Iron Ridge Residential Development

Traffic Impact Study
June 27, 2022

Prepared by:
VRPA Technologies, Inc.
4630 W. Jennifer, Suite 105
Fresno, CA 93722

Iron Ridge
Traffic Impact Study

Study Team

- ✓ Georgiena Vivian, President, VRPA Technologies, Inc., gvivian@vrpatechnologies.com, (559) 259-9257
- ✓ Erik Ruehr, Dir. of Traffic Engineering, VRPA Technologies, Inc., eruehr@vrpatechnologies.com, (858) 566-1766
- ✓ Jeff Stine, Senior Transportation Planner, VRPA Technologies, Inc. jstine@vrpatechnologies.com,
- ✓ (858) 566-1766
- ✓ Nisha Pathak, Transportation Engineer, VRPA Technologies, Inc., npath@vrpatechnologies.com, (559) 271-1200

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Executive Summary

This Traffic Impact Study (TIS) has been prepared for the purpose of analyzing traffic conditions related to the Iron Ridge Development (Project). The Project site is generally located along Shirk Street (Road 92) between Hurley Avenue and Goshen Avenue, two-thirds of a mile north of State Route (SR) 198. Regional access to the site is provided by SR 198. The Project seeks to develop approximately 238 single family dwelling units on roughly 50 acres of land.

Vehicular access to the site would be provided by Shirk Street, Allen Avenue (new road), and Road 88. The new roadway would be constructed to City standards and would be dedicated as public right of way. Project access at Road 88 would also be consistent with City standards and would meet adequate spacing requirements with respect to the existing driveway to the north.

STUDY AREA

The study intersections included in this TIS are listed below. The study intersections were developed in consultation with City of Visalia staff and are located within 1-mile of the Project site based on analysis requirements found in the City of Visalia "Procedures For Traffic Impact Analysis (TIA)", dated March 2021.

Intersections

- ✓ Shirk Street / SR 198 EB Ramps
- ✓ Shirk Street / SR 198 WB Ramps
- ✓ Shirk Street / Hillsdale Avenue
- ✓ Shirk Street / School Avenue
- ✓ Shirk Street / Hurley Avenue
- ✓ Shirk Street / Allen Avenue (New Road)
- ✓ Shirk Street / Goshen Avenue
- ✓ Road 88 / Project Access
- ✓ Road 88 / Goshen Avenue

Study Scenarios

The TIS completed for the Project includes level of service (LOS) analysis for the following traffic scenarios.

- ✓ Existing Conditions
- ✓ Opening Year Without Project
- ✓ Opening Year Plus Project
- ✓ 5-Year Horizon Without Project
- ✓ 5-Year Horizon Plus Project
- ✓ 10-Year Horizon Without Project (Shirk Street and SR 198 intersections Only)
- ✓ 10-Year Horizon Plus Project (Shirk Street and SR 198 intersections Only)

- ✓ 20-Year Horizon Without Project (Shirk Street and SR 198 intersections Only)
- ✓ 20-Year Horizon Plus Project (Shirk Street and SR 198 intersections Only)

IMPACTS

Intersections

Table E-1 shows intersections that are expected to fall short of desirable operating conditions for various scenarios. Potential mitigation measures are discussed below. Results of the analysis show that the Project will contribute to an unacceptable LOS at four (4) of the study intersections when comparing the 5-Year Horizon scenarios.

Table E-1
Intersection Operations

INTERSECTION	CONTROL	TARGET LOS	PEAK HOUR	OPENING YEAR WITHOUT PROJECT		OPENING YEAR PLUS PROJECT		5-YEAR HORIZON WITHOUT PROJECT		5-YEAR HORIZON PLUS PROJECT		10-YEAR HORIZON WITHOUT PROJECT		10-YEAR HORIZON PLUS PROJECT		20-YEAR HORIZON WITHOUT PROJECT		20-YEAR HORIZON PLUS PROJECT	
				DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
1. Shirk Street / SR 198 EB Ramps	All-Way Stop Sign	-- [1]	AM	20.1	C	24.1	C	25.6	D	32.8	D	**42.6**	**E**	**52.5**	**F**	**98.6**	**F**	**116.0**	**F**
			PM	26.2	D	34.8	D	27.7	D	**49.1**	**E**	**57.7**	**F**	**62.7**	**F**	**130.3**	**F**	**148.3**	**F**
2. Shirk Street / SR 198 WB Ramps	All-Way Stop Sign	-- [1]	AM	**64.7**	**F**	**95.1**	**F**	**96.3**	**F**	**127.0**	**F**	**138.4**	**F**	**169.9**	**F**	**239.8**	**F**	**275.0**	**F**
			PM	**83.0**	**F**	**117.4**	**F**	**115.4**	**F**	**156.7**	**F**	**173.6**	**F**	**218.4**	**F**	**309.5**	**F**	**354.3**	**F**
3. Shirk Street / Hillsdale Avenue	One-Way Stop Sign	D	AM	**92.4**	**F +**	**140.4**	**F +**	**157.9**	**F +**	**242.4**	**F +**								
			PM	**54.6**	**F +**	**79.0**	**F +**	**77.6**	**F +**	**121.9**	**F +**								
4. Shirk Street / School Avenue	One-Way Stop Sign	D	AM	**43.1**	**E +**	**54.3**	**F +**	**56.4**	**F +**	**74.5**	**F +**								
			PM	34.8	D	**44.6**	**E +**	**42.9**	**E +**	**56.4**	**F +**								
5. Shirk Street / Hurley Avenue	Signalized	D	AM	18.7	B	19.7	B	21.3	C	22.4	C								
			PM	10.0	B	11.3	B	10.7	B	12.1	B								
6. Shirk Street / Allen Avenue	One-Way Stop Sign	D	AM			16.6	C			18.1	C								
			PM			16.5	C			18.0	C								
7. Shirk Street / Goshen Avenue	Signalized	D	AM	40.0	D	41.1	D	44.3	D	46.6	D								
			PM	34.4	C	41.9	D	38.0	D	49.0	D								
8. Road 88 / Project Access	One-Way Stop Sign	D	AM			8.5	A			8.5	A								
			PM			8.5	A			8.5	A								
9. Road 88 / Goshen Avenue	One-Way Stop Sign	D	AM	17.8	C	17.8	C	19.1	C	19.3	C								
			PM	17.9	C	17.9	C	19.6	C	20.1	C								

DELAY is measured in seconds

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

For signalized and all-way stop intersections, delay results show the average for the entire intersection. For one-way and two-way stop controlled intersections, delay results show the delay for the worst movement.

1 - With the changes brought about by SB 743, Caltrans no longer uses level of service to determine the need for transportation improvements. Instead, the focus is on providing adequate facilities for pedestrians, bicycles, and transit as well as safety considerations for all transportation modes. Guidance is provided in the Transportation Impact Study Guide dated May 20, 2020 and the Interim Land Development and Intergovernmental Review Safety Review Practitioners Guidance dated July 2020. This guidance was used in determining the need for roadway improvements on Caltrans facilities.

+ Does not meet peak hour signal warrants. Provided for informational purposes only.

MITIGATION

This section describes potential improvements to mitigate the traffic impacts of the Project. The potentially significant impacts resulting from the Project relate to the generation of unacceptable LOS at various intersections in the long term. Considering the criteria provided in Section 1.3 and the results presented above, the following improvements could be considered to alleviate project-specific impacts.

Roadway Improvements

Intersections

✓ Shirk Street at SR 198 EB Ramps
Improvements to achieve acceptable levels of service:

- 5-Year With Project and 10-Year With and Without Project Horizon scenarios:
  - Install Traffic Signal

- 20-Year With and Without Project Horizon scenarios:
  - Install Traffic Signal
  - Widen the eastbound approach to 1 left turn lane, 1 left-through lane, and 1 right turn lane (adding 1 left turn lane)

✓ Shirk Street at SR 198 WB Ramps
Improvements to achieve acceptable levels of service:

- Opening Year With and Without Project, 5-Year With and Without Project, and 10-Year Without Project Horizon scenarios:
  - Install Traffic Signal

- 10-Year With Project and 20-Year With and Without Project Horizon scenarios:
  - Install Traffic Signal
  - Widen the westbound approach to 1 left-through lane and 2 right turn lanes (adding 1 right turn lane)

✓ Shirk Street at Hillsdale Avenue
No improvements are recommended.

The intersection is forecasted to operate at unacceptable levels of service under the Existing (AM only), Opening Year, and 5-Year Horizon scenarios. However, this intersection does not meet the peak hour traffic signal warrant because the minor approach does not carry enough traffic to justify signalization. As noted in Section 1.2.1, the City of Visalia uses the California MUTCD Eight (8) Peak Hour Signal Warrant (Warrant 1) when evaluating the need for signalization at an intersection.

It should be noted that the City of Visalia proposes to widen Shirk Street from two to four lanes between a point approximately 750 feet north of the intersection of Shirk Road and State Route 198 and the North Mill Creek culvert, north of School Avenue. The Project is intended to improve traffic flow and safety and to accommodate existing development and future growth in the area.

✓ Shirk Street at School Avenue
No improvements are recommended.

The intersection is forecasted to operate at unacceptable levels of service under the Existing (AM only), Opening Year, and 5-Year Horizon scenarios. However, this intersection does not meet the peak hour traffic signal warrant because the minor approach does not carry enough traffic to justify signalization. It should be noted that installation of a traffic signal would alleviate level of service deficiencies at the intersection.

Post-Mitigation Level of Service

The level of service resulting from the potential improvements identified above is shown in Table E-2 for study area intersections.

Table E-2
Intersection Operations with Mitigation

INTERSECTION	TARGET LOS	PEAK HOUR	OPENING YEAR WITHOUT PROJECT		OPENING YEAR PLUS PROJECT		5-YEAR HORIZON WITHOUT PROJECT		5-YEAR HORIZON PLUS PROJECT		10-YEAR HORIZON WITHOUT PROJECT		10-YEAR HORIZON PLUS PROJECT		20-YEAR HORIZON WITHOUT PROJECT		20-YEAR HORIZON PLUS PROJECT	
			DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
1. Shirk Street / SR 198 EB Ramps	-- [1]	AM							18.9	B	18.7	B	21.0	C	22.1	C	26.5	C
		PM							20.5	C	23.7	C	29.2	C	32.2	C	37.6	D
2. Shirk Street / SR 198 WB Ramps	-- [1]	AM	23.1	C	26.5	C	27.9	C	36.5	D	39.2	D	23.0	C	47.8	D	50.1	D
		PM	12.9	B	15.6	B	14.5	B	18.5	B	22.0	C	17.0	B	26.5	C	37.5	D

DELAY is measured in seconds
LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded
For signalized and all-way stop intersections, delay results show the average for the entire intersection. For one-way and two-way stop controlled intersections, delay results show the delay for the worst movement.

1 - With the changes brought about by SB 743, Caltrans no longer uses level of service to determine the need for transportation improvements. Instead, the focus is on providing adequate facilities for pedestrians, bicycles, and transit as well as safety considerations for all transportation modes. Guidance is provided in the Transportation Impact Study Guide dated May 20, 2020 and the Interim Land Development and Intergovernmental Review Safety Review Practitioners Guidance dated July 2020. This guidance was used in determining the need for roadway improvements on Caltrans facilities.

Project Percentage of Future Traffic

This section of the report provides analysis of the percentage of future traffic generated by the project at key study area locations. This information can be used in evaluating the need for improvements to be provided by the Project. The formulas used to calculate the Project percentage of future traffic to City of Visalia/Caltrans facilities is as follows:

Project Percentage of Future Traffic = (Project Trips)/(20-Year Horizon Plus Project Traffic – Existing Traffic)

Table E-3 shows the Project percentage of future traffic to City of Visalia/Caltrans facilities as described above.

Table E-3
20-Year Horizon Project Percentage of Future Traffic

INTERSECTION	PEAK HOUR	EXISTING	PROJECT TRIPS	20-YEAR HORIZON PLUS PROJECT	PROJECT PERCENTAGE
Shirk Street / SR 198 EB Ramps	AM	1,136	77	2,037	8.5%
	PM	1,275	79	2,230	8.3%
Shirk Street / SR 198 WB Ramps	AM	1,519	122	2,773	9.7%
	PM	1,446	164	2,677	13.3%
Shirk Street / Hillsdale Avenue [1]	AM	1,362	122	1,871	24.0%
	PM	1,349	164	1,872	31.4%
Shirk Street / School Avenue [1]	AM	1,304	122	1,765	26.5%
	PM	1,277	164	1,738	35.6%

1 - Provided for inormational purposes only and based on 5-Year Horizon

Implementation

Based on the results of the capacity analysis and mitigation analysis, improvements are recommended at the Shir Avenue intersections with the SR 198 Eastbound ramps and Shirk Avenue/SR 198 Westbound Ramps. Traffic signals as well as the additional lanes are expected to be needed. Implementation of this level of improvements is beyond the scale of the proposed Project and is recommended to be done by others.

It is recommended that the Project contribute to the City of Visalia's traffic impact fee program. Contribution of fees to this program will directly or indirectly contribute to the improvements described above as will as general roadway improvements in the City of Visalia.

1.0 Introduction

1.1 Description of the Region/Project

This Traffic Impact Study (TIS) has been prepared for the purpose of analyzing traffic conditions related to the Iron Ridge Development (Project). The Project site is generally located along Shirk Street (Road 92) between Hurley Avenue and Goshen Avenue, two-thirds of a mile north of State Route (SR) 198. Regional access to the site is provided by SR 198. The Project seeks to develop approximately 241 single family dwelling units on roughly 50 acres of land. Figure 1-1 shows the site's regional context while Figure 1-2 shows the Project location within the City of Visalia. Figure 1-3 shows the conceptual layout of the Project.

1.1.1 *Project Access*

Vehicular access to the site would be provided by Shirk Street, Allen Avenue (new road), and Road 88. The new roadway would be constructed to City standards and would be dedicated as public right of way. Regional access to the site is provided via SR 198.

1.1.2 *Study Area*

The study intersections included in this TIS are listed below and shown in Figure 1-2. The study intersections were developed in consultation with City of Visalia staff and are located within 1-mile of the Project site based on analysis requirements found in the City of Visalia "Procedures For Traffic Impact Analysis (TIA)", dated March 2021.

Intersections

- ✓ Shirk Street / SR 198 EB Ramps
- ✓ Shirk Street / SR 198 WB Ramps
- ✓ Shirk Street / Hillsdale Avenue
- ✓ Shirk Street / School Avenue
- ✓ Shirk Street / Hurley Avenue
- ✓ Shirk Street / Allen Avenue (New Road)
- ✓ Shirk Street / Goshen Avenue
- ✓ Road 88 / Project Access
- ✓ Road 88 / Goshen Avenue

1.1.3 *Study Scenarios*

The TIS completed for the Project includes level of service (LOS) analysis for the following traffic scenarios.

- ✓ Existing Conditions
- ✓ Opening Year Without Project
- ✓ Opening Year Plus Project

- ✓ 5-Year Horizon Without Project
- ✓ 5-Year Horizon Plus Project
- ✓ 10-Year Horizon Without Project (Shirk Street and SR 198 intersections Only)
- ✓ 10-Year Horizon Plus Project (Shirk Street and SR 198 intersections Only)
- ✓ 20-Year Horizon Without Project (Shirk Street and SR 198 intersections Only)
- ✓ 20-Year Horizon Plus Project (Shirk Street and SR 198 intersections Only)

1.2 Methodology

When preparing a TIS, guidelines set by affected agencies are followed. In analyzing street and intersection capacities the Level of Service (LOS) methodologies are applied. LOS standards are applied by transportation agencies to quantitatively assess a street and highway system's performance. In addition, safety concerns are analyzed to determine the need for appropriate mitigation resulting from increased traffic near sensitive uses, the need for dedicated ingress and egress access lanes to the project, and other evaluations such as the need for signalized intersections or other improvements. Guidelines incorporated in the Highway Capacity Manual (HCM), 6th Edition, published in 2016 were also used in the development of this TIS.

1.2.1 *Intersection Analysis*

Intersection LOS analysis was conducted using the Synchro software program. Synchro supports HCM methodologies and is deemed an acceptable program by City of Visalia staff for assessment of traffic impacts. Levels of Service can be determined for both signalized and unsignalized intersections.

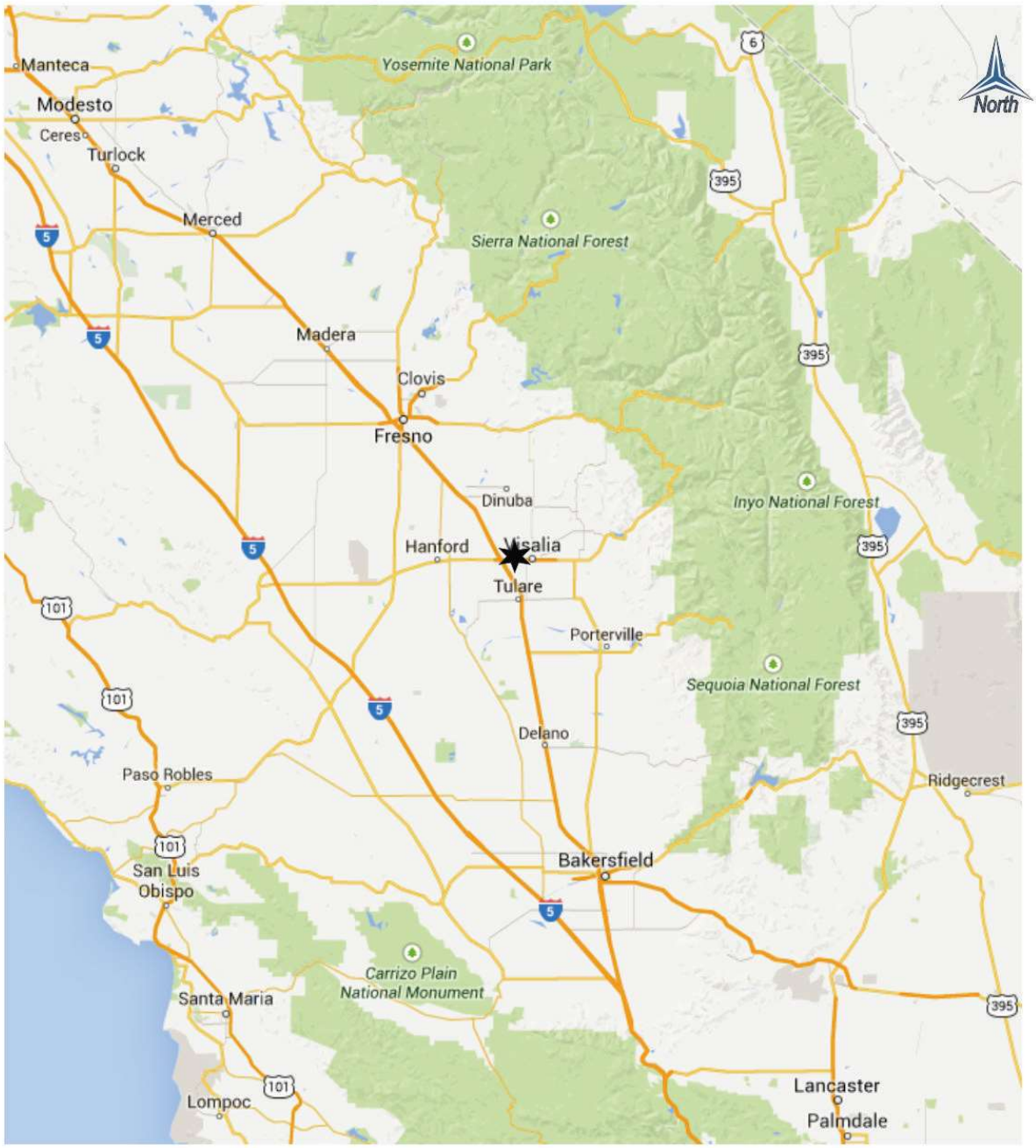
Tables 1-1 and 1-2 indicate the ranges in the amounts of average delay for a vehicle at signalized and unsignalized intersections for the various levels of service ranging from LOS "A" to "F".

The signalized LOS standards applied to calculate intersection LOS are in accordance with the current edition of the HCM. Intersection turning movement counts and roadway geometrics used to develop LOS calculations were obtained from field review findings and count data provided from the traffic count sources identified in Section 2.1.

When an unsignalized intersection does not meet acceptable LOS standards, the investigation of the need for a traffic signal shall be evaluated. The latest edition of the California Manual on Uniform Traffic Control Devices for Streets and Highways (California MUTCD) introduces standards for determining the need for traffic signals. The California MUTCD indicates that the satisfaction of one or more traffic signal warrants does not in itself require the installation of a traffic signal. In addition to the warrant analysis, an engineering study of the current or expected traffic conditions should be conducted to determine whether the installation of a traffic signal is justified. The City of Visalia uses the California MUTCD Eight (8) Peak Hour Signal Warrant (Warrant 1) when evaluating the need for signalization at an intersection. The California MUTCD Peak Hour Warrant (Warrant 3) was solely used to illustrate peak hour conditions at unsignalized intersections that do not meet the City of Visalia's acceptable level of service criteria.

Iron Ridge Development
Regional Location

Figure 1-1



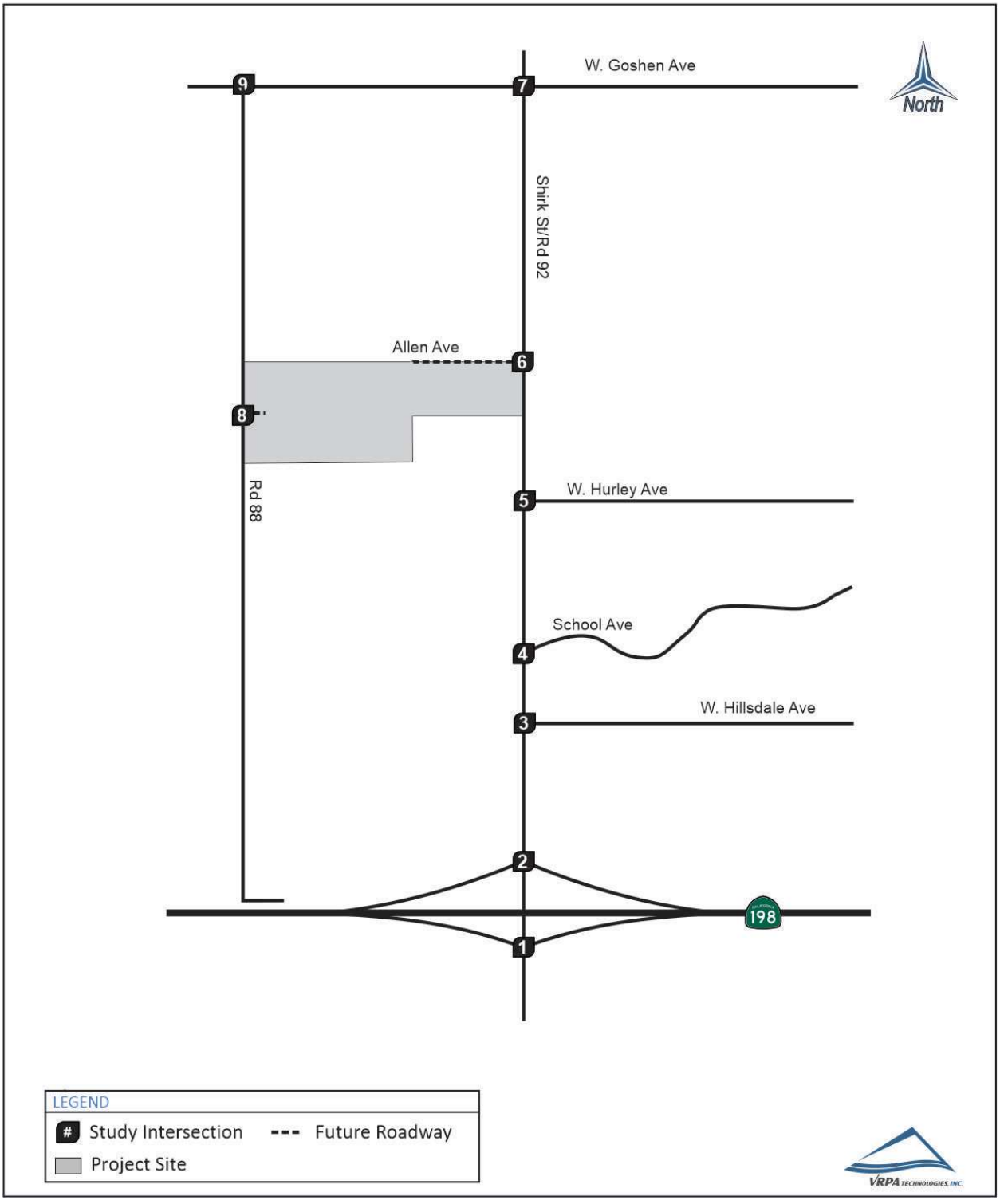
LEGEND

★ Project Location

VRPA TECHNOLOGIES, INC.

Iron Ridge Development
Study Area

Figure 1-2



Iron Ridge Development
Project Conceptual Layout

Figure 1-3

Table 1-1
Signalized Intersections
Level of Service Definitions
(Highway Capacity Manual)

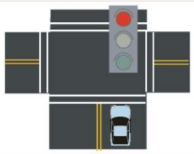
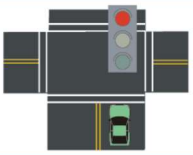
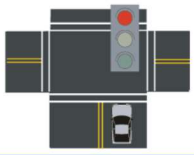
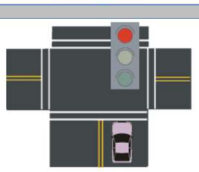
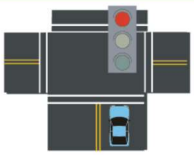
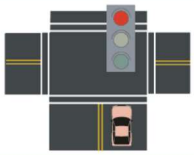
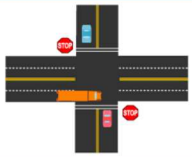
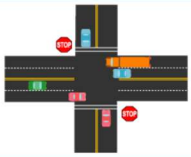
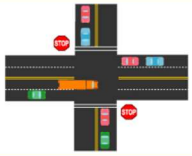
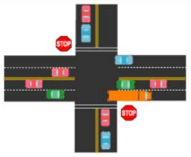
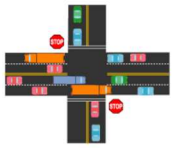
LEVEL OF SERVICE	DEFINITION		AVERAGE TOTAL DELAY (sec/veh)
A	Describes operations with very low delay. This level of service occurs when there is no conflicting traffic for a minor street.		≤ 10.0
B	Describes operations with moderately low delay. This level generally occurs with a small amount of conflicting traffic causing higher levels of average delay.		> 10.0 - 20.0
C	Describes operations with average delays. These higher delays may result from a moderate amount of minor street traffic. Queues begin to get longer.		> 20.0 - 35.0
D	Describes a crowded operation, with below average delays. At level D, the influence of congestion becomes more noticeable. Longer delays may result from shorter gaps on the mainline and an increase of minor street traffic. The queues of vehicles are increasing.		> 35.0 - 55.0
E	Describes operations at or near capacity. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor gaps for the minor street to cross and large queues.		> 55.0 - 80.0
F	Describes operations that are at the failure point. This level, considered to be unacceptable to most drivers, often occurs with over- saturation, that is, when arrival flow rates exceed the capacity of the intersection. Insufficient gaps of suitable size exist to allow minor traffic to cross the intersection safely.		> 80.0

Table 1-2
Unsignalized Intersections
Level of Service Definitions
(Highway Capacity Manual)

LEVEL OF SERVICE	DEFINITION	AVERAGE TOTAL DELAY (sec/veh)
A	No delay for stop-controlled approaches. 	0 - 10.0
B	Describes operations with minor delay. 	> 10.0 - 15.0
C	Describes operations with moderate delays. 	> 15.0 - 25.0
D	Describes operations with some delays. 	> 25.0 - 35.0
E	Describes operations with high delays and long queues. 	> 35.0 - 50.0
F	Describes operations with extreme congestion, with very high delays and long queues unacceptable to most drivers. 	> 50.0

1.3 Policies to Maintain Level of Service

1.3.1 *City of Visalia*

The City of Visalia General Plan states the City will plan for LOS "D" for street segments and intersections.

1.3.2 *California Department of Transportation (Caltrans)*

With the changes brought about by SB 743, Caltrans no longer uses level of service to determine the need for transportation improvements. Instead, the focus is on providing adequate facilities for pedestrians, bicycles, and transit as well as safety considerations for all transportation modes. Guidance is provided in the Transportation Impact Study Guide dated May 20, 2020, and the Interim Land Development and Intergovernmental Review Safety Review Practitioners Guidance dated July 2020. This guidance was used in determining the need for roadway improvements on Caltrans facilities.

1.4 VMT Analysis

Senate Bill 743 (SB 743) went into effect throughout California on July 1, 2020. This legislation changed the performance measure for CEQA transportation studies from level of service to vehicle miles traveled (VMT). An assessment of potential VMT impacts associated with the Project is provided in Chapter 3 to address changes in CEQA requirements.

2.0 Existing Conditions

2.1 Existing Traffic Counts and Roadway Geometrics

The first step toward assessing Project traffic impacts is to assess existing traffic conditions. Existing AM and PM peak hour turning movements were collected at each study intersection by National Data and Surveying Services. Intersection turning movement counts were conducted for the peak hour periods of 7:00-9:00 AM and 4:00-6:00 PM for study intersections on Tuesday, September 21st, 2021. Traffic count data worksheets are provided in Appendix A.

2.2 Existing Functional Roadway Classification System

Functional classification is the process by which streets and highways are grouped into classes, or systems, according to the type of service they are intended to provide. Fundamental to this process is the recognition that individual streets and highways do not serve travel independently in any major way. Rather, most travel involves movement through a network of roads.

The current hierarchical system of roadways within the study area consists of the following four (4) basic classifications:

- ✓ **State Freeways and Highways** – provide for the ability to carry large traffic volumes at high speeds for long distances. Access points are fully controlled. Freeways connect points within the City/County and link the City/County to other parts of the State.
- ✓ **Arterials** – provide for mobility within the City/County, carrying through traffic on continuous routes and joining major traffic generators, freeways, and other arterials. Access to abutting private property and intersecting local streets shall generally be restricted.
- ✓ **Collectors** – provide for internal traffic movement within communities and connect local roads to arterials. Direct access to abutting private property shall generally be permitted.
- ✓ **Local Streets** – Roadways which provide direct access to abutting property and connect with other local roads, collectors, and arterials. Local roads are typically developed as two-lane undivided roadways. Access to abutting private property and intersecting streets shall be permitted.

2.3 Affected Streets and Highways

The study intersections included in this TIS are listed below and shown in Figure 1-2. The study intersections were developed in consultation with City of Visalia staff and are located within 1-mile of the Project site based on analysis requirements found in the City of Visalia "Procedures For Traffic Impact Analysis (TIA)", dated March 2021.

Intersections

- ✓ Shirk Street / SR 198 EB Ramps
- ✓ Shirk Street / SR 198 WB Ramps
- ✓ Shirk Street / Hillsdale Avenue
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- ✓ Shirk Street / Hurley Avenue
- ✓ Shirk Street / Allen Avenue (New Road)
- ✓ Shirk Street / Goshen Avenue
- ✓ Road 88 / Project Access
- ✓ Road 88 / Goshen Avenue

The existing lane geometry at study area intersections is shown in Figure 2-1. Figure 2-2 shows existing traffic volumes for the AM and PM peak hours in the study area.

2.4 Level of Service

2.4.1 *Intersection Capacity Analysis*

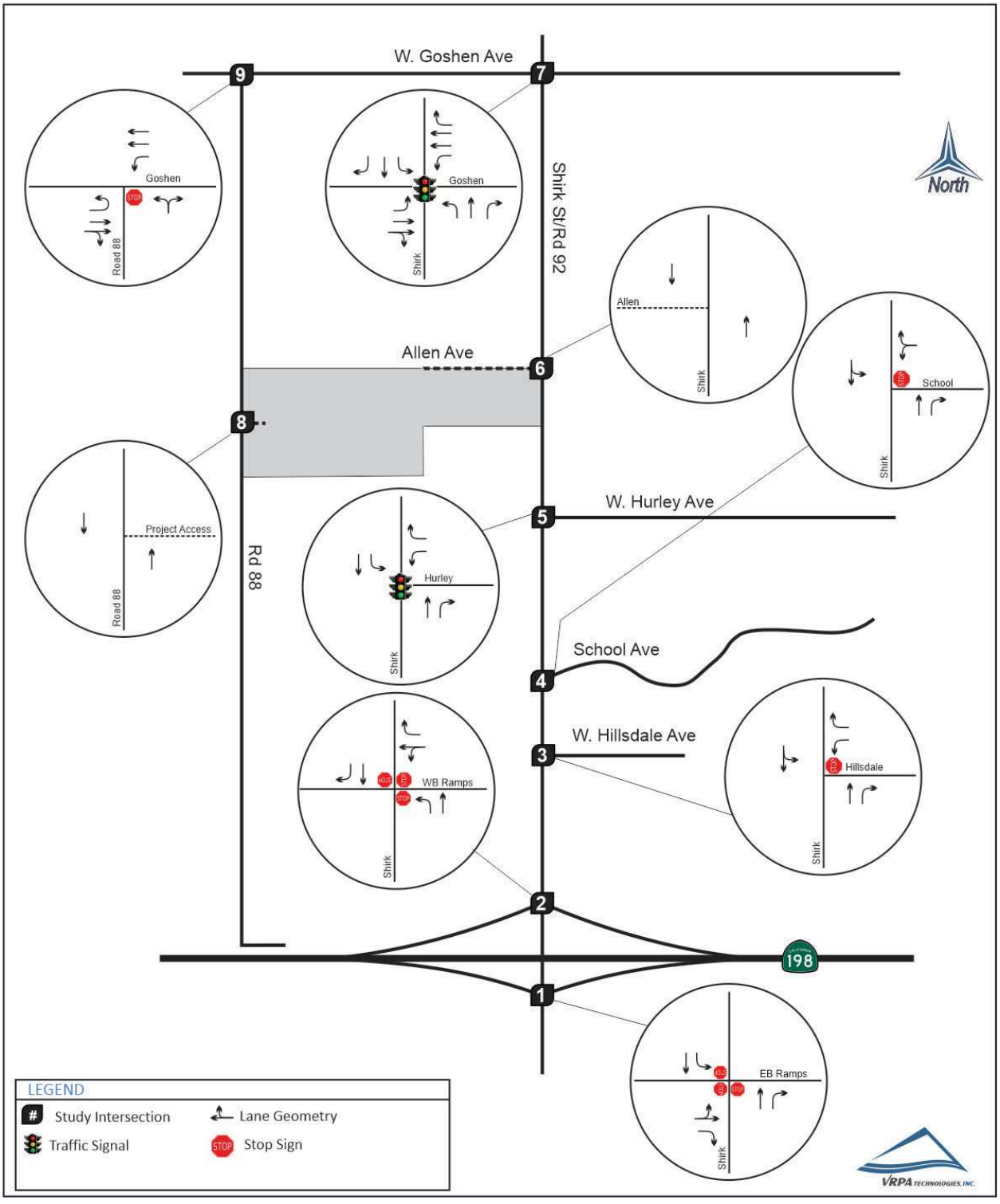
All intersection LOS analyses were estimated using Synchro 10 Software. Various roadway geometrics, traffic volumes, and properties (peak hour factors, storage pocket length, etc.) were input into the Synchro 10 Software program to accurately determine the travel delay and LOS for each Study scenario. The intersection LOS and delays reported represent the 6th Edition HCM outputs. Synchro assumptions, listed below, show the various Synchro inputs and methodologies used in the analysis.

- ✓ **Lane Geometry**
  - Storage lengths for turn lanes for existing intersections were obtained from aerial photos and rounded to the nearest 25 feet
  - VRPA conducted a field study of the specified intersections and segments to verify lane geometry and intersection control as well as to obtain other pertinent data such as signal timing and phasing, where applicable

- ✓ **Traffic Conditions**
  - Peak hour factors (PHF) for each intersection approach was obtained from traffic counts in the study area and were utilized for Existing, Opening Day, and 5-Year Horizon conditions. For 10-Year Horizon and 20-Year Horizon conditions, a PHF of 0.92 was applied unless the existing PHF was greater than 0.92
  - Heavy vehicle percentages were based on the HCM default
  - Roadway link speed limits were observed in the field and input into the Synchro network to determine roadway link speeds

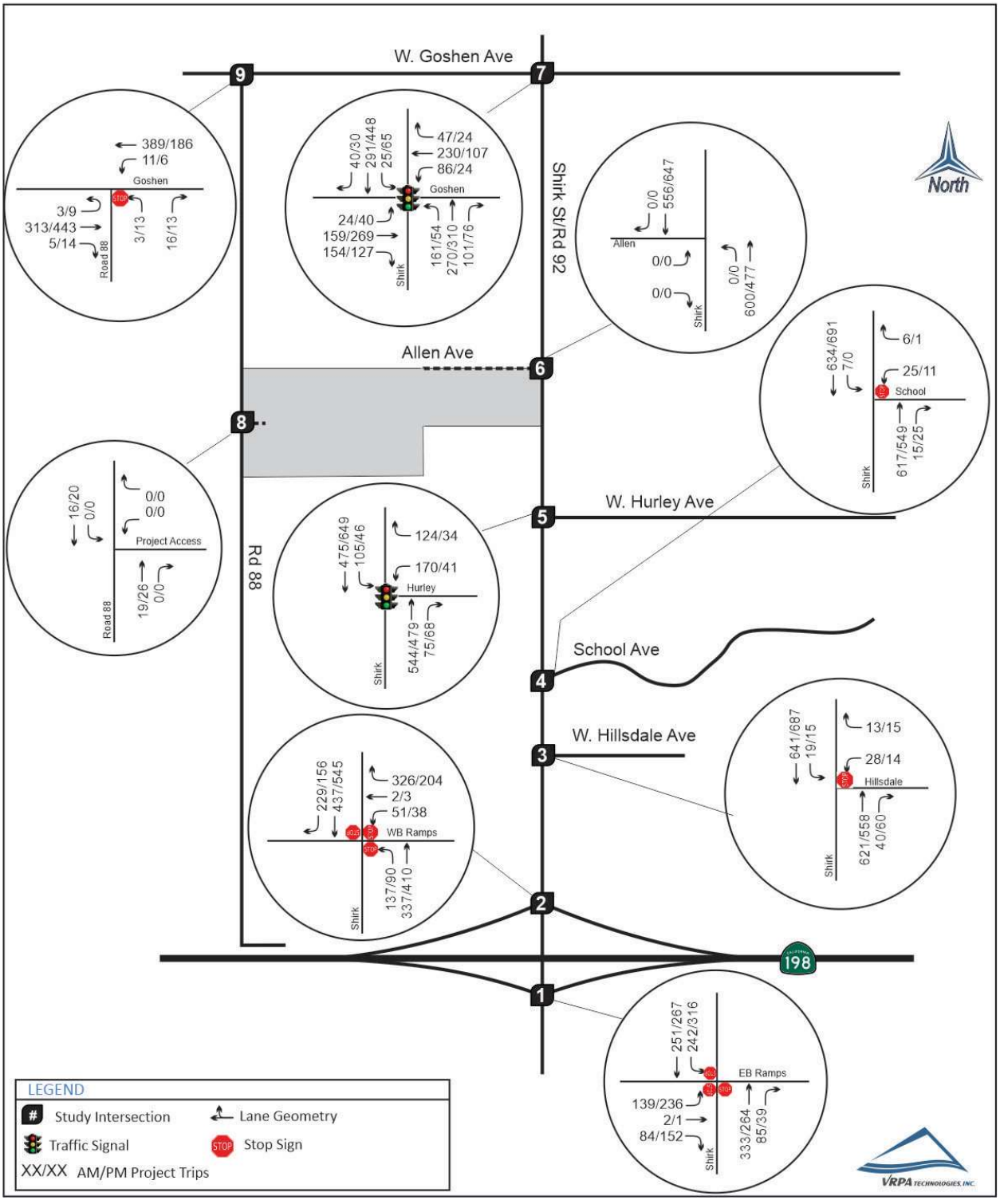
Iron Ridge Development
Existing Lane Geometry

Figure 2-1



Iron Ridge Development
Existing AM & PM Peak Hour Volumes

Figure 2-2



Results of the analysis show that all of the study intersections currently meet the City of Visalia's minimum level of service criteria with the exception of the Shirk Street at Hillsdale Avenue intersection (AM Peak hour). It should be noted that the peak hour traffic at the intersection does not meet the California MUTCD Peak Hour (Warrant 3). As indicated in Chapter 1, the City of Visalia uses the California MUTCD Eight (8) Peak Hour Signal Warrant (Warrant 1) when evaluating the need for signalization at an intersection. Table 2-1 shows the intersection LOS for the existing conditions. Synchro 10 (HCM 6th Edition) Worksheets are provided in Appendix B.

2.4.2 *Queuing Analysis*

Table 2-2 provides a queue length summary for left and right turn lanes at the study intersections for Existing Conditions. Queuing analysis for City of Visalia intersections was completed using the queuing formulas presented in the City of Visalia "Procedures For Traffic Impact Analysis (TIA)", dated March 2021. Queuing analysis for Caltrans intersections was completed using Index 405.2 pf the Highway Design Manual (HDM). As shown in Table 2-2, there are a few locations where queuing currently exceeds the existing queue lane storage length.

2.5 Study Area Collision Data

The Transportation Injury Mapping System (TIMS) provided by University of California, Berkeley was used to evaluate traffic collisions in the study area. TIMS utilizes geocoded data provided by the Statewide Integrated Traffic Records System (SWITRS). SWITRS is a tool used by California Highway Patrol (CHP) and other Allied Agencies throughout California and includes various types of statistical reports and data. The database serves as a means to collect and process data gathered from a collision scene. Information from the TIMS database shows that approximately seven (7) injury or fatal accidents have occurred throughout the study area in the past 3 years. A graphical representation of traffic collisions throughout the study area for the past 3 years is provided in Figure 2-3. Collision data worksheets are provided in Appendix C. The City of Visalia area had approximately 1,276 injury or fatal accidents over the same timeframe referenced above. Injury and fatal accidents in the study area represent 0.5% of incidents that occurred in the City of Visalia. Collision data in the study area shows that 'Rear End' and 'Broadside' collisions are the most common accidents in the study area.

Table 2-1
Existing Intersection Operations

INTERSECTION	CONTROL	TARGET LOS	PEAK HOUR	EXISTING	
				DELAY	LOS
1. Shirk Street / SR 198 EB Ramps	All-Way Stop Sign	-- [1]	AM	15.8	C
			PM	17.3	C
2. Shirk Street / SR 198 WB Ramps	All-Way Stop Sign	-- [1]	AM	33.7	D
			PM	32.0	D
3. Shirk Street / Hillsdale Avenue	One-Way Stop Sign	D	AM	**38.2**	**E +**
			PM	29.4	D
4. Shirk Street / School Avenue	One-Way Stop Sign	D	AM	30.3	D
			PM	26.7	D
5. Shirk Street / Hurley Avenue	Signalized	D	AM	18.0	B
			PM	8.4	A
6. Shirk Street / Allen Avenue	One-Way Stop Sign	D	AM		
			PM		
7. Shirk Street / Goshen Avenue	Signalized	D	AM	30.4	C
			PM	24.8	C
8. Road 88 / Project Access	One-Way Stop Sign	D	AM		
			PM		
9. Road 88 / Goshen Avenue	One-Way Stop Sign	D	AM	10.8	B
			PM	12.8	B

DELAY is measured in seconds

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

For signalized and all-way stop intersections, delay results show the average for the entire intersection. For one-way and two-way stop controlled intersections, delay results show the delay for the worst movement.

1 - With the changes brought about by SB 743, Caltrans no longer uses level of service to determine the need for transportation improvements. Instead, the focus is on providing adequate facilities for pedestrians, bicycles, and transit as well as safety considerations for all transportation modes. Guidance is provided in the Transportation Impact Study Guide dated May 20, 2020 and the Interim Land Development and Intergovernmental Review Safety Review Practitioners Guidance dated July 2020. This guidance was used in determining the need for roadway improvements on Caltrans facilities.

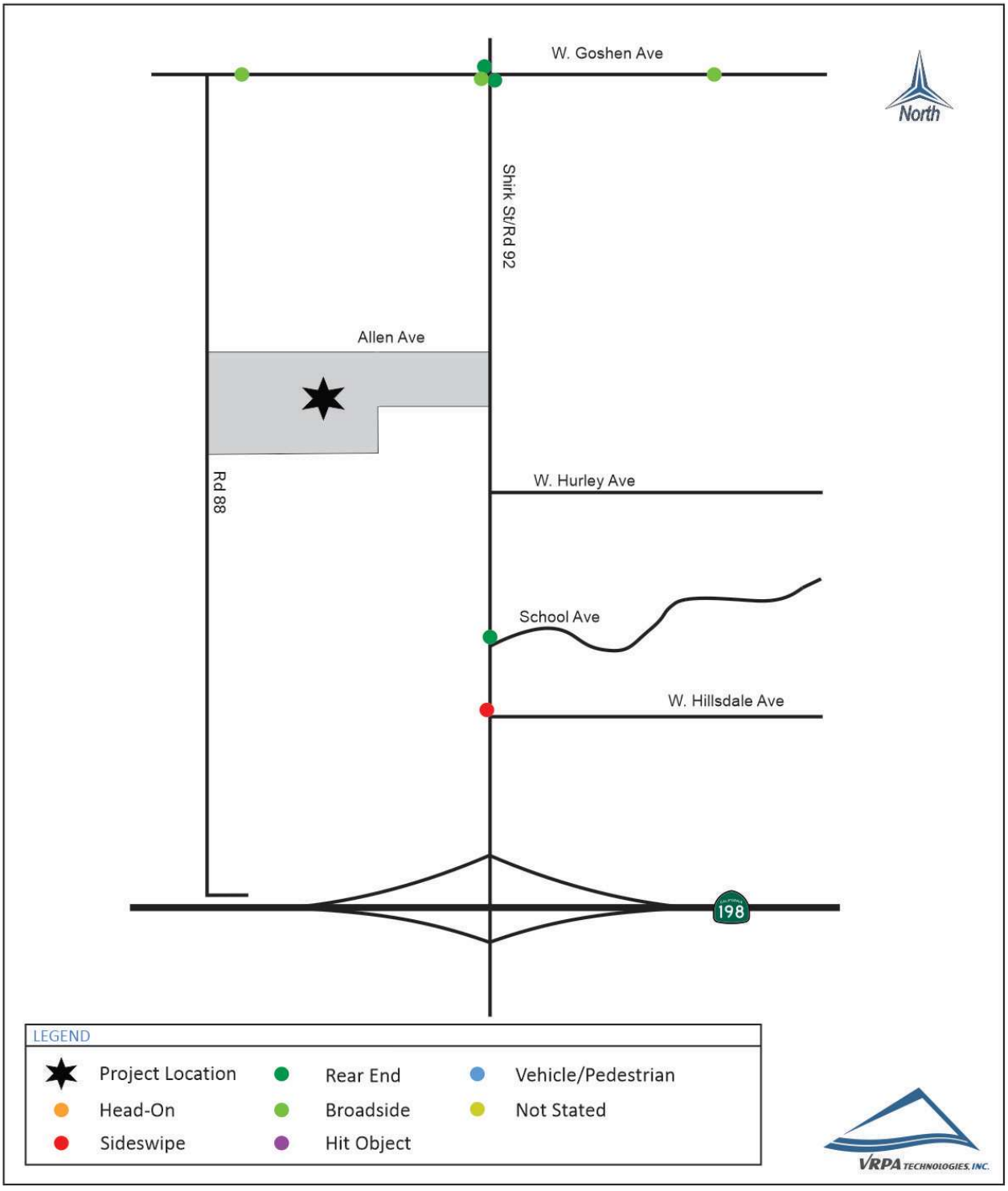
+ Does not meet peak hour signal warrants. Provided for inormation purposes only.

Table 2-2
Existing Queuing Operations

INTERSECTION	EXISTING QUEUE STORAGE LENGTH (ft)		EXISTING CONDITIONS	
			AM Queue	PM Queue
Shirk Street / SR 198 EB Ramps	NB Right	50	**71**	33
	SB Left	150	**202**	**263**
	EB Right	200	70	127
Shirk Street / SR 198 WB Ramps	NB Left	200	114	158
	SB Right	50	**191**	**130**
	WB Right	350	272	170
Shirk Street / Hillsdale Avenue	NB Right	100	33	50
	WB Right	125	11	13
Shirk Street / School Avenue	NB Right	225	13	21
Shirk Street / Hurley Avenue	NB Right	250	109	99
	SB Left	200	153	67
	WB Left	275	248	60
Shirk Street / Goshen Avenue	NB Left	250	235	79
	NB Right	100	**147**	**111**
	SB Left	50	36	**95**
	SB Right	50	**58**	44
	EB Left	275	35	58
	WB Left	275	125	35
	WB Right	250	69	35
Road 88 / Goshen Avenue	EB Left	200	3	8
	WB Left	200	9	5

Queue is measured in feet / **BOLD** denotes exceedance

Iron Ridge Development **Figure 2-3**
Existing Study Are Collision Map (01/01/2018 - 12/31/2020)



3.0 Traffic Impacts

3.1 Trip Generation

To assess the impacts that the Project may have on the surrounding roadway network, the first step is to determine Project trip generation. Project trip generation was determined using trip generation rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition). The considerations described above led to the recommended trip generation for weekday AM (7:00-9:00am) and PM (4:00-6:00pm) peak hours shown in Table 3-1.

Table 3-1
Project Trip Generation

									Peak Hour Trips			
Land Use	Units	ITE Land Use Code	Daily Trip Rate	Daily Trips	% AM Peak	% AM Inbound	% PM Peak	% PM Inbound	AM In	AM Out	PM In	PM Out
Single Family Housing	241	210	9.407	2,267	7.3%	26%	10.0%	63%	43	123	143	84
			Total	2,267				Total	43	123	143	84
									166		227	

Generation factors from ITE Trip Generation Manual, 11th Edition

The trip generation in Table 3-1 is based on a project size of 241 dwelling units and the current (11th Edition) of the ITE trip generation manual. The remainder of the calculations are based on slightly larger (more conservative) trip generation numbers using a previous project size (238 dwelling units) and the (10th Edition) of the ITE trip generation manual. The remainder of the calculations are based on 2,309 daily trips, 174 AM peak hour trips, and 234 PM peak hour trips.

3.2 Trip Distribution

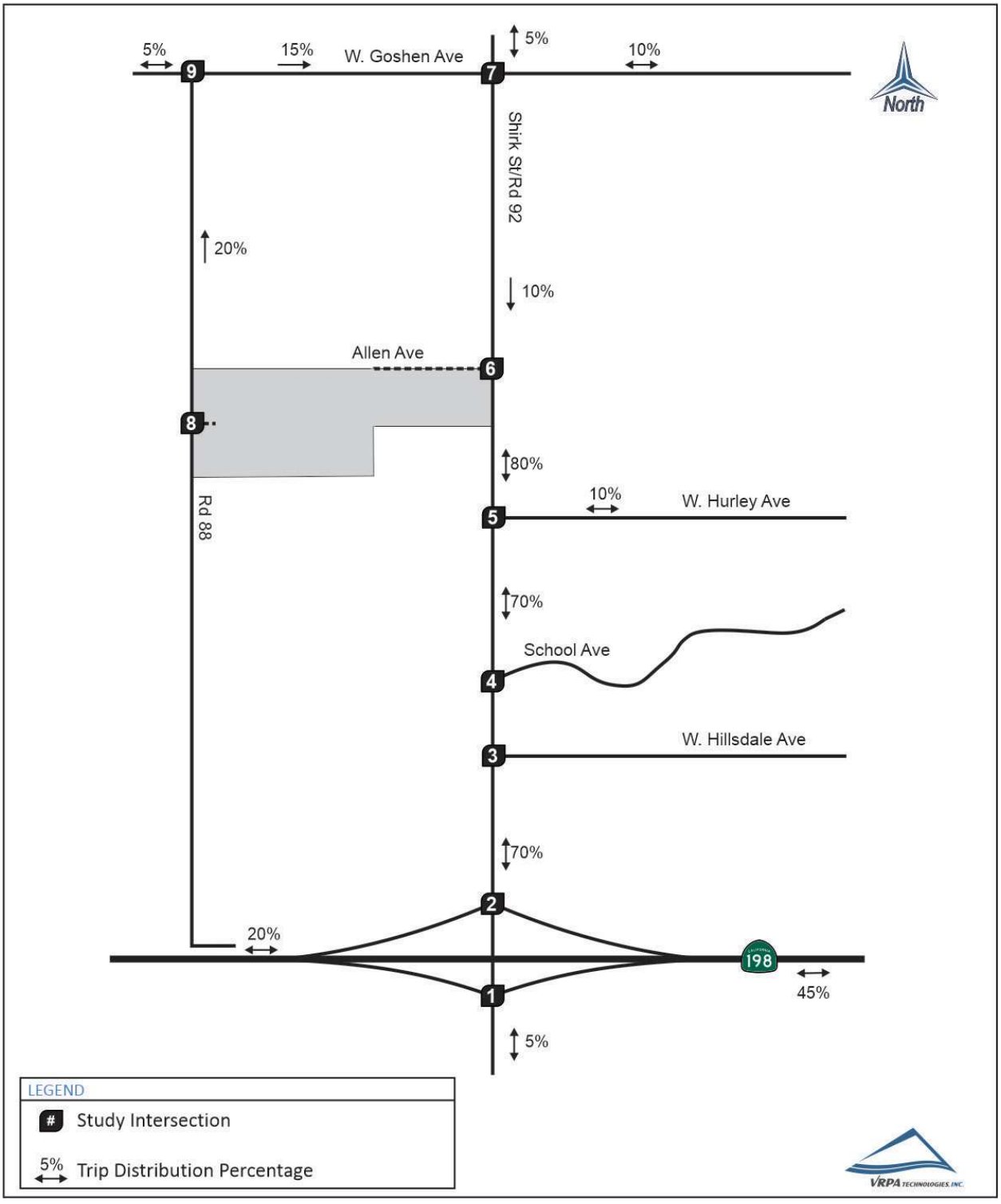
Project trip distribution percentages for the Opening Year, 5-Year Horizon, 10-Year Horizon, and 20-Year Horizon scenarios is shown in Figure 3-1. These percentages are based upon knowledge of the study area, engineering judgement, prevailing traffic patterns in the study area, major routes, population centers, and other existing development.

Vehicular access to the site would be provided by Shirk Street, Allen Avenue (new road), and Road 88. The new roadway would be constructed to City standards and would be dedicated as public right of way. Regional access to the site is provided via SR 198.

Based on the projected trips, the project will generate 174 AM peak hour trips and 234 PM peak hour trips. A project of this size is considered a moderate development and therefore requires a Category ll analysis. VRPA has prepared an analysis consistent with Table 1 in the City of Visalia "Procedures for Traffic Impact Analysis (TIA)".

Iron Ridge Development
Trip Distribution - Opening Year and Horizon Scenarios

Figure 3-1



3.3 Project Traffic

Project traffic as shown in Table 3-1 was distributed to the roadway system using the trip distribution percentages shown in Figures 3-1. A graphical representation of the resulting AM and PM peak hour Project trips used is shown in Figure 3-2.

3.4 Approved/Pending Project Traffic

Traffic impact analyses typically require the analysis of approved or pending developments that have not yet been built in the vicinity of the Project. There are several development projects in the Project's vicinity that will add new trips to the intersections and roadway segments being evaluated in this TIS. The approved or pending projects included in this TIS are graphically displayed in Figure 3-3. Trip generation and distribution information for the approved and pending developments was estimated using trip generation rates from the ITE Trip Generation Manual (10th Edition) and engineering judgement and prevailing traffic patterns. Table 3-2 shows the trip generation information for approved and pending projects and Figure 3-4 shows the AM and PM peak hour trips for approved and pending project traffic. The peak hour trips for approved and pending project traffic were applied to the Opening Year, 5-Year Horizon, 10-Year Horizon, and 20-Year Horizon conditions discussed later in the report.

3.5 Opening Year Traffic Conditions

Traffic conditions with and without the Project in the Year 2022 were estimated by applying a growth rate of 2% per year to the existing traffic volumes. A comparison of the TCAG base year and future year travel model showed that the growth in the study area is approximately 2% per year. The resulting traffic for the Opening Year scenario is shown in Figures 3-5 and 3-6.

3.6 5-Year Horizon Traffic Conditions

Traffic conditions with and without the Project in the Year 2027 (5 years after Opening conditions) were estimated by applying a growth rate of 2% per year to the existing traffic volumes. A comparison of the TCAG base year and future year travel model showed that the growth in the study area is approximately 2% per year. The resulting traffic for the Opening Year scenario is shown in Figures 3-7 and 3-8.

3.7 10-Year and 20-Year Horizon Traffic Conditions

The impacts of the Project were analyzed considering future traffic conditions in the year 2032 and 2042. It should be noted that 2032 and 2042 conditions were only evaluated for the Shirk Street at SR 198 intersections. The levels of traffic expected in 2032 and 2042 relate to the cumulative effect of traffic increases resulting from the implementation of the General Plans of local agencies, including the City of Visalia and Tulare County. Traffic conditions without the Project in the Year 2032 and 2042 were estimated by applying a growth rate of 2.3% per year to

the existing traffic volumes which is based on the SR 198 Transportation Concept Report. The resulting traffic for the 10-Year and 20-Year scenario is shown in Figure 3-9, 3-10, 3-11, and 3-12.

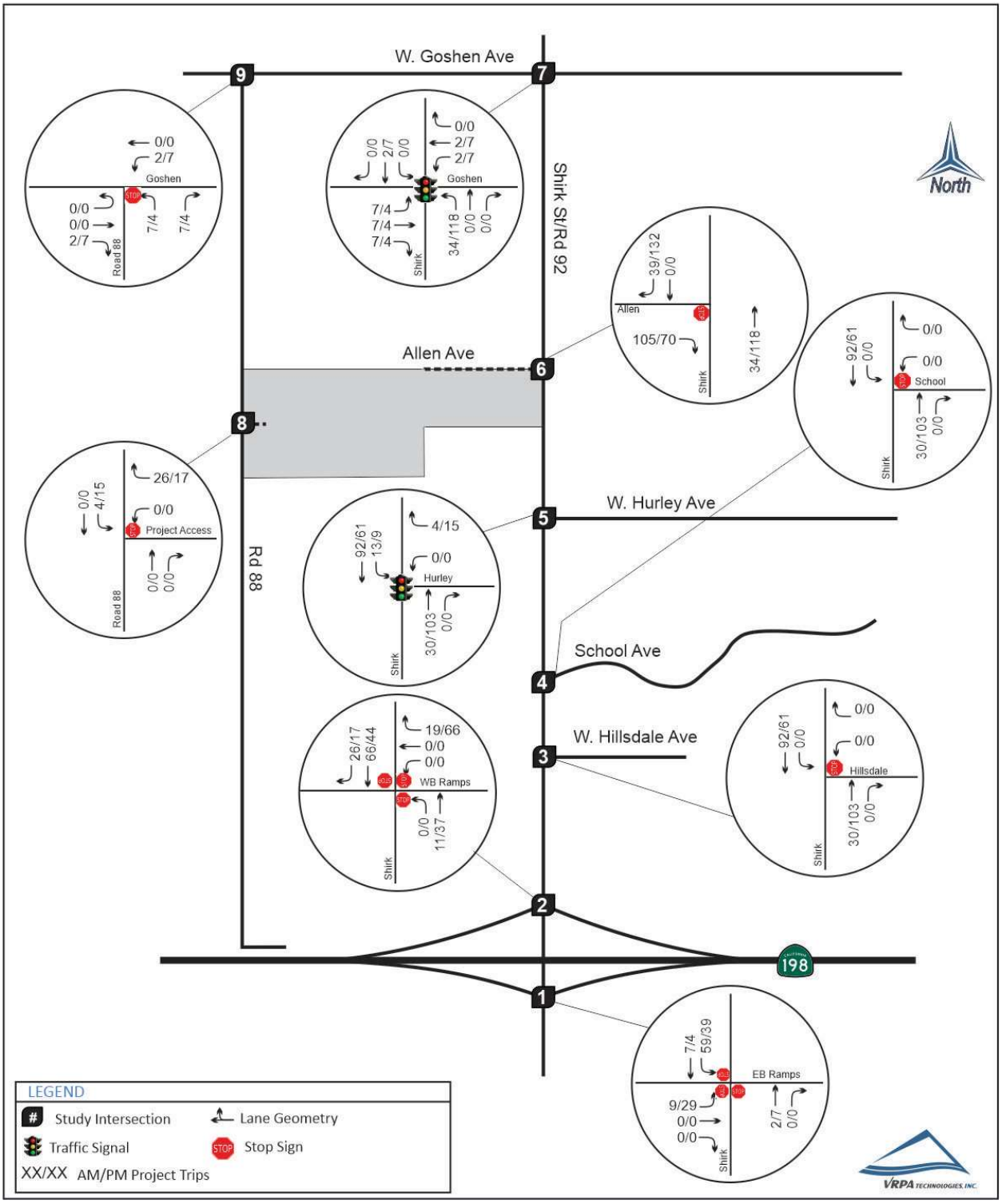
Table 3-2
Approved and Pending Project Trip Generation

PROJECT NAME	LAND USE	QUANTITY	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
			RATE	VOLUME			RATE	VOLUME		
				IN	OUT	TOTAL		IN	OUT	TOTAL
C.U.P. 2017-08	Multi-Family Residential	200 D.U.	0.46	23	69	92	0.56	71	41	112
Building Permit B204641	RV Park Storage	6.6 acres	0.74	2	1	3	0.98	4	2	6
	Single Family Residential	3 D.U.	0.74	2	0	2	0.99	2	1	3
C.U.P. 2021-01	Church	18.65 k.s.f	0.33	4	2	6	0.49	5	6	11
Walnut Park Estates Tentative Subdivision Map No. 5572	Single Family Residential	34 D.U.	0.74	7	22	29	0.99	23	13	36
Hillsdale Southland Tentative Subdivision Map No. 5574	Single Family Residential	41 D.U.	0.74	8	26	34	0.99	27	16	43
Building Permit B213733 [1]	Fuel transfer facility improvement	N/A	N/A	0	0	0	N/A	0	0	0
C. U.P 2020-24	11,100 sq. ft. Vocational Training and Administrative Facility	11.1 k.s.f	11.59	88	73	161	6.53	35	37	72
TOTAL TRIP GENERATION				**134**	**193**	**327**		**167**	**116**	**283**

Source: Generation factors from ITE Trip Generation Manual, 10th Edition.
Trip ends are one-way traffic movements, entering or leaving.
The numbers in parenthesis are ITE land use codes.
1: Onsite Improvements

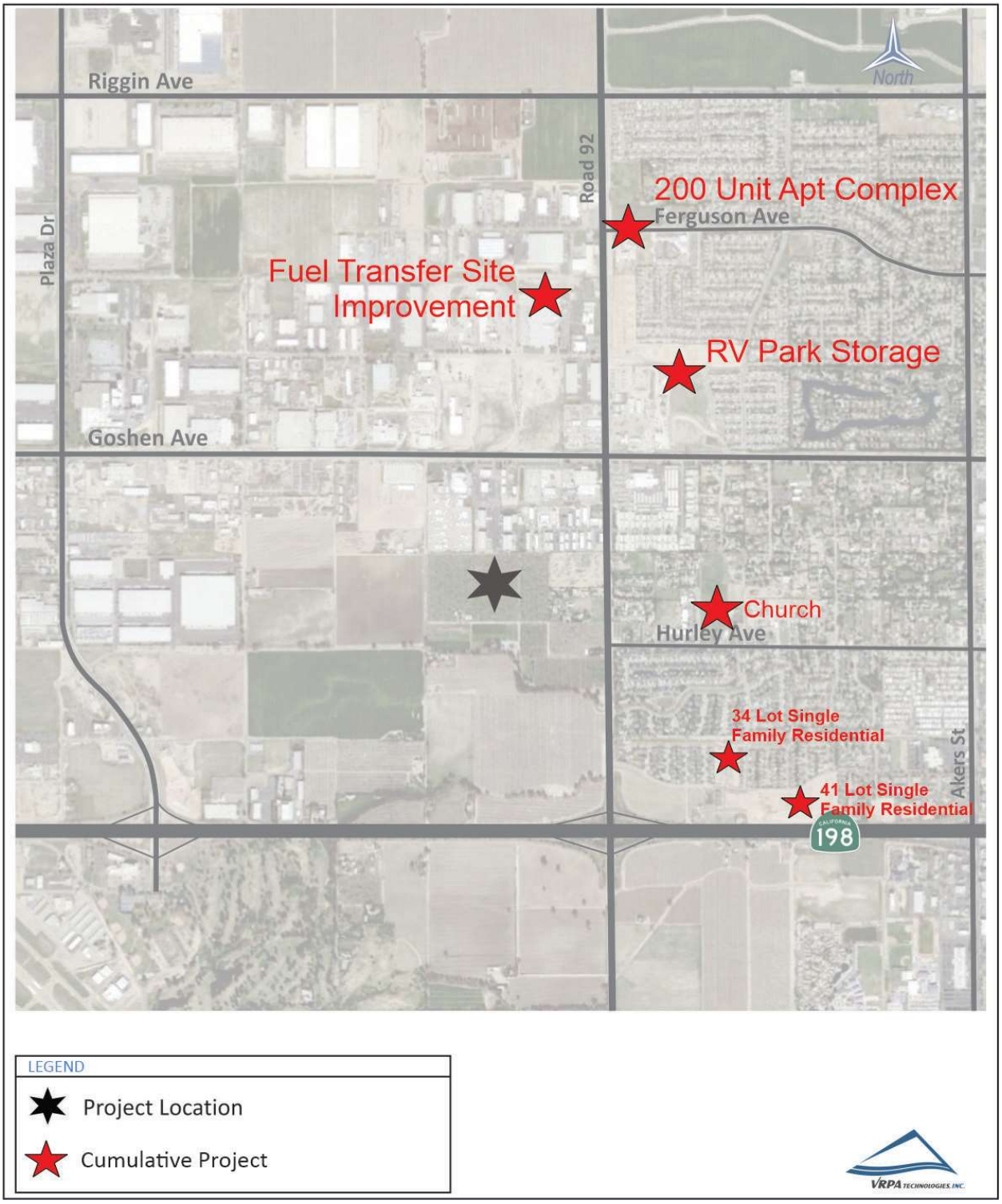
Iron Ridge Development
AM & PM Peak Hour Project Trips

Figure 3-2



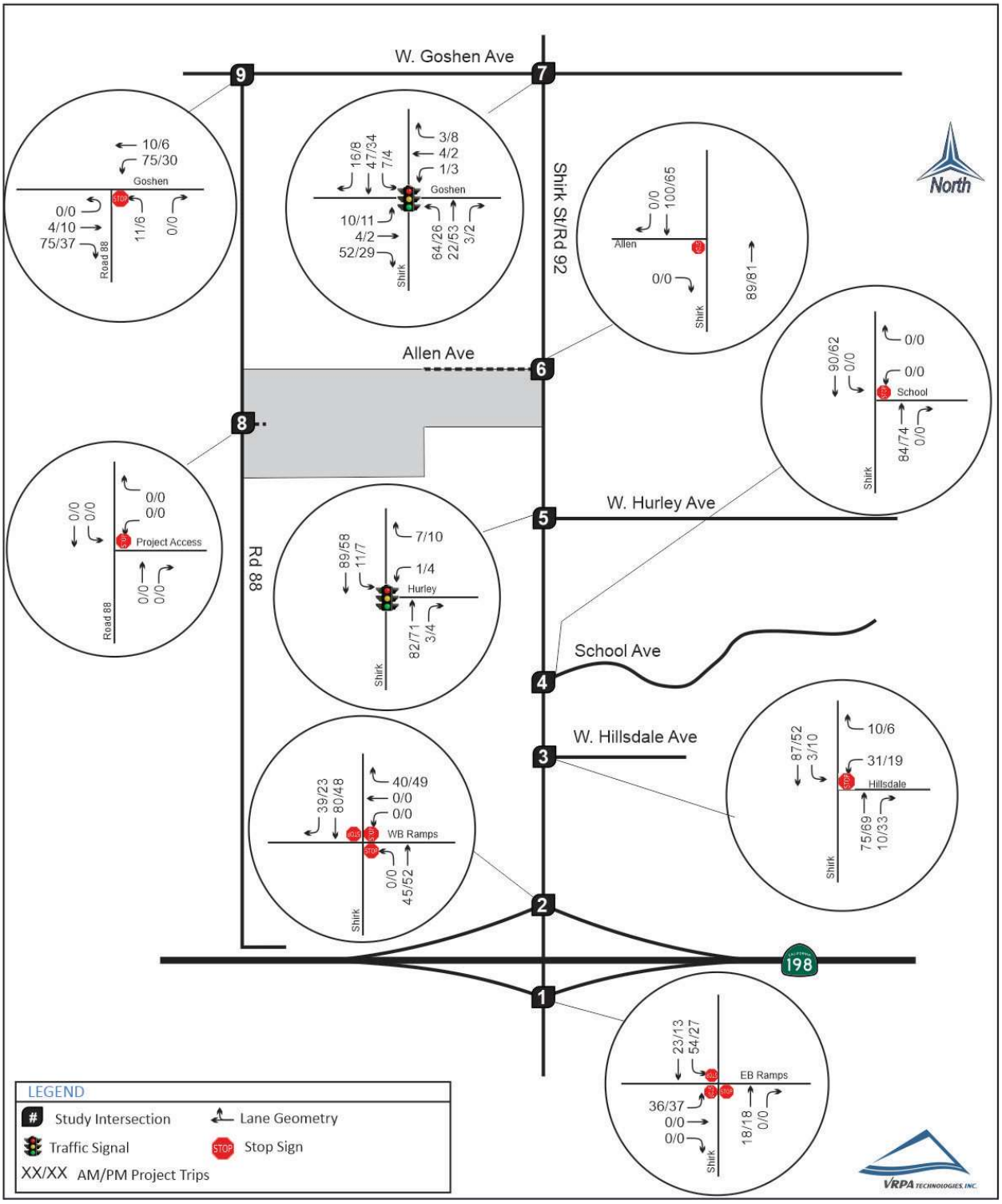
Iron Ridge Development
Approved/Pending Project Location

Figure 3-3



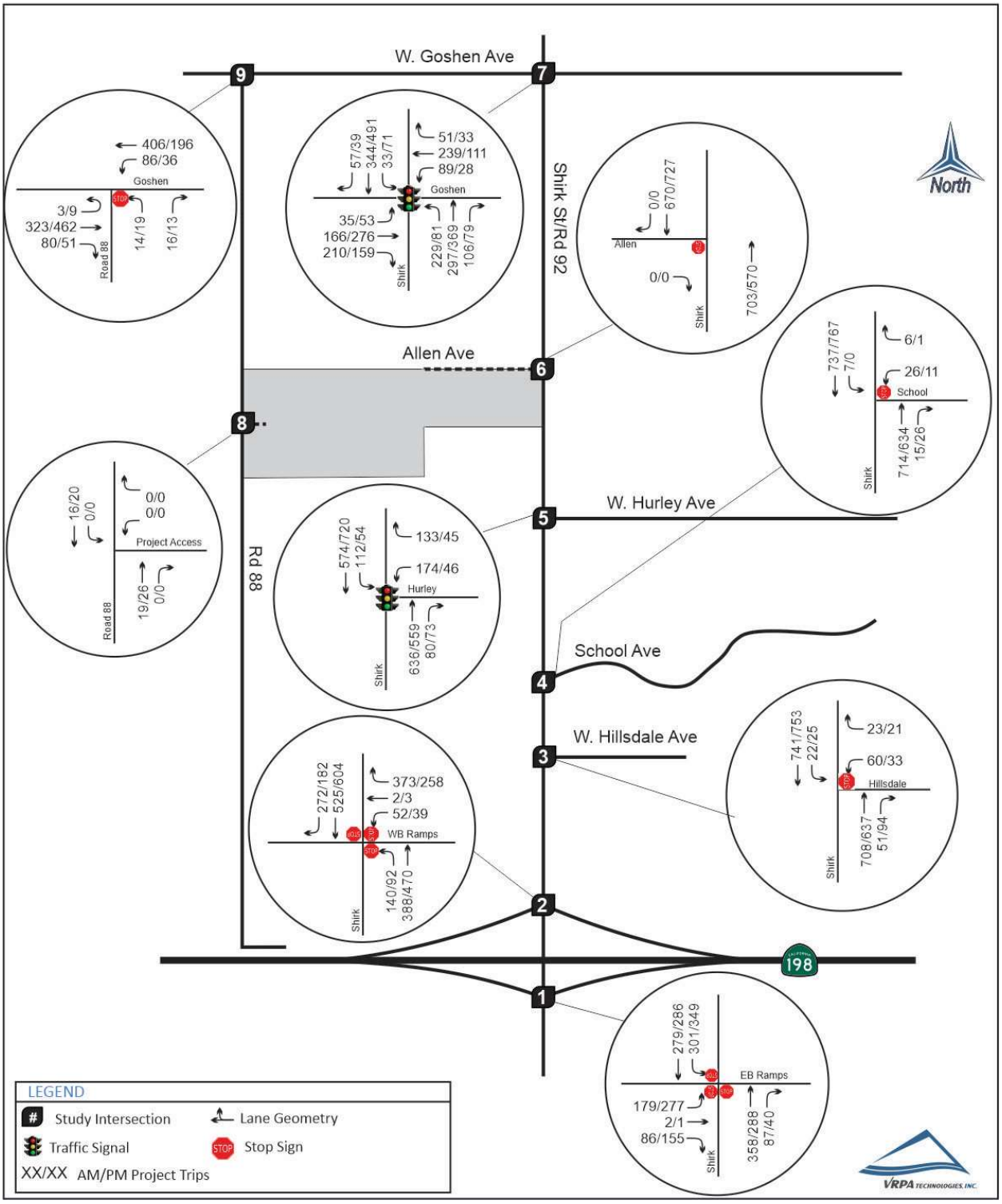
Iron Ridge Development
Approved/Pending Projects AM & PM Peak Hour Traffic

Figure 3-4



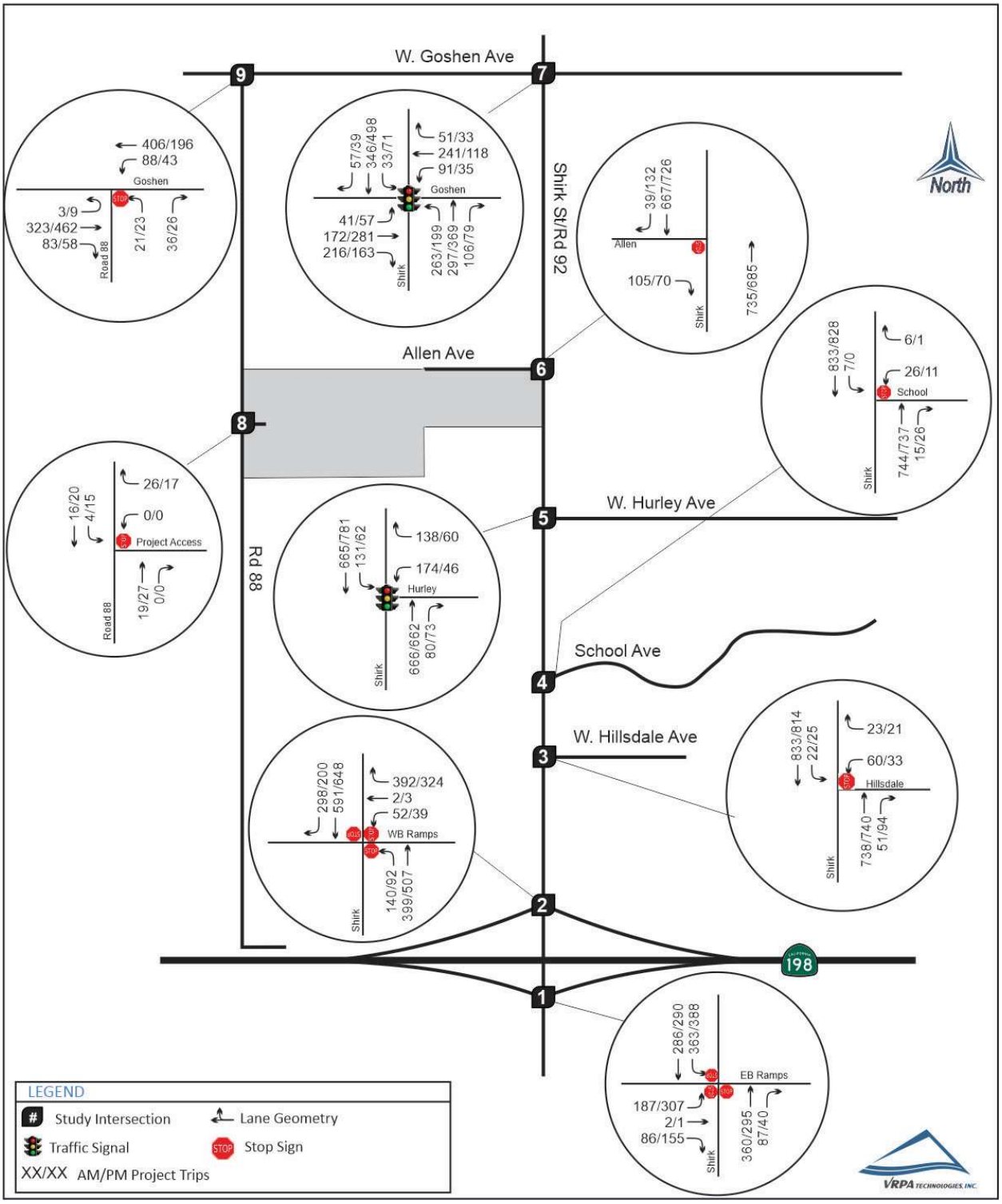
Iron Ridge Development
Opening Year Without Project AM & PM Peak Hour Traffic

Figure 3-5



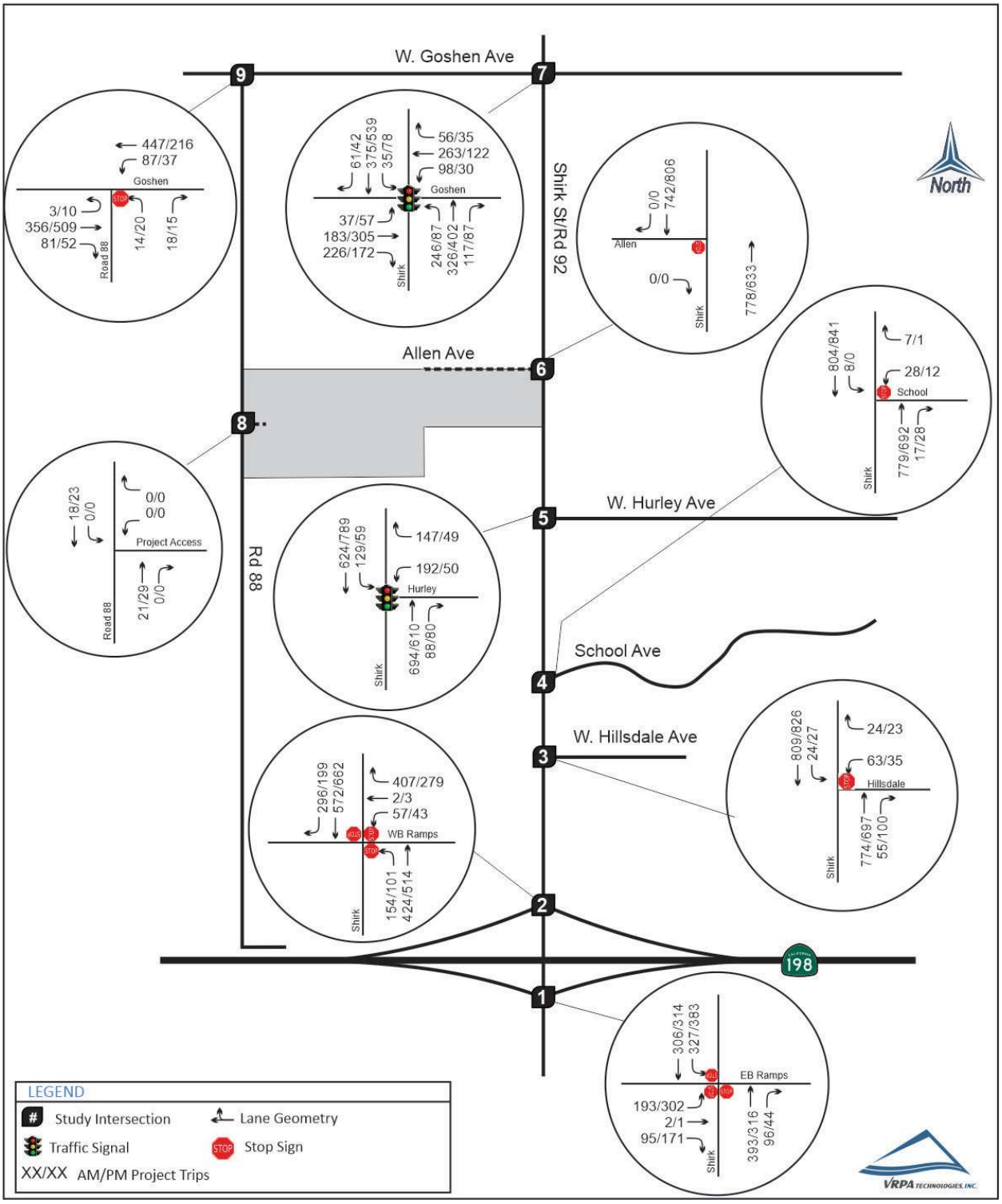
Iron Ridge Development
Opening Year Plus Project AM & PM Peak Hour Traffic

Figure 3-6



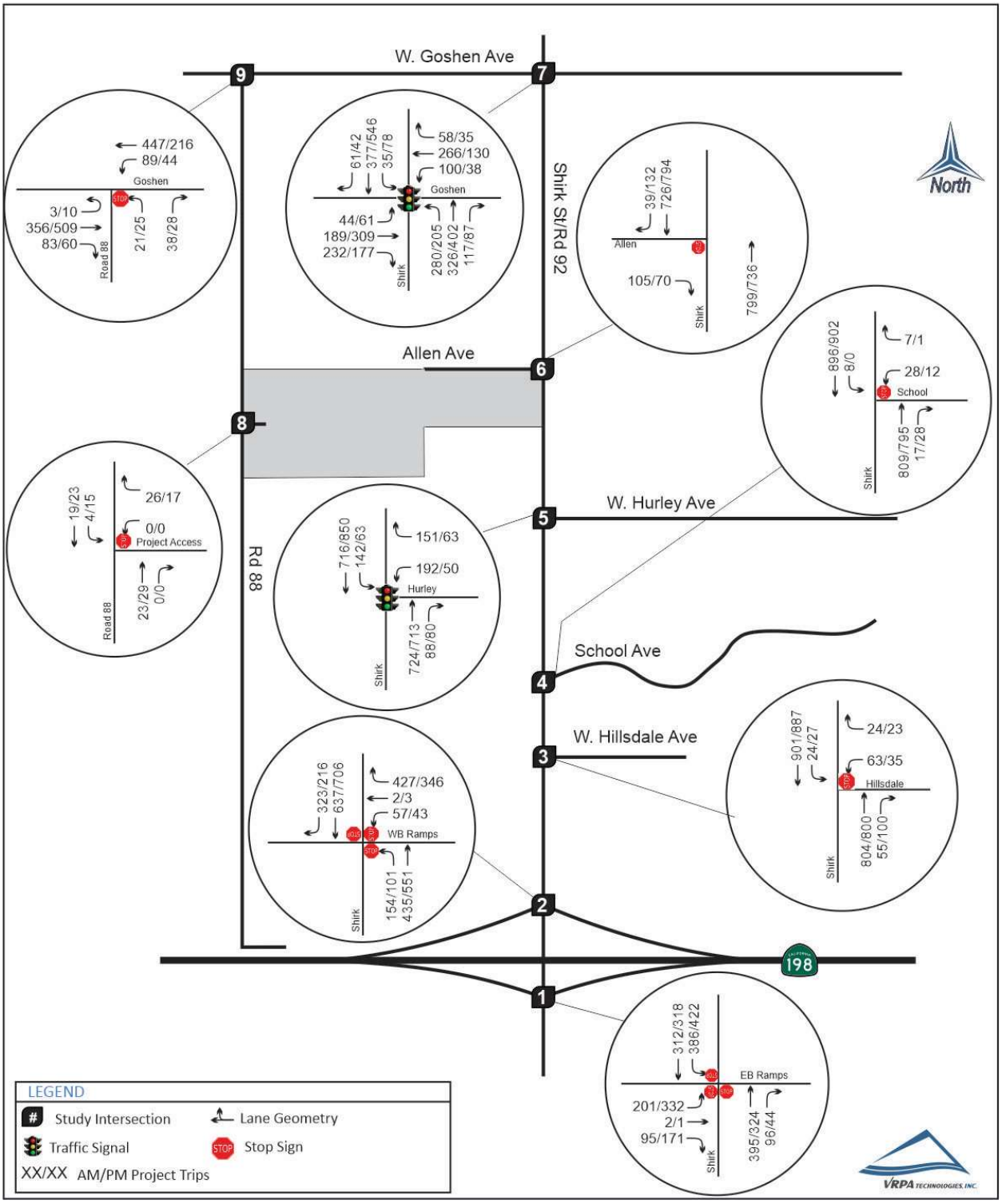
Iron Ridge Development
5-Year Horizon Without Project AM & PM Peak Hour Traffic

Figure 3-7



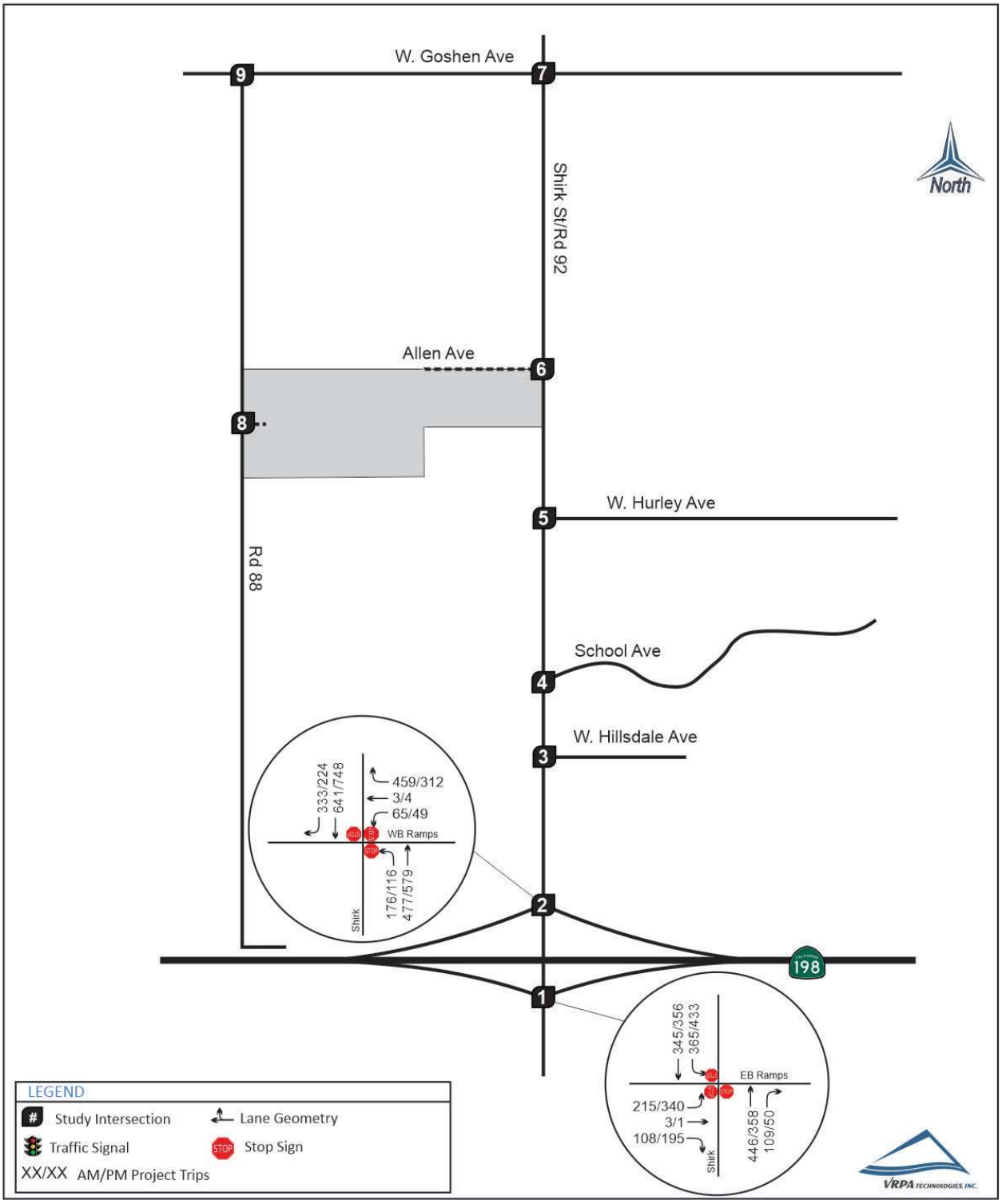
Iron Ridge Development
5-Year Horizon Plus Project AM & PM Peak Hour Traffic

Figure 3-8



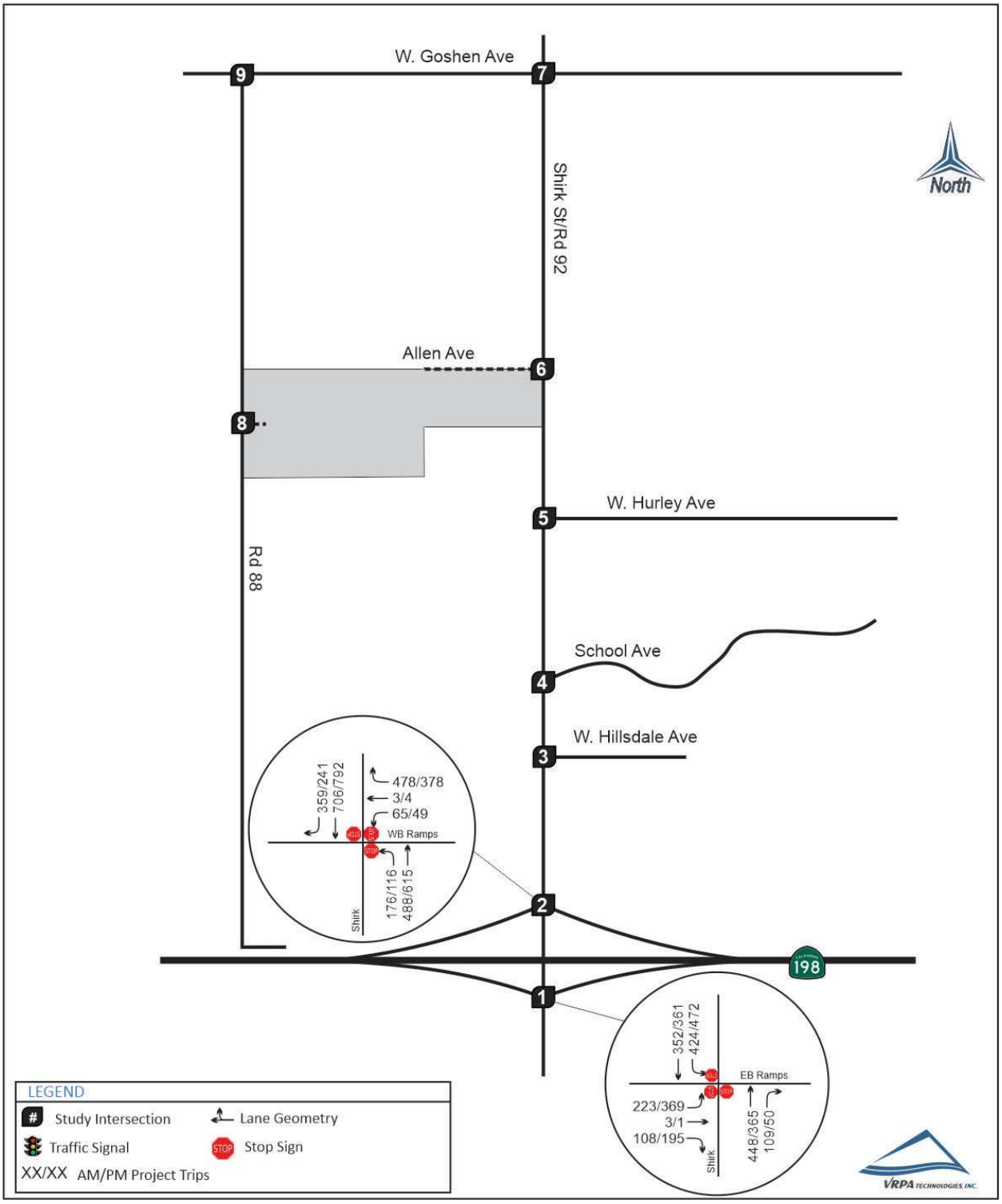
Iron Ridge Development
10-Year Horizon Without Project AM & PM Peak Hour Traffic

Figure 3-9



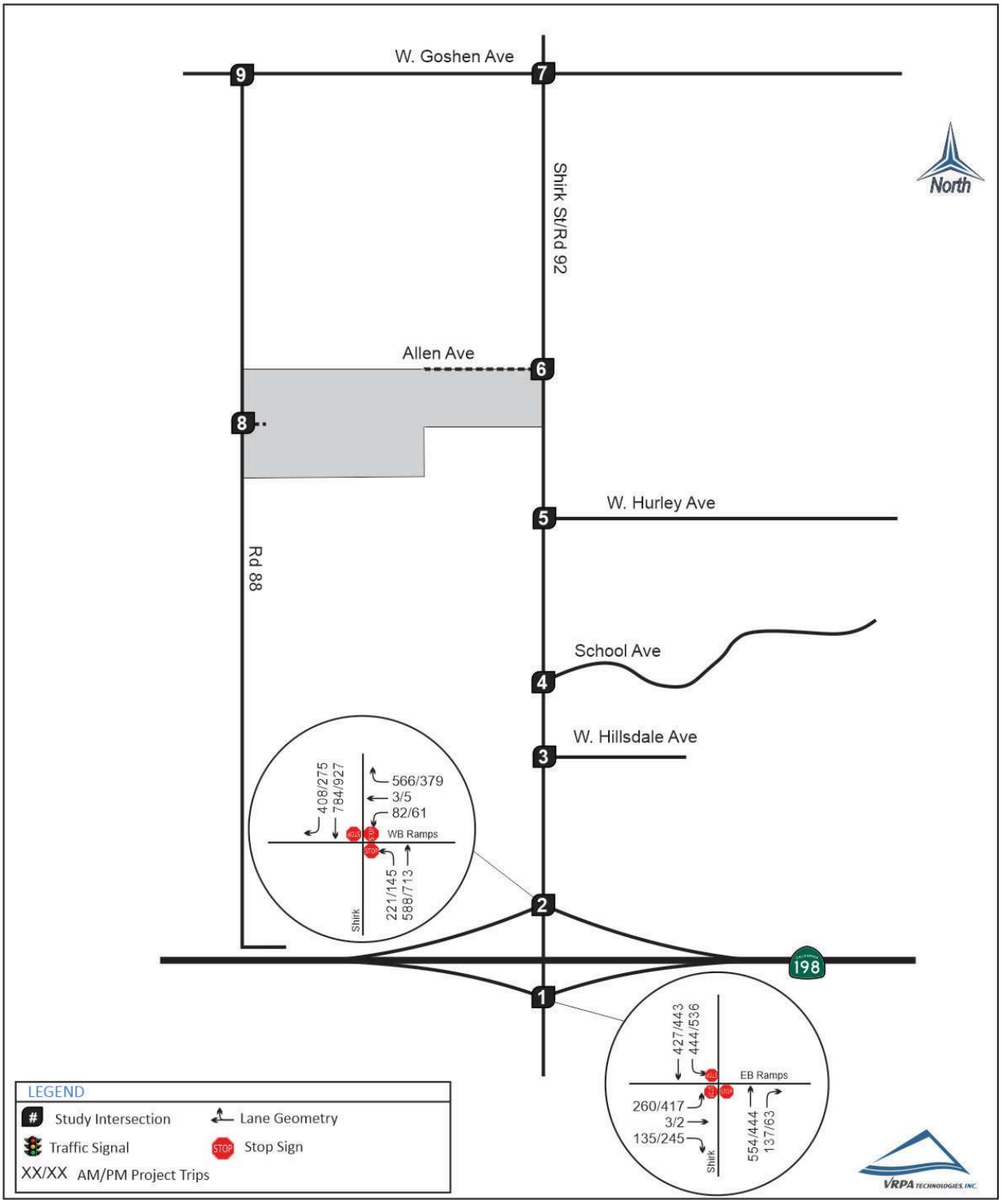
Iron Ridge Development
10-Year Horizon Plus Project AM & PM Peak Hour Traffic

Figure 3-10



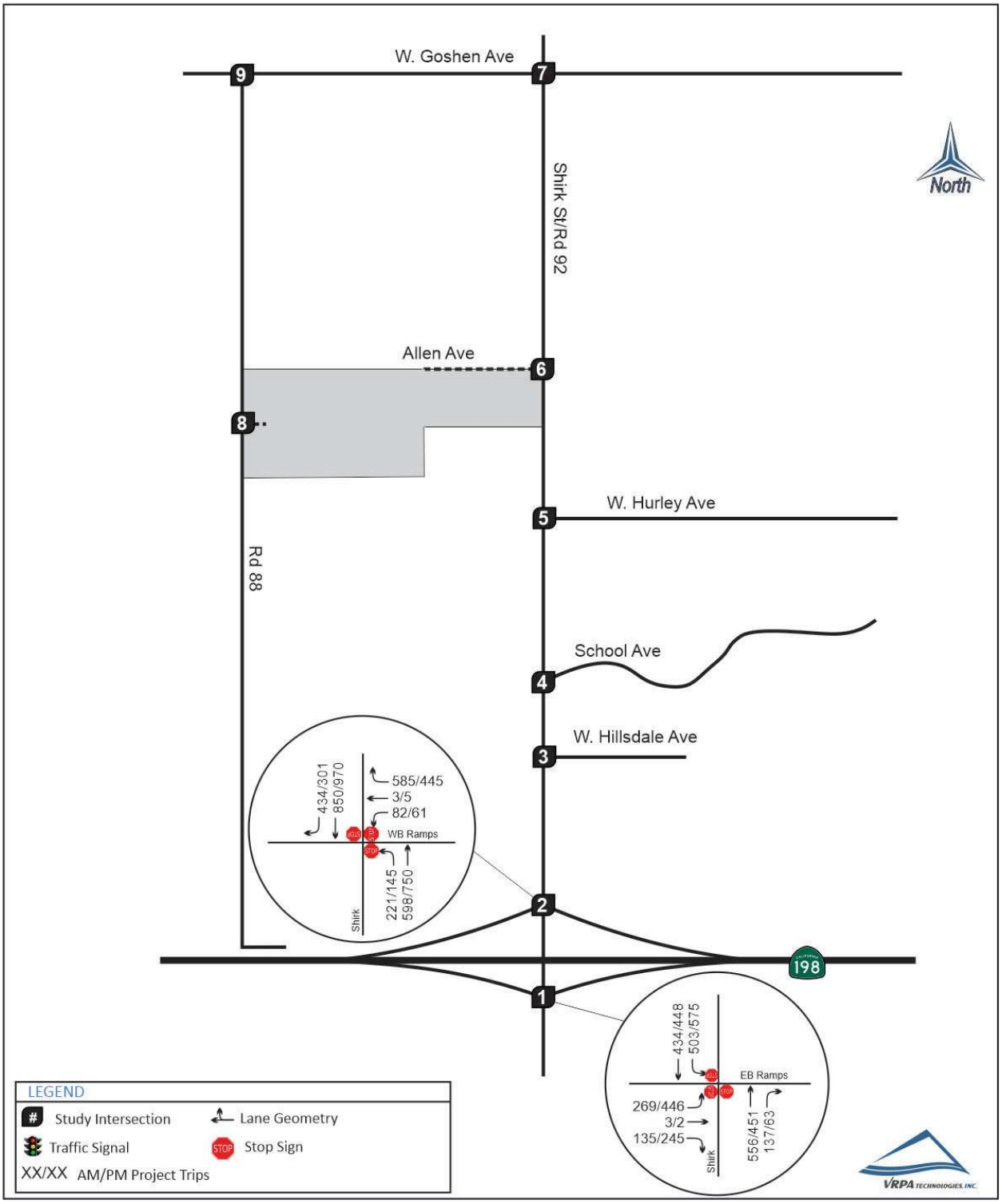
Iron Ridge Development
20-Year Horizon Without Project AM & PM Peak Hour Traffic

Figure 3-11



Iron Ridge Development
20-Year Horizon Plus Project AM & PM Peak Hour Traffic

Figure 3-12



3.8 Impacts

3.8.1 *Intersection Capacity Analysis*

Table 3-3 provides the intersection level of service analysis for the study intersections considering the study scenarios discussed above. Potential mitigation measures are discussed in Chapter 4 of this report. Results of the analysis show that the Project will contribute to an unacceptable LOS at four (4) of the study intersections when comparing the 5-Year Horizon scenarios.

3.8.2 *Queuing Analysis*

Table 3-4 provides a queue length summary for left and right turn lanes at the study intersections for Existing Conditions. Queuing analysis for City of Visalia intersections was completed using the queuing formulas presented in the City of Visalia "Procedures For Traffic Impact Analysis (TIA)", dated March 2021. Queuing analysis for Caltrans intersections was completed using Index 405.2 of the HDM. The queue presented in Table 3-4 represents the approximate queue lengths for the respective lane movements. Results of the queuing analysis show that several movements exceed the existing queue lane storage lengths. Chapter 4 of this report provides recommended storage lengths for study area intersections.

3.9 Project Access

Vehicular access to the site would be provided by Shirk Street, Allen Avenue (new road), and Road 88. The new roadway would be constructed to City standards and would be dedicated as public right of way. Project access at Road 88 would also be consistent with City standards and would meet adequate spacing requirements with respect to the existing driveway to the north. Shirk Street is classified as an arterial which includes restricted access along the corridor. The Project driveway at Shirk Street and Allen Avenue would be restricted to right-in and right-out access once a center median is installed. Results of the analysis presented in Table 3-3 indicates that the intersection will meet the City of Visalia's level of service criteria/standard. The Project Driveway located along Road 88 is also projected to meet the City's level of service criteria.

3.10 VMT Analysis

The VMT analysis was conducted according to the City of Visalia's VMT Thresholds and Implementation Guidelines (City of Visalia 2021).

For residential projects, VMT analysis is conducted by comparing the project's expected VMT/capita to regional averages. The Project's VMT impacts are considered to be less than significant if the Project's VMT per capita is 16% below regional averages (or lower). A model run of the Tulare Council of Governments (TCAG) regional travel demand model was used in making this calculation.

The City of Visalia's VMT Thresholds and Implementation Guidelines provide the following documentation for the selection of a significance threshold of VMT per capita 16% below the regional average:

"CARB establishes GHG targets for each of the 18 MPOs in the State, reviews the SCSs, and makes a determination of whether the SCSs would achieve GHG reduction targets if implemented. In the spring of 2018, CARB adopted new GHG targets for all the 18 MPOs in the State based on the 2017 Scoping Plan and other new data as illustrated in Figure 9. CARB established a 16 percent GHG reduction target for 2035 for the Tulare region. The State recognizes that Tulare County's contribution to the aggregate 15 percent statewide GHG emission reduction is 16 percent. Other regions may achieve lower reductions to achieve the aggregate statewide goal.4 As such, reduction in GHG directly corresponds to reduction in VMT. In order to reach the statewide GHG reduction goal of 15 percent, the Tulare region must reduce GHG by 16 percent. The method of reducing GHG by 16 percent is to reduce VMT by 16 percent as well.

Therefore, the City has established a threshold for land use developments, specifically residential and office, of exceeding 16 percent below the existing regional VMT per capita or VMT per employee as indicative of a significant environmental impact."

The results are as follows:

Project VMT/capita: 8.07

Regional VMT/capita: 11.7

The project's VMT/capita is 32.8% less than the regional average. Therefore, the project's VMT impacts are less than significant. A copy of the results of the model run is included in Appendix E.

Table 3-3
Intersection Operations

INTERSECTION	CONTROL	TARGET LOS	PEAK HOUR	OPENING YEAR WITHOUT PROJECT		OPENING YEAR PLUS PROJECT		5-YEAR HORIZON WITHOUT PROJECT		5-YEAR HORIZON PLUS PROJECT		10-YEAR HORIZON WITHOUT PROJECT		10-YEAR HORIZON PLUS PROJECT		20-YEAR HORIZON WITHOUT PROJECT		20-YEAR HORIZON PLUS PROJECT	
				DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
1. Shirk Street / SR 198 EB Ramps	All-Way Stop Sign	-- [1]	AM	20.1	C	24.1	C	25.6	D	32.8	D	**42.6**	**E**	**52.5**	**F**	**98.6**	**F**	**116.0**	**F**
			PM	26.2	D	34.8	D	27.7	D	**49.1**	**E**	**57.7**	**F**	**62.7**	**F**	**130.3**	**F**	**148.3**	**F**
2. Shirk Street / SR 198 WB Ramps	All-Way Stop Sign	-- [1]	AM	**64.7**	**F**	**95.1**	**F**	**96.3**	**F**	**127.0**	**F**	**138.4**	**F**	**169.9**	**F**	**239.8**	**F**	**275.0**	**F**
			PM	**83.0**	**F**	**117.4**	**F**	**115.4**	**F**	**156.7**	**F**	**173.6**	**F**	**218.4**	**F**	**309.5**	**F**	**354.3**	**F**
3. Shirk Street / Hillsdale Avenue	One-Way Stop Sign	D	AM	**92.4**	**F +**	**140.4**	**F +**	**157.9**	**F +**	**242.4**	**F +**								
			PM	**54.6**	**F +**	**79.0**	**F +**	**77.6**	**F +**	**121.9**	**F +**								
4. Shirk Street / School Avenue	One-Way Stop Sign	D	AM	**43.1**	**E +**	**54.3**	**F +**	**56.4**	**F +**	**74.5**	**F +**								
			PM	34.8	D	**44.6**	**E +**	**42.9**	**E +**	**56.4**	**F +**								
5. Shirk Street / Hurley Avenue	Signalized	D	AM	18.7	B	19.7	B	21.3	C	22.4	C								
			PM	10.0	B	11.3	B	10.7	B	12.1	B								
6. Shirk Street / Allen Avenue	One-Way Stop Sign	D	AM			16.6	C			18.1	C								
			PM			16.5	C			18.0	C								
7. Shirk Street / Goshen Avenue	Signalized	D	AM	40.0	D	41.1	D	44.3	D	46.6	D								
			PM	34.4	C	41.9	D	38.0	D	49.0	D								
8. Road 88 / Project Access	One-Way Stop Sign	D	AM			8.5	A			8.5	A								
			PM			8.5	A			8.5	A								
9. Road 88 / Goshen Avenue	One-Way Stop Sign	D	AM	17.8	C	17.8	C	19.1	C	19.3	C								
			PM	17.9	C	17.9	C	19.6	C	20.1	C								

DELAY is measured in seconds

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

For signalized and all-way stop intersections, delay results show the average for the entire intersection. For one-way and two-way stop controlled intersections, delay results show the delay for the worst movement.

1 - With the changes brought about by SB 743, Caltrans no longer uses level of service to determine the need for transportation improvements. Instead, the focus is on providing adequate facilities for pedestrians, bicycles, and transit as well as safety considerations for all transportation modes. Guidance is provided in the Transportation Impact Study Guide dated May 20, 2020 and the Interim Land Development and Intergovernmental Review Safety Review Practitioners Guidance dated July 2020. This guidance was used in determining the need for roadway improvements on Caltrans facilities.

+ Does not meet peak hour signal warrants. Provided for informational purposes only.

Table 3-4
Queuing Operations

INTERSECTION	EXISTING QUEUE STORAGE LENGTH (ft)		OPENING YEAR WITHOUT PROJECT		OPENING YEAR PLUS PROJECT		5-YEAR HORIZON WITHOUT PROJECT		5-YEAR HORIZON PLUS PROJECT		10-YEAR HORIZON WITHOUT PROJECT		10-YEAR HORIZON PLUS PROJECT		20-YEAR HORIZON WITHOUT PROJECT		20-YEAR HORIZON PLUS PROJECT	
			AM Queue	PM Queue	AM Queue	PM Queue	AM Queue	PM Queue	AM Queue	PM Queue	AM Queue	PM Queue	AM Queue	PM Queue	AM Queue	PM Queue	AM Queue	PM Queue
Shirk Street / SR 198 EB Ramps	NB Right	50	**73**	33	**73**	33	**80**	37	**80**	37	**91**	42	**91**	42	**114**	**53**	**114**	**53**
	SB Left	150	**251**	**291**	**303**	**323**	**273**	**319**	**322**	**352**	**304**	**361**	**353**	**393**	**370**	**447**	**419**	**479**
	EB Right	200	72	129	72	129	79	143	79	143	90	163	90	195	113	**204**	113	**204**
Shirk Street / SR 198 WB Ramps	NB Left	200	117	77	117	77	128	84	128	84	147	97	147	97	184	121	184	121
	SB Right	50	**227**	**152**	**248**	**167**	**247**	**166**	**269**	**180**	**278**	**187**	**299**	**201**	**340**	**229**	**362**	**251**
	WB Right	350	311	215	327	270	339	233	**356**	288	**383**	260	**398**	315	**472**	316	**488**	371
Shirk Street / Hillsdale Avenue	NB Right	100	43	78	43	78	46	83	46	83								
	WB Right	125	19	18	19	18	20	19	20	19								
Shirk Street / School Avenue	NB Right	225	13	22	13	22	14	23	14	23								
Shirk Street / Hurley Avenue	NB Right	250	117	106	117	106	128	117	128	117								
	SB Left	200	163	79	191	90	188	86	**207**	92								
	WB Left	275	**254**	67	**254**	67	**280**	73	**280**	73								
Shirk Street / Goshen Avenue	NB Left	250	**334**	118	**384**	**290**	**359**	127	**408**	**299**								
	NB Right	100	**155**	**115**	**155**	**115**	**171**	**127**	**171**	**127**								
	SB Left	50	48	**104**	48	**104**	**51**	**114**	**51**	**114**								
	SB Right	50	**83**	**57**	**83**	**57**	**89**	**61**	**89**	**61**								
	EB Left	275	51	77	60	83	54	83	64	89								
	WB Left	275	130	41	133	51	143	44	146	55								
	WB Right	250	74	48	74	48	82	51	85	51								
Road 88 / Goshen Avenue	EB Left	200	3	8	3	8	3	8	3	8								
	WB Left	200	72	30	73	36	73	31	74	37								

Queue is measured in feet / **BOLD** denotes exceedance

3.11 Impacts to Public Transit, Bicycle, and Pedestrian Facilities

The Project does not conflict with any applicable adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities. Visalia Transit (VT) operates 13 bus routes that serve Visalia, Farmersville, Exeter, Goshen, and Tulare. Implementation of the Project will not hinder the operation of Route 15 in the City of Visalia which runs along Shirk Street from SR 198 to north of Goshen Avenue.

The City of Visalia's Active Transportation Plan (ATP) identifies goals and objectives to improve conditions for people walking, bicycling, or using other mobility devices throughout the City of Visalia. The proposed Project will not prohibit walking or bicycling throughout the study area or within the Project boundaries. As shown in Figure 1-3, the Project includes the development of multi-use trails with exercise stations which coincides with the goals and objectives of the ATP. The Project will also include the development of sidewalks throughout the Project site.

As a result, the Project will not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

4.0 Mitigation

As discussed in Section 3.0 Impacts, the potentially significant impacts resulting from the Project relate to the generation of unacceptable LOS at various intersections in the long term. Considering the criteria provided in Section 1.3 and the results presented in Section 3.0, the following improvements are recommended to alleviate project-specific impacts.

4.1 Recommended Improvements

4.1.1 *Intersections*

✓ Shirk Street at SR 198 EB Ramps
Recommended improvements to achieve acceptable levels of service:

- 5-Year With Project and 10-Year With and Without Project Horizon scenarios:
  - Install Traffic Signal

- 20-Year With and Without Project Horizon scenarios:
  - Install Traffic Signal
  - Widen the eastbound approach to 1 left turn lane, 1 left-through lane, and 1 right turn lane (adding 1 left turn lane)

✓ Shirk Street at SR 198 WB Ramps
Recommended improvements to achieve acceptable levels of service:

- Opening Year With and Without Project, 5-Year With and Without Project, and 10-Year Without Project Horizon scenarios:
  - Install Traffic Signal

- 10-Year With Project and 20-Year With and Without Project Horizon scenarios:
  - Install Traffic Signal
  - Widen the westbound approach to 1 left-through lane and 2 right turn lanes (adding 1 right turn lane)

Caltrans District 6 prepared the SR 198 Corridor Study in September 2016 for TCAG and the City of Visalia. The SR 198 Corridor Study identified an L-9 interchange as the ultimate design for the Shirk Street at SR 198 interchange. The ultimate L-9 interchange would be developed over three (3) phases and includes the relocation of the SR 198 EB Ramp intersection to the south (approx. 250 ft) and four (4) lanes along Shirk Street at the interchange among other improvements.

✓ Shirk Street at Hillsdale Avenue
No improvements are recommended.

The intersection is forecasted to operate at unacceptable levels of service under the Existing (AM only), Opening Year, and 5-Year Horizon scenarios. However, this intersection does not meet the peak hour traffic signal warrant because the minor approach does not carry enough traffic to justify signalization. As noted in Section 1.2.1, the City of Visalia uses the California MUTCD Eight (8) Peak Hour Signal Warrant (Warrant 1) when evaluating the need for signalization at an intersection.

It should be noted that the City of Visalia proposes to widen Shirk Street from two to four lanes between a point approximately 750 feet north of the intersection of Shirk Road and State Route 198 and the North Mill Creek culvert, north of School Avenue. The Project is intended to improve traffic flow and safety and to accommodate existing development and future growth in the area.

✓ Shirk Street at School Avenue
No improvements are recommended.

The intersection is forecasted to operate at unacceptable levels of service under the Existing (AM only), Opening Year, and 5-Year Horizon scenarios. However, this intersection does not meet the peak hour traffic signal warrant because the minor approach does not carry enough traffic to justify signalization. It should be noted that installation of a traffic signal would alleviate level of service deficiencies at the intersection.

Post-Mitigation Level of Significance

The level of service resulting from the potential improvements identified above is shown in Table 4-1. Figure 4-1 graphically displays the recommended improvements. Table 4-2 identifies the recommended left turn and right turn lane pocket lengths for the 5-Year Horizon scenario. Although the need for extended turn lane pockets would occur at some locations prior to the 5-Year Horizon scenario, this scenario provides the maximum length needed and therefore these lengths would also provide for projected traffic volumes under the Opening Year scenario.

Table 4-1
Intersection Operations with Mitigation

INTERSECTION	TARGET LOS	PEAK HOUR	OPENING YEAR WITHOUT PROJECT		OPENING YEAR PLUS PROJECT		5-YEAR HORIZON WITHOUT PROJECT		5-YEAR HORIZON PLUS PROJECT		10-YEAR HORIZON WITHOUT PROJECT		10-YEAR HORIZON PLUS PROJECT		20-YEAR HORIZON WITHOUT PROJECT		20-YEAR HORIZON PLUS PROJECT	
			DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
1. Shirk Street / SR 198 EB Ramps	--[1]	AM							18.9	B	18.7	B	21.0	C	22.1	C	26.5	C
		PM							20.5	C	23.7	C	29.2	C	32.2	C	37.6	D
2. Shirk Street / SR 198 WB Ramps	--[1]	AM	23.1	C	26.5	C	27.9	C	36.5	D	39.2	D	23.0	C	47.8	D	50.1	D
		PM	12.9	B	15.6	B	14.5	B	18.5	B	22.0	C	17.0	B	26.5	C	37.5	D

DELAY is measured in seconds
LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded
For signalized and all-way stop intersections, delay results show the average for the entire intersection. For one-way and two-way stop controlled intersections, delay results show the delay for the worst movement.

1 - With the changes brought about by SB 743, Caltrans no longer uses level of service to determine the need for transportation improvements. Instead, the focus is on providing adequate facilities for pedestrians, bicycles, and transit as well as safety considerations for all transportation modes. Guidance is provided in the Transportation Impact Study Guide dated May 20, 2020 and the Interim Land Development and Intergovernmental Review Safety Review Practitioners Guidance dated July 2020. This guidance was used in determining the need for roadway improvements on Caltrans facilities.

Iron Ridge Development
Proposed Roadway Improvements

Figure 4-1

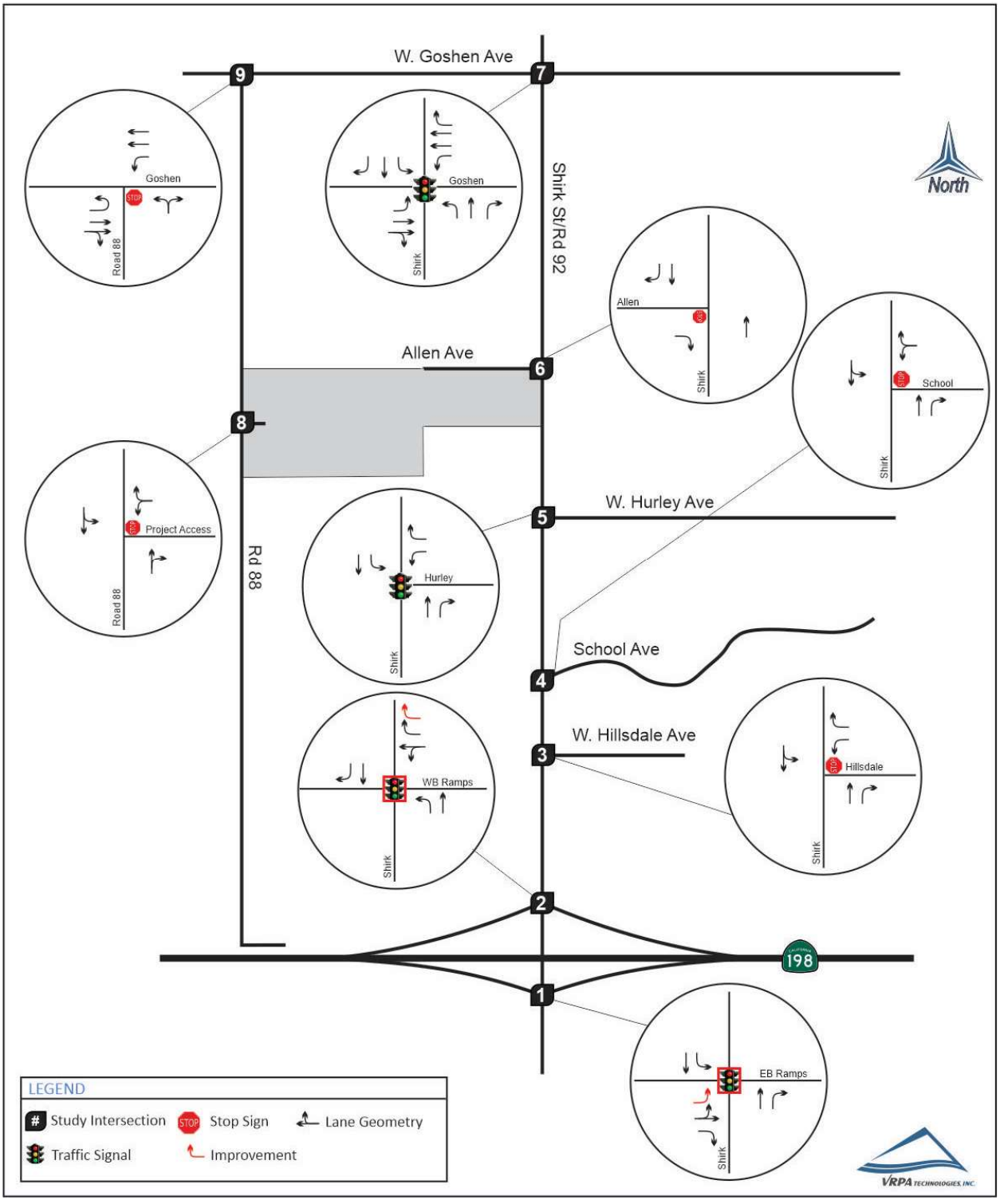


Table 4-2
Left Turn and Right Turn Storage Requirements

INTERSECTION	EXISTING QUEUE STORAGE LENGTH (ft)		5-YEAR HORIZON RECOMMENDED STORAGE LENGTH (ft)	
Shirk Street / SR 198 EB Ramps [1]	NB Right	50	NB Right	**75**
	SB Left	150	SB Left	150
	EB Right	200	EB Right	200
Shirk Street / SR 198 WB Ramps [1]	NB Left	200	NB Left	200
	SB Right	50	SB Right	**375**
	WB Right	350	WB Right	**2 @ 350**
Shirk Street / Hillsdale Avenue	NB Right	100	NB Right	100
	WB Right	125	WB Right	125
Shirk Street / School Avenue	NB Right	225	NB Right	225
Shirk Street / Hurley Avenue	NB Right	250	NB Right	250
	SB Left	200	SB Left	**225**
	WB Left	275	WB Left	**300**
Shirk Street / Goshen Avenue	NB Left	250	NB Left	**400**
	NB Right	100	NB Right	**175**
	SB Left	50	SB Left	**125**
	SB Right	50	SB Right	**100**
	EB Left	275	EB Left	275
	WB Left	275	WB Left	275
	WB Right	250	WB Right	250
Road 88 / Goshen Avenue	EB Left	200	EB Left	200
	WB Left	200	WB Left	200

BOLD denotes change in storage length

1: Based upon 20-Year Horizon Scenario

4.2 Project Percentage of Future Traffic

This section of the report provides analysis of the percentage of future traffic generated by the project at key study area locations. This information can be used in evaluating the need for improvements to be provided by the Project. The formulas used to calculate the Project percentage of future traffic to City of Visalia/Caltrans facilities is as follows:

Project Percentage of Future Traffic = (Project Trips)/(20-Year Horizon Plus Project Traffic – Existing Traffic)

Table 4-3 the Project percentage of future traffic to City of Visalia/Caltrans facilities as described above.

Table 4-3
20-Year Horizon Equitable Share Responsibility

INTERSECTION	PEAK HOUR	EXISTING	PROJECT TRIPS	20-YEAR HORIZON PLUS PROJECT	PROJECT PERCENTAGE
Shirk Street / SR 198 EB Ramps	AM	1,136	77	2,037	8.5%
	PM	1,275	79	2,230	8.3%
Shirk Street / SR 198 WB Ramps	AM	1,519	122	2,773	9.7%
	PM	1,446	164	2,677	13.3%
Shirk Street / Hillsdale Avenue [1]	AM	1,362	122	1,871	24.0%
	PM	1,349	164	1,872	31.4%
Shirk Street / School Avenue [1]	AM	1,304	122	1,765	26.5%
	PM	1,277	164	1,738	35.6%

1 - Provided for inormational purposes only and based on 5-Year Horizon

Implementation

Based on the results of the capacity analysis and mitigation analysis, improvements are recommended at the Shir Avenue intersections with the SR 198 Eastbound ramps and Shirk Avenue/SR 198 Westbound Ramps. Traffic signals as well as the additional lanes are expected to be needed. Implementation of this level of improvements is beyond the scale of the proposed Project and is recommended to be done by others.

It is recommended that the Project contribute to the City of Visalia's traffic impact fee program. Contribution of fees to this program will directly or indirectly contribute to the improvements described above as will as general roadway improvements in the City of Visalia.