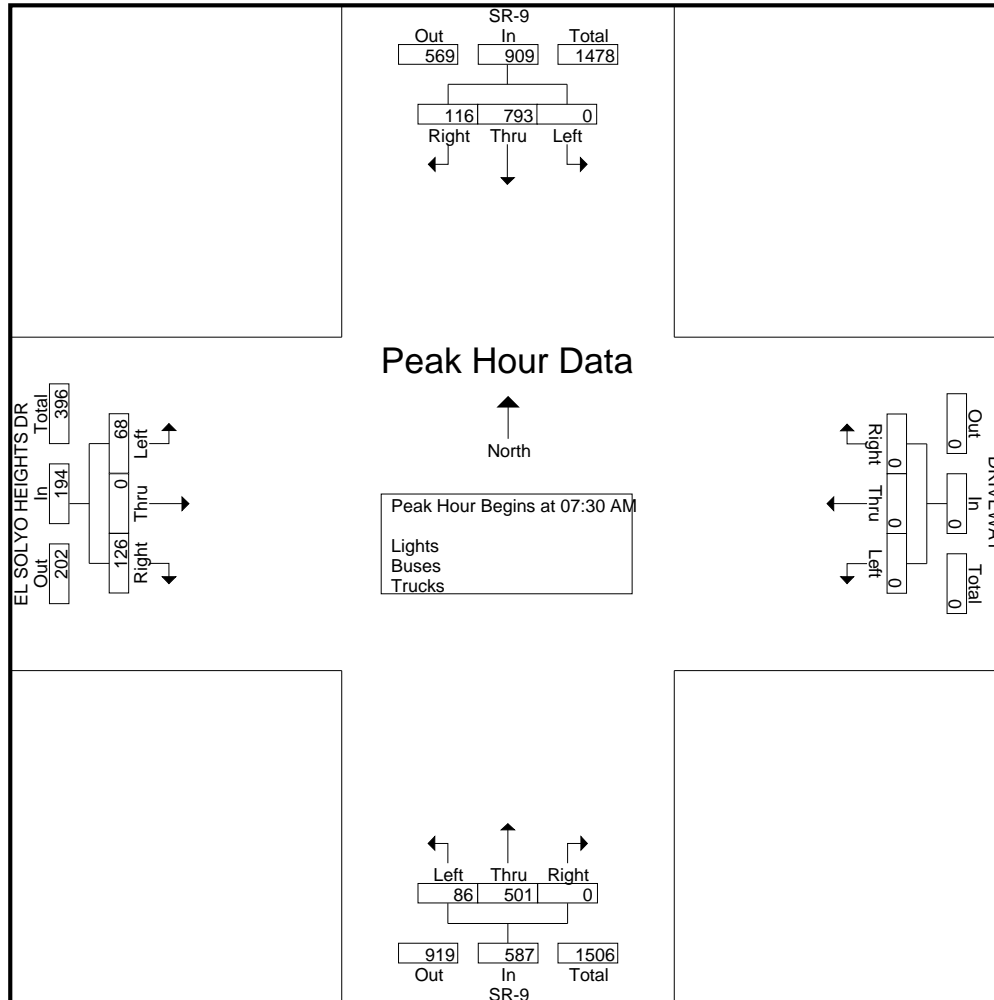
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Site Code : 00000003
Start Date : 5/3/2022
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Groups Printed- Bikes

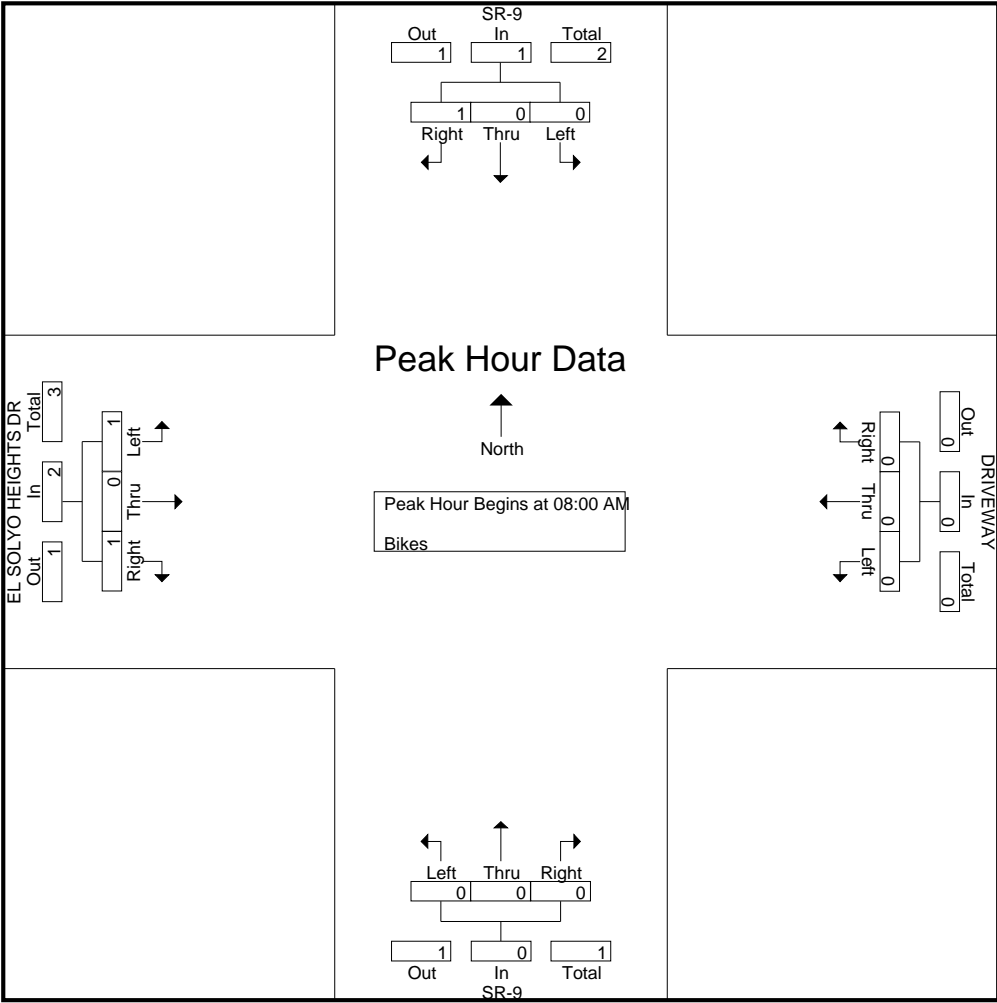
	SR-9 Southbound					DRIVEWAY Westbound					SR-9 Northbound					EL SOLYO HEIGHTS DR Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	3
Grand Total	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	4
Apprch %	50	50	0	0		0	0	0	0		0	0	0	0		50	0	50	0		
Total %	25	25	0	0	50	0	0	0	0	0	0	0	0	0	0	25	0	25	0	50	

	SR-9 Southbound				DRIVEWAY Westbound				SR-9 Northbound				EL SOLYO HEIGHTS DR Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	1	0	0	1	0	0	0	0	0	0	0	0	1	0	1	2	3
% App. Total	100	0	0		0	0	0		0	0	0		50	0	50		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.500	.375

Traffic Data Service

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File Name : 3AM FINAL
Site Code : 00000003
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File Name : 3PM FINAL
Site Code : 00000003
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Page No : 1

Groups Printed- Lights - Buses - Trucks

	SR-9 Southbound					DRIVEWAY Westbound					SR-9 Northbound					EL SOLYO HEIGHTS DR Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
02:00 PM	12	158	0	0	170	1	0	0	0	1	0	161	11	0	172	10	0	2	0	12	355
02:15 PM	8	188	0	0	196	0	0	0	0	0	0	187	15	0	202	20	0	10	0	30	428
02:30 PM	11	184	0	0	195	0	0	0	0	0	0	214	11	0	225	22	0	20	0	42	462
02:45 PM	11	189	0	0	200	1	0	0	0	1	0	235	15	0	250	20	0	7	0	27	478
Total	42	719	0	0	761	2	0	0	0	2	0	797	52	0	849	72	0	39	0	111	1723
03:00 PM	11	160	0	0	171	0	0	0	0	0	0	235	17	0	252	19	0	22	0	41	464
03:15 PM	5	152	0	0	157	0	0	1	0	1	0	220	13	0	233	12	0	0	0	12	403
03:30 PM	2	173	0	0	175	0	0	0	0	0	0	233	9	0	242	9	0	8	0	17	434
03:45 PM	6	198	0	0	204	0	0	0	0	0	0	209	14	0	223	5	0	3	0	8	435
Total	24	683	0	0	707	0	0	1	0	1	0	897	53	0	950	45	0	33	0	78	1736
04:00 PM	10	175	0	0	185	0	0	0	3	3	0	229	11	0	240	10	0	13	0	23	451
04:15 PM	2	155	0	0	157	0	0	0	1	1	0	225	10	1	236	8	0	11	0	19	413
04:30 PM	1	194	0	0	195	0	0	0	0	0	0	248	10	0	258	9	0	2	0	11	464
04:45 PM	4	151	0	0	155	0	0	1	0	1	0	249	9	0	258	12	0	1	1	14	428
Total	17	675	0	0	692	0	0	1	4	5	0	951	40	1	992	39	0	27	1	67	1756
05:00 PM	2	173	0	0	175	0	0	0	0	0	0	260	10	0	270	6	0	6	0	12	457
05:15 PM	3	169	0	0	172	0	0	0	0	0	0	285	3	0	288	10	0	5	0	15	475
05:30 PM	3	111	0	0	114	0	0	0	0	0	0	271	8	0	279	7	0	2	0	9	402
05:45 PM	2	114	0	0	116	0	0	0	0	0	0	246	11	0	257	4	0	3	0	7	380
Total	10	567	0	0	577	0	0	0	0	0	0	1062	32	0	1094	27	0	16	0	43	1714
Grand Total	93	2644	0	0	2737	2	0	2	4	8	0	3707	177	1	3885	183	0	115	1	299	6929
Apprch %	3.4	96.6	0	0		25	0	25	50		0	95.4	4.6	0		61.2	0	38.5	0.3		
Total %	1.3	38.2	0	0	39.5	0	0	0	0.1	0.1	0	53.5	2.6	0	56.1	2.6	0	1.7	0	4.3	
Lights	92	2574	0	0	2666	2	0	2	4	8	0	3648	176	1	3825	183	0	114	1	298	6797
% Lights	98.9	97.4	0	0	97.4	100	0	100	100	100	0	98.4	99.4	100	98.5	100	0	99.1	100	99.7	98.1
Buses	0	20	0	0	20	0	0	0	0	0	0	24	0	0	24	0	0	0	0	0	44
% Buses	0	0.8	0	0	0.7	0	0	0	0	0	0	0.6	0	0	0.6	0	0	0	0	0	0.6
Trucks	1	50	0	0	51	0	0	0	0	0	0	35	1	0	36	0	0	1	0	1	88
% Trucks	1.1	1.9	0	0	1.9	0	0	0	0	0	0	0.9	0.6	0	0.9	0	0	0.9	0	0.3	1.3

	SR-9 Southbound				DRIVEWAY Westbound				SR-9 Northbound				EL SOLYO HEIGHTS DR Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:15 PM																	
02:15 PM	8	188	0	196	0	0	0	0	0	187	15	202	20	0	10	30	428
02:30 PM	11	184	0	195	0	0	0	0	0	214	11	225	22	0	20	42	462
02:45 PM	11	189	0	200	1	0	0	1	0	235	15	250	20	0	7	27	478
03:00 PM	11	160	0	171	0	0	0	0	0	235	17	252	19	0	22	41	464
Total Volume	41	721	0	762	1	0	0	1	0	871	58	929	81	0	59	140	1832
% App. Total	5.4	94.6	0		100	0	0		0	93.8	6.2		57.9	0	42.1		
PHF	.932	.954	.000	.953	.250	.000	.000	.250	.000	.927	.853	.922	.920	.000	.670	.833	.958

Traffic Data Service

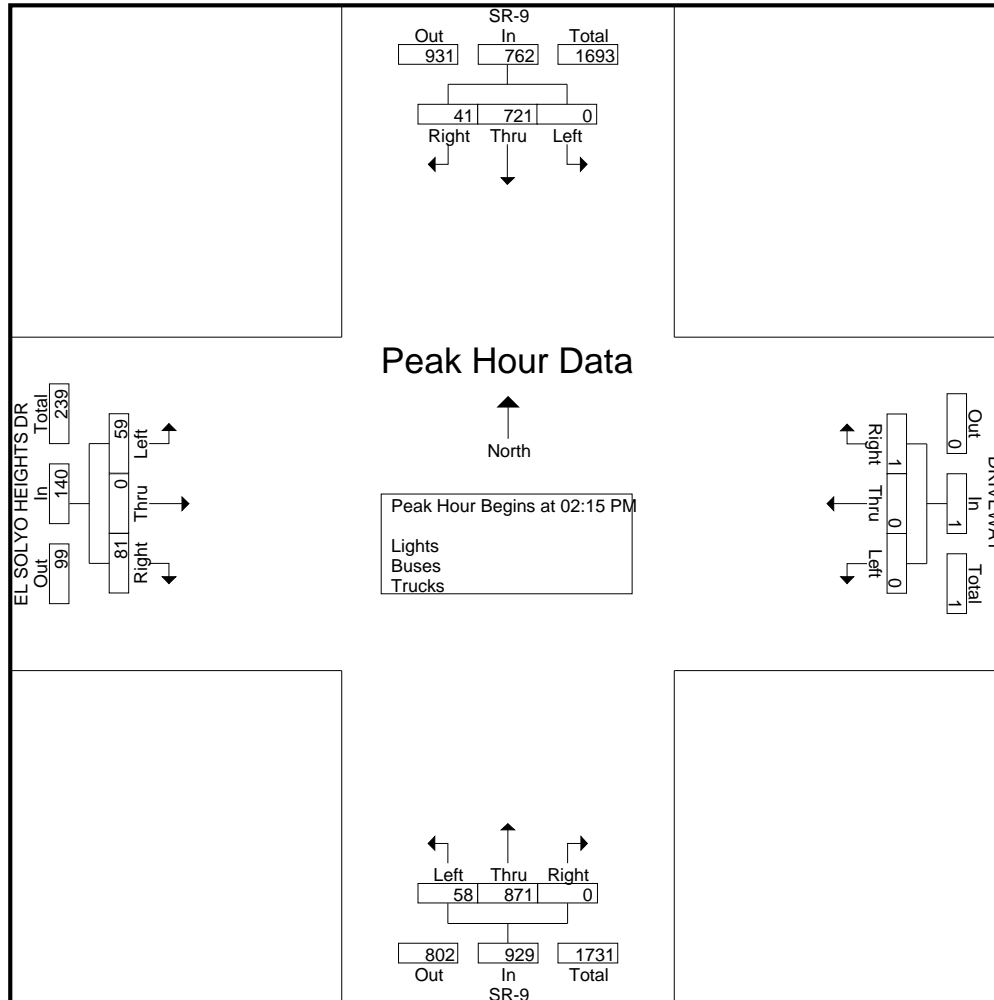
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Groups Printed- Bikes

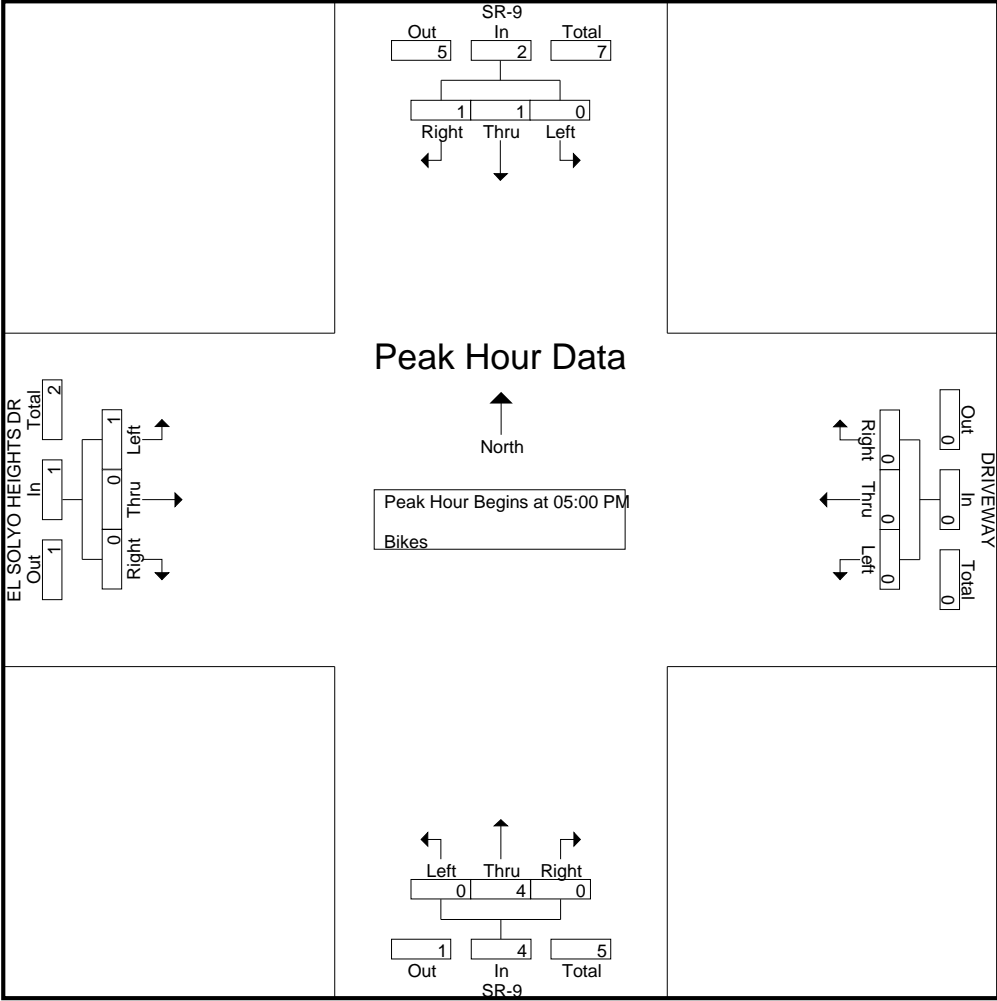
	SR-9 Southbound					DRIVEWAY Westbound					SR-9 Northbound					EL SOLYO HEIGHTS DR Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	1	0	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	5
Total	1	1	0	0	2	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	7
Grand Total	1	2	0	0	3	0	0	0	0	0	0	7	0	0	7	0	0	1	0	1	11
Apprch %	33.3	66.7	0	0		0	0	0	0		0	100	0	0		0	0	100	0		
Total %	9.1	18.2	0	0	27.3	0	0	0	0	0	0	63.6	0	0	63.6	0	0	9.1	0	9.1	

	SR-9 Southbound				DRIVEWAY Westbound				SR-9 Northbound				EL SOLYO HEIGHTS DR Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	1	0	0	1	0	0	0	0	0	3	0	3	0	0	1	1	5
Total Volume	1	1	0	2	0	0	0	0	0	4	0	4	0	0	1	1	7
% App. Total	50	50	0		0	0	0		0	100	0		0	0	100		
PHF	.250	.250	.000	.500	.000	.000	.000	.000	.000	.333	.000	.333	.000	.000	.250	.250	.350

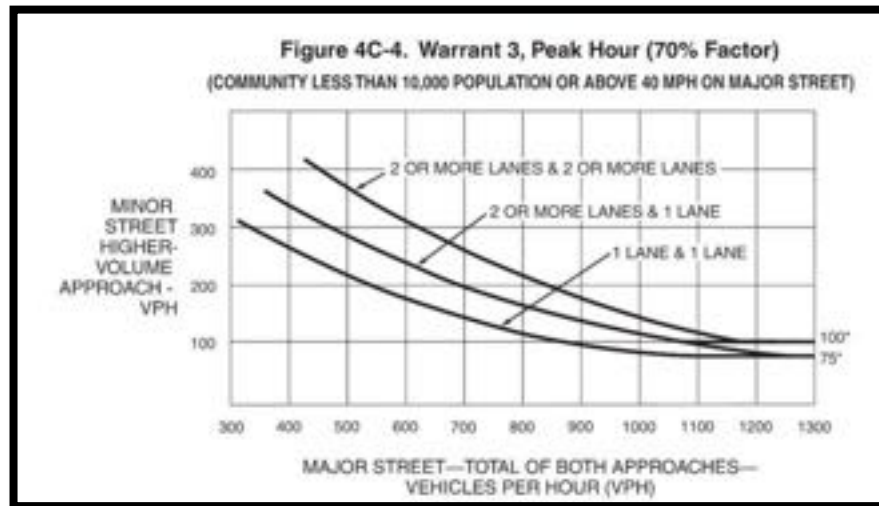
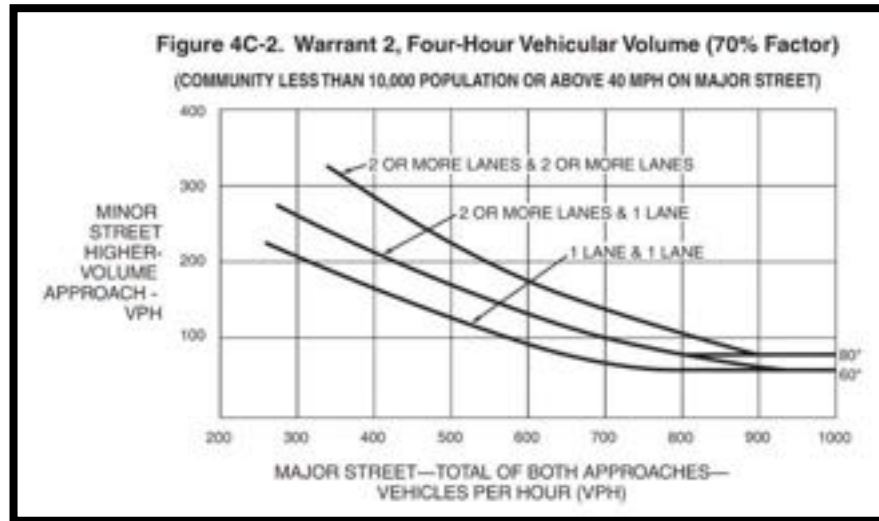
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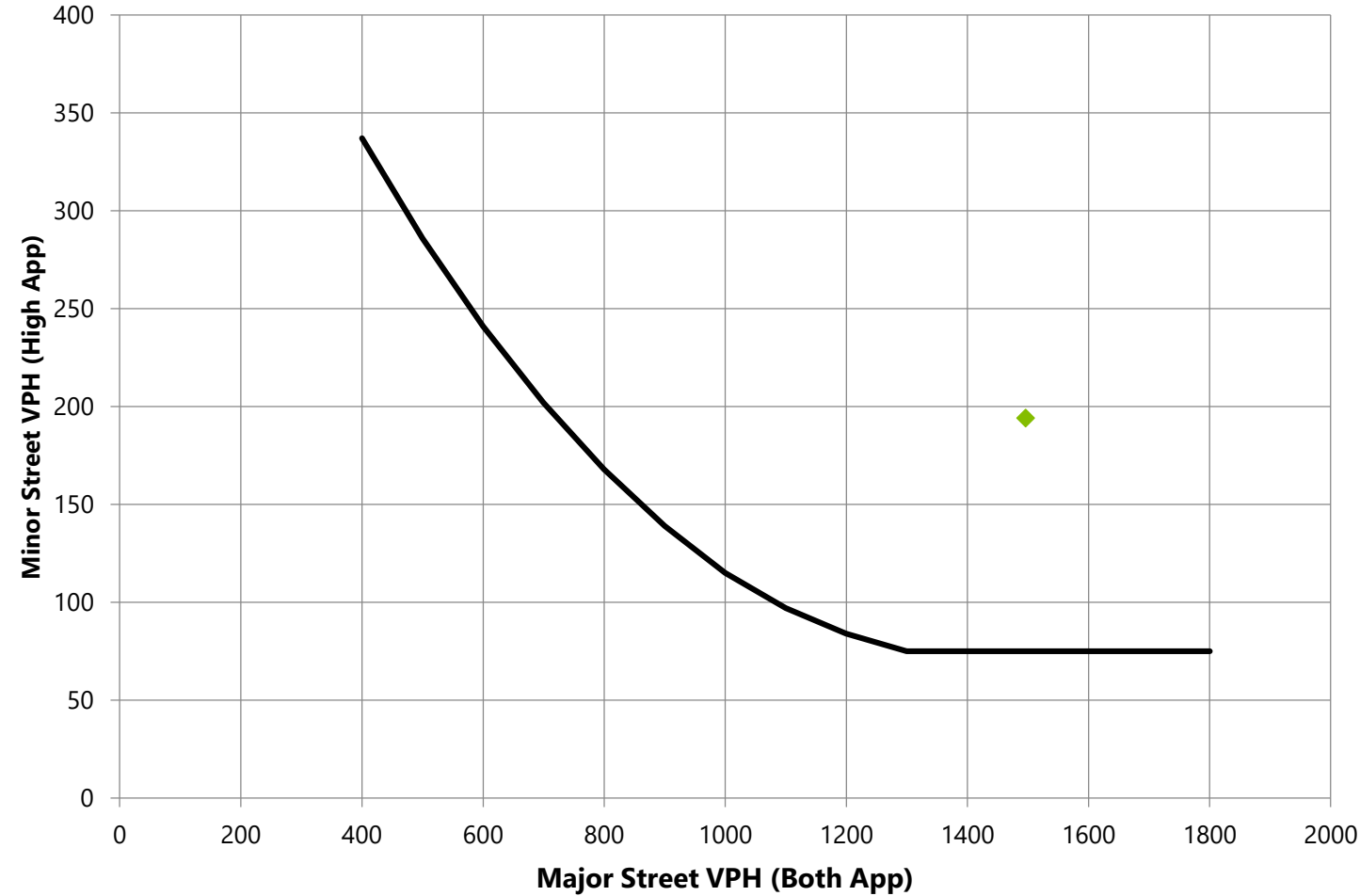
Signal Warrants



- From the California Manual on Uniform Traffic Control Devices (MUTCD)
- Evaluate whether the installation of a signal is justified at a particular location
- Not the “be-all and end-all”, but useful for guidance
- We evaluated El Solyo Heights Drive and the Elementary School Driveway using:
 - Warrant 2 (“Are there at least four hours in the day where minor street vehicles have trouble turning?”)
 - Warrant 3 (“Do minor street vehicles have trouble turning during peak periods, like during student pick-up and drop-off?”)

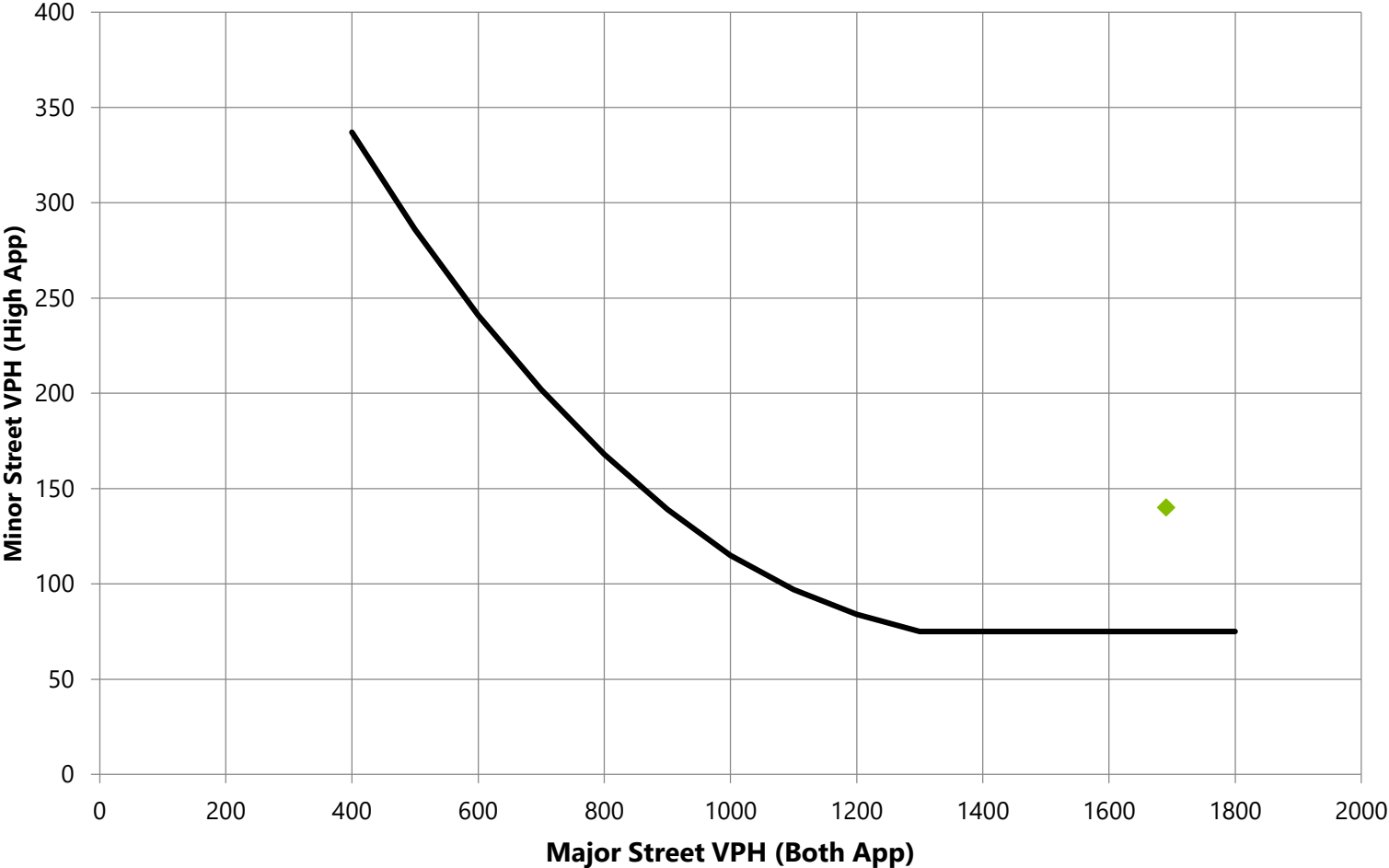
SR-9 / El Solyo Heights Drive

AM Peak Hour Warrant



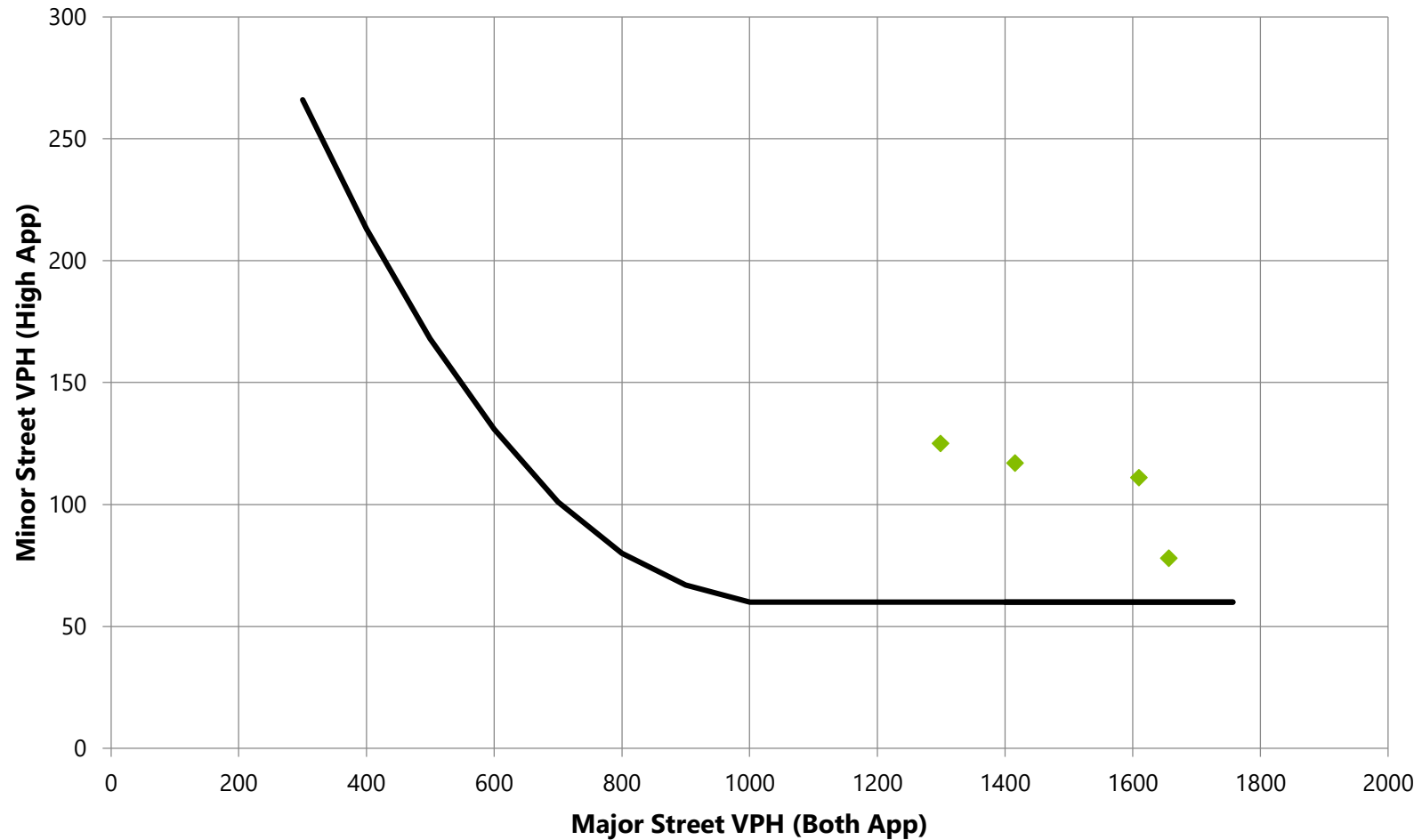
SR-9 / El Solyo Heights Drive

PM Peak Hour Warrant



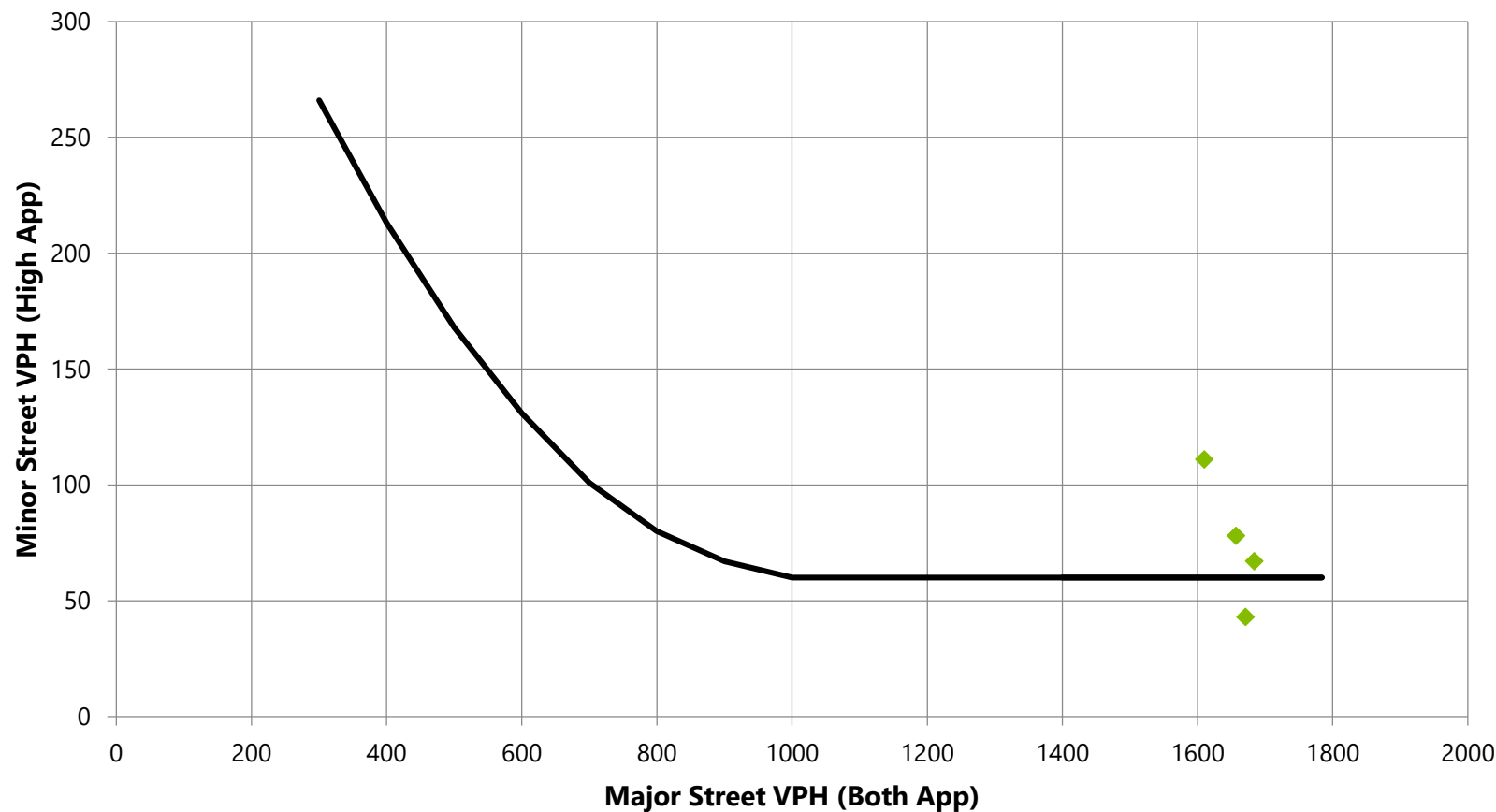
SR-9 / El Solyo Heights Drive

AM/PM Four-Hour Warrant



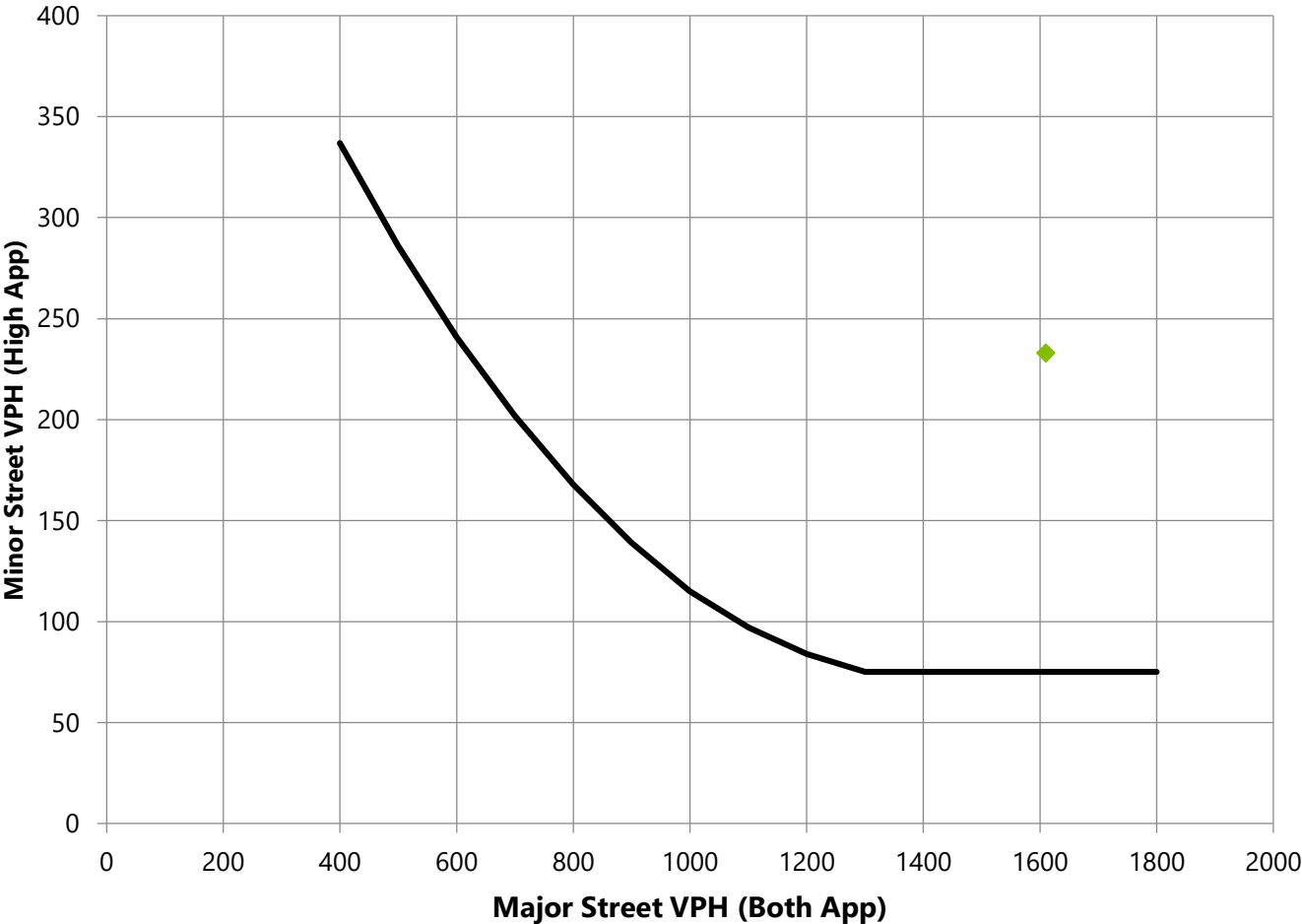
SR-9 / El Solyo Heights Drive

PM Four-Hour Warrant



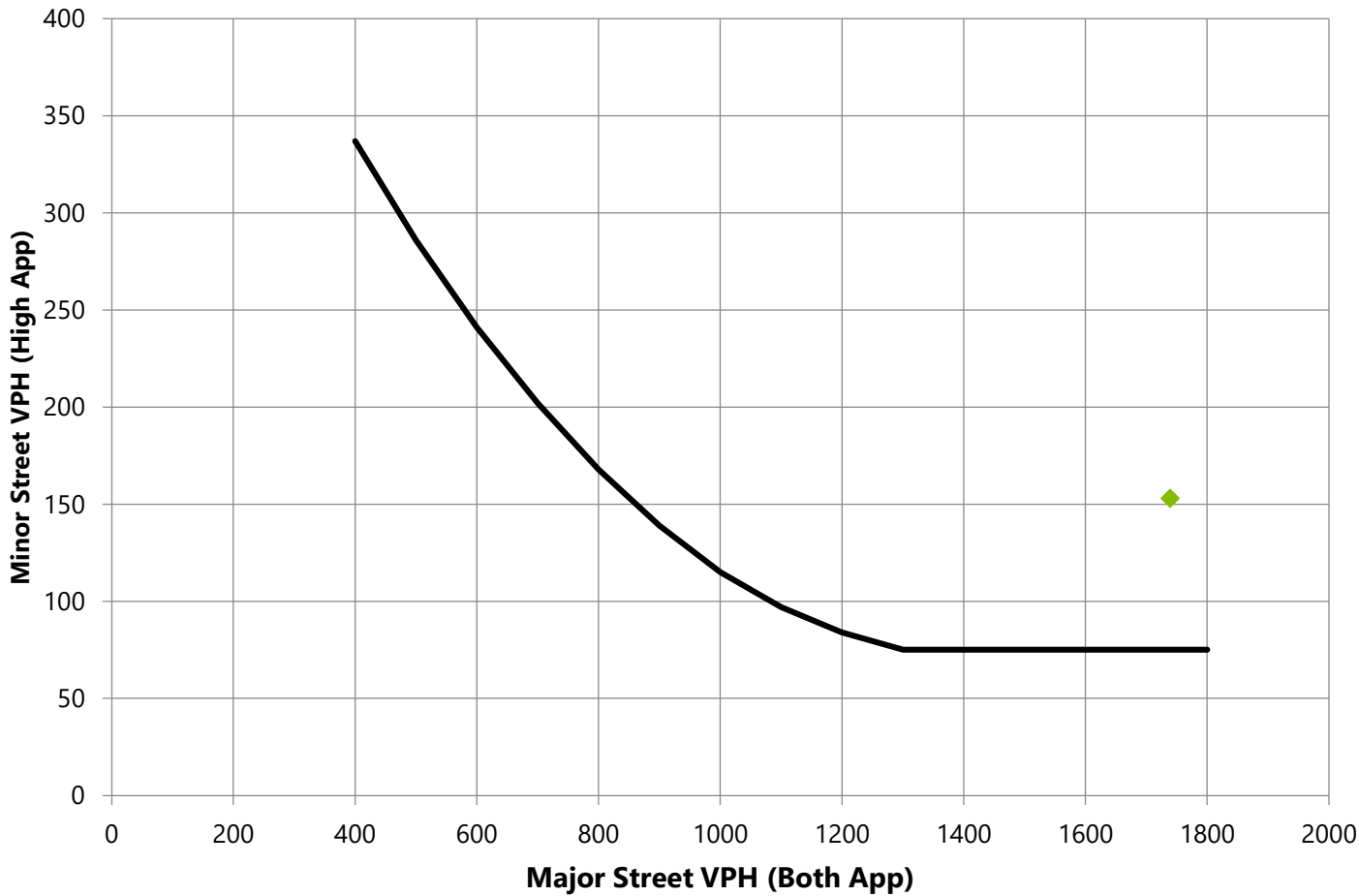
SR-9 / Elementary School Entrance

AM Peak Hour Warrant



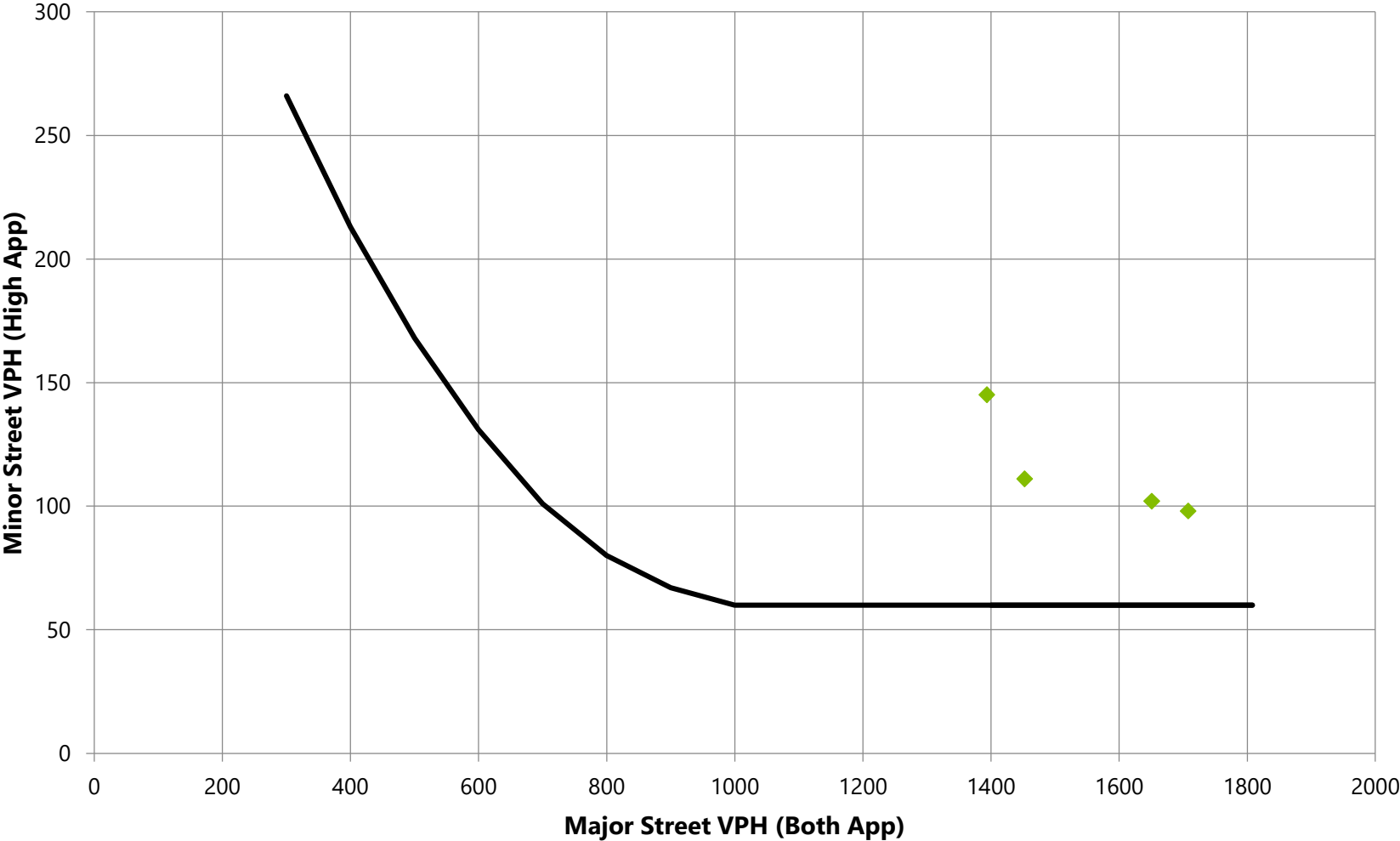
SR-9 / Elementary School Entrance

PM Peak Hour Warrant



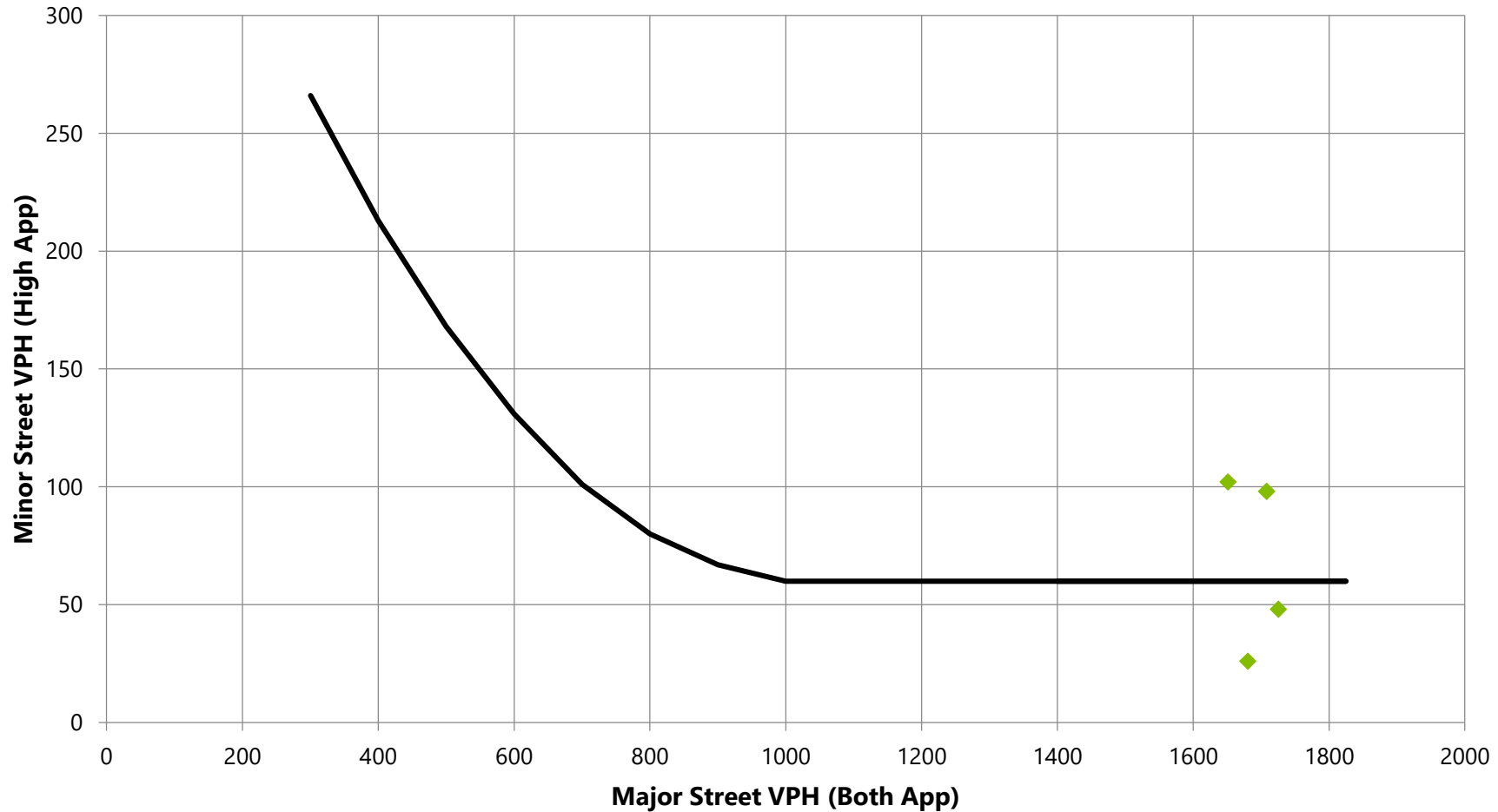
SR-9 / Elementary School Entrance

AM/PM Four-Hour Warrant



SR-9 / Elementary School Entrance

PM Four-Hour Warrant



HCM 6th Signalized Intersection Summary

2: SR 9 & High School Driveway







07/27/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↰	↱	↱	↰
Traffic Volume (veh/h)	74	98	151	589	854	129
Future Volume (veh/h)	74	98	151	589	854	129
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	107	164	640	928	140
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	356	317	188	1309	1018	863
Arrive On Green	0.20	0.20	0.11	0.70	0.54	0.54
Sat Flow, veh/h	1781	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	80	107	164	640	928	140
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1870	1585
Q Serve(g_s), s	3.4	5.2	8.2	14.0	40.4	4.0
Cycle Q Clear(g_c), s	3.4	5.2	8.2	14.0	40.4	4.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	356	317	188	1309	1018	863
V/C Ratio(X)	0.22	0.34	0.87	0.49	0.91	0.16
Avail Cap(c_a), veh/h	356	317	188	1309	1018	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	30.9	39.7	6.2	18.5	10.2
Incr Delay (d2), s/veh	1.5	2.9	39.0	1.3	13.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	5.1	5.6	5.0	19.5	1.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.6	33.8	78.6	7.5	32.1	10.6
LnGrp LOS	C	C	E	A	C	B
Approach Vol, veh/h	187			804	1068	
Approach Delay, s/veh	32.8			22.0	29.3	
Approach LOS	C			C	C	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	67.5			22.5	14.0	53.5
Change Period (Y+Rc), s	4.5			4.5	4.5	4.5
Max Green Setting (Gmax), s	63.0			18.0	9.5	49.0
Max Q Clear Time (g_c+I1), s	16.0			7.2	10.2	42.4
Green Ext Time (p_c), s	5.2			0.4	0.0	3.8
Intersection Summary						
HCM 6th Ctrl Delay			26.8			
HCM 6th LOS			C			





HCM 6th TWSC
3: SR 9 & Elementary School Driveway

07/27/2022

Intersection						
Int Delay, s/veh	14.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	69	164	148	522	819	121
Future Vol, veh/h	69	164	148	522	819	121
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	75	178	161	567	890	132
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1845	956	1022	0	-	0
Stage 1	956	-	-	-	-	-
Stage 2	889	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	82	313	679	-	-	-
Stage 1	373	-	-	-	-	-
Stage 2	402	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 63	313	679	-	-	-
Mov Cap-2 Maneuver	~ 63	-	-	-	-	-
Stage 1	285	-	-	-	-	-
Stage 2	402	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	106	2.6		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	679	-	63	313	-	-
HCM Lane V/C Ratio	0.237	-	1.19	0.57	-	-
HCM Control Delay (s)	11.9	-	285.1	30.7	-	-
HCM Lane LOS	B	-	F	D	-	-
HCM 95th %tile Q(veh)	0.9	-	6.1	3.3	-	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

HCM 6th TWSC
5: SR 9 & El Solyo Heights Dr







07/27/2022

Intersection						
Int Delay, s/veh	22					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	68	126	86	501	793	116
Future Vol, veh/h	68	126	86	501	793	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	74	137	93	545	862	126
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1656	925	988	0	-	0
Stage 1	925	-	-	-	-	-
Stage 2	731	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	108	326	699	-	-	-
Stage 1	386	-	-	-	-	-
Stage 2	476	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	94	326	699	-	-	-
Mov Cap-2 Maneuver	94	-	-	-	-	-
Stage 1	335	-	-	-	-	-
Stage 2	476	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	186.9	1.6		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	699	-	175	-	-	
HCM Lane V/C Ratio	0.134	-	1.205	-	-	
HCM Control Delay (s)	10.9	-	186.9	-	-	
HCM Lane LOS	B	-	F	-	-	
HCM 95th %tile Q(veh)	0.5	-	11.4	-	-	

HCM 6th Signalized Intersection Summary 2: SR 9 & High School Driveway

07/27/2022









Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	181	78	822	801	61
Future Volume (veh/h)	101	181	78	822	801	61
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	110	197	85	893	871	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	356	317	188	1309	1018	863
Arrive On Green	0.20	0.20	0.11	0.70	0.54	0.54
Sat Flow, veh/h	1781	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	110	197	85	893	871	66
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1870	1585
Q Serve(g_s), s	4.7	10.2	4.0	24.7	35.7	1.8
Cycle Q Clear(g_c), s	4.7	10.2	4.0	24.7	35.7	1.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	356	317	188	1309	1018	863
V/C Ratio(X)	0.31	0.62	0.45	0.68	0.86	0.08
Avail Cap(c_a), veh/h	356	317	188	1309	1018	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	32.9	37.8	7.8	17.5	9.7
Incr Delay (d2), s/veh	2.2	8.9	7.7	2.9	9.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	9.6	2.1	8.9	16.4	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.9	41.7	45.5	10.6	26.6	9.9
LnGrp LOS	C	D	D	B	C	A
Approach Vol, veh/h	307			978	937	
Approach Delay, s/veh	38.6			13.7	25.5	
Approach LOS	D			B	C	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	67.5			22.5	14.0	53.5
Change Period (Y+Rc), s	4.5			4.5	4.5	4.5
Max Green Setting (Gmax), s	63.0			18.0	9.5	49.0
Max Q Clear Time (g_c+l1), s	26.7			12.2	6.0	37.7
Green Ext Time (p_c), s	8.6			0.5	0.0	5.1
Intersection Summary						
HCM 6th Ctrl Delay			22.1			
HCM 6th LOS			C			

HCM 6th TWSC






3: SR 9 & Elementary School Driveway

07/27/2022

Intersection						
Int Delay, s/veh	6.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	56	97	48	883	770	38
Future Vol, veh/h	56	97	48	883	770	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	61	105	52	960	837	41
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1922	858	878	0	-	0
Stage 1	858	-	-	-	-	-
Stage 2	1064	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	74	357	769	-	-	-
Stage 1	415	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	69	357	769	-	-	-
Mov Cap-2 Maneuver	69	-	-	-	-	-
Stage 1	387	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	77	0.5		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	769	-	69	357	-	-
HCM Lane V/C Ratio	0.068	-	0.882	0.295	-	-
HCM Control Delay (s)	10	-	177	19.3	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.2	-	4.3	1.2	-	-

HCM 6th TWSC
5: SR 9 & El Solyo Heights Dr

07/27/2022

Intersection						
Int Delay, s/veh	13.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	59	81	58	871	721	41
Future Vol, veh/h	59	81	58	871	721	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	64	88	63	947	784	45
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1880	807	829	0	-	0
Stage 1	807	-	-	-	-	-
Stage 2	1073	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	78	381	803	-	-	-
Stage 1	439	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	72	381	803	-	-	-
Mov Cap-2 Maneuver	72	-	-	-	-	-
Stage 1	405	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	176.7	0.6		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	803	-	136	-	-	
HCM Lane V/C Ratio	0.079	-	1.119	-	-	
HCM Control Delay (s)	9.9	-	176.7	-	-	
HCM Lane LOS	A	-	F	-	-	
HCM 95th %tile Q(veh)	0.3	-	8.6	-	-	

HCM 6th Signalized Intersection Summary3: SR 9 & Elementary School Driveway

04/27/2023







Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	69	164	148	522	819	121
Future Volume (veh/h)	69	164	148	522	819	121
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	75	178	161	567	890	132
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	358	319	184	1307	868	129
Arrive On Green	0.20	0.20	0.21	1.00	1.00	1.00
Sat Flow, veh/h	1781	1585	1781	1870	1592	236
Grp Volume(v), veh/h	75	178	161	567	0	1022
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	0	1828
Q Serve(g_s), s	3.2	9.1	7.9	0.0	0.0	46.6
Cycle Q Clear(g_c), s	3.2	9.1	7.9	0.0	0.0	46.6
Prop In Lane	1.00	1.00	1.00			0.13
Lane Grp Cap(c), veh/h	358	319	184	1307	0	997
V/C Ratio(X)	0.21	0.56	0.87	0.43	0.00	1.02
Avail Cap(c_a), veh/h	358	319	184	1307	0	997
HCM Platoon Ratio	1.00	1.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.0	32.4	35.1	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.3	6.9	40.0	1.1	0.0	35.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	8.6	5.1	0.4	0.0	9.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.3	39.3	75.1	1.1	0.0	35.0
LnGrp LOS	C	D	E	A	A	F
Approach Vol, veh/h	253			728	1022	
Approach Delay, s/veh	36.9			17.4	35.0	
Approach LOS	D			B	C	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		67.4		22.6	13.8	53.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		62.9		18.1	9.3	49.1
Max Q Clear Time (g_c+I1), s		2.0		11.1	9.9	48.6
Green Ext Time (p_c), s		4.4		0.4	0.0	0.4
Intersection Summary						
HCM 6th Ctrl Delay			28.8			
HCM 6th LOS			C			

HCM 6th Signalized Intersection Summary 5: SR 9 & El Solto Heights Dr

04/27/2023








Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	68	126	86	501	793	116
Future Volume (veh/h)	68	126	86	501	793	116
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	74	137	93	545	862	126
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	116	214	129	1307	920	134
Arrive On Green	0.20	0.20	0.10	0.93	0.58	0.58
Sat Flow, veh/h	576	1066	1781	1870	1595	233
Grp Volume(v), veh/h	212	0	93	545	0	988
Grp Sat Flow(s),veh/h/ln	1650	0	1781	1870	0	1828
Q Serve(g_s), s	10.6	0.0	4.6	3.0	0.0	44.8
Cycle Q Clear(g_c), s	10.6	0.0	4.6	3.0	0.0	44.8
Prop In Lane	0.35	0.65	1.00			0.13
Lane Grp Cap(c), veh/h	332	0	129	1307	0	1054
V/C Ratio(X)	0.64	0.00	0.72	0.42	0.00	0.94
Avail Cap(c_a), veh/h	332	0	129	1307	0	1054
HCM Platoon Ratio	1.00	1.00	1.33	1.33	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	39.8	1.1	0.0	17.5
Incr Delay (d2), s/veh	9.1	0.0	29.5	1.0	0.0	16.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	0.0	3.0	1.0	0.0	21.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.0	0.0	69.3	2.0	0.0	33.7
LnGrp LOS	D	A	E	A	A	C
Approach Vol, veh/h	212			638	988	
Approach Delay, s/veh	42.0			11.8	33.7	
Approach LOS	D			B	C	
Timer - Assigned Phs	2		4		5	6
Phs Duration (G+Y+Rc), s	67.4		22.6		11.0	56.4
Change Period (Y+Rc), s	4.5		4.5		4.5	4.5
Max Green Setting (Gmax), s	62.9		18.1		6.5	51.9
Max Q Clear Time (g_c+l1), s	5.0		12.6		6.6	46.8
Green Ext Time (p_c), s	4.2		0.3		0.0	3.2
Intersection Summary						
HCM 6th Ctrl Delay			27.1			
HCM 6th LOS			C			

HCM 6th Signalized Intersection Summary

3: SR 9 & Elementary School Driveway

04/27/2023







Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	56	97	48	883	770	38
Future Volume (veh/h)	56	97	48	883	770	38
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	105	52	960	837	41
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	401	357	114	1239	959	47
Arrive On Green	0.22	0.22	0.06	0.66	0.54	0.54
Sat Flow, veh/h	1781	1585	1781	1870	1768	87
Grp Volume(v), veh/h	61	105	52	960	0	878
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	0	1855
Q Serve(g_s), s	2.2	4.4	2.3	28.5	0.0	32.9
Cycle Q Clear(g_c), s	2.2	4.4	2.3	28.5	0.0	32.9
Prop In Lane	1.00	1.00	1.00			0.05
Lane Grp Cap(c), veh/h	401	357	114	1239	0	1006
V/C Ratio(X)	0.15	0.29	0.46	0.77	0.00	0.87
Avail Cap(c_a), veh/h	401	357	114	1239	0	1006
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.9	25.7	36.1	9.4	0.0	15.9
Incr Delay (d2), s/veh	0.8	2.1	12.7	4.8	0.0	10.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	4.3	1.4	10.7	0.0	15.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.7	27.8	48.8	14.1	0.0	26.3
LnGrp LOS	C	C	D	B	A	C
Approach Vol, veh/h	166			1012	878	
Approach Delay, s/veh	27.0			15.9	26.3	
Approach LOS	C			B	C	
Timer - Assigned Phs	2		4		5	6
Phs Duration (G+Y+Rc), s	57.5		22.5		9.6	47.9
Change Period (Y+Rc), s	4.5		4.5		4.5	4.5
Max Green Setting (Gmax), s	53.0		18.0		5.1	43.4
Max Q Clear Time (g_c+I1), s	30.5		6.4		4.3	34.9
Green Ext Time (p_c), s	8.3		0.3		0.0	4.1
Intersection Summary						
HCM 6th Ctrl Delay			21.2			
HCM 6th LOS			C			

HCM 6th Signalized Intersection Summary 5: SR 9 & El Solto Heights Dr

04/27/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	81	58	871	721	41
Future Volume (veh/h)	59	81	58	871	721	41
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	88	63	947	784	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	167	230	121	1197	897	51
Arrive On Green	0.24	0.24	0.07	0.64	0.51	0.51
Sat Flow, veh/h	696	957	1781	1870	1752	101
Grp Volume(v), veh/h	153	0	63	947	0	829
Grp Sat Flow(s),veh/h/ln	1663	0	1781	1870	0	1852
Q Serve(g_s), s	5.8	0.0	2.6	27.7	0.0	29.7
Cycle Q Clear(g_c), s	5.8	0.0	2.6	27.7	0.0	29.7
Prop In Lane	0.42	0.58	1.00			0.05
Lane Grp Cap(c), veh/h	399	0	121	1197	0	948
V/C Ratio(X)	0.38	0.00	0.52	0.79	0.00	0.87
Avail Cap(c_a), veh/h	399	0	121	1197	0	948
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	33.8	9.8	0.0	16.2
Incr Delay (d2), s/veh	2.8	0.0	15.1	5.4	0.0	11.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	1.6	10.6	0.0	13.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.6	0.0	48.8	15.2	0.0	27.2
LnGrp LOS	C	A	D	B	A	C
Approach Vol, veh/h	153			1010	829	
Approach Delay, s/veh	26.6			17.3	27.2	
Approach LOS	C			B	C	
Timer - Assigned Phs	2		4		5	6
Phs Duration (G+Y+Rc), s	52.5		22.5		9.6	42.9
Change Period (Y+Rc), s	4.5		4.5		4.5	4.5
Max Green Setting (Gmax), s	48.0		18.0		5.1	38.4
Max Q Clear Time (g_c+I1), s	29.7		7.8		4.6	31.7
Green Ext Time (p_c), s	7.4		0.3		0.0	3.2
Intersection Summary						
HCM 6th Ctrl Delay			22.1			
HCM 6th LOS			C			

SANTA CRUZ COUNTY REGIONAL TRANSPORTATION COMMISSION

APPENDIX E: COST ESTIMATES



SLV Circulation & Access Study
Highway 9 - Northbound Continuous Bike Lane
(Graham Hill Rd to Rocky's Café)



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 50,000	\$ 50,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 5,000	\$ 5,000
3	170103	CLEARING AND GRUBBING (LS)	LS	1	\$ 40,000	\$ 40,000
4	190101	ROADWAY EXCAVATION	CY	280	\$ 60	\$ 16,800
5	260203	CLASS 2 AGGREGATE BASE (CY)	CY	160	\$ 200	\$ 32,000
6	390132	HOT MIX ASPHALT (TYPE A)	TON	200	\$ 250	\$ 50,000
7	510094	STRUCTURAL CONCRETE, DRAINAGE INLET	CY	8	\$ 2,000	\$ 16,000
8	710150	REMOVE INLET	EA	3	\$ 1,000	\$ 3,000
9	730020	MINOR CONCRETE (CURB) (CY)	CY	25	\$ 1,500	\$ 37,500
10		FENCE	LF	600	\$ 40	\$ 24,000
11	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	1,300	\$ 2	\$ 2,600
ROADWAY SUBTOTAL						\$ 276,900
12	999990	MINOR ITEMS (10%)	LS	1	\$ 28,000.00	\$ 28,000
13	999990	MOBILIZATION (10%)	LS	1	\$ 30,000.00	\$ 30,000
CONSTRUCTION TOTAL=						\$ 334,900
CONTINGENCY (30%)=						\$ 100,470
GRAND TOTAL=						\$ 436,000

SLV Circulation & Access Study

High School - Outbound "Right-Only" Driveway Exist



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 4,000	\$ 4,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
3	170103	CLEARING AND GRUBBING (LS)	LS	1	\$ 2,000	\$ 2,000
4	190101	ROADWAY EXCAVATION	CY	210	\$ 60	\$ 12,600
5	260203	CLASS 2 AGGREGATE BASE (CY)	CY	125	\$ 200	\$ 25,000
6	390132	HOT MIX ASPHALT (TYPE A)	TON	110	\$ 250	\$ 27,500
7	730020	MINOR CONCRETE (CURB) (CY)	CY	5	\$ 1,200	\$ 6,000
8	731521	MINOR CONCRETE (SIDEWALK)	CY	5	\$ 1,000	\$ 5,000
9	731623	MINOR CONCRETE (CURB RAMP)	CY	3	\$ 1,300	\$ 3,900
10	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	190	\$ 2	\$ 380
11	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	490	\$ 10	\$ 4,900
12	846030	REMOVE THERMOPLASTIC TRAFFIC STRIPE	LF	260	\$ 1	\$ 260
13	846035	REMOVE THERMOPLASTIC PAVEMENT MARKING	SQFT	180	\$ 5	\$ 900
ROADWAY SUBTOTAL						\$ 94,440
12	999990	MINOR ITEMS (10%)	LS	1	\$ 9,000	\$ 9,000
13	999990	MOBILIZATION (10%)	LS	1	\$ 10,000	\$ 10,000
CONSTRUCTION TOTAL=						\$ 113,440
CONTINGENCY (30%)=						\$ 34,032
GRAND TOTAL=						\$ 148,000

SLV Circulation & Access Study

High School - Bus Only Travel Lanes




ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 2,000	\$ 2,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 1,000	\$ 1,000
3	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	170	\$ 10	\$ 1,700
4	847148A	RED METHYL METHACRYLATE PAINT	SQFT	2,650	\$ 15	\$ 39,750
ROADWAY SUBTOTAL						\$ 44,450
5	999990	MINOR ITEMS (10%)	LS	1	\$ 4,000	\$ 4,000
6	999990	MOBILIZATION (10%)	LS	1	\$ 5,000	\$ 5,000
CONSTRUCTION TOTAL=						\$ 53,450
CONTINGENCY (30%)=						\$ 16,035
GRAND TOTAL=						\$ 70,000

SLV Circulation & Access Study

High School - Student Loading Zone



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 2,000	\$ 2,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
3	190101	ROADWAY EXCAVATION	CY	310	\$ 60	\$ 18,600
4	260203	CLASS 2 AGGREGATE BASE (CY)	CY	190	\$ 200	\$ 38,000
5	390132	HOT MIX ASPHALT (TYPE A)	TON	180	\$ 250	\$ 45,000
6	730020	MINOR CONCRETE (CURB) (CY)	CY	8	\$ 1,200	\$ 9,600
7	731521	MINOR CONCRETE (SIDEWALK)	CY	30	\$ 1,000	\$ 30,000
8	731623	MINOR CONCRETE (CURB RAMP)	CY	2	\$ 1,300	\$ 2,600
9	800360	CHAIN LINK FENCE (TYPE CL-6)	LF	60	\$ 50	\$ 3,000
10	803020	REMOVE FENCE	LF	80	\$ 10	\$ 800
11	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	190	\$ 2	\$ 380
ROADWAY SUBTOTAL						\$ 151,600
12	999990	MINOR ITEMS (10%)	LS	1	\$ 15,000	\$ 15,000
13	999990	MOBILIZATION (10%)	LS	1	\$ 17,000	\$ 17,000
CONSTRUCTION TOTAL=						\$ 183,600
CONTINGENCY (30%)=						\$ 55,080
GRAND TOTAL=						\$ 239,000

<div> <div>SLV Circulation & Access Study</div> <div>High School - One Way Drive Aisle Travel</div> </div> <div>  </div>						
ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 2,000	\$ 2,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
3	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	200	\$ 20	\$ 4,000
ROADWAY SUBTOTAL						\$ 8,000
4	999990	MINOR ITEMS (10%)	LS	1	\$ 1,000	\$ 1,000
5	999990	MOBILIZATION (10%)	LS	1	\$ 1,000	\$ 1,000
CONSTRUCTION TOTAL=						\$ 10,000
CONTINGENCY (30%)=						\$ 3,000
GRAND TOTAL=						\$ 13,000

SLV Circulation & Access Study

High School - Widen for Additional Car Parking



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 2,000	\$ 2,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
3	190101	ROADWAY EXCAVATION	CY	42	\$ 60	\$ 2,520
4	260203	CLASS 2 AGGREGATE BASE (CY)	CY	28	\$ 200	\$ 5,600
5	390132	HOT MIX ASPHALT (TYPE A)	TON	30	\$ 250	\$ 7,500
6	377501	SLURRY SEAL	TON	20	\$ 1,000	\$ 20,000
7	840655	PAINT TRAFFIC STRIPE (1-COAT)	LF	1,250	\$ 2	\$ 2,500
ROADWAY SUBTOTAL						\$ 42,120
8	999990	MINOR ITEMS (10%)	LS	1	\$ 4,000.00	\$ 4,000
9	999990	MOBILIZATION (10%)	LS	1	\$ 5,000.00	\$ 5,000
CONSTRUCTION TOTAL=						\$ 51,120
CONTINGENCY (30%)=						\$ 15,336
GRAND TOTAL=						\$ 67,000

SLV Circulation & Access Study

High School - Enhance Transit Stops



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 4,000	\$ 4,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
3	190101	ROADWAY EXCAVATION	CY	250	\$ 60	\$ 15,000
4	260203	CLASS 2 AGGREGATE BASE (CY)	CY	130	\$ 200	\$ 26,000
5	390132	HOT MIX ASPHALT (TYPE A)	TON	70	\$ 250	\$ 17,500
6	510094	STRUCTURAL CONCRETE, DRAINAGE INLET	CY	4	\$ 3,500.00	\$ 14,000
7	650014	18" REINFORCED CONCRETE PIPE	LF	90	\$ 250.00	\$ 22,500
8	730020	MINOR CONCRETE (CURB) (CY)	CY	13	\$ 1,200	\$ 15,600
9	731521	MINOR CONCRETE (SIDEWALK)	CY	80	\$ 1,000	\$ 80,000
10	731623	MINOR CONCRETE (CURB RAMP)	CY	9	\$ 1,300	\$ 11,700
11		RELOCATE BUS SHELTER	EA	3	\$ 5,000	\$ 15,000
12	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	320	\$ 10	\$ 3,200
13	847148A	GREEN METHYL METHACRYLATE PAINT	SQFT	2,660	\$ 15	\$ 39,900
ROADWAY SUBTOTAL						\$ 266,400
14	999990	MINOR ITEMS (10%)	LS	1	\$ 27,000.00	\$ 27,000
15	999990	MOBILIZATION (10%)	LS	1	\$ 29,000.00	\$ 29,000
CONSTRUCTION TOTAL=						\$ 322,400
CONTINGENCY (30%)=						\$ 96,720
GRAND TOTAL=						\$ 420,000

SLV Circulation & Access Study

High School - Sidewalk Northbound SR-9



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 2,000	\$ 2,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
3	190101	ROADWAY EXCAVATION	CY	140	\$ 60	\$ 8,400
4	260203	CLASS 2 AGGREGATE BASE (CY)	CY	45	\$ 200	\$ 9,000
5	390132	HOT MIX ASPHALT (TYPE A)	TON	26	\$ 250	\$ 6,500
6	730020	MINOR CONCRETE (CURB) (CY)	CY	25	\$ 1,200	\$ 30,000
7	731516	MINOR CONCRETE (DRIVEWAY)	CY	15	\$ 1,000	\$ 15,000
8	731521	MINOR CONCRETE (SIDEWALK)	CY	37	\$ 1,000	\$ 37,000
9	731623	MINOR CONCRETE (CURB RAMP)	CY	2	\$ 1,300	\$ 2,600
ROADWAY SUBTOTAL						\$ 112,500
10	999990	MINOR ITEMS (10%)	LS	1	\$ 11,000	\$ 11,000
11	999990	MOBILIZATION (10%)	LS	1	\$ 12,000	\$ 12,000
CONSTRUCTION TOTAL=						\$ 135,500
CONTINGENCY (30%)=						\$ 40,650
GRAND TOTAL=						\$ 177,000

SLV Circulation & Access Study

Elementary School - Second Student Loading Zone



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 4,000	\$ 4,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
3	377501	SLURRY SEAL	TON	38	\$ 1,000	\$ 38,000
4	730020	MINOR CONCRETE (CURB) (CY)	CY	4	\$ 1,500	\$ 6,000
5	731521	MINOR CONCRETE (SIDEWALK)	CY	18	\$ 1,000	\$ 18,000
6	833020	CHAIN LINK RAILING	LF	152	\$ 200	\$ 30,400
7	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	2,030	\$ 2	\$ 4,060
8	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	490	\$ 10	\$ 4,900
9	846030	REMOVE THERMOPLASTIC TRAFFIC STRIPE	LF	490	\$ 3	\$ 1,470
10	846035	REMOVE THERMOPLASTIC PAVEMENT MARKING	SQFT	200	\$ 5	\$ 1,000
ROADWAY SUBTOTAL						\$ 109,830
11	999990	MINOR ITEMS (10%)	LS	1	\$ 11,000.00	\$ 11,000
12	999990	MOBILIZATION (10%)	LS	1	\$ 12,000.00	\$ 12,000
CONSTRUCTION TOTAL=						\$ 132,830
CONTINGENCY (30%)=						\$ 39,849
GRAND TOTAL=						\$ 173,000

SLV Circulation & Access Study

Elementary School - Dual Inbound Lanes



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 6,000	\$ 6,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
3	190101	ROADWAY EXCAVATION	CY	32	\$ 60	\$ 1,920
4	260203	CLASS 2 AGGREGATE BASE (CY)	CY	25	\$ 200	\$ 5,000
5	390132	HOT MIX ASPHALT (TYPE A)	TON	20	\$ 250	\$ 5,000
6	510094	STRUCTURAL CONCRETE, DRAINAGE INLET	CY	2	\$ 2,000	\$ 4,000
7	730020	MINOR CONCRETE (CURB) (CY)	CY	4	\$ 1,500	\$ 6,000
8	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	225	\$ 2	\$ 450
9	846030	REMOVE THERMOPLASTIC TRAFFIC STRIPE	LF	225	\$ 0.60	\$ 135
9	846035	REMOVE THERMOPLASTIC PAVEMENT MARKING	SQFT	180	\$ 5	\$ 900
10	872136	MODIFYING FLASHING BEACON SYSTEMS	LS	1	\$ 60,000	\$ 60,000
ROADWAY SUBTOTAL						\$ 91,405
11	999990	MINOR ITEMS (10%)	LS	1	\$ 9,000.00	\$ 9,000
12	999990	MOBILIZATION (10%)	LS	1	\$ 10,000.00	\$ 10,000
CONSTRUCTION TOTAL=						\$ 110,405
CONTINGENCY (30%)=						\$ 33,122
GRAND TOTAL=						\$ 144,000

SLV Circulation & Access Study

Elementary School - Sidewalk To Building



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 2,000	\$ 2,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 5,000	\$ 5,000
3	190101	ROADWAY EXCAVATION	CY	40	\$ 60	\$ 2,400
4	204203A	LANDSCAPE PLANTING	SQFT	1,200	\$ 15	\$ 18,000
5	260203	CLASS 2 AGGREGATE BASE (CY)	CY	20	\$ 200	\$ 4,000
6	730020	MINOR CONCRETE (CURB) (CY)	CY	29	\$ 1,500	\$ 43,500
7	731521	MINOR CONCRETE (SIDEWALK)	CY	25	\$ 1,000	\$ 25,000
8	731623	MINOR CONCRETE (CURB RAMP)	CY	6	\$ 1,300	\$ 7,800
9	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	150	\$ 10	\$ 1,500
ROADWAY SUBTOTAL						\$ 109,200
10	999990	MINOR ITEMS (10%)	LS	1	\$ 11,000.00	\$ 11,000
11	999990	MOBILIZATION (10%)	LS	1	\$ 12,000.00	\$ 12,000
CONSTRUCTION TOTAL=						\$ 132,200
CONTINGENCY (30%)=						\$ 39,660
GRAND TOTAL=						\$ 172,000

SLV Circulation & Access Study

Elementary School - Overflow Parking



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 2,000	\$ 2,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 3,000	\$ 3,000
3	170103	CLEARING AND GRUBBING (LS)	LS	1	\$ 15,000	\$ 15,000
4	190101	ROADWAY EXCAVATION	CY	750	\$ 60	\$ 45,000
5	260203	CLASS 2 AGGREGATE BASE (CY)	CY	530	\$ 200	\$ 106,000
6	390132	HOT MIX ASPHALT (TYPE A)	TON	490	\$ 250	\$ 122,500
7	510094	STRUCTURAL CONCRETE, DRAINAGE INLET	CY	6	\$ 2,000	\$ 12,000
8	650018	24" REINFORCED CONCRETE PIPE	LF	200	\$ 200	\$ 40,000
9	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	1,300	\$ 2	\$ 2,600
10	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	150	\$ 10	\$ 1,500
ROADWAY SUBTOTAL						\$ 349,600
11	999990	MINOR ITEMS (10%)	LS	1	\$ 35,000.00	\$ 35,000
12	999990	MOBILIZATION (10%)	LS	1	\$ 38,000.00	\$ 38,000
CONSTRUCTION TOTAL=						\$ 422,600
CONTINGENCY (30%)=						\$ 126,780
GRAND TOTAL=						\$ 550,000

SLV Circulation & Access Study
Elementary School - Widen School Driveway for
Outbound Right Turn Pocket



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 5,000	\$ 5,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
3	170103	CLEARING AND GRUBBING (LS)	LS	1	\$ 15,000	\$ 15,000
4	190101	ROADWAY EXCAVATION	CY	120	\$ 150	\$ 18,000
5	260203	CLASS 2 AGGREGATE BASE (CY)	CY	60	\$ 200	\$ 12,000
6	390132	HOT MIX ASPHALT (TYPE A)	TON	60	\$ 250	\$ 15,000
7	510094	STRUCTURAL CONCRETE, DRAINAGE INLET	CY	3	\$ 2,000	\$ 6,000
8	650018	24" REINFORCED CONCRETE PIPE	LF	50	\$ 500	\$ 25,000
9	710150	REMOVE INLET	EA	1	\$ 1,000	\$ 1,000
10	730020	MINOR CONCRETE (CURB) (CY)	CY	1	\$ 1,500	\$ 1,500
11	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	100	\$ 2	\$ 200
12	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	90	\$ 10	\$ 900
ROADWAY SUBTOTAL						\$ 101,600
13	999990	MINOR ITEMS (10%)	LS	1	\$ 10,000.00	\$ 10,000
14	999990	MOBILIZATION (10%)	LS	1	\$ 11,000.00	\$ 11,000
CONSTRUCTION TOTAL=						\$ 122,600
CONTINGENCY (30%)=						\$ 36,780
GRAND TOTAL=						\$ 160,000

SLV Circulation & Access Study

Elementary School - Southbound Hwy 9 Right Turn Pocket



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 10,000	\$ 10,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 5,000	\$ 5,000
3	190101	ROADWAY EXCAVATION	CY	160	\$ 60	\$ 9,600
4	260203	CLASS 2 AGGREGATE BASE (CY)	CY	110	\$ 200	\$ 22,000
5	390132	HOT MIX ASPHALT (TYPE A)	TON	100	\$ 250	\$ 25,000
6	510094	STRUCTURAL CONCRETE, DRAINAGE INLET	CY	6	\$ 2,000	\$ 12,000
7	650018	24" REINFORCED CONCRETE PIPE	LF	200	\$ 200	\$ 40,000
8	510060	RETAINING WALL	SQFT	900	\$ 225	\$ 202,500
9	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	215	\$ 2	\$ 430
10	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	490	\$ 10	\$ 4,900
11	846030	REMOVE THERMOPLASTIC TRAFFIC STRIPE	LF	215	\$ 0.60	\$ 129
12	846035	REMOVE THERMOPLASTIC PAVEMENT MARKING	SQFT	200	\$ 5	\$ 1,000
ROADWAY SUBTOTAL						\$ 332,559
13	999990	MINOR ITEMS (10%)	LS	1	\$ 33,000.00	\$ 33,000
14	999990	MOBILIZATION (10%)	LS	1	\$ 37,000.00	\$ 37,000
CONSTRUCTION TOTAL=						\$ 402,559
CONTINGENCY (30%)=						\$ 120,768
GRAND TOTAL=						\$ 524,000

SLV Circulation & Access Study

Elementary School - Traffic Signal



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 8,000	\$ 8,000
2	870400	SIGNAL AND LIGHTING SYSTEM	LS	1	\$ 500,000	\$ 500,000
ROADWAY SUBTOTAL						\$ 508,000
3	999990	MINOR ITEMS (10%)	LS	1	\$ 51,000.00	\$ 51,000
4	999990	MOBILIZATION (10%)	LS	1	\$ 56,000.00	\$ 56,000
CONSTRUCTION TOTAL=						\$ 615,000
CONTINGENCY (30%)=						\$ 184,500
GRAND TOTAL=						\$ 800,000

SLV Circulation & Access Study Elementary School - Slurry and Restripe Parking Lot



ITEM No.	BEEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	377501	SLURRY SEAL	TON	38	\$ 1,000	\$ 38,000
2	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	2,030	\$ 2	\$ 4,060
ROADWAY SUBTOTAL						\$ 42,060
3	999990	MOBILIZATION (10%)	LS	1	\$ 4,000.00	\$ 4,000
CONSTRUCTION TOTAL=						\$ 46,060
CONTINGENCY (30%)=						\$ 13,818
GRAND TOTAL=						\$ 60,000

SLV Circulation & Access Study

Elementary School - Sidewalk to High School



ITEM No.	BEEs	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 2,000	\$ 2,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 5,000	\$ 5,000
3	170103	CLEARING AND GRUBBING (LS)	LS	1	\$ 10,000	\$ 10,000
4	190101	ROADWAY EXCAVATION	CY	80	\$ 60	\$ 4,800
5	260203	CLASS 2 AGGREGATE BASE (CY)	CY	33	\$ 200	\$ 6,600
6	510060	RETAINING WALL	SQFT	800	\$ 225	\$ 180,000
7	731521	MINOR CONCRETE (SIDEWALK)	CY	50	\$ 1,000	\$ 50,000
ROADWAY SUBTOTAL						\$ 258,400
8	999990	MINOR ITEMS (10%)	LS	1	\$ 26,000.00	\$ 26,000
9	999990	MOBILIZATION (10%)	LS	1	\$ 28,000.00	\$ 28,000
CONSTRUCTION TOTAL=						\$ 312,400
CONTINGENCY (30%)=						\$ 93,720
GRAND TOTAL=						\$ 407,000

SLV Circulation & Access Study

Middle School - Pave Path to Elementary School



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	190101	ROADWAY EXCAVATION	CY	25	\$ 150	\$ 3,750
2	260203	CLASS 2 AGGREGATE BASE (CY)	CY	25	\$ 200	\$ 5,000
ROADWAY SUBTOTAL						\$ 8,750
3	999990	MINOR ITEMS (10%)	LS	1	\$ 1,000.00	\$ 1,000
4	999990	MOBILIZATION (10%)	LS	1	\$ 1,000.00	\$ 1,000
CONSTRUCTION TOTAL=						\$ 10,750
CONTINGENCY (30%)=						\$ 3,225
GRAND TOTAL=						\$ 14,000

SLV Circulation & Access Study

Formalize On-Campus Parking



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
2	190101	ROADWAY EXCAVATION	CY	240	\$ 60	\$ 14,400
3	260203	CLASS 2 AGGREGATE BASE (CY)	CY	160	\$ 200	\$ 32,000
4	390132	HOT MIX ASPHALT (TYPE A)	TON	170	\$ 250	\$ 42,500
5	394075	PLACE HOT MIX ASPHALT DIKE (TYPE D)	LF	365	\$ 10	\$ 3,650
6	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	580	\$ 2	\$ 1,160
ROADWAY SUBTOTAL						\$ 95,710
7	999990	MINOR ITEMS (10%)	LS	1	\$ 10,000.00	\$ 10,000
8	999990	MOBILIZATION (10%)	LS	1	\$ 11,000.00	\$ 11,000
CONSTRUCTION TOTAL=						\$ 116,710
CONTINGENCY (30%)=						\$ 35,013
GRAND TOTAL=						\$ 152,000

SLV Circulation & Access Study

Hacienda/El Solyo Heights Sidewalk



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 10,000	\$ 10,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 5,000	\$ 5,000
3	170103	CLEARING AND GRUBBING (LS)	LS	1	\$ 5,000	\$ 5,000
4	190101	ROADWAY EXCAVATION	CY	50	\$ 160	\$ 8,000
5	260203	CLASS 2 AGGREGATE BASE (CY)	CY	35	\$ 200	\$ 7,000
6	510060	RETAINING WALL	SQFT	540	\$ 225	\$ 121,500
7	510094	STRUCTURAL CONCRETE, DRAINAGE INLET	CY	7	\$ 2,000	\$ 14,000
8	730020	MINOR CONCRETE (CURB) (CY)	CY	15	\$ 1,500	\$ 22,500
9	731521	MINOR CONCRETE (SIDEWALK)	CY	100	\$ 1,000	\$ 100,000
10	731623	MINOR CONCRETE (CURB RAMP)	CY	5	\$ 1,300	\$ 6,500
11	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	100	\$ 2	\$ 200
12	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	90	\$ 10	\$ 900
ROADWAY SUBTOTAL						\$ 300,600
13	999990	MINOR ITEMS (10%)	LS	1	\$ 30,000.00	\$ 30,000
14	999990	MOBILIZATION (10%)	LS	1	\$ 33,000.00	\$ 33,000
CONSTRUCTION TOTAL=						\$ 363,600
CONTINGENCY (30%)=						\$ 109,080
GRAND TOTAL=						\$ 473,000

SLV Circulation & Access Study

Hacienda/El Solyo Heights Bike Lanes



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 5,000	\$ 5,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
3	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	2,100	\$ 2	\$ 4,200
4	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	120	\$ 10	\$ 1,200
ROADWAY SUBTOTAL						\$ 12,400
5	999990	MINOR ITEMS (10%)	LS	1	\$ 1,000.00	\$ 1,000
6	999990	MOBILIZATION (10%)	LS	1	\$ 1,000.00	\$ 1,000
CONSTRUCTION TOTAL=						\$ 14,400
CONTINGENCY (30%)=						\$ 4,320
GRAND TOTAL=						\$ 19,000

SLV Circulation & Access Study

El Solyo Heights Right Turn



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 2,000	\$ 2,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 5,000	\$ 5,000
3	190101	ROADWAY EXCAVATION	CY	55	\$ 60	\$ 3,300
4	260203	CLASS 2 AGGREGATE BASE (CY)	CY	36	\$ 200	\$ 7,200
5	390132	HOT MIX ASPHALT (TYPE A)	TON	40	\$ 250	\$ 10,000
6	510060	RETAINING WALL	SQFT	475	\$ 225	\$ 106,875
7	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	1,320	\$ 2	\$ 2,640
8	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	400	\$ 10	\$ 4,000
ROADWAY SUBTOTAL						\$ 141,015
9	999990	MINOR ITEMS (10%)	LS	1	\$ 14,000.00	\$ 14,000
10	999990	MOBILIZATION (10%)	LS	1	\$ 16,000.00	\$ 16,000
CONSTRUCTION TOTAL=						\$ 171,015
CONTINGENCY (30%)=						\$ 51,305
GRAND TOTAL=						\$ 223,000

SLV Circulation & Access Study

Sidewalk and ADA Access to Southbound Transit Stop



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 5,000	\$ 5,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
3	170103	CLEARING AND GRUBBING (LS)	LS	1	\$ 5,000	\$ 5,000
4	190101	ROADWAY EXCAVATION	CY	50	\$ 150	\$ 7,500
5	260203	CLASS 2 AGGREGATE BASE (CY)	CY	20	\$ 200	\$ 4,000
6	510060	RETAINING WALL	SQFT	500	\$ 225	\$ 112,500
7	510094	STRUCTURAL CONCRETE, DRAINAGE INLET	CY	4	\$ 2,000	\$ 8,000
8	730020	MINOR CONCRETE (CURB) (CY)	CY	12	\$ 1,500	\$ 18,000
9	731521	MINOR CONCRETE (SIDEWALK)	CY	23	\$ 1,000	\$ 23,000
10	731623	MINOR CONCRETE (CURB RAMP)	CY	5	\$ 1,300	\$ 6,500
11	840501	THERMOPLASTIC TRAFFIC STRIPE	LF	100	\$ 2	\$ 200
12	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	90	\$ 10	\$ 900
13	872136	MODIFYING FLASHING BEACON SYSTEMS	LS	1	\$ 60,000	\$ 60,000
ROADWAY SUBTOTAL						\$ 252,600
13	999990	MINOR ITEMS (10%)	LS	1	\$ 25,000.00	\$ 25,000
14	999990	MOBILIZATION (10%)	LS	1	\$ 28,000.00	\$ 28,000
CONSTRUCTION TOTAL=						\$ 305,600
CONTINGENCY (30%)=						\$ 91,680
GRAND TOTAL=						\$ 398,000

SLV Circulation & Access Study

Middle School - Sidewalk From Lazy Woods To Existing Transit Stop



ITEM No.	BEES	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY						
1	120100	TRAFFIC CONTROL SYSTEM	LS	1	\$ 2,000	\$ 2,000
2	130100	JOB SITE MANAGEMENT	LS	1	\$ 2,000	\$ 2,000
3	190101	ROADWAY EXCAVATION	CY	70	\$ 60	\$ 4,200
4	260203	CLASS 2 AGGREGATE BASE (CY)	CY	20	\$ 200	\$ 4,000
5	730020	MINOR CONCRETE (CURB) (CY)	CY	25	\$ 1,500	\$ 37,500
6	731521	MINOR CONCRETE (SIDEWALK)	CY	50	\$ 1,000	\$ 50,000
ROADWAY SUBTOTAL						\$ 99,700
7	999990	MINOR ITEMS (10%)	LS	1	\$ 10,000.00	\$ 10,000
8	999990	MOBILIZATION (10%)	LS	1	\$ 11,000.00	\$ 11,000
CONSTRUCTION TOTAL=						\$ 120,700
CONTINGENCY (30%)=						\$ 36,210
GRAND TOTAL=						\$ 157,000