VALLEY SPRINGS TOWN CENTER CONNECTIVITY PLAN

APPENDICES

APRIL 2020

PREPARED FOR

CALAVERAS COUNCIL of GOVERNMENTS

PREPARED BY

GHD

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TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

APPENDIX A: PLANNING CONTEXT

This Appendix summarizes existing regulatory and planning documents that have guided transportation planning decisions in Valley Springs and Calaveras County. The *Valley Spring Town Center Connectivity Plan* aims to align its recommendations with these available documents, where appropriate and necessary:

- Calaveras County General Plan
- Calaveras County Regional Transportation Plan
- Main Street, California: A Guide for Improving Community and Transportation Vitality
- Complete Streets Implementation Action Plan 2.0
- Calaveras Transit Intercity Service Feasibility Study
- Calaveras County Regional Bicycle, Pedestrian, and Safe Routes to School Master Plan
- Calaveras County Short Range Transit Plan Update
- Caltrans District 10 State Route 26 Transportation Concept Report
- Caltrans District 10 State Route 12 Transportation Concept Report

LOCAL AND REGIONAL PLANS

CALAVERAS COUNTY GENERAL PLAN, 2019

The most recent *Calaveras County General Plan* was adopted by the County Board of Supervisors in November 2019. This document aims to meet State planning requirements and guides countywide development in land use, circulation, housing, conservation, open space, noise, and safety.

The *General Plan Land Use Element* provides the general framework for development in the County, and identifies future land use designations in the unincorporated areas of Calaveras County to establish where and what type of development can occur. The Land Use Element aims to maintain rural, open space by focusing development in and around existing communities.

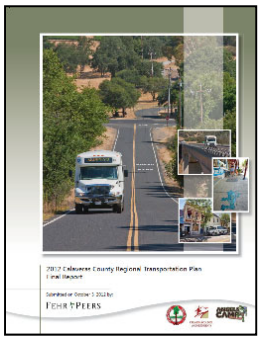
The *General Plan Circulation Element* provides the framework for countywide transportations systems. The Circulation Element identifies improvements needed to support the land use element.

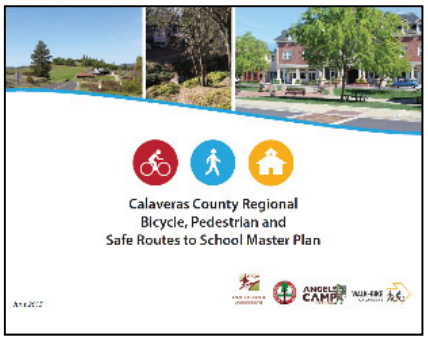
CALAVERAS COUNTY REGIONAL TRANSPORTATION PLAN, 2017

A *Regional Transportation Plan* (RTP) for Calaveras County was prepared in 2017. As required by California law, the CCOG must adopt and submit an approved RTP to the California Transportation Commission (CTC) every five years. The RTP generally aims to guide transportation investments in the region over a 20-25 year period.

CALAVERAS TRANSIT INTERCITY SERVICE FEASIBILITY STUDY, 2014

The *Transit Intercity Service Feasibility Study* (Transit Study) was prepared for CCOG in 2014 to address intercity transit needs for Calaveras County residents. The study focused on a new route(s) that would connect to Greyhound and Amtrak, provide service to residents with out-of-county medical needs, and serve commuters and students.





CALAVERAS COUNTY SHORT RANGE TRANSIT PLAN UPDATE, 2016

The *Short Range Transit Plan Update* (SRTP) was recommended for approval in February 2016. Key issues addressed in this plan include the maintenance and improvement of transit connections to regional transit services in Calaveras County.

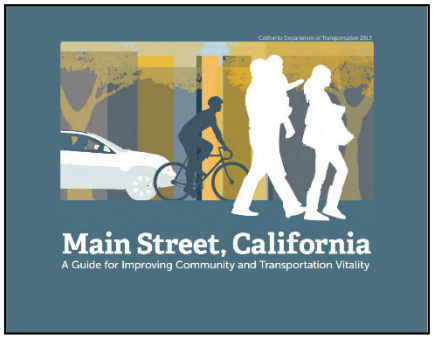
CALAVERAS COUNTY REGIONAL BICYCLE, PEDESTRIAN AND SAFE ROUTES TO SCHOOL MASTER PLAN, 2015

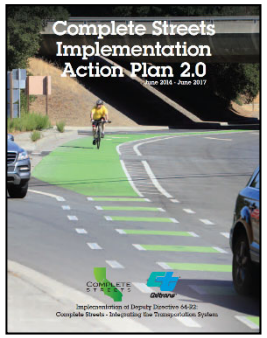
This *Bicycle, Pedestrian, and Safe Routes to School Plan* identifies existing and proposed bicycle and pedestrian infrastructure and support facilities, and encourages improvements that enhance safety for active transportation modes. The plan serves as a guide for active transportation improvements that require federal, state, and local funding. As Valley Springs Elementary School is within the study area, safe and reliable walking and biking routes for children is an important component of the *Valley Springs Town Center Connectivity Plan*.

STATE PLANS AND POLICIES

MAIN STREET, CALIFORNIA: A GUIDE FOR IMPROVING COMMUNITY AND TRANSPORTATION VITALITY, 2013

In 2013, Caltrans published *Main Street, California - A Guide for Improving Community and Transportation Vitality*. The report provides planning, design, maintenance, and operational concepts for main street projects, and serves as a guide to complete streets and active transportation planning along State highways.





COMPLETE STREETS IMPLEMENTATION ACTION PLAN 2.0 (CSIAP 2.0), JUNE 2014 - JUNE 2017

The CSIAP 2.0 was prepared by Caltrans to describe the complete streets policy framework currently held by Caltrans for planning and implementation of complete streets on the State highway system. The CSIAP 2.0 is required by the *Deputy Directive 64-Revision 2: Complete Streets - Integrating the Transportation System (DD-64-R2),* which is an update of the State's complete streets policy signed in October 2014. *DD-64-R2* provides the following Caltrans policy on complete streets:

> *[Caltrans] provides for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities and products on the State highway system [and] recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system.*

CALTRANS DISTRICT 10 STATE ROUTE 26 AND STATE ROUTE 12 TRANSPORTATION CONCEPT REPORTS

The Transportation Concept Report (TCR) is a document that each Caltrans district prepares for each state highway, or segment of state highway, in its jurisdiction where long term planning for the corridor occurs. The SR 26 report proposes adding lanes to SR 26 from Silver Rapids Road to Valley Springs and SR 12 as well as adding Safe Routes to School characteristics and Complete Street solutions. The District 10 TCR for SR 12 was completed in January of 2012.

APPENDIX B: COMMUNITY INPUT

This appendix summarizes public engagement activities and input received throughout this planning effort.

Online tools were used to engage the public by sharing information about upcoming outreach events, providing online versions of surveys, and posting draft documents for review. These included a project website as well as email distribution lists and social media posts.

Community input received at events or through tools advertised using these online tools are reported in the appropriate section of this appendix.

COMMUNITY WORKSHOPS

COMMUNITY WORKSHOP #1 – DECEMBER 3, 2018

The first Community Workshop allowed the project team to provide an overview of the project, the intended outcomes, public engagement opportunities, and a summary of the information collected to date. Information about the meeting was distributed in emails to existing mailing lists of My Valley Springs and Valley Springs Elementary School, posted online by My Valley Springs and Pine Tree, and shared on social media by several project partners. Press releases were also sent to local media, and flyers were inserted into the Valley Springs News.

The meeting allowed an opportunity to establish expectations for the work and inform the public of opportunities to provide input on development of the project. Most importantly, the first community meeting provided an opportunity for "ground floor" input regarding existing issues and barriers, as well as potential opportunities the community would like the project team to consider.

During the first Community Workshop, the project team provided a brief presentation to introduce the attendees to the project purpose, goals, and approach. A Caltrans representative provided a synopsis of the scope of the study and the grant and why the study area was formulated as reflected in the project.

The members of the public in attendance were invited to provide feedback relating to transportation concerns in Valley Springs. The following are comments made during the meetings:

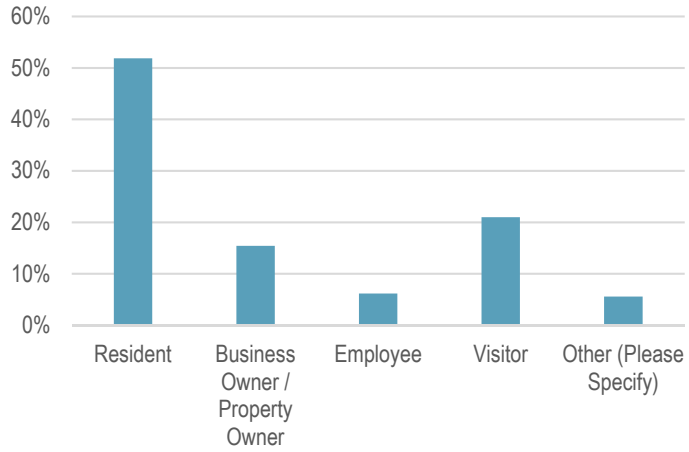
- A community member noted that there are a lot of bicyclists between town and Vista Del Logo, and noted that these appear to be more serious riders, as they wear bicycling gear.
- Another community member brought up that many people in attendance at the meeting live south of Hogan Dam in the neighborhoods of Vista Del Logo, Gold Creek, and La Contenta.
- Another community member expressed interest in extending a bike lane farther south than Hogan Dam.

The project team closed the meeting by inviting attendees to review and comment via the project website, and stated that others who did not attend are also welcome to submit comments on the website. Key takeaways from the community survey responses collected in-person and online are presented in the following charts.

COMMUNITY SURVEY RESULTS

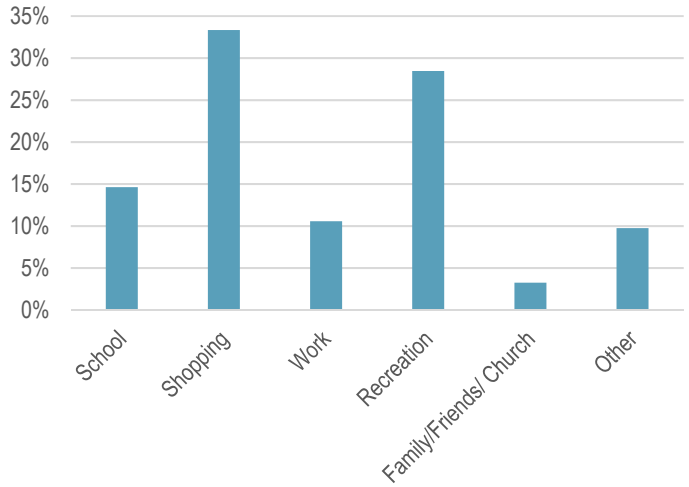
As shown in Figure B-1, more than half of respondents identified themselves as residents of the Valley Springs area, confirming that the survey responses reflect input of the local community.

FIGURE B-I: I AM A(N) ____ IN THE VALLEY SPRINGS AREA



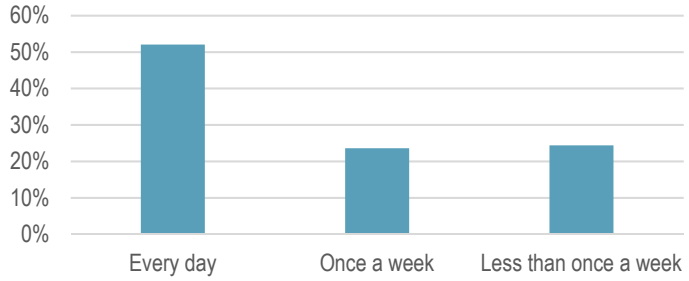
Shopping and recreation are the two most common purposes for survey respondents to travel to the Town Center, followed by school (see Figure B-2).

FIGURE B-2: WHAT IS YOUR PRIMARY REASON FOR TRAVELING TO THE TOWN CENTER?



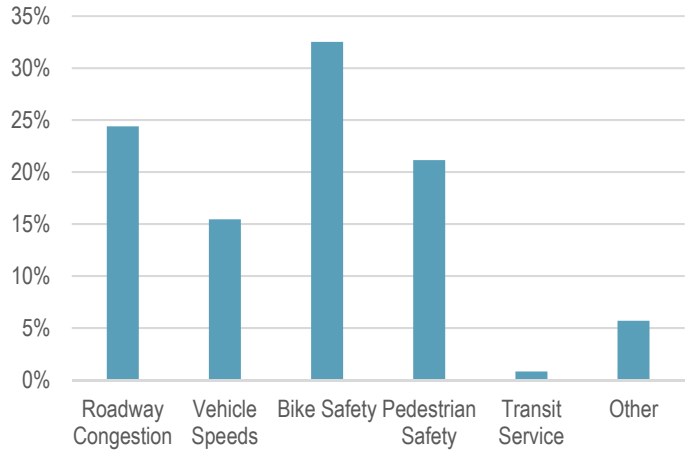
More than half of respondents visit the Town Center every day, as shown in Figure B-3.

FIGURE B-3: HOW OFTEN DO YOU VISIT THE TOWN CENTER AREA?



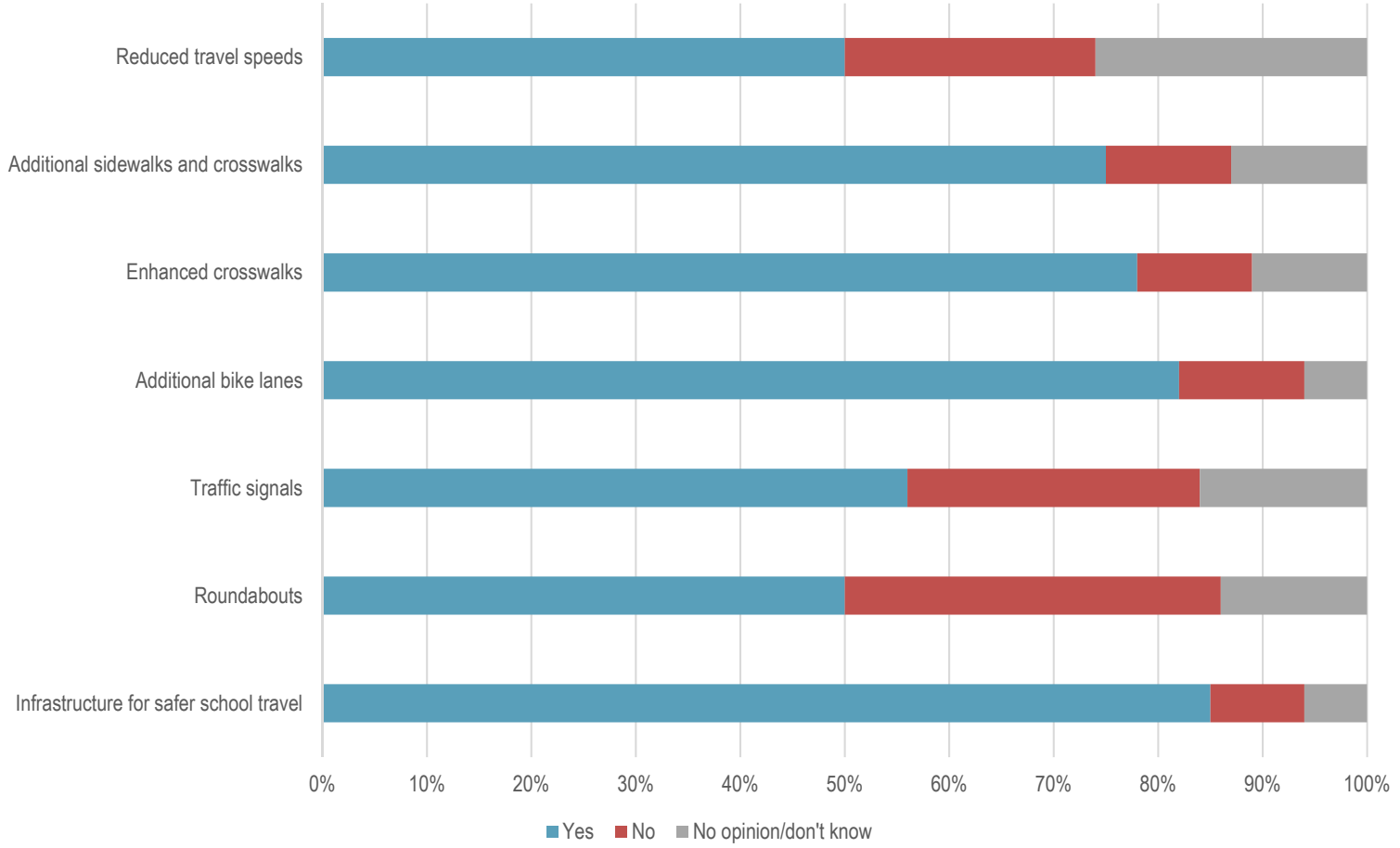
Traffic congestion and safety for people walking and bicycling were the biggest transportation concerns for survey respondents. Figure B-4 shows nearly one third of respondents said bike safety was their primary concern.

FIGURE B-4: WHAT IS YOUR BIGGEST TRANSPORTATION CONCERN IN THE TOWN CENTER?



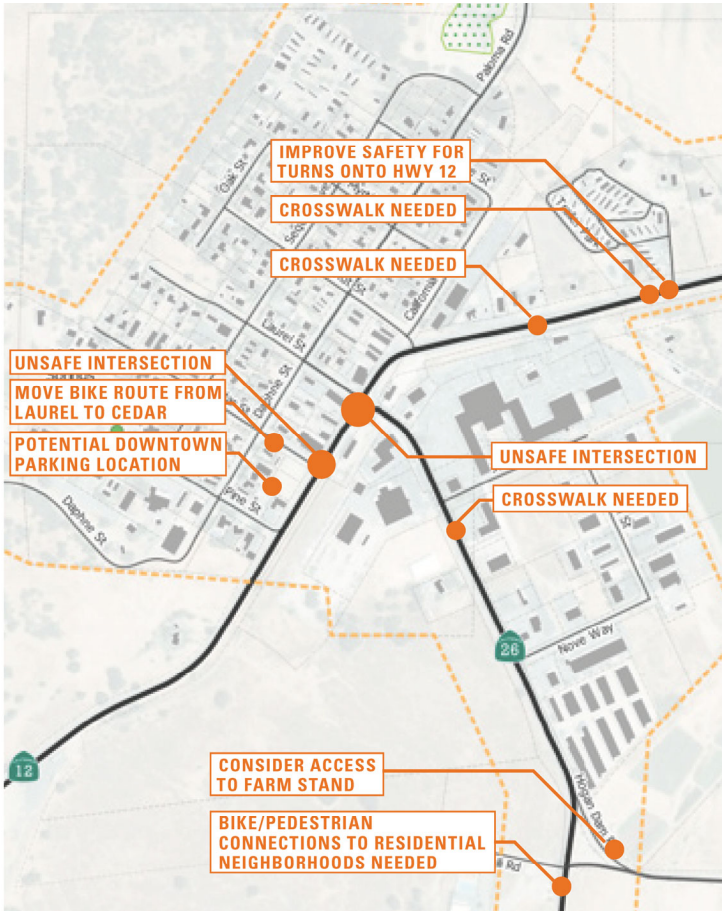
Finally, a series of questions asked respondents whether they would support various types of improvements in the study area. Responses (Figure B-5) show strong support for new sidewalks, crosswalks, and bicycle facilities, as well as enhanced crossings at key locations and improvements for school travel safety.

FIGURE B-5: WOULD YOU SUPPORT _____ IN THE STUDY AREA?



Participants at the workshop also placed colored dots on maps of the study area to note challenge areas for different modes of transportation. Concerns for bicycling, walking, and driving were similarly concentrated along the state highways and near Valley Springs Elementary School.

FIGURE B-6 COMMENTS FROM COMMUNITY WORKSHOP #2



COMMUNITY WORKSHOP #2 – MARCH 11, 2019

During the second Community Workshop, the project team sought public input on draft complete streets alternatives, ideas, and solutions for accomplishing the goals and objectives for the project. Information was distributed using the same methods employed for the first community workshop.

The Workshop was held in an open house format with key pad polling to solicit input about the best components from each alternative. The same information was posted online after the completion of the public meeting to allow others not in attendance to review the information and comment.

Figure B-6 shows map comments provided by attendees at the meeting. Participants were also asked whether they favored or opposed roundabouts and traffic signals at three intersections in the study area. Neither improvement was favored at Highway 12 and the Valley Oaks Shopping Center. Roundabouts were favored at the intersections of Highway 26 with Highway 12 and with Hogan Dam Road.

Attendees at the meeting were asked to consider alternatives proposed for four street types in the study area and indicated whether they were in favor of or against each configuration. These locations included Sequoia Avenue, Laurel Street, other typical grid streets, and the state highways.

The most favorable alternative for Sequoia Avenue includes a wide shared use path with a landscaped buffer while maintaining 12' wide vehicle lanes and on-street parking on one side of the street. Participants also noted concerns about drainage and exhaust from idling cars.

For Laurel Street, the most favorable alternative included diagonal parking located in the center of the street in addition to sidewalks and on-street bicycle lanes.

The most favorable alternative for typical grid streets includes a wide shared use path with a soft surface shoulder while maintaining 12' wide vehicle lanes and on-street parking on one side of the street.

For the state highways, the most favorable alternative included buffered bicycle lanes and sidewalks with landscaped buffers on both sides of the street. Participants also noted a need for additional marked crosswalks and solutions that would reduce vehicle speeds.

COMMUNITY WORKSHOP #3 – MAY 30, 2019

At the third Community Workshop, the project team presented the preferred complete streets concepts for the *Valley Springs Town Center Connectivity Plan* for review and comment. Information was distributed using the same methods employed for the first two community workshops.

The workshop was conducted in an open house structure with a presentation highlighting key components of the project. The workshop provided an opportunity for dialogue with the community about what they liked about the concepts, what they thought could be improved, and which components they were most excited about.

Respondents were surveyed to gather input on their support for various improvements included in the plan as well as their preferences and priorities.

- Nearly 60 percent of respondents said they are generally supportive of the concepts presented at the meeting
- Project Area 5 (Highway 12 East) was reported as the highest priority area
- Improving highway traffic operations and improving pedestrian connectivity were both ranked as overall top priorities by 30 percent of respondents
- In individual project areas, top priorities for improvements were:
    - Area 1: Creating safe bicycling and walking spaces, and enhancing parking (approximately 38 percent each)
    - Area 2: Creating trail connections (35 percent)
    - Area 3: Highway 12/26 intersection improvements (30 percent)
    - Area 4: Sidewalks (approximately 28 percent)
    - Area 5: Shared use paths and crossings (approximately 29 percent)
    - Area 6: Bicycle lanes (approximately 44 percent)

BACK TO SCHOOL NIGHT

On Wednesday, August 7, 2019, members of the project team attended Back to School Night at Valley Springs Elementary to promote the *Valley Springs Town Center Connectivity Plan* to the school community, collect feedback, and gauge support for improvements near the school.

The project team set up a table to provide project information to members of the school community and solicit feedback. The table was staffed by two members of the consultant team, two County staff members, and a Caltrans staff member.

The project team set up the table for Back to School Night in the Multi-Purpose Room at 5:00 PM to talk with parents and caregivers as they arrived for the event. The table was positioned facing the entry door, and a banner was affixed to the front with colorful icons of transportation modes asking "How Do You Get to School?" The project boards flanked the table, and the project goals and objectives, website address cards, and comment forms were on the table along with sheets asking for signatures from those who support improvements near the school.

Prior to the start of the event, the project team spoke with more than 30 people. Many shared concerns about hectic drop-off and pick-up, as well as concerns about pedestrian safety due to the lack of sidewalks and need for improved crossings. In sum, 32 people signed the document in support of improvements near Valley Springs Elementary School.

INTERCEPT SURVEY

On October 30, 2018, a shopper survey was conducted to gauge public opinions on transportation and connectivity in the Town Center area. Members of the project team intercepted people at the Valley Springs shopping center using a system intended to minimize selection bias. Information about the survey and a link to an online version was also distributed in flyers posted in the community and shared with people who wished to complete the survey at a later time. A total of 21 people responded to the survey. Of these, seven live in the study area, 11 live elsewhere in Valley Springs, and three do not live in the community.

Bicycle and pedestrian safety were ranked as most important by 12 respondents, followed by reducing vehicle speeds (seven respondents), increasing transit (five respondents), and reducing congestion (four respondents).

Only five respondents said they currently walk or bicycle in the study area, and two more said they walk or bicycle elsewhere in Valley Springs. Of the 14 respondents who do not currently walk or bicycle in the community, nine cited the lack of designated bicycling and walking paths. If improvements for bicycle and pedestrian safety were made, 17 respondents said they would walk or bicycle more often.

STAKEHOLDER COMMITTEE

A stakeholder committee was formed by Calaveras COG to guide development of the recommendations for the study area. Representatives invited to participate included the local business community, school faculty and parents, Caltrans and other agency partners, and local community organizations including the visitors' bureau, senior center, library, and Jenny Lind Veterans Memorial District.

Two meetings of the committee have been convened. The first meeting, held early in the project, presented information about the scope of the project and provided an opportunity for stakeholders to share their concerns and vision for the Town Center area. A second meeting was held to review draft design concepts and provide comments to the project team.

BUSINESS STAKEHOLDER POP-UP

A pop-up outreach event was conducted at the corner of Laurel Street and SR 12/SR 26 on May 8, 2019. Members of the project team partnered with the Valley Springs Area Business Association to invite the local business community to evaluate the draft concepts for the Town Center. Members of the business community were generally supportive of the project, and expressed a desire for on-street parking to be retained to serve their businesses. This feedback was incorporated into the revised concepts for the Town Center.

SUMMARY OF SUPPORT FOR IMPROVEMENTS

Community support for improvements was evident at each public workshop and within the stakeholder committee group. However, community preference for alternatives was divided when presented with various cross sections, multimodal facility types, or intersection treatments. This section presents a summary of support received for the proposed improvements, including comments received in person and online through the project website.

LOCAL STREET IMPROVEMENTS (AREAS 1, 2, AND 3)

- General support for improvements in the area
- Support for chosen alternative(s)
  - Perpendicular parking on Laurel Street
  - On-street parking to be retained to the extent possible
  - Shared use path on Sequoia Street
- Priorities for these areas
  - Create safe bicycling and walking spaces
  - Enhance parking
  - Provide trail connections

STATE HIGHWAY IMPROVEMENTS (AREAS 4, 5, AND 6)

- General support for improvements on the state highways
- Support for chosen alternative(s) (including stakeholder pop-up)
  - Buffered bicycle lanes
  - Sidewalks buffered from the vehicle lanes
  - Traffic calming
- Priorities for state highways
  - Intersection improvements
  - Provide shared use paths for people bicycling and walking
  - Create enhanced crossings of the highways

STATE HIGHWAY INTERSECTIONS

- General support for improving the intersections
- Community members were equally supportive of a roundabout or traffic signal at Highway 12 and the Valley Oaks Shopping Center
- Roundabouts were favored at the intersections of Highway 26 with Highway 12 and with Hogan Dam Road

APPENDIX C: DATA AND ANALYSES

This appendix provides additional data, methodologies, and findings on the following topics and analyses as they relate to the Valley Springs Town Center study area:

- Current transportation behavior
- Existing traffic data counts
- Level of Service for existing and future conditions
- Level of Traffic Stress for bicyclists and pedestrians
- Collision analysis

CURRENT TRANSPORTATION BEHAVIOR

Table C-1 displays commuter travel times to work in the area based on American Community Survey (ACS) 2016 5-year estimates. The mean travel time to work for residents of Valley Springs is 40.8 minutes, 5.3 minutes longer than the County mean of 35.5 minutes.

TABLE C-I: COMMUTER TRAVEL TIME TO WORK

Travel Time to Work	Valley Springs		Calaveras County	
	Estimate	Percent	Estimate	Percent
Less than 10 min.	252	15.9%	2,724	16.7%
10 to 14 min.	157	9.9%	1,680	10.3%
15 to 19 min.	17	1.1%	1,337	8.2%
20 to 24 min.	66	4.2%	979	6.0%
25 to 29 min.	17	1.1%	555	3.4%
30 to 34 min.	117	7.4%	1,484	9.1%
35 to 44 min.	234	14.8%	1,794	11.0%
45 to 59 min.	424	26.8%	2,447	15.0%
60 or more min.	301	19.0%	3,311	20.3%
Mean Travel Time	*40.8*		*35.5*	

Source: American Community Survey 2016 5-year estimates

Table C-2 shows access to vehicles in Valley Springs compared to Calaveras County based on ACS 2016 5-year estimates. The percent of households in Valley Springs without access to a vehicle is nearly twice the County rate. The percent of households in Valley Springs with access to two or more vehicles is higher than the County rate, however, which may indicate income disparity within the community.

TABLE C-2: VEHICLES AVAILABLE PER HOUSEHOLD

Number of Vehicles Available	Valley Springs		Calaveras County	
	Estimate	Percent	Estimate	Percent
No Vehicles	49	3.4%	288	1.8%
1 vehicle available	25	1.7%	1,727	10.8%
2 vehicle available	617	42.5%	6,094	38.1%
3 or more vehicles	761	52.4%	7,870	49.2%

Source: American Community Survey 2016 5-year estimates

Table C-3 presents the busiest boarding locations along the Red Line transit route that serves Valley Springs. As presented, there are 8 boardings at Vista Del Lago and 5 boardings and 3 alightings at Daphne Street on a daily basis in the southbound direction. These trips are assumed to be reversed in the northbound direction, bringing the total boardings and alightings at Daphne Street to 16.

TABLE C-3: BUSIEST BOARDING LOCATIONS

Stop	Route	Boarding	Alighting	Total
SR 49 & Demarest Transfer	1 NB	25	0	25
ARC	1 NB	8	0	8
Downtown San Andreas at Tower	1 NB	7	0	7
Government Center	1 NB	4	2	6
Flag Stop (Treats)	1 NB	3	1	4
Flag Stop (San Andreas Post Office)	1 NB	2	2	4
ARC	1 SB	11	2	13
Government Center	1 SB	11	0	11
Flag Stop (btwn San Andreas Post Office and ARC)	1 SB	8	4	12
Vista Del Lago	1 SB	8	0	8
Daphne St	1 SB	5	3	8
Flag Stop (Sierra Gas Station)	1 SB	4	3	7
Flag Stop (btwn Daphne St and San Andreas Post Office)	1 SB	3	3	6
San Andreas Post Office	1 SB	2	1	3

Source: Calaveras County Short Range Transit Plan Update

EXISTING TRAFFIC DATA COLLECTION

In coordination with staff from the Calaveras Council of Governments, Calaveras County, and Caltrans, the 12 intersections listed at right were selected for this study. Traffic counts were collected at ten of the selected intersections on Tuesday, September 18, 2018 for the AM, PM, and School peak hours. Traffic counts for the remaining two intersections were collected on Tuesday, December 4, 2018.

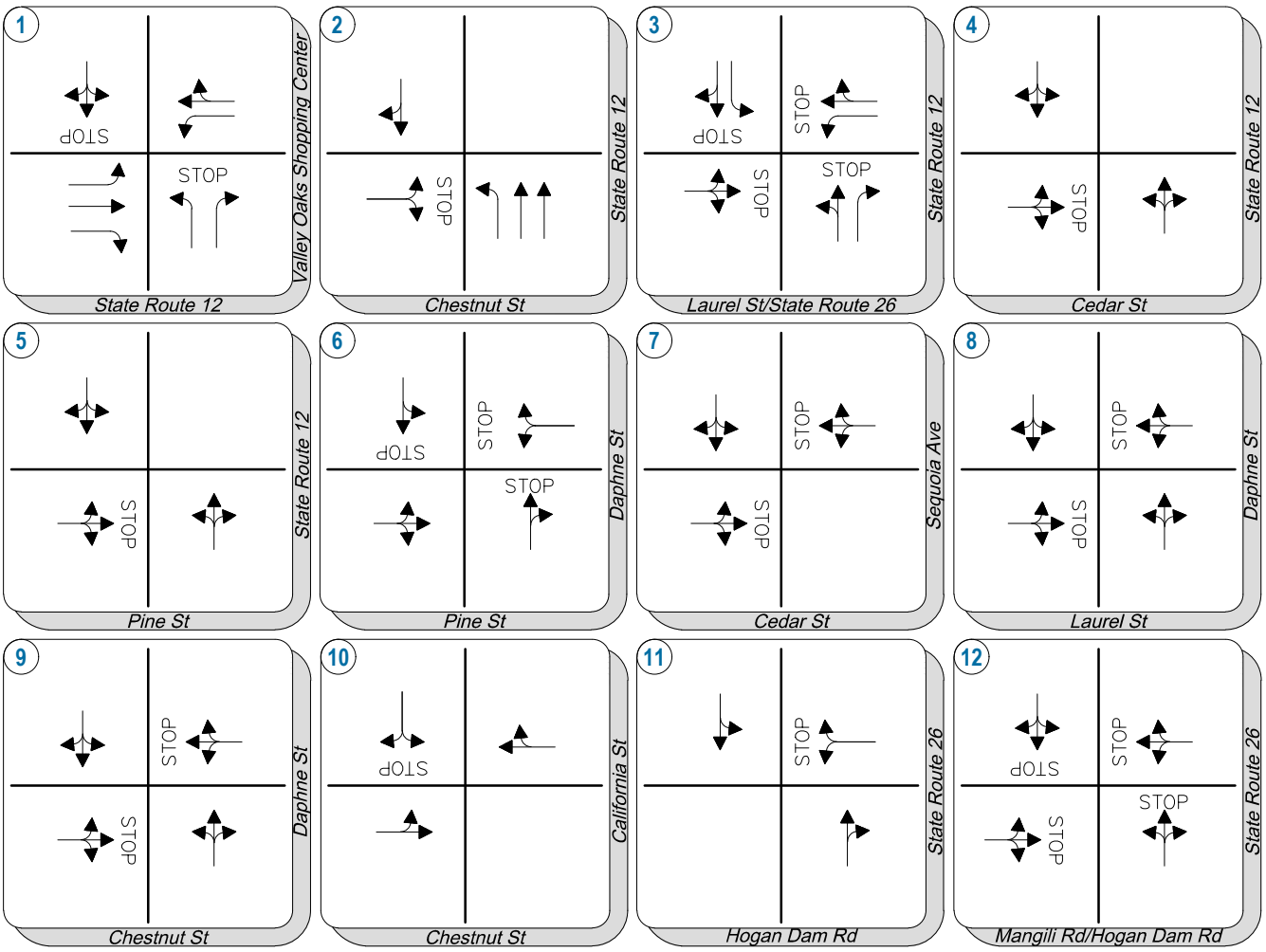
The peak hour is defined as the four consecutive 15-minute count periods that together have the highest total volume. AM peak hours were identified based on counts conducted between 7:00 and 9:00 AM, with the exception of the intersection of SR 12 at the Valley Oaks Shopping Center which was counted from 11:00 AM to 1:30 PM. The school peak hour was counted from 1:30 to 3:30 PM. PM peak hours were counted from 3:30 to 6:00 PM.

No known special events were occurring in the area at the time of the traffic counts, and local schools were in session. Counts were obtained in the absence of inclement weather.

STUDY INTERSECTIONS

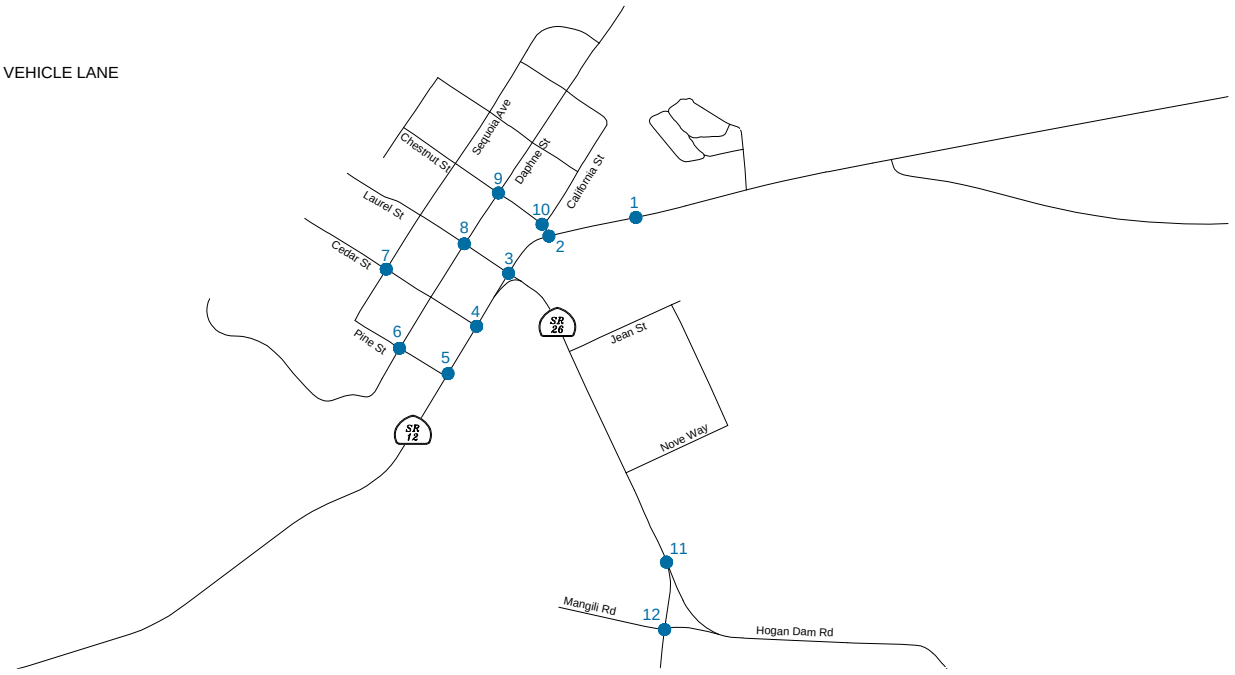
1. SR 12 at the Valley Oaks Entrance
2. SR 12 at Chestnut Street
3. SR 12 at SR 26
4. SR 12 at Cedar Street
5. SR 12 at Pine Street
6. Pine Street at West Daphne Street
7. Sequoia Avenue at Cedar Street
8. Laurel Street at Daphne Street
9. Chestnut Street at Daphne Street
10. Chestnut Street at California Street
11. SR 26 at Hogan Dam Road
12. SR 26 at Mangili Road/Hogan Dam Road

Figure C-1 shows the existing geometrics and controls for the study intersections. Figure C-2 lists existing peak hour traffic volume for each study intersection.



LEGEND:

VEHICLE LANE



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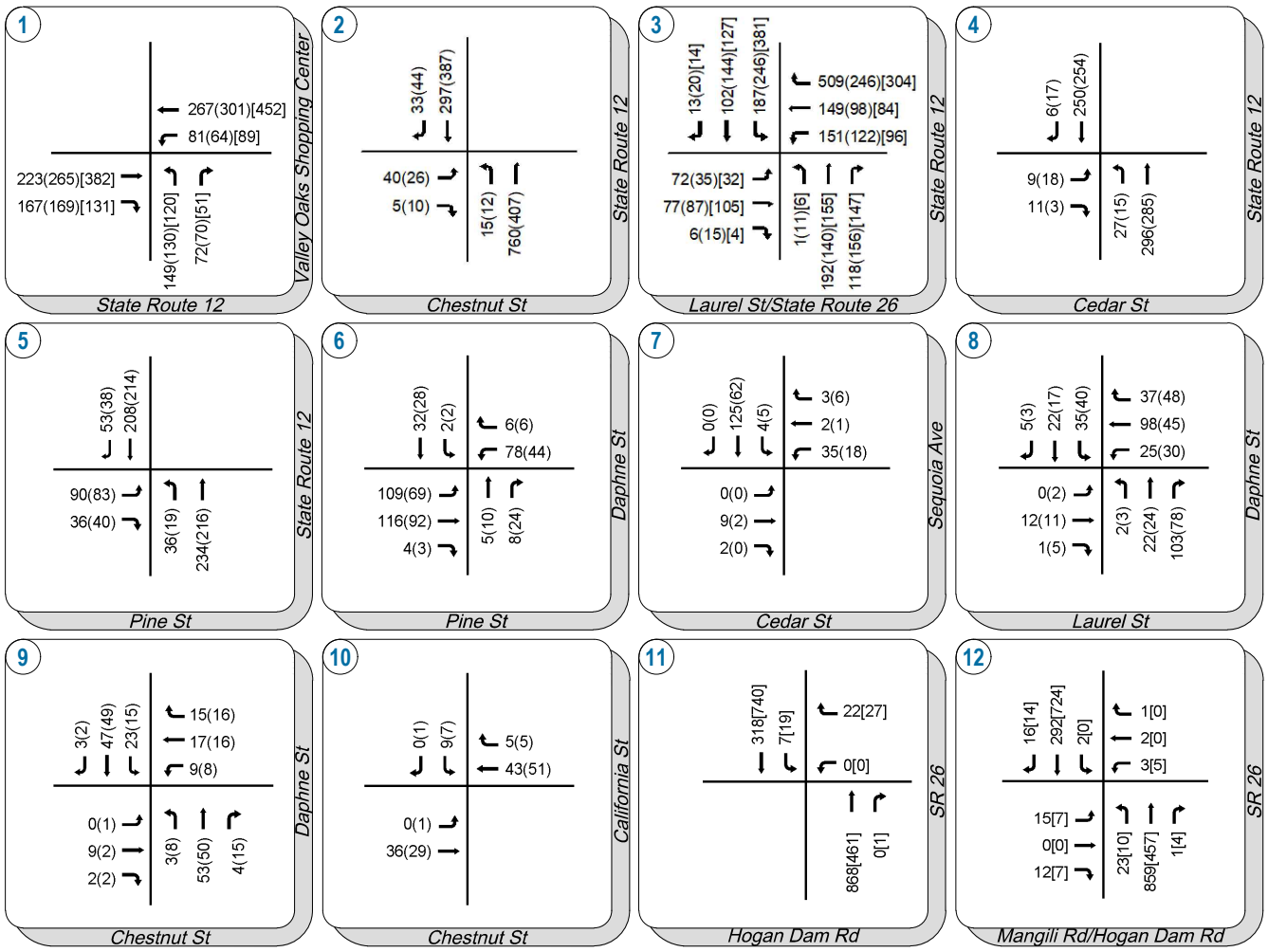
CALAVERAS COUNCIL OF GOVERNMENTS
VALLEY SPRINGS TOWN CENTER
CONNECTIVITY PLAN

EXISTING LANE GEOMETRICS AND CONTROL

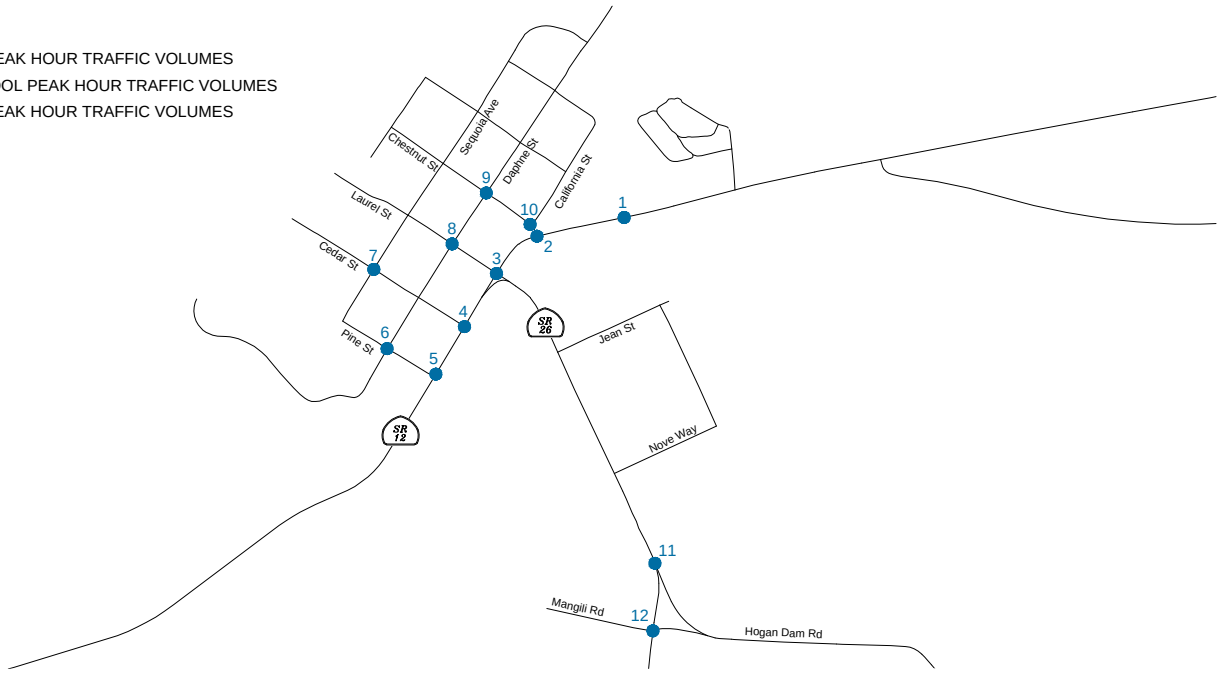
Project No. **11159238**
Report No. **001**
Date **11.27.2018**

FIGURE C-1



LEGEND:

XX - AM PEAK HOUR TRAFFIC VOLUMES
(XX) - SCHOOL PEAK HOUR TRAFFIC VOLUMES
[XX] - PM PEAK HOUR TRAFFIC VOLUMES



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CALAVERAS COUNCIL OF GOVERNMENTS
VALLEY SPRINGS TOWN CENTER
CONNECTIVITY PLAN

EXISTING PEAK HOUR TRAFFIC VOLUMES

Project No. **11159238**
Report No. **001**
Date **11.27.2018**

FIGURE C-2

LEVEL OF SERVICE

METHODOLOGY

Traffic operations are quantified through the determination of "Level of Service" (LOS). LOS was calculated for all study intersection control types using the methods documented in the Transportation Research Board publication *Highway Capacity Manual, Sixth Edition, A Guide to Multimodal Mobility Analysis, 2016* (HCM 6).

LOS is a qualitative measure of traffic operating conditions, where a letter grade from A to F is assigned to an intersection representing progressively worsening traffic operations as measured by vehicle delay or congestion. LOS A represents free-flow operating conditions and LOS F represents over-capacity conditions.

Synchro version 10 (Trafficware) was used to analyze the study intersections based on the HCM 6 methodology. Synchro is capable of producing results using HCM 2000, HCM 2010, and HCM 6 methodologies and takes into account queueing constraints when calculating delay, the corresponding delay, and queue lengths. For intersections with channelized free right-turn movements which bypass the intersection, HCM methodologies assume vehicles using a free right-turn movement will not contribute to vehicle delay at the intersection.

Table C-5 presents the vehicular delay-based LOS criteria for different types of intersection control. For an all-way stop controlled (AWSC) intersection, LOS is based on the average delay for all approaches and movements. For a two-way or one-way (T intersection) stop controlled (TWSC) intersection, LOS is based on the average delay for all movements on the worst performing approach.

EXISTING INTERSECTION OPERATIONS

Existing intersection operations were quantified in terms of LOS for the 12 study intersections utilizing existing traffic volumes collected during weekday AM, School, and PM peak hours on typical weekdays in September and December 2018, while school was in session.

TECHNICAL ANALYSIS PARAMETERS AND ASSUMPTIONS

Table C-4 presents the technical parameters assumed for the evaluation of the study intersections for the analysis scenarios. All parameters not listed should be assumed as default or calculated values based on HCM methodology.

TABLE C-4: TECHNICAL PARAMETERS AND ASSUMPTIONS

Technical Parameters	Assumptions
1. Intersection Peak Hour Factor (PHF)	Intersection overall, Based on Existing Counts
2. Intersection Heavy Vehicle Percentage	Intersection overall, Based on Existing Counts, minimum 2%

TABLE C-5: LEVEL OF SERVICE (LOS) CRITERIA FOR INTERSECTIONS

LOS	Flow Type	Delay	Maneuverability	Stopped Delay/Vehicle	
				Signalized	Un-signalized
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	≤10.0	≤10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10.0 and ≤20.0	>10.0 and ≤15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	>20.0 and ≤35.0	>15.0 and ≤25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and ≤55.0	>25.0 and ≤35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and ≤80.0	>35.0 and ≤50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	>80.0	>50.0

Source: *Highway Capacity Manual Sixth Edition, A Guide for Multimodal Mobility Analysis*, 2016 (HCM 6)

WARRANT ANALYSIS

A supplemental traffic signal "warrant" analysis was completed for unsignalized intersections that were determined to be operating at an unacceptable LOS, and for the intersection at the entrance to the Valley Oaks Center. The term "signal warrant" refers to the list of established criteria used by public agencies to quantitatively justify or ascertain the need for installation of a traffic signal at an unsignalized intersection. This study has employed the signal warrant criteria presented in the latest edition of the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD), as amended by the MUTCD 2014 California Supplement (CA MUTCD), for all study intersections. The signal warrant criteria are based upon several factors, including volume of vehicular and pedestrian traffic, collision frequency, location of school areas, etc. Both the MUTCD and the CA MUTCD indicate that the installation of a traffic signal should be considered if one or more of the signal warrants are met. The ultimate decision to signalize an intersection should be determined after careful analysis of all intersection and area characteristics.

This study utilizes the 70% threshold option for Warrant 3 as the representative type of traffic signal warrant analysis. The 70% volume threshold can be used instead of the 100% threshold if the statutory speed limit of the 85th percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built up area of an isolated community having a population less than 10,000 people. Valley Springs meets this criteria for utilizing the 70% threshold option.

INTERSECTION OPERATIONS

Existing weekday AM, School, and PM peak hour intersection traffic operations were quantified using the existing traffic volumes and existing intersection geometrics and controls. Table C-6 presents the intersection operations for the Existing Conditions.

SR 12 & SR 26/Laurel Street currently operates at an unacceptable LOS in the AM and PM peak hours. All other intersections currently operate at or above the target LOS threshold. During site visits, substantial queuing was observed on the internal local roads at the School peak hour. The queue extended for several blocks along Sequoia Avenue. Figure C-3, Figure C-4, and Figure C-5 present maps of the intersection LOS during AM, School, and PM peak hours respectively.

TABLE C-6: EXISTING CONDITIONS INTERSECTION OPERATIONS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			School Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met[3]	Delay	LOS	Warrant Met[3]	Delay	LOS	Warrant Met[3]
1	SR 12 & Valley Oaks Shopping Center Dwy[5]	TWSC	C	15.2	C	Yes	15.6	C	Yes	22.7	C	Yes
2	SR 12 & Chestnut St	TWSC	C	15.2	C	-	16.2	C	-	-	-	-
3	**SR 12 & SR 26/Laurel St**	**AWSC**	**C**	**46.9**	**E**	**Yes**	17.0	C	-	**29.3**	**D**	**Yes**
4	SR 12 & Cedar St	TWSC	C	12.5	B	-	14.8	B	-	-	-	-
5	SR 12 & Pine St	TWSC	C	15.9	A	-	16.2	C	-	-	-	-
6	Daphne St & Pine St	AWSC	D	9.1	A	-	9.3	A	-	-	-	-
7	Sequoia Ave & Cedar St	TWSC	D	10.8	B	-	10.1	B	-	-	-	-
8	Daphne St & Laurel St	TWSC	D	12.5	B	-	11.7	B	-	-	-	-
9	Daphne St & Chestnut St	TWSC	D	10.1	A	-	9.9	A	-	-	-	-
10	California St & Chestnut St	TWSC	D	9.0	A	-	9.0	A	-	-	-	-
11	SR 26 & Hogan Dam Road	TWSC	D	18.7	C	-	-	-	-	11.4	B	-
12	Mangili Rd/Hogan Dam RD & SR 26	TWSC	D	32.2	D	-	-	-	-	31.1	D	-

Notes:

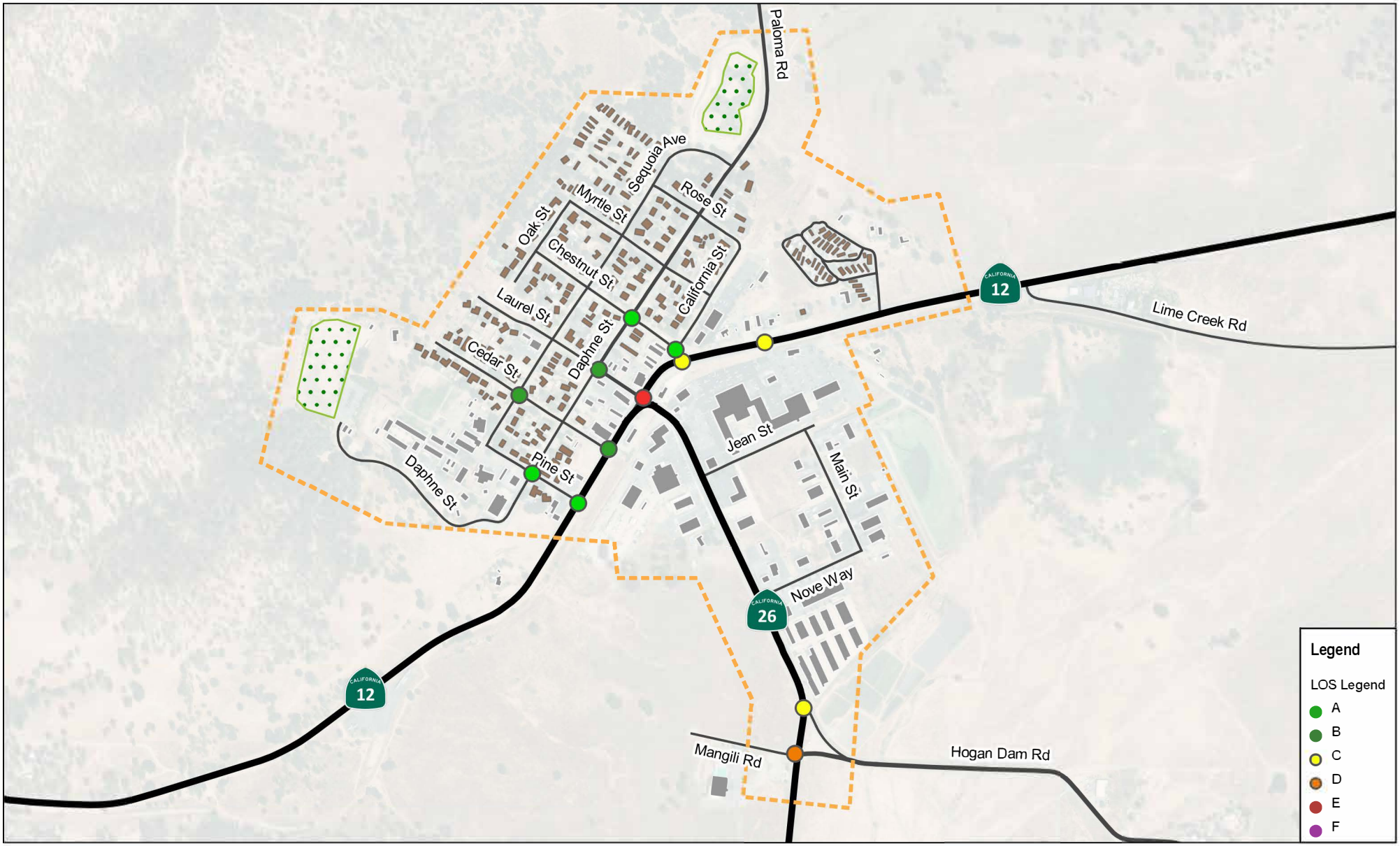
1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC

3. Warrant = Based on California MUTCD Warrant 3

*4. **Bold** = Unacceptable Conditions*

5. For Intersection 1, the AM peak hour counts reflect 11:00 AM and 1:30 PM



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CALAVERAS COUNCIL OF GOVERNMENTS
VALLEY SPRINGS
TOWN CENTER CONNECTIVITY PLAN

AM Peak Hour
Level of Service

Project No. **11159238**
Revision No. **-**
Date. **01/14/2020**

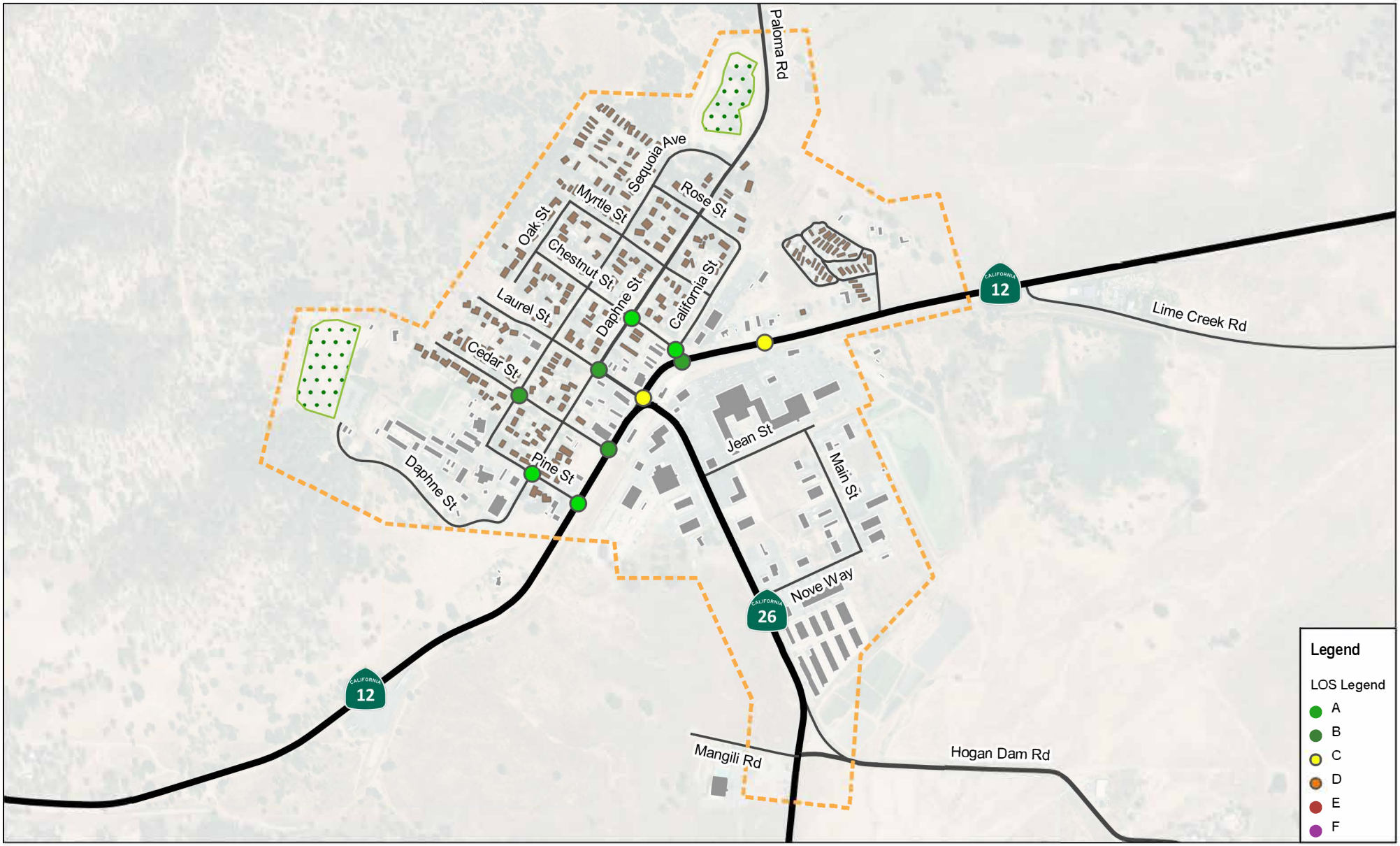
FIGURE C-3

Document Path: K:\PRJ\2522\G2522\Base Map.qgs

Data Source:

Print Date: 01/14/2020

Created By: Rosanna Southern



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CALAVERAS COUNCIL OF GOVERNMENTS
VALLEY SPRINGS
TOWN CENTER CONNECTIVITY PLAN

School Peak Hour
Level of Service

Project No. **11159238**
Revision No. **-**
Date. **01/14/2020**

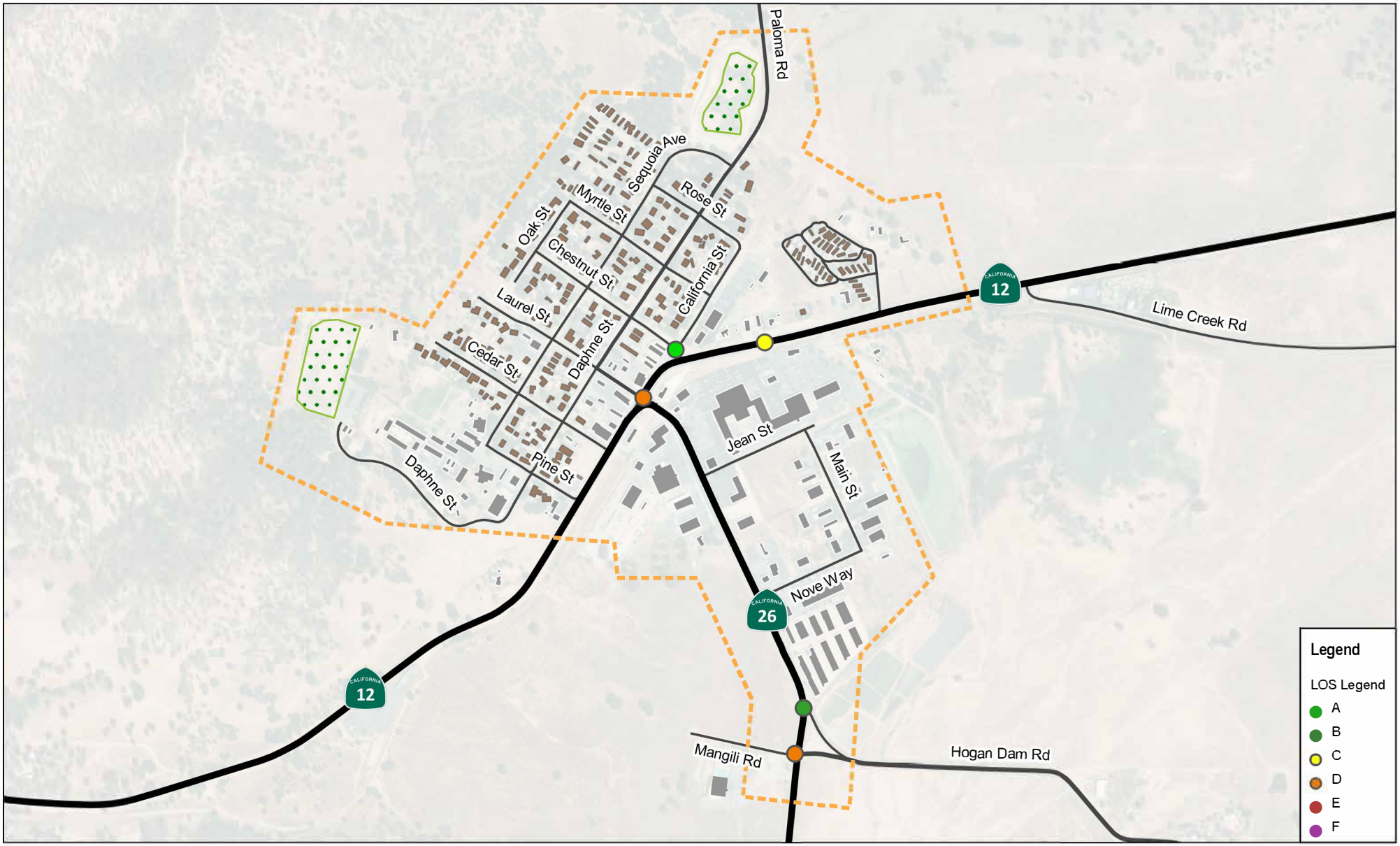
FIGURE C-4

Document Path: K:\PR\J2522\G2522\Base Map.mxd

Data Source:

Print Date: 01/14/2020

Created By: Rosanna Southern



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Map Projection: Lambert Conformal Conic
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Grid: NAD 1986 CORS96 StatePlane California III FIPS 0403 Ft US

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GHD

CALAVERAS COUNCIL OF GOVERNMENTS
VALLEY SPRINGS
TOWN CENTER CONNECTIVITY PLAN

PM Peak Hour
Level of Service

Project No. **11159238**
Revision No. **-**
Date. **01/14/2020**

FIGURE C-5

Document Path: K:\PR\J\2522\G2522\Base Map.mxd
Print Date: 01/14/2020

Data Source:
Created By: Rosanna Southern

FUTURE CONDITIONS ASSESSMENT

Future conditions were assessed based on the General Plan buildout scenario contained within the Calaveras County Travel Demand Model, consistent with the County's 2018 General Plan Update. In order to provide a "worst case" scenario, constrained by programmed funding, the Valley Springs bypass alignment included in the General Plan is assumed to cross SR 26 around Hogan Dam Road. Although not quantified in this study from an operational perspective, a bypass scenario was run in the travel demand model to assess the anticipated level of traffic diversion from the current SR 12 alignment. Table C-7 presents the future intersection operations (without the bypass), and Figure C-6 presents the future intersection turning movements assumed in this operational analysis.

The following intersections are projected to operate at an unacceptable LOS in the Cumulative conditions:

- Intersection 1: SR 12 & Valley Oaks Shopping Center
- Intersection 3: SR 12 & SR 26/Laurel Street
- Intersection 11: SR 26 & Hogan Dam Road
- Intersection 12 & Mangili Road/Hogan Road

FUTURE CONDITIONS INTERSECTION OPERATIONS (WITHOUT BYPASS)

Using the Calaveras County Travel Demand Model, a bypass scenario was developed for this assessment. The model run estimated roughly 80% of "through" traffic along SR 12, from west of the study area to east of Lime Kiln Road, is anticipated to divert from the current SR 12 alignment to the bypass. Under this scenario, the intersection of the bypass (presumably in the vicinity of Hogan Dam Road) would require improvement design to handle the anticipated traffic flows acceptably, which would be significant. All study intersections along the existing SR 12 and SR 26 alignment would perform at LOS A to C without further improvement need.

TABLE C-7: FUTURE CONDITIONS INTERSECTION OPERATIONS (WITHOUT BYPASS)

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			School Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met[3]	Delay	LOS	Warrant Met[3]	Delay	LOS	Warrant Met[3]
1	SR 12 & Valley Oaks Shopping Center Dwy[5]	TWSC	D	73.0	F	Yes	78.8	F	Yes	283.2	F	Yes
2	SR 12 & Chestnut St	TWSC	D	27.9	D	No	20.5	C	-	-	-	-
3	**SR 12 & SR 26/Laurel St**	**AWSC**	**D**	**OVR**	**F**	**Yes**	86.6	F	Yes	**182.4**	**F**	**Yes**
4	SR 12 & Cedar St	TWSC	D	17.0	C	-	15.2	C	-	-	-	-
5	SR 12 & Pine St	TWSC	D	18.9	C	-	22.6	C	-	-	-	-
6	Daphne St & Pine St	AWSC	D	11.1	B	-	12.4	B	-	-	-	-
7	Sequoia Ave & Cedar St	TWSC	D	13.8	B	-	10.8	B	-	-	-	-
8	Daphne St & Laurel St	TWSC	D	23.0	C	-	17.8	C	-	-	-	-
9	Daphne St & Chestnut St	TWSC	D	11.3	B	-	11.2	B	-	-	-	-
10	California St & Chestnut St	TWSC	D	9.3	A	-	9.4	A	-	-	-	-
11	SR 26 & Hogan Dam Road	TWSC	D	46.9	E	No	-	-	-	16.8	C	-
12	Mangili Rd/Hogan Dam RD & SR 26	TWSC	D	OVR	F	No	-	-	-	241.0	F	No

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control

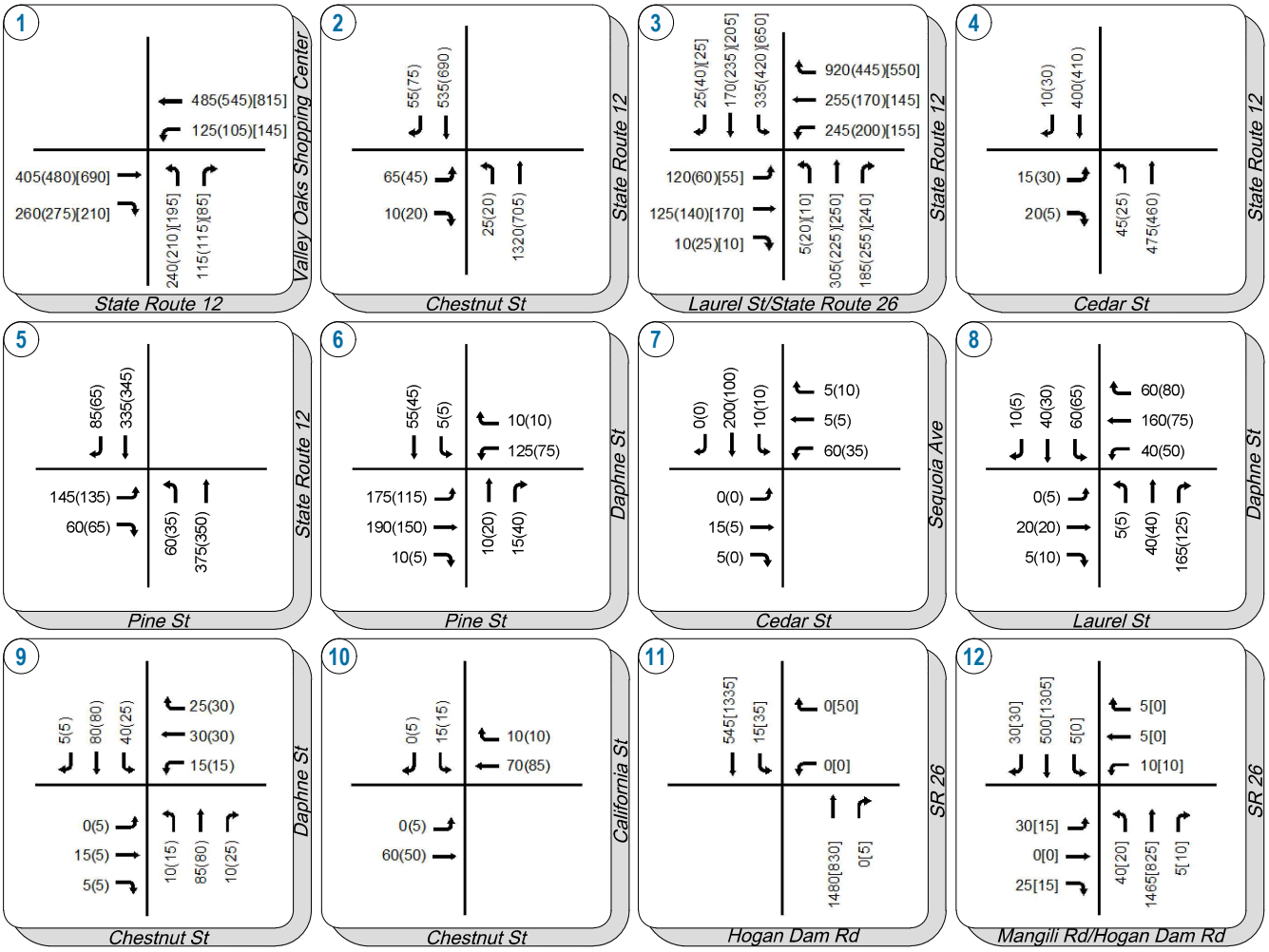
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC

3. Warrant = Based on California MUTCD Warrant 3

*4. **Bold** = Unacceptable Conditions*

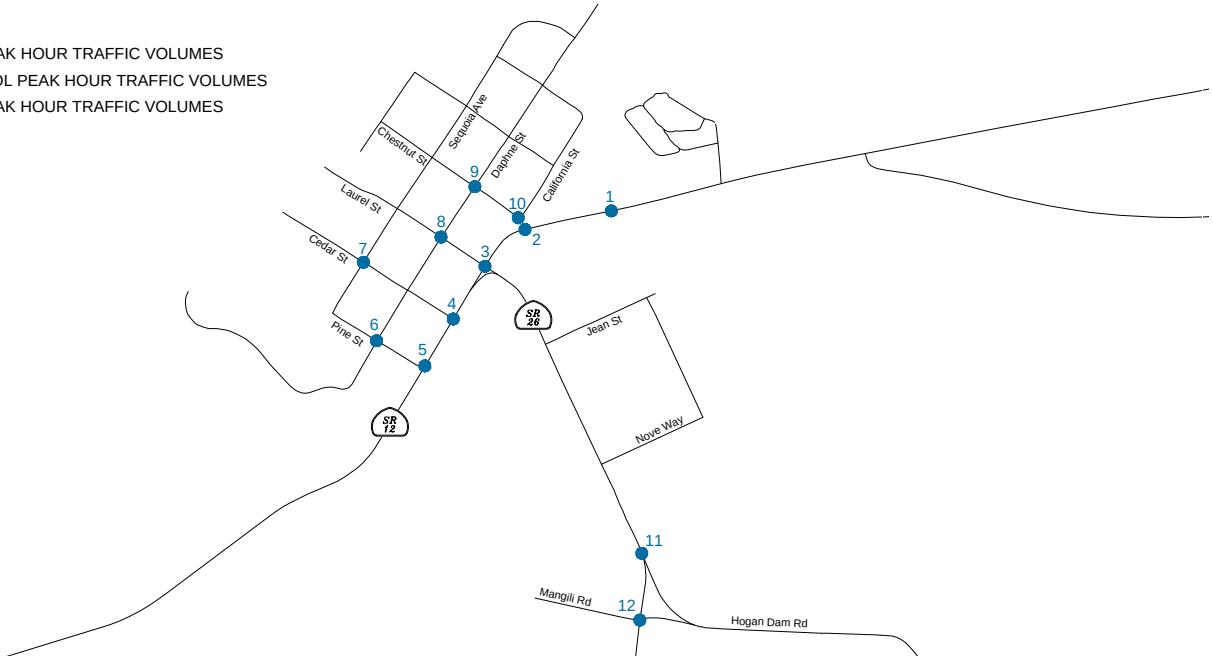
5. For Intersection 1, the AM peak hour counts reflect 11:00 AM and 1:30 PM

6. OVR = Delay value is over 300 seconds



LEGEND:

XX - AM PEAK HOUR TRAFFIC VOLUMES
(XX) - SCHOOL PEAK HOUR TRAFFIC VOLUMES
[XX] - PM PEAK HOUR TRAFFIC VOLUMES



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CALAVERAS COUNCIL OF GOVERNMENTS
VALLEY SPRINGS TOWN CENTER
CONNECTIVITY PLAN

CUMULATIVE PEAK HOUR
TRAFFIC VOLUMES

Project No. **11159238**
Report No. **001**
Date **08.29.2019**

FIGURE C-6

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Source:

LEVEL OF TRAFFIC STRESS

BICYCLE LEVEL OF TRAFFIC STRESS

METHODOLOGY

Existing Facilities for the study corridor were analyzed based on Bicycle Level of Traffic Stress (LTS). The methodology for Bicycle LTS is adapted from the most recent version of the Oregon Department of Transportation (ODOT) *Analysis Procedure Manual, Version 2*. The original methodology can be obtained from the paper, "Low Stress Bicycling and Network Connectivity," Mineta Transportation Institute, Report 11-19, May 2012.

Bicycle LTS is generally a perception-based rating system of the safety, comfort, and convenience of transportation facilities from the perspective of the user. The approach outlined in the ODOT manual uses roadway network data, including the posted speed limit, number of vehicle travel lanes, and presence and character of bicycle lanes as a proxy for bicyclist comfort level in urban context, and uses ADT, traffic speed, and shoulder or bike lane width in rural settings. The Bicycle LTS methodology breaks road segments into one of four classifications or ratings for measuring the effects of traffic-based stress on bicycle riders, with 1 being the lowest stress or most comfortable, and 4 being the highest stress or least comfortable. Examples and descriptions for each level of traffic stress are presented in Table C-8.

The Bicycle LTS methodology is broken into three categories: segment (bike lanes), intersection approach (turn lanes), and intersection crossing (unsignalized). Table-based criteria are applied separately for each category. Depending on the community context and the detail level desired, the overall methodology may be simplified based on the general consistency of facility types, as certain elements (e.g. turn lanes, bike lanes, speed limits, etc.) may not exist in a particular community. If there are no turn lanes on an approach, then this portion of the methodology is skipped. Signalized intersections do not receive an LTS score. Signalized crossings usually do not create a barrier as the signal provides a protected way across and are not considered in the methodology.

All roadways received a segment score. However, not all roadways received an approach or intersection crossing score. For example, a midblock portion of a street link received a segment score, but because it does not intersect another street, nor does it have turn lanes, neither an intersection nor approach score was assigned. The methodology uses the worst overall LTS value of each LTS category. For example, if a segment has an LTS score of 2 but there is an intersection approach at the end of the segment at LTS 4, then the overall LTS for the segment is LTS 4. The same applies for entire routes, which are typically reported in a single direction between two points of interest and can contain many segments and intersections. It is likely that the LTS will be different in the two directions (i.e. right turn maneuver vs. left turn maneuver), so both directions should be reported for a given route.

TABLE C-8: BICYCLE LEVEL OF TRAFFIC STRESS

	LTS 1: Comfortable for all ages and abilities Represents little traffic stress and requires less attention, so is suitable for all cyclists. This includes children that are trained to safely cross intersections (around 10 yrs. old/5th grade) alone and supervising riding parents of younger children. Generally, the age of 10 is the earliest age that children can adequately understand traffic and make safe decisions which is also the reason that many youth bike safety programs target this age level. Traffic speeds are low and there is no more than one lane in each direction. Intersections are easy to cross by children and adults. Typical locations include residential local streets and separated bike paths/cycle tracks.
	LTS 2: Comfortable for most adults Represents little traffic stress but requires more attention than young children can handle, so is suitable for teen and adult cyclists with adequate bike handling skills. Traffic speeds are slightly higher but speed differentials are still low and roadways can be up to three lanes wide in total for both directions. Intersections are not difficult to cross for most teenagers and adults. Typical locations include collector-level streets with bike lanes or a central business district.
	LTS 3: Comfortable for confident bicyclists Represents moderate stress and suitable for most observant adult cyclists. Traffic speeds are moderate but can be on roadways up to five lanes wide in both directions. Intersections are still perceived to be safe by most adults. Typical locations include low-speed arterials with bike lanes or moderate speed non-multilane roadways.
	LTS 4: Uncomfortable for most Represents high stress and suitable for experienced and skilled cyclists. Traffic speeds are moderate to high and can be on roadways from two to over five lanes wide in both directions. Intersections can be complex, wide, and or high volume/speed that can be perceived as unsafe by adults and are difficult to cross. Typical locations include high speed or multilane roadways with narrow or no bike lanes.

Source: Oregon Department of Transportation, Analysis Procedure Manual, Version 2, 2016

Table C-9 and Table C-10 present the scoring criteria for segments, Table C-11 presents the scoring criteria for approaches, and Table C-12 and Table C-13 present the criteria for crossing intersections.

All Tables are sourced directly from "Low Stress Bicycling and Network Connectivity," Mineta Transportation Institute, Report 11-19, May 2012.

TABLE C-9: LEVEL OF TRAFFIC STRESS CRITERIA FOR BIKE LANES ALONGSIDE A PARKING LANE

	LTS≥1	LTS≥2	LTS≥3	LTS≥4
Street Width (through lanes per direction)	1	(no effect)	2 or more	(no effect)
Sun of Bike Lane and parking lane width (includes marked buffer and paved gutter)	15 ft or more	14 or 14.5 ft[1]	13.5 or less	(no effect)
Speed limit or prevailing speed	25 mph or less	30 mph	35 mph	40 mph or more
Bike Lane blockage (typically applies in commercial areas)	rare	(no effect)	frequent	(no effect)

Notes:

(no effect) = factor does not trigger an increase to this level of traffic stress

[1]If speed limit < 25 mph or Class + residential, then any width is acceptable for LTS 2.

TABLE C-10: LEVEL OF TRAFFIC STRESS CRITERIA FOR BIKE LANES NOT ALONGSIDE PARKING

	LTS≥1	LTS≥2	LTS≥3	LTS≥4
Street Width (through lanes per direction)	1	2, if directions are separated by a raised median	more than 2, or 2 without a separating median	(no effect)
Bike Lane width (includes marked buffer and paved gutter)	6 ft or more	5.5 ft	(no effect)	(no effect)
Speed limit or prevailing speed	30 mph or less	(no effect)	35 mph	40 mph or more
Bike Lane blockage (may applies in commercial areas)	rare	(no effect)	frequent	(no effect)

Notes:

(no effect) = factor does not trigger an increase to this level of traffic stress

TABLE C-I1: LEVEL OF TRAFFIC STRESS CRITERIA FOR POCKET BIKE LANES

Configuration	Level of Traffic Stress
Single right-turn lane up to 150 ft. long starting abruptly while the bike lane continues straight, and having an intersection angle and curb radius such that turning speed is ≤15 mph.	LTS ≥ 2
Single right-turn lane longer than 150 ft. starting abruptly while the bike lane continues straight, and having an intersection angle and curb radius such that turning speed is ≤20 mph.	LTS ≥ 3
Single right-turn lane in which the bike lane shifts to the left but the intersection angle and curb radius are such that turning speed is ≤15 mph.	LTS ≥ 3
Single right-turn lane with any other configuration; dual right-turn lanes; or right-turn lane along with an option (through-right) lane.	LTS 4

TABLE C-I2: LEVEL OF TRAFFIC STRESS CRITERIA FOR CROSSINGS WITH A MEDIAN REFUGE OF AT LEAST 6 FEET

Speed Limit of Street Being Crossed	Width of Street Being Crossed		
	Up to 3 lanes	4-5 lanes	6+ lanes
Up to 25 mph	LTS 1	LTS 1	LTS 2
30 mph	LTS 1	LTS 2	LST 3
35 mph	LTS 2	LST 3	LTS 4
40+	LST 3	LTS 4	LTS 4

TABLE C-I3: LEVEL OF TRAFFIC STRESS CRITERIA FOR CROSSINGS WITHOUT A MEDIAN

Speed Limit of Street Being Crossed	Width of Street Being Crossed		
	Up to 3 lanes	4-5 lanes	6+ lanes
Up to 25 mph	LTS 1	LTS 2	LTS 4
30 mph	LTS 1	LTS 2	LTS 4
35 mph	LTS 2	LST 3	LTS 4
40+	LST 3	LTS 4	LTS 4

FINDINGS

Most of the existing segments in the study area include no facilities for bicycles. The highway sections that feature bike facilities lack continuity, so the overall routes are still considered LTS 4. Daphne Street is the only street with bike lanes along both sides for the whole length of the segment. The streets in the neighborhood by the school have an LTS of 2, even though they lack facilities, due to having low vehicle speeds and only one lane in each direction. Table C-14 presents the Bicycle LTS for each existing roadway segment.

There are currently few facilities for bicyclists, leaving many road segments with an overall Bicycle LTS of 4. There are gaps in bicycle facilities between housing and key destinations for residents and visitors such as the school, the library, Valley Oaks Town Center, and the Valley Springs Sport & Fitness Center.

Many of the intersections do not include left or right turn lanes so the approach scores for many of the intersections are not applicable. Table C-15 on the following page presents the Bicycle LTS for each approach, where applicable.

There are no signalized intersections in the study area so all 12 intersections are included. Due to the low speeds and two lane roads in the community, intersections 6-10 have a Bicycle LTS of 1. At busier intersections, the Bicycle LTS deteriorates to 2 or 3.

Table C-16 presents the Bicycle LTS for each intersection.

TABLE C-14: SEGMENT BICYCLE LEVEL OF TRAFFIC STRESS

Roadway	Zone	Limits	Segment LTS Score	
			West Side	East Side
Highway 12	1	Pine St. to Cedar St.	4	4
	2	Cedar St. to Laurel St.	4	4
	3	Laurel St. to Chestnut St.	4	3
	4	Chestnut St. to Castle Rock Estates Dwy	4	4
Highway 26	5	Highway 12 to Jean St.	4	4
	6	Jean St. to Nove Way	4	4
Pine St.	7	Highway 12 to Sequoia Ave.	2	2
Cedar St.	8	Terminus to Highway 12	2	2
Laurel St.	9	Terminus to Highway 12/26	2	2
Chestnut St.	10	Oak St. to Highway 12	2	2
Myrtle St.	11	Oak St. to California St.	2	2
Rose St.	12	Sequoia Ave. to California St.	2	2
Paloma Rd.	13	Rose St. to Sequoia Ave.	1	2
California St.	14	Chestnut St. to Rose St.	2	2
Daphne St.	15	Pine St. to Rose St.	1	1
Sequoia Ave.	16	Before Chestnut St. to Myrtle St.	2	2
Oak St.	17	Pine St. to Rose St.	2	2
Highway 26	18	Nove Way to Hogan Dam Rd	4	4

TABLE C-15: APPROACH BICYCLE LEVEL OF TRAFFIC STRESS

Roadway	Intersection Number	Approach Score (Turn lanes)							
		EB Left	EB Right	WB Left	WB Right	SB Left	SB Right	NB left	NB Right
SR 12/Valley Oaks Shopping Center	1	-	3	-	-	-	-	-	-
SR 12/SR 26	3	-	-	4	3	4	-	-	3

TABLE C-16: INTERSECTION BICYCLE LEVEL OF TRAFFIC STRESS

#	Location	Crossing Score (Unsignalized Intersections)				Overall Score
		E	W	S	N	
1	SR 12/Valley Oaks Center	3	3	1	-	3
2	SR 12/Chestnut	3	3	-	2	3
3	SR 12/SR 26	3	2	2	3	3
4	SR 12/Cedar	2	-	2	2	2
5	SR 12/Pine	2	-	2	2	2
6	Pine/Daphne	1	1	-	1	1
7	Sequoia/Cedar	1	1	1	1	1
8	Laurel/Daphne	1	1	1	1	1
9	Chestnut/Daphne	1	1	1	1	1
10	Chestnut/California	1	1	1	1	1
11	SR 26/Hogan Dam Rd	-	3	3	3	3
12	SR 26/Hogan Dam Rd/Mangili Rd	3	3	3	3	3

PEDESTRIAN LEVEL OF TRAFFIC STRESS

METHODOLOGY

Pedestrian facilities were analyzed in terms of Pedestrian Level of Traffic Stress (LTS), which is adapted from the Oregon Department of Transportation (ODOT) *Analysis Procedure Manual, Version 2*. The Pedestrian LTS measure was developed to work with Bicycle LTS to determine the multimodal comfort level of various users on roadways. Similar to the Bicycle LTS methodology, the Pedestrian LTS methodology does not involve extensive data collection.

Pedestrian LTS uses the same 1 to 4 rating system as Bicycle LTS, with LTS 1 being the least stressful and LTS 4 being the most stressful.

- LTS 1 – Represents little to no traffic stress and requires little attention by pedestrians to the traffic situation. This is suitable for all users including children 10 years of age or younger, groups of people, and people using a wheeled mobility device. The facility is a sidewalk or shared-use path with a buffer between the pedestrians and motor vehicle facility. Pedestrians feel safe and comfortable on the pedestrian facility. Motor vehicles are either far from the pedestrian facility and/or traveling at a low speed and volume. All users are willing to use this facility.
- LTS 2 – Represents little traffic stress but requires more attention to the traffic situation than may be capable of young children. These facilities would be suitable for children over 10, teens and adults. All users should be able to use the facility, but some factors may limit people using wheeled mobility devices. Sidewalk condition should be good, with limited areas of fair condition. Roadways may have higher speeds and/or higher volumes. Most users are willing to use this facility.
- LTS 3 – Represents moderate stress and is suitable for adults. Able-bodied adults would feel uncomfortable, but safe using this facility. The roadways are higher speeds with smaller buffers. Small areas in the facility may be impassable for a person using a wheeled mobility device and/or requires the user to travel on the shoulder/bike lane/ street. Some users are willing to use this facility.
- LTS 4 – Represents high traffic stress. Only able-bodied adults with limited route choices would use this facility. Traffic speeds are moderate to high with narrow or no pedestrian facilities provided. Typical locations include high speed, multilane roadways with narrow sidewalks and buffers. This also includes facilities with no sidewalks. This could include evident trails next to roads or “cut through” trails. Only the most confident or trip-purpose driven users will use this facility.

Pedestrian LTS is broken into two primary sections: segments and intersection crossings. The criteria for segments are presented in Table C-17, Table C-18, and Table C-19, while the criteria for intersection crossings are presented in Table C-20 and Table C-21. Only the tables for the criteria applicable for the study area are shown.

TABLE C-17: SIDEWALK CONDITION [1,2]

Actual/Effective Sidewalk Width (ft.)[3]		Sidewalk Condition				
		Good	Fair	Poor	Very Poor	No Sidewalk
Actual	<4	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4
	≥4 to <5	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4
	≥5	LTS 2	LTS 2	LTS 3	LTS 4	LTS 4
Effective	≥6[4]	LTS 1	LTS 1	LTS 2	LTS 3	LTS 4

Notes:

[1]May be applied other pedestrian facilities, such as walkways and shared-use paths

[2]Consider increasing the LTS one level (Max LTS 4) for segments that do not have illumination. Darkness requires more awareness especially if sidewalk is in fair or worse conditions.

[3]Effective width is the available/useable area for the pedestrian. Does not include areas occupied by store fronts or curb side features.

[4]Effective width should be proportional to volume as higher volume sidewalks should be wider than the base six feet. Use a minimum LTS 2 for higher volume sidewalks that are not proportional (include documentation).

TABLE C-18: PHYSICAL BUFFER TYPE

Buffer Type[1]	Prevailing of Posted Speed			
	≤25 MPH	30 MPH	35 MPH	≥40 MPH
No Buffer (curb tight)	LTS 2	LTS 3	LTS 1	LTS 4
Solid Surface	LTS 2[2]	LTS 2	LTS 2	LTS 2
Landscaped	LTS 1	LTS 2	LTS 2	LTS 2
Lanscaped with Trees	LTS 1	LTS 1	LTS 1	LTS 2
Vertical				

Notes:

[1]Combined buffers: If two or more buffer conditions apply, use the most appropriate, typically the lower stress level

[2]If street furniture, street trees, lighting, planters, surface change, etc. are present then the LTS can be lowered to LTS 1.

TABLE C-19: TOTAL BUFFER WIDTH

Total Number of Travel Lanes (both directions)	Total Buffering Width (ft)[1]				
	<5	≥5 to <10	≥10 to <15	≥15 to <25	≥25
2	LTS 2	LTS 2	LTS 1	LTS 1	LTS 1
3	LTS 3	LTS 2	LTS 2	LTS 1	LTS 1
4 - 5	LTS 4[2]	LTS 3	LTS 2	LTS 1	LTS 1
6	LTS 4[2]	LTS 4	LTS 3	LTS 2	LTS 2

Notes:

[1]Total Buffering Width is the summation of the width of buffer, width of parking, width of shoulder and width of the bike lane on the same side of the roadway as the pedestrian facility being evaluated.

[2]Sections with substantial physical barrier/tall railing between the travel lanes and the walkways (like might be found on a bridge) can be lowered to LTS 3.

TABLE C-20: COLLECTOR & UNSIGNALIZED INTERSECTION CROSSING[1,2,3]

Prevailing Speed or Speed Limit (mph)	No Median Refuge		Median Refuge Present
	Total Lanes Crossed		Maximum one Through/ Turn Lane Crossed Per Direction
	1 Lane	2 Lanes	
≤25	LTS 1	LTS 1	LTS 1[4]
30	LTS 1	LTS 2	LTS 1
35	LTS 2	LTS 2	LTS 2
≥40	LTS 3	LTS 3	LTS 3

Notes:

[1]For street being crossed.

[2]Minimum LTS 3 when crossing lacks standard ramps.

[3]Street may be considered a one-lane road when no centerline is striped and when oncoming vehicles commonly yield to each other

[4]Refuge should be at least 10 feet for LTS 1, otherwise use LTS 2 for refuges 6 to <10 feet.

TABLE C-2I: ARTERIAL UNSIGNALIZED INTERSECTION CROSSING WITHOUT A MEDIAN REFUGE

Prevailing Speed or Speed Limit (mph)	Total Lanes Crossed (Both Directions)[1,2]					
	2 Lanes			3 Lanes		
	<5,000 vpd	5,000- 9,000 vpd[3]	>9,000	<8,000	8,000-12,000 vpd	12,000
≤25	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3	LTS 4
30	LTS 2	LTS 3	LTS 3	LTS 3	LTS 3	LTS 4
35	LTS 3	LTS 3	LTS 4	LTS 3	LTS 4	LTS 4
≥40	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4

Notes:

[1]For street being crossed.

[2]Minimum PLTS 3 when crossing lacks standard ramps.

[3]Use these columns when ADT volumes are not available

FINDINGS

Similar to the current conditions for bicyclists, many of the segments within the study area do not include facilities for pedestrians. This is especially true in the vicinity of Valley Springs Elementary School, and connecting through the neighborhood. There are also gaps in pedestrian facilities between the residential area and the Valley Oaks Center, as well as the library and fitness center. Table C-22 presents the Pedestrian LTS for each roadway segment. Due to the lack of facilities, many of the segments have a Pedestrian LTS of 4.

Table C-23 presents the Pedestrian LTS for each crossing for the study intersections. Many of the study intersections include crosswalks for pedestrians. However, Intersections 1, 2, 5, 7, 10, 11, and 12 do not provide crosswalks for pedestrians.

TABLE C-22: SEGMENT PEDESTRIAN LEVEL OF TRAFFIC STRESS

Roadway	Zone	Limits	Segment Score	
			West Side	East Side
Highway 12	1	Pine St. to Cedar St.	4	4
	2	Cedar St. to Laurel St.	4	2
	3	Laurel St. to Chestnut St.	4	2
	4	Chestnut St. to Castle Rock Estates Dwy.	4	4
Highway 26	5	Highway 12 to Jean St.	4	2
	6	Jean St. to Nove Way	4	2
Pine St.	7	Highway 12 to Sequoia Ave.	4	4
Cedar St.	8	Terminus to Highway 12	4	4
Laurel St.	9	Terminus to Highway 12/26	4	4
Chestnut St.	10	Oak St. to Highway 12	4	4
Myrtle St.	11	Oak St. to California St.	4	4
Rose St.	12	Sequoia Ave. to California St.	4	4
Paloma Rd.	13	Rose St. to Sequoia Ave.	4	4
California St.	14	Chestnut St. to Rose St.	4	4
Daphne St.	15	Pine St. to Rose St.	4	4
Sequoia Ave.	16	Before Chestnut St. to Myrtle St.	4	4
Oak St.	17	Pine St. to Rose St.	4	4
Highway 26	18	Nove Way to Hogan Dam Rd	4	4

TABLE C-23: UNSIGNALIZED INTERSECTION PEDESTRIAN LEVEL OF TRAFFIC STRESS

Roadway	Intersection Number	Crossing Score				Overall Score
		E	W	N	S	
SR 12/ Valley Oaks Center	1	4	4	NA	3	4
SR 12/Chestnut	2	4	4	3	NA	4
SR 12/SR 26	3	3	3	3	3	4
SR 12/ Cedar	4	NA	3	3	3	3
SR 12/ Pine	5	NA	3	3	3	3
Pine/Daphne	6	1	1	1	1	1
Sequoia/ Cedar	7	1	1	1	1	1
Laurel/Daphne	8	1	1	1	1	1
Chestnut/Daphne	9	1	1	1	1	1
SR 26/Hogan Dam Rd	11	-	4	4	4	4
SR 26/Hogan Dam Rd/Mangili Rd	12	4	4	4	4	4

COLLISION ANALYSIS

State Departments of Transportation are required to create a safety plan specific to their state's safety needs under the current transportation-funding bill (FAST Act) and the Highway Safety Improvement Plan (HSIP). A Strategic Highway Safety Plan (SHSP) is a statewide-coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads. SHSP's are a critical and comprehensive tool for states to keep moving towards zero deaths related to motor vehicles and roadways. California's SHSP for 2015-2019 has adopted a "Toward Zero Deaths" (TZD) strategy for reducing traffic fatalities and injuries. TZD is also a national strategy supported by the Federal Highway Administration and many other organizations.

Collision data for Valley Springs, SR 12, and SR 26 were derived from the California Highway Patrol Statewide Integrated Traffic Records System (SWITRS) and the Transportation Injury Mapping System (TIMS) for a 12-year period between January 1, 2006 and December 31, 2017. The accuracy of the data is subject to reporting levels of the law enforcement agencies supplying the collision reports.

Based on the collision data, there were 152 collisions along SR 12 and SR 26 within the study area. Although there were no fatalities, 62 collisions (41%) resulted in injuries, and 126 collisions (82%) occurred at intersections. There were no bicycle or pedestrian collisions reported.

COLLISION RATES

The 12-year period from January 1, 2006 to December 31, 2017 was analyzed for roadway segments and intersections. The collision rate is calculated for each facility type to determine relative safety compared to other similar roadways, segments, or intersections. Collision rates are defined as the number of collisions per million vehicle miles traveled (ACC/MVM) for roadway segments, and the number of collisions per million vehicles entering the intersection (ACC/MVE) for intersections. The vehicle miles traveled is equal to the ADT volumes multiplied by the length of the segment, multiplied by the number of years of data, and multiplied by 365 (days per year). The roadway collision rate equation is shown below:

$$Collision\ Rate = \frac{(\text{Number of Collisions}) \times (1{,}000{,}000)}{\text{Vehicle Miles of Travel}}$$

The calculated collision rates are compared to statewide average rates for like facilities compiled by Caltrans, as published in their most recent document *2015 Collision Data on California State Highways*[1]. The document provides basic average collision rates, derived from SWITRS data, for various types of roadways and intersections, categorized by highway type, control type, intersection type, design speed, area type, and terrain.

Collision rates were calculated for both roadways and intersections and compared to the statewide average for like facilities. Table C-24 and Table C-25 present the analysis.

[1] Caltrans 2015 Collision Data on California State Highways (road miles, travel, collisions, collision rates), Division of Research, Innovation, and System Information, Sacramento, CA.

TABLE C-24: ROADWAY COLLISION ANALYSIS

Roadway	Highway Type	Length (mi)	ADT[1]	MVM[2]	Collisions			Collision Rate		Percent Fatal		Percent Fatal + Injury	
					Total	Fatal	Injury	VSTC[3]	CA	VSTC[3]	CA	VSTC[3]	CA
SR 12	2 Lane	1.03	8,900	40.2	85	0	36	2.12	1.08	-	2.5%	42.4%	49.2%
SR 26	2 Lane	0.72	11,300	35.6	67	0	26	1.88	1.10	-	2.5%	38.8%	49.2%

Notes:

1. ADT = Average Daily Traffic

2. MVM = Total travel in million vehicle miles

3. VSTC = Valley Springs Town Center

Source: Caltrans 2015 Collision Data on California State Highways

TABLE C-25: INTERSECTION COLLISION ANALYSIS

Intersection	Type	Control Type	Million Vehicles	Collisions			Collision Rate		Percent Fatal		Percent Fatal + Injury	
				Total	Fatal	Injury	VSTC[3]	CA	VSTC[3]	CA	VSTC[3]	CA
SR 12 & Pine St	T	TWSC	27	4	0	1	0.15	0.16	-	1.8%	25.0%	41.3%
SR 12 & Cedar St	T	TWSC	27	4	0	2	0.15	0.16	-	1.8%	50.0%	41.3%
SR 12 & Laurel St/SR 26	4-legged	AWSC	39	17	0	6	0.44	0.16	-	0.8%	35.3%	34.0%
SR 12 & Chestnut St	T	TWSC	39	15	0	5	0.39	0.16	-	1.8%	33.3%	41.3%
SR 12 & Valley Oaks Center Driveway	T	TWSC	39	35	0	12	0.91	0.16	-	1.8%	34.3%	41.3%
SR 12 & Castle Rock Estates Driveway	T	TWSC	39	8	0	5	0.21	0.16	-	1.8%	62.5%	41.3%
SR 12 & Lime Creek Rd	T	TWSC	34	10	0	6	0.30	0.16	-	1.8%	60.0%	41.3%
SR 26 & Jean St	T	TWSC	49	6	0	3	0.12	0.16	-	1.8%	50.0%	41.3%
SR 26 & Nove Way	T	TWSC	50	7	0	2	0.14	0.16	-	1.8%	28.6%	41.3%
SR 26 & Hogan Dam Rd	T	TWSC	50	20	0	7	0.40	0.16	-	1.8%	35.0%	41.3%

Notes:

1. T = three-legged intersection

2. TWSC = Two-way stop control, or one-way stop control at a T intersection. AWSC = All-way stop control

3. VSTC = Valley Springs Town Center

Source: Caltrans 2015 Collision Data on California State Highways

As presented in Table C-24, both SR 12 and SR 26 have higher collision rates than the statewide average rate. However, the percent fatal and injury are lower than the state rates.

As presented in Table C-25, the following intersections were found to have a collision rate higher than the statewide average rates:

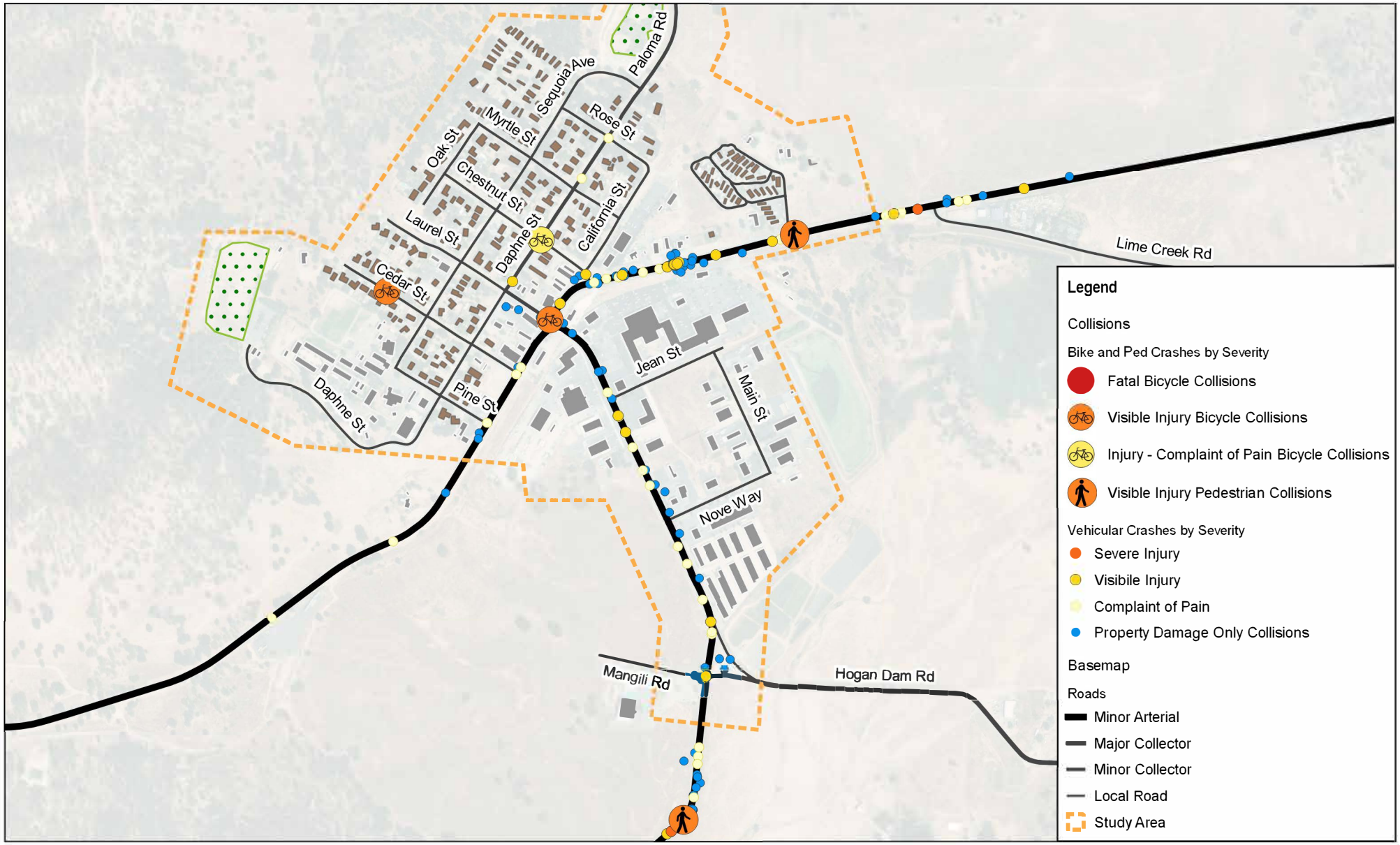
- SR 12 & SR 26/Laurel Street
- SR 12 & Chestnut Street
- SR 12 & Valley Oaks Shopping Center Driveway
- SR 12 & Castle Rock Estates Driveway
- SR 12 & Lime Creek Road
- SR 26 & Hogan Dam Road

The following intersections have a higher fatal plus injury rate than the state average:

- SR 12 & Cedar Street
- SR 12 & SR 26/Laurel Street
- SR 12 & Castle Rock Estates Driveway
- SR 12 & Lime Creek Road
- SR 26 & Jean Street

Caltrans and Calaveras County completed safety improvements to the intersection of SR 12 and SR 26 in 2015.

Figure C-7 presents the Collision Map of the study area.



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Map Projection: Lambert Conformal Conic
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CALAVERAS COUNCIL OF GOVERNMENTS
VALLEY SPRINGS
TOWN CENTER CONNECTIVITY PLAN

COLLISION MAP (ALL, BICYCLE AND PEDESTRIAN)

Project No. **11159238**
Revision No. **-**
Date. **01/14/2020**

FIGURE C-7

Document Path: K:\PR\A2522\G2522\Base Map.mxd

Data Source:

Print Date: 11/06/2019

Created By: Erin Gibbs

APPENDIX D: IMPROVEMENTS BENEFIT ASSESSMENT

The improvements presented in Chapter 4 were assessed against several quantitative and qualitative rubrics. These assessments are intended to demonstrate comparative benefit between the improvements, and the rubrics are generally consistent with anticipated competitive funding source rubrics and performance metrics. This Appendix is broken down in the following analysis categories:

- Multimodal Connectivity
- Safety
- Congestion, Delay, and Mode Shift
- Emissions and Vehicle Miles Traveled
- Disadvantaged Community

The assessment categories are further broken down into the following categories of improvements:

- Local Street Improvements: these are the improvement areas 1, 2, and 3, and do not include improvements within Caltrans right-of-way
- State Highway Improvements: these are the improvement areas 4, 5, and 6, and include on- and off-street improvements within Caltrans right-of-way)
- State Highway Intersections: these are the three intersections that were found to operate below acceptable operational delay thresholds today or in future conditions (without a bypass), and the intersections where collision rates exceed statewide averages:
  - State Route 12 @ State Route 26 / Laurel Street
  - State Route 12 @ Valley Oaks Center Driveway
  - State Route 26 @ Hogan Dam Road

Specific improvements were not identified to address these operational issues, deferring instead to the Caltrans *Intersection Control Evaluation (ICE)* process, which requires consideration of roundabouts and signals when improving state highway intersections.

PROJECT IMPROVEMENT COST ESTIMATES

Table D-1 summarizes the costs of recommended improvement projects. Although the study identifies the need to improve the three State Highway intersections mentioned above, the improvement selection is deferred to later study under the Caltrans ICE process. The cost of these improvements, being unknown at this time, are not included in the project total cost. However, Table D-1 shows the assumed cost for a typical signalized intersection or roundabout in the area. The total estimated cost of all recommended projects is $7,800,000. The intersection costs are intentionally conservative, and are used for benefit comparison purposes only.

TABLE D-I: PROJECT COSTS BY IMPROVEMENT AREA

#	Improvement Area	Construction Cost	Soft Costs	Total Project Cost
1	Township West / Elementary School Improvements	$1,072,200	$429,100	$1,501,300
2	Township East Improvements	$835,700	$334,400	$1,170,100
3	Town Center Improvements	$1,041,300	$416,700	$1,458,000
4	Highway 12 (West) Improvements	$262,700	$105,400	$368,100
5	Highway 12 (East) Improvements	$1,417,400	$567,100	$1,984,500
6	Highway 26 Improvements	$938,700	$375,700	$1,314,400
			Rounded Total	**$7,800,000**
X	Signalized Intersection	~$800,000	~$720,000	~$1,520,000
X	Roundabout Intersection	~$2,000,000	~$1,800,000	~$3,800,000

UNIT COSTS

Table D-2 presents the unit costs used to develop the cost estimates shown in Table D-1.

TABLE D-2: UNIT COST ASSUMPTIONS

#	Item Description	Unit[1]	Quantity	Unit Cost	Total Project Cost
1	High Visibility Striping	LF	34,840	$1.50	$52,260
2	Resurface Roadway	SQFT	118,525	$10.00	$1,185,250
3	Road Widening	SQFT	30,750	$18.00	$553,500
4	Class I Path (paved)	SQFT	60,425	$12.00	$725,100
5	Concrete Sidewalk/Path (includes curb and gutter)	SQFT	58,523	$17.00	$994,891
6	High Visibility Markings (white)	SQFT	17,414	$10.00	$174,140
7	High Visibility Markings (green)	SQFT	2,206	$12.00	$26,472
8	Contingency/Miscellaneous Items (50%)	LS	1	$1,855,900.00	$1,855,900

Notes:

[1]Units are reported in linear feet (LF), square feet (SQFT), or lump sum (LS)

MULTIMODAL CONNECTIVITY

Multimodal connectivity was assessed using LTS as a measure of low-stress bicycle and pedestrian connectivity between origins (residential uses) and destinations (points of interest) described in Chapter 3. Figure D-1 shows the improved Bicycle LTS results following implementation of the proposed improvements. Figure D-2 shows the improved Pedestrian LTS results. Since the entire study area is within two miles of Valley Springs Elementary School, all improvements described below would likely qualify for Safe Routes to School categories on grant funding applications, and all improvements improve connections between Valley Springs Elementary School and the community.

LOCAL STREET IMPROVEMENTS (AREAS 1, 2, AND 3)

The recommended improvements improve the multimodal connectivity of the local streets in the study area dramatically, making most of the central residential and civic core comfortable for users of all ages and abilities to walk and bicycle. Most importantly, the improvements provide a safe dedicated walking and bicycling space in the vicinity of Valley Springs Elementary School and the homes, parks, Town Center shops, and other community points of interest. On Laurel Street, the bicycle and pedestrian improvements will provide safe connectivity without compromising ample on-street parking, which was identified as a community priority.

STATE HIGHWAY IMPROVEMENTS (AREAS 4, 5, AND 6)

The bicycle and pedestrian improvements along State Routes 12 and 26 will extend the connectivity benefits of the local streets along and across these busy regional facilities, creating a low-stress multimodal network between the local street improvements and additional points of interest along SR 12 and SR 26 and additional homes, including the Castle Rock Estates mobile home park. This includes connectivity to additional popular restaurants, community services like the post office, access to fresh food and groceries at Mar-Val and Dollar General, various retail stores, and Valley Springs Sports & Fitness.

STATE HIGHWAY INTERSECTIONS

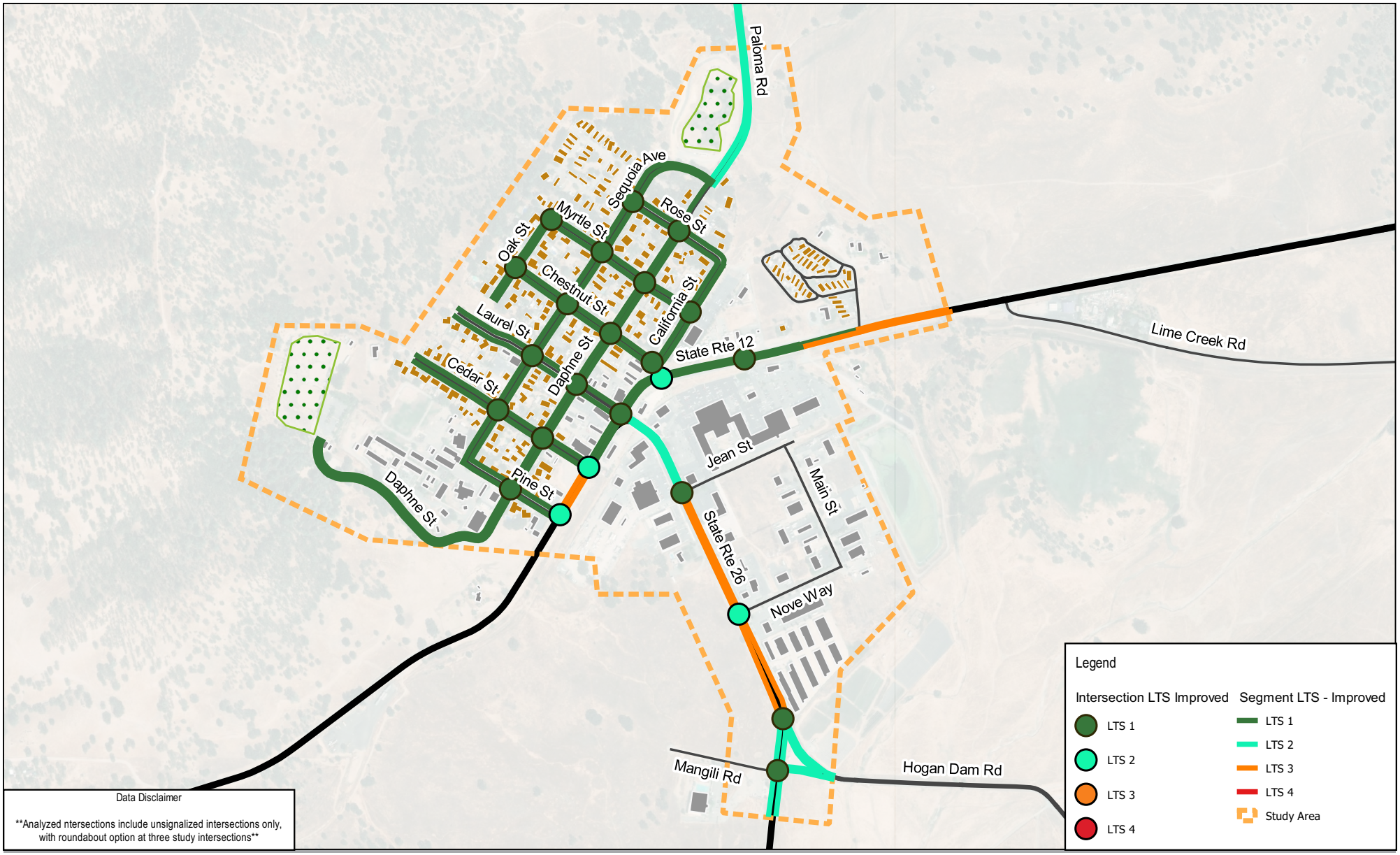
Notwithstanding the network connectivity benefits of improvements in Areas 1 through 6, the intersections on SR 12 and 26 will remain barriers to low-stress connectivity. Three intersections, in particular, as noted in the introduction to Chapter 5, will require signalization or conversion to modern roundabouts in order to maintain acceptable operations in the future. The selection of traffic signal or roundabout is deferred to the Caltrans ICE process. The selection of a roundabout or signal will, however, impact the connectivity and LTS scores of the study area as follows:

SIGNALIZED ALTERNATIVE: LTS

Utilizing the Mineta Transportation Institute Bicycle LTS methodology, signalized intersections are generally not analyzed as signals often provide adequately timed protection for a cyclist to cross a roadway. An exception to this is a long crossing where the signal phase protecting the cyclist is too short for the cyclist to cross before intersecting traffic is released. However, the methodology describes this as an unusual situation. Moreover, it is unlikely that the crossing width of intersections on SR 12 and 26 will result in this type of scenario. Thus, it is assumed signalized intersections would not create a barrier to low-stress network connectivity in Valley Springs. For this reason the BLTS analysis of improved conditions depicted in Figure D-1 includes roundabouts at the three intersections previously recommended for improvement.

ROUNDABOUT ALTERNATIVE: LTS

While roundabouts are not addressed in Mineta's level of traffic stress methodology, it is assumed that roundabouts will provide low-stress connectivity and improve safety. Roundabouts will improve traffic operations and safety conditions compared to existing two-way and all-ways stop configurations by reducing speeds of vehicles traveling on SR 12 and 26, and the number potential conflict points at each intersection. By reducing speeds and angles for potential collisions, roundabouts provide safe and low-stress crossing conditions. The improved conditions for locations where roundabouts are proposed are displayed in Figure D-1.



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Horizontal Datum: WGS 1984

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Calaveras Council of Governments

Valley Springs Town Center Connectivity Plan

Bicycle LTS with Improvements

Project No. **11159238**
Revision No. **-**
Date. **01/14/2020**

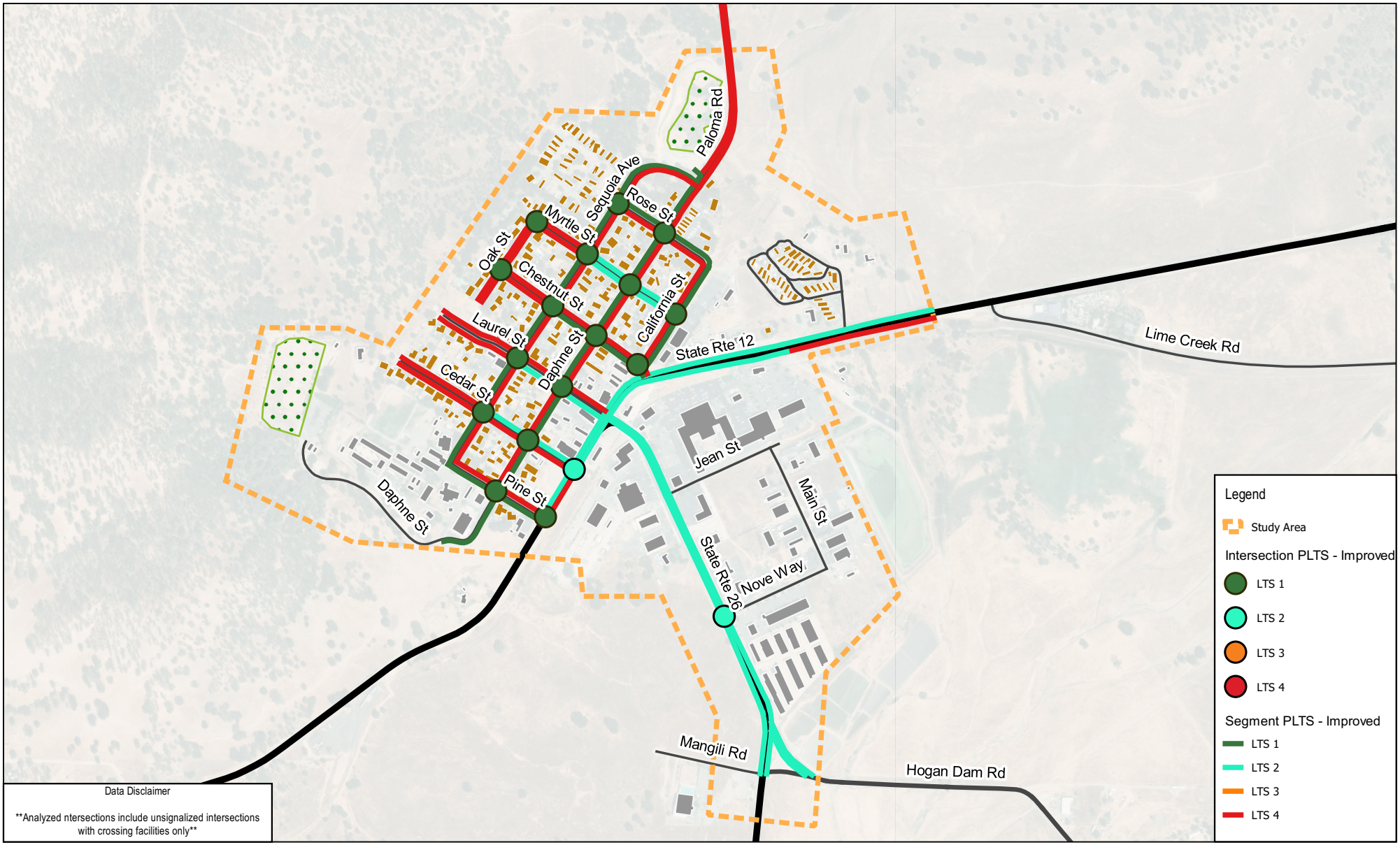
FIGURE D-1

Document Path: K:\PRJ\2522\G2522\Map Workspaces\BikeLTS Improvements.qgs.qgz

Data Source:

Print Date: 01/14/2020

Created by: RS



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Map Projection: Mercator Auxillary Sphere
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GHD

Calaveras Council of Governments

Valley Springs Town Center Connectivity Plan

Pedestrian LTS with Improvements

Project No. **11159238**
Revision No. **-**
Date. **01/15/2020**

FIGURE D-2

Document Path: K:\PRJ\2522\G2522\Map Workspaces\PedLTS Improvements.qgs.qgz

Data Source:

Print Date:

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SAFETY

The primary source of analysis for assessing safety benefit in this study is the Highway Safety Improvement Program (HSIP) project analyzer. Estimated project costs are used with quantified safety benefits to calculate a benefit/cost ratio (B/C); a value greater than 1 indicates a positive return on investment. Higher values may increase project competitiveness for funding.

LOCAL STREET IMPROVEMENTS (AREAS 1, 2, AND 3)

Projects on local streets do not yield a substantial quantifiable safety benefit as these streets do not exhibit a high level of crashes historically. This is in part due to the generally low level of traffic and lower travel speeds of these streets, but also due to the low volume of bicycle and pedestrian travel on streets that mostly lack paved shoulders or sidewalks. The bicycle collisions that occurred on the local street network, however, which did result in injury, could have potentially been prevented with the implementation of the improvements, as they occurred in locations that lack any dedicated space to bike or walk.

Based on field observations and anecdotal data collected during outreach, however, there is a concern about student safety during pick-up and drop-off activity at the Valley Springs Elementary School. With cars parked haphazardly along unpaved shoulders and long queues of cars along Sequoia Avenue, students walk between school, their homes, the town bus stop, shops, restaurants, and cars while weaving between vehicles. While this condition is in itself concerning, discussions with parents indicated that the lack of sidewalk or dedicated space to walk or bike played a contributing factor in their decision to drive their children to school.

AREA-WIDE IMPROVEMENTS

In order to estimate the safety benefits associated with area-wide improvements, a collision modification factor (CMF) analysis was performed using Caltrans' HSIP Analyzer tool. Collision modification factors are multiplicative factors used to calculate the expected reduction in collisions associated with a particular countermeasure. CMFs have been established based on safety research over the last several decades; however, CMFs may not be available for all countermeasure types—despite the safety improvements provided by the improvement. Moreover, the HSIP Analyzer allows a maximum of three selected countermeasures to be included in the analysis, and benefit will be reflected only if there is a significant crash history associated with the countermeasures. Table D-3 displays the results of the safety benefit-cost analysis.

While implementation of sidewalks and Class I Paths will improve the safety and comfort of bicyclists and pedestrians, the calculated safety B/C is modest at 0.5 due the low number of bicycle and pedestrian collisions occurring over the five-year study period. Paving of existing shoulder on Highway 26 and Highway 12, and implementation of bike lanes throughout the study area offer much more robust B/C at 1.2 and 1.6 respectively. These two countermeasures buttress the total benefit-cost ratio for the project area at 1.1.

STATE HIGHWAY IMPROVEMENTS (AREAS 4, 5, AND 6)

The potential safety benefit of installing signals or modern roundabouts at the three identified intersections on Caltrans right-of-way is significant.

Table D-4 and Table D-5 at right present the B/C calculations for either signalization or roundabout installation. The selection of a treatment at these locations is deferred to the Caltrans ICE process.

TABLE D-3: AREA-WIDE SAFETY BENEFIT COST SUMMARY (AREAS 1-6)

Segment	Countermeasure	2019 Benefit	2019 Cost	B/C
Study Area	Sidewalks/Class I Paths	$1,444,480	$3,153,008	0.5
Study Area	Bike Lanes	$631,960	$521,459	1.2
Study Area	Pave existing shoulder	$6,027,901	$3,824,033	1.6
	Total Expected Benefit	**$8,104,341**	**$7,498,500**	**1.1**

Note: Safety benefit analyzed using Caltrans HSIP analyzer, and includes set-asides for pedestrian improvements

TABLE D-4: SAFETY BENEFIT COST SUMMARY - SIGNALIZATION

Location	2019 Benefit	2019 Cost	B/C
SR 26/12 & Valley Oaks Center Driveway	$1,363,300	$1,520,000	0.90
SR 12/SR 26	$3,536,100	$1,520,000	2.33
SR 26/Hogan Dam Road	$17,080,500	$1,520,000	11.24
Total Expected Benefit	**$21,979,900**	**$4,560,000**	**4.82**

Note: Safety benefit analyzed using Caltrans HSIP analyzer

TABLE D-5: SAFETY BENEFIT COST STUDIES – ROUNDABOUTS

Location	2019 Benefit	2019 Cost	B/C
SR 26/12 & Valley Oaks Center Driveway	$55,367,909	$3,800,000	14.57
SR 12/ SR 26	$47,265,288	$3,800,000	12.44
SR 26/ Hogan Dam Road	$97,231,450	$3,800,000	25.59
Total Expected Benefit	**$199,864,647**	**$11,400,000**	**17.53**

Note: Safety benefit analyzed using Caltrans HSIP analyzer

CONGESTION, DELAY, AND MODE SHIFT

The primary source of analysis for assessing congestion benefit in this study is the anticipated reduction in auto trips from mode shift (induced demand) and the operational benefits associated with intersection improvements, as quantified in delay and LOS. The NCHRP 552 methodology assesses the induced demand mode-shift associated with proposed bicycle improvements, and monetizes the annualized mobility, health, recreation and decreased auto use benefits provided by the projected mode shift at high, moderate and low estimates.

LOCAL STREET IMPROVEMENTS (AREAS 1, 2, AND 3)

The improvements on the local street system are not anticipated to generate significant reductions in automotive delay or congestion. Very little congestion occurs on local streets today, outside of school drop-off and pick-up areas, and relatively little growth is anticipated within the Valley Springs study area at General Plan buildout.

However, based on clearer signage and improvement to the school drop-off area, it could be anticipated that some marginal reduction in automobile queuing would be expected with implementation of the proposed improvements. A mode shift analysis was also performed on the study area, based on the induced demand procedures documented in NCHRP 552, which estimated a nominal increase in bicycle use. The results of this analysis are displayed in Table D-6.

This methodology is intentionally conservative, as it is difficult to assess the amount of bicycle use that can be expected in any given community following construction of a trail, bike lane, or other high-quality, low-stress bikeway. Furthermore, the NCHRP 552 methodology does not account for the potential for induced pedestrian demand, which may provide additional benefit beyond what is reflected in the mode shift analysis. Based on the estimated increase in commuters, the result would be 235 fewer trips on the local streets following implementation of the project, and thus possibly a marginal reduction in congestion.

TABLE D-6: ANTICIPATED BICYCLE MODE SHIFT BENEFITS (AREAS 1-3)

Bicycle Facility Benefits	
Annual Mobility Benefit	
Off-Street Trail	$4,358
Bicycle Lane without Parking	$3,854
Bicycle Lane with Parking	$3,385
Annual Health Benefit	
High Estimate	$1,280
Moderate Estimate	$1,152
Low Estimate	$896
Annual Recreation Benefit	
High Estimate	$36,500
Moderate Estimate	$32,850
Low Estimate	$25,550
Annual Decreased Auto Use Benefit	$56
Total Annual Benefit, High	**$49,433**
Total Annual Benefit, Moderate	**$45,655**
Total Annual Benefit, Low	**$38,099**

AREA-WIDE MODE SHIFT BENEFITS

Table D-7 displays the bicycle mode shift benefits associated with the entire study area. There is a nominal difference in the benefits provided by the area-wide analysis compared to that conducted for Areas 1, 2 & 3, due to the small difference in population captured to estimate the increase in bicycle use. This small difference in population resulted in the same estimated increase in new bicycle commuters used to estimate the decrease in auto use associated with the proposed improvements. Thus, the estimate reduction in vehicle trips for the project area as a whole is also 235.

TABLE D-7: ANTICIPATED BICYCLE MODE SHIFT BENEFITS (AREA-WIDE)

Bicycle Facility Benefits	
Annual Mobility Benefit	
Off-Street Trail	$6,537
Bicycle Lane without Parking	$5,780
Bicycle Lane with Parking	$5,078
Annual Health Benefit	
High Estimate	$2,176
Moderate Estimate	$2,048
Low Estimate	$1,792
Annual Recreation Benefit	
High Estimate	$58,400
Moderate Estimate	$54,750
Low Estimate	$47,450
Annual Decreased Auto Use Benefit	$56
Total Annual Benefit, High	**$78,248**
Total Annual Benefit, Moderate	**$74,470**
Total Annual Benefit, Low	**$66,914**

STATE HIGHWAY IMPROVEMENTS (AREAS 4, 5, AND 6)

The improvements on SR 12 and SR 26, excluding any intersection control changes, are also unlikely to result in significant reductions in delay or congestion, as they do not involve changes to intersection control type or major expansion of geometry. However, an inbound left turn pocket from SR 12 into Castle Rock Estates, east of the Valley Oaks Shopping Center, is proposed. This project was primarily a safety project, as this intersection has experienced a high level of crashes historically, including severe injury and other injury collisions.

The study segments of SR 12 and SR 26 are anticipated to increase in congestion by buildout of the County General Plan, owing not to local Valley Springs land development, but rather to increases in regional "through" traffic. This increase in traffic will continue to exacerbate existing LOS issues, and will potentially trigger new deficiencies, such as those identified in this study.

STATE HIGHWAY INTERSECTIONS

The potential operational benefit of signalization or installation of modern roundabouts at the three identified intersections on Caltrans right-of-way are significant. These three intersections are anticipated to fail at General Plan buildout (without implementation of a Valley Springs bypass). Table D-8 presents a comparison of the delay and LOS results of signalization and roundabout installation. The selection of a treatment at these locations is deferred to the Caltrans ICE process.

Delay benefits can also be monetized using the 2016 Caltrans economic parameters. The delay cost of the signal and roundabout alternatives, compared to the "no build" scenario, is presented in Table D-9 for the three intersections.

TABLE D-8: INTERSECTION IMPROVEMENT OPERATIONS COMPARISON

#	Intersection	Target LOS	Signal Alternative				Roundabout Alternative			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 12 & Valley Oaks Center Driveway	D	15.4	B	16.5	B	8.9	A	17.2	B
3	SR 12 & SR 26/Laurel St	D	48.8	D	55.0	D	10.1	B	15.5	B
11	SR 26 & Mangili Rd/Hogan Dam Rd	D	35.9	D	16.5	B	13.9	B	9.2	A

Notes:

LOS = Delay based on average of all approaches for signalized intersections, worst minor street approach for roundabout intersections

For intersection 1, AM peak hour counts were collected between 11:00 AM and 1:30 PM

TABLE D-9: INTERSECTION IMPROVEMENT DELAY MONETIZATION

Intersection	No Build Alternative	Traffic Signal Alternative	Roundabout Alternative
SR 12 / Valley Springs Center Driveway	$18,400,000	$780,000	$390,000
SR 26 / Hogan Dam Road	$3,810,000	$860,000	$450,000
SR 12 / SR 26 / Laurel St	$7,380,000	$2,020,000	$500,000

EMISSIONS AND VEHICLE MILES TRAVELED

The primary source of analysis for assessing congestion benefit in this study is the anticipated reduction in auto trips from mode shift (induced demand) and the operational benefits associated with intersection improvements, as measured in emissions by pollutant and fuel consumption.

VEHICLES MILES TRAVELED

No significant changes in vehicle miles traveled (VMT) are anticipated as a results of this project, notwithstanding the potential mode shift from automobile to non-motorized means documented in prior sections. The projects included as part of our recommendations would have no impact on trip length or total trips, other than to incentivize a reduction in auto travel within Valley Springs. As such, the greater the improvement area, the more benefit would be generated.

FUEL AND EMISSIONS

Because the improvements proposed in Areas 1 through 6 do not include any operational projects that would increase or decrease roadway or intersection capacity, just as with the delay analysis, only potential intersection improvements have been included for emissions assessment. Marginal emissions reductions would be expected by shifts in travel mode to non-motorized uses.

Fuel and emissions estimates are an output of the SIDRA software utilized to analyze the operations of the potential roundabout or signalization improvements on SR 12 and SR 26. These emissions estimates are not the same as a standard air quality assessment, and are provided solely for comparison purposes. Fuel and emissions benefits can also be monetized using the 2016 Caltrans economic parameters. The fuel and emission costs of the signal and roundabout alternatives, along with the "no build" scenario, are presented in Table D-10 below for the three intersections.

TABLE D-10: INTERSECTION IMPROVEMENT FUEL & EMISSIONS MONETIZATION

Intersection	No Build Alternative	Traffic Signal Alternative	Roundabout Alternative
SR 12 / Valley Springs Center Driveway	$2,016,000	$1,591,000	$1,627,000
SR 26 / Hogan Dam Road	$1,303,000	$1,627,000	$1,647,000
SR 12 / SR 26	$4,421,000	$2,399,000	$2,191,000

DISADVANTAGED COMMUNITY

For competitive grant funding programs that include an equity component, disadvantaged communities are typically identified using three metrics based on publicly available data: air pollution burdens, median household income, and free or reduced-price meal eligibility at schools. Each of these three data sources is discussed and summarized for the project area below, using thresholds for disadvantaged communities from the most recent cycle of Active Transportation Program (ATP) grant application guidelines in 2018. While these thresholds may change in future years or in other grant programs, they serve as a helpful point of reference in determining whether any part of the project area may qualify as a disadvantaged community for funding purposes.

For communities that do not qualify as disadvantaged under any of these three criteria, many grant funding programs offer a more open-ended option for communities to make a case using another data source to demonstrate that their project will benefit disadvantaged residents. Potentially applicable data sources for Valley Springs are discussed in this section.

AIR POLLUTION

Many programs evaluate pollution burdens using CalEnviroScreen, which identifies census tracts that are disproportionately burdened by or vulnerable to pollution. To qualify as a disadvantaged community under ATP guidelines, a census tract must be in the most disadvantaged 25% of tracts statewide. This is equivalent to a score higher than 39.34. Severely disadvantaged communities are those in the most disadvantaged 10% of tracts, or a score higher than 51.19.

Valley Springs is located in census tract 6009000210, which is in the top 44% of most pollution-burdened tracts with a score of 22.90. This does not meet the most recent ATP threshold for disadvantaged communities.

MEDIAN HOUSEHOLD INCOME

Under the most recent ATP guidelines, a disadvantaged community is defined as one where median household income is less than 80% of the statewide average. A severely disadvantaged community is defined as one where median income is less than 65% of statewide average. As of the 2017 American Community Survey (ACS) 5-Year Estimate, the California median household income is $67,169. To qualify as a disadvantaged or severely disadvantaged community, the median household income thresholds are therefore $53,735 and $43,660, respectively. Based on its 2017 median household income of $62,417, Valley Springs does not appear to meet traditional disadvantaged community measures, but additional study is needed.

Valley Springs is a Census Designated Place (CDP), yet the boundary of the CDP includes a variety of demographic profiles, from relatively affluent suburban homes to more economically challenged neighborhoods. Similarly, the smallest unit of census analysis for which economic data is available, the Block Group, includes suburban communities south of the study area, not representative of the immediate study area demographics. The decennial census (2010) includes median household income by Block Group, yet the ACS only includes income level down to the Census Tract level. Thus, neither the representative CDP, Block Groups, nor Tract household income data are appropriate representations of the study area median household income. If household or per capita income data can be obtained for a smaller geographic area that more closely matches the boundary of the study area, this may be accepted as an “Other” source of data (see below).

FREE OR REDUCED PRICE MEAL ELIGIBILITY

The percentage of students eligible for free or reduced-price meals (FRPM) at schools is another commonly used metric to establish disadvantaged community status. In the most recent ATP cycle, 75% of a school’s students must be FRPM eligible to qualify as a disadvantaged community. To qualify as a severely disadvantaged community, more than 90% of students must be eligible. The project must also demonstrate that the improvements will provide a direct benefit to students.

At Valley Springs Elementary School, 60.1% of students qualify for reduced or free lunches. This makes them unlikely to qualify as a disadvantaged community based on this metric. Valley Springs Elementary School is a Title 1 school, however, indicating at least 40% of students are considered low-income.

OTHER AVAILABLE DATA SOURCES

Many competitive grant funding programs, including ATP, allow applicants to submit an alternative data source if they feel the standard qualifying criteria do not accurately reflect the disadvantaged status of the project area. The study area is only a small portion of the Census Tract it is located within, and is a smaller area than the CDP of Valley Springs as well.

Data sources and criteria listed in this section may use sources other than Census or American Community Survey data, may be available at a smaller geography than Census Tract or CDP, or may use a different population such as students or utility customers. These statistics should be investigated further, as they may contribute to a more accurate depiction of the disadvantaged status of the Valley Springs Town Center.

HOUSEHOLD POVERTY

The ACS indicates 15% of families in the Valley Springs CDP are under the poverty line, and 23% of families with children under 18 are under the poverty line. This compares to 11.1% and 16.7% respectively for California, and 8.6% and 16.3% respectively for Calaveras County.

TITLE I SCHOOL

Valley Springs Elementary School is a Title I school, qualifying for federal financial assistance based on the percent of children from low-income families enrolled at the school. More than 40 percent of children at Valley Springs Elementary come from low-income families, making the school eligible to use Title I funds for school-wide programs such as free breakfast.

The complex formula used to identify Title I schools is based primarily on census poverty estimates and the cost of education in each state. In the Valley Springs CDP, 18% of the population was below the poverty level in 2017. This suggests a concentration of low-income families within the school community compared to the larger Valley Springs community, but additional information about enrolled student addresses would be required to determine whether concentrated poverty levels exist within the geography of the study area.

LONGITUDINAL EMPLOYER-HOUSEHOLD DYNAMICS

Longitudinal Employer-Household Dynamics (LEHD) data, a US Census product, includes job information at a much smaller geographic resolution, appropriate to analyze the study area. While this data does not represent median household income, it does present the percentage of resident workers' job earnings, as well as the percentage of jobs within an area by wage. Home jobs data indicates the monthly earnings of area residents. Work jobs data indicates the monthly earnings of workers at jobs in the area. Table D-11 presents a summary of the LEHD data compared to median household income data from the ACS.

The LEHD monthly jobs earnings data should be taken cautiously, as it includes part-time work and may not be indicative of annualized income. Nonetheless, it is clear that Valley Springs residents earn about the same, if not slightly more than Calaveras County averages. However, the jobs available in the study area yield far lower wages than those in the County or State at large.

TABLE D-II: STUDY AREA INCOME & EARNINGS COMPARISON

Wage Data	California	Calaveras County	Valley Springs (CDP)	Town Center (Study Area)
Median Household Income (2017 5-Year ACS)	$67,169	$54,800	$62,417	N/A
Per Capita Earnings (2017 5-Year ACS)	$32,738	$31,652	$28,412	N/A
People / Household	2.05	1.73	2.20	N/A
Monthly Earnings at Primary Jobs - Home				
Up to $1,250	21.4 %	25.6 %	21.4 %	22.7 %
$1,251 to $3,333	31.7 %	32.8 %	28.2 %	29.3 %
$3,334 or more	46.9 %	41.6 %	50.4 %	48.0 %
Monthly Earnings at Primary Jobs - Work				
$1,250 or less	21.4 %	29.3 %	39.4 %	43.0 %
$1,251 to $3,333	31.7 %	36.0 %	43.2 %	44.7 %
$3,334 or more	46.9 %	34.7 %	17.4 %	12.3 %

DISCOUNTED UTILITY BILLS

Pacific Gas & Electric (PG&E) offers two programs that provide discounted rates on utility bills for low-income households. The California Alternate Rates for Energy (CARE) Program offers discounts on both gas and electricity, and the Family Electric Rate Assistance (FERA) Program offers discounts on electricity for households with three or more people. Eligibility for both programs is based primarily on household income and the number of people in the household, as shown in Table D-12.

TABLE D-12: HOUSEHOLD INCOME TO QUALIFY FOR DISCOUNTED UTILITIES

People in Household	CARE	FERA
1 or 2	$33,280 or less	Not eligible
3	$42,660 or less	$42,661-$53,325
4	$51,500 or less	$51,501-$64,375
5	$60,340 or less	$60,341-$75,425
6	$69,180 or less	$69,181-$86,475
7	$78,020 or less	$78,021-$97,525
8	$86,860 or less	$86,861-$108,575
9	$95,700 or less	$95,701-$119,625
10	$104,540 or less	$104,541-$130,675
Each additional person, add	$8,840	$8,840-$11,050

Households may also qualify for the CARE program if anyone in the household participates in certain public assistance programs, including:

- Low Income Home Energy Assistance Program (LIHEAP)
- Women, Infants, and Children (WIC)
- CalFresh/SNAP (Food Stamps)
- CalWORKs (TANF) or Tribal TANF
- Head Start Income Eligible (Tribal only)
- Supplemental Security Income (SSI)
- Medi-Cal for Families (Healthy Families A & B)
- National School Lunch Program (NSLP)
- Bureau of Indian Affairs General Assistance
- Medicaid/Medi-Cal (under age 65)
- Medicaid/Medi-Cal (age 65 and over)

Additional data on utility customer addresses and program eligibility would be required to determine whether participation in either of these discounted utility programs suggests a disadvantaged community within the Valley Springs Town Center study area.

CALIFORNIA HEALTHY PLACES INDEX

Cycle 5 of the ATP funding program suggests the California Healthy Places Index as an alternative source to qualify as a disadvantaged community. While this tool incorporates additional data beyond Census and American Community Survey metrics, the geographies for reporting scores are census tracts, which do not provide a focused analysis of conditions in the smaller study area.

For ATP applications, a threshold will be determined in early 2020 that will determine qualifying scores to be considered a disadvantaged community in that program. At the time of writing, that score threshold has not been identified.

Across all indicators included in the California Healthy Places Index, the census tract that includes the Valley Springs Town Center has an overall score of 45. This means the census tract has healthier conditions than 45% of California census tracts.

Indicators where the Valley Springs census tract received a score below 50 are listed in Table D-13. The score represents the percent of California census tracts that Valley Springs has healthier conditions than; for example, a score of 25 means Valley Springs has healthier conditions than 25% of California census tracts as measured by that indicator. A lower score therefore indicates a more disadvantaged community.

TABLE D-13: CALIFORNIA HEALTHY PLACES INDEX INDICATORS

Indicator	Score	Metric
Employment	23.9	64.1% of people aged 25-64 are employed
Bachelor's Education or Higher	22.8	12.5% of people over age 25 have a bachelor's degree or higher
Preschool Enrollment	11.3	19.1% of 3 and 4 year olds are enrolled in school
High School Enrollment	18.2	95.9% of 15-17 year olds are enrolled in school
Active Commuting	2.5	0.25% of workers 16 years old and older commute to work by transit, walking, or bicycling
Supermarket Access	40.7	36.08% of people in rural areas reside less than 10 miles from a supermarket or large grocery store
Retail Density	4	0.01 retail, entertainment, and education jobs exist per acre of unprotected land
Park Access	6.5	5.08% of people live within one half-mile of a park, beach, or open space greater than 1 acre
Housing Habitability	36.4	98.82% of households have basic kitchen facilities and plumbing
Safe Drinking Water – Contaminants	48.1	486.98 is the index score in this tract for 13 contaminants and 2 types of water quality violations
Clean Air – Ozone	28.3	0.5 ppm is the average daily maximum 8-hour ozone concentration during summer months (May-October) over three years (2012-2014)