The purpose of this EIR section is to identify impacts related to traffic operations and site access and recommend mitigation measures to avoid or minimize the significance of potential impacts. There was one written comment received during the public review period for the Notice of Preparation regarding this topic:

- A letter to Shasta County from Marcelino Gonzalez at Caltrans District 2 in Redding indicated that approval of the proposed project would not adversely impact facilities under the jurisdiction of Caltrans.
- A letter to Shasta County from Daniel Kevin at the California Public Utilities Commission indicated that the EIR should discuss traffic safety at the rail crossing locating at the intersection of Ox Yoke Road and Riverside Avenue.

Information in this section is derived primarily from the *Cogeneration Plant Expansion at Anderson SPI Facility Traffic Impact Study*, prepared by Omni-Means, February 25, 2008, revised April 16, 2010. (Attached as **Appendix G**) This report was professionally peer reviewed by Mike Aronson, P.E., a Principal with the traffic engineering firm, Dowling Associates in August 2009 and again in April 2010.

3.10.1 ENVIRONMENTAL SETTING

PROJECT LOCATION

The project site is located on a 121.39-acre parcel (APNs: 050-110-023 and 050-110-025) at the end of Riverside Avenue, approximately five-tenths of a mile west of the Interstate 5 Interchange. The northeastern border of the project site is adjacent to the Sacramento River. The southwestern border of the project site is adjacent to State Route (SR) 273 and a Union Pacific Railroad line. The northwestern border of the project site is adjacent to undeveloped industrial land. The southeastern border of the project site is adjacent to Spring Gulch Creek. Anderson Cottonwood Irrigation District (ACID) Canal Overflow ditch. The project site is accessed from Riverside Avenue.

STUDY AREA ROADWAYS AND INTERSECTIONS

Regional access to the study area is provided by I-5 and SR 273, while local access to the project site is provided via Riverside Avenue. The roadways and intersections in the study area are described below and their locations in relation to the project site are shown on Figure 3.10-1.

Study Roadways

Riverside Avenue is a two-lane arterial street that begins at North Street and extends to the west until it becomes Ox Yoke Road.

Study Intersections

1. ***Ox Yoke Road/Riverside Avenue*** is a two-way stop-controlled intersection.

2. ***I-5 Southbound (SB) Ramps/Riverside Avenue*** is a two-way stop-controlled intersection.

3. ***I-5 NB Ramps/Riverside Avenue*** is a two-way stop-controlled intersection.

Existing Freight Rail

The project site is accessed by a freight rail line that is primarily used to ship finished lumber products from the existing SPI facility to local and regional distribution centers. The freight rail line approaches the project site by running parallel to SR 273, and then turning in a northeasterly direction to run parallel to the southeastern boundary of the SPI property.

3.10.2 ANALYSIS METHODS

The operational performance of a roadway network is commonly described with the term "level of service" or "LOS". LOS is a qualitative description of operating conditions, ranging from LOS A (free-flow traffic conditions with little or no delay) to LOS F (oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). The LOS analysis methods outlined in the *Highway Capacity Manual* (HCH) (Transportation Research Board, 2000) were used in this study. The HCM methods for calculating LOS for signalized intersections are described below.

Signalized Intersections

Traffic operations at signalized intersections are evaluated using the LOS method described in Chapter 16 of the 2000 *Highway Capacity Manual*. A signalized intersection's LOS is based on the weighted average control delay measured in seconds per vehicle. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration. Table 3.10-1 summarizes the relationship between the control delay and LOS for signalized intersections.

TABLE 3.10-1: SIGNALIZED INTERSECTION LOS CRITERIA

LEVEL OF SERVICE	DESCRIPTION	AVERAGE CONTROL DELAY (SECONDS)
A	Operations with very low delay occurring with favorable traffic signal progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55.0 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

Unsignalized Intersections

In Chapter 17 of the Transportation Research Board's 2000 *Highway Capacity Manual*, the LOS for unsignalized intersections (side-street or all-way stop controlled intersections) is also defined by the average control delay per vehicle (measured in seconds). The control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. For side-street stop-controlled intersections, delay is calculated separately for each stop-controlled movement and for the uncontrolled left turns, if any, from the main street. The intersection average delay is reported for all-way stop intersections. Table 3.10-2 summarizes the relationship between delay and LOS for unsignalized intersections. The delay ranges for unsignalized intersections are lower than for signalized intersections as drivers expect less delay at unsignalized intersections.

TABLE 3.10-2 UNSIGNALIZED INTERSECTION LOS CRITERIA

LEVEL OF SERVICE	DESCRIPTION	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)
A	Little or no delays	≤ 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded	> 50.0

Source: *Highway Capacity Manual* (Transportation Research Board, 2000).

Signal Warrants

Traffic signal warrants are standards that provide guidelines in the determination of the need for a traffic signal. A traffic signal should not be installed if no warrants are met, since the installation of traffic signals may increase delays for the majority of through traffic and increase some types of accidents. If one or more warrants are met, a signal may be appropriate.

The unsignalized intersections were analyzed to determine whether or not the projected traffic volumes and operations would meet Signal Warrants according to the California Manual of Uniform Traffic Control Devices (FHWA's MUTCD 2003 Revision 1, as amended for use in California), Chapter 4C – Traffic Control Signal Needs Studies (September 26, 2006). The analysis is based on Warrant 3, Peak Hour. Warrant 3 includes both Part A and Part B.

For Part A of Warrant 3, the Peak Hour Delay Warrant is met if all three of the following conditions are determined:

1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: four vehicle-hours for a one-lane approach; or five vehicle-hours for a two-lane approach, and
2. The volume of the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

For Part B of Warrant 3, the warrant tests the peak hour volumes as a function of the number of approach lanes for both the minor and major street approaches. The Peak Hour Volume Warrant

is met if the minor street volumes are sufficiently high enough to fall on or above the lines on the appropriate graph in the manuals (Figures 4C-3 and 4C-4).

The peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume-based signal warrants (such as the 4-hour or 8-hour warrants). The peak hour warrant analysis is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction using actual observed traffic volumes. Consideration of the other signal warrants may yield different results.

ANALYSIS SCENARIOS

Included in this section is a description of the existing transportation setting and an analysis and discussion of the following items:

- Analysis of the existing transportation setting with the development of the proposed project.
- The projected cumulative year (2030) peak hour intersection operations with and without the development of the proposed project.

The following traffic scenarios are analyzed within this section:

- Existing Conditions
- Existing Plus Project Conditions
- Cumulative No Project Conditions
- Cumulative Plus Project Conditions

Existing conditions describes the existing transportation facilities serving the project site, and the traffic operations which currently exist for those facilities.

Cumulative conditions are assumed as those which will exist in the year 2030. The *Cumulative* condition investigates projected traffic operations in 2030, but excluding development of the proposed project. The *Cumulative Plus Project* condition is the analysis scenario in which traffic impacts associated with the proposed project are investigated in comparison to the *Cumulative* condition scenario.

EXISTING DATA COLLECTION

Existing traffic counts were obtained from data collected by OMNI-MEANS for the Shasta County Regional Transportation Planning Agency (RTPA) *Ox Yoke Road/Riverside Avenue Corridor Study and Traffic Impact Fee Program Updated Working Paper #1, August 24, 2007*. The AM peak hour is defined as the one-hour of peak traffic flow (which is the highest total volume count over four consecutive 15-minute count periods) counted between 7:00 AM and 9:00 AM on a typical

weekday. The PM peak hour is defined as the one-hour of peak traffic flow counted between 4:00 PM and 6:00 PM on a typical weekday.

TECHNICAL ANALYSIS PARAMETERS

This traffic analysis incorporates heavy vehicle adjustment factors, peak hour factors, and signal lost-time factors and reports the resulting intersection delays and LOS as estimated using HCM-2000 based analysis methodologies. Appropriate Peak Hour Factors (PHF) were applied in the analysis of all study intersections under all analysis scenarios in this study. The HCM-2000 analysis methodologies are implemented using the simulation software *Synchro 6* developed by Trafficware.

EXISTING INTERSECTION OPERATIONS

Existing operations were evaluated for the weekday AM and PM peak hours at the study intersections. Intersection traffic operations were quantified utilizing the existing traffic volumes, as shown in Figure 3.10-1, and the existing intersection lane geometrics and control, also shown in Figure 3.10-1. Table 3.10-3 summarizes the intersection analysis results.

TABLE 3.10-3: EXISTING CONDITIONS, INTERSECTION LEVELS OF SERVICE

			AM PEAK HOUR			PM PEAK HOUR		
INTERSECTION		CONTROL	DELAY (SEC/VEH)	LOS	WARRANT MET?	DELAY (SEC/VEH)	LOS	WARRANT MET?
1.	Ox Yoke Rd./Riverside Ave.	TWSC	14.6	B	No	19.0	C	No
2.	I-5 SB Ramps/Riverside Ave.	TWSC	15.3	C	No	52.2	**F**	**Yes**
3.	I-5 NB Ramps/Riverside Ave.	TWSC	32.1	**D**	No	25.4	**D**	No

Note: Results in **bold** represent unacceptable levels of service.
TWSC- Two Way Stop Control Intersection
LOS- Minor Street Approach Level of Service for TWSC intersections
Delay- Minor Street Approach Delay for TWSC intersections
Warrant- MUTCD Peak Hour Warrant-3
Source: OMNI-MEANS, 2008.

As shown in Table 3.10-3, the following study intersections will operate at unacceptable LOS conditions under existing (no project) conditions:

I-5 SB Ramps/Riverside Ave: This two-way stop-controlled intersection is found to operate at unacceptable LOS during the PM peak hour under Existing Conditions. This unacceptable LOS is found to be caused by the delay experienced by vehicles exiting I-5 that are waiting to find gaps in the uncontrolled traffic flow on Riverside Avenue. This intersection is found to meet the peak hour volume signal warrant under the peak hour conditions.

I-5 NB Ramps/Riverside Ave: This two-way stop-controlled intersection is found to operate at unacceptable LOS during both the AM and PM peak hours under Existing Conditions. This

unacceptable LOS is caused by the delay experienced by vehicles exiting I-5 that are waiting to find gaps in the uncontrolled traffic flow on Riverside Avenue. This intersection is not found to meet the peak hour volume signal warrant under either AM or PM peak hour conditions.

3.10.3 PROJECT CHARACTERISTICS

TRIP GENERATION AND DISTRIBUTION

The proposed project will require an additional 23 truck trips per day to deliver additional fuel to the facility. It is expected that between two (2) and three (3) trucks will be used on a daily basis to supply the additional biomass needed for the proposed project. In addition to the increased fuel needs, the proposed project will require six (6) additional employees split between rotating shifts. Table 3.10-4 is a summary of the traffic that is assumed to be generated by the project during the AM and PM peak hours.

TABLE 3.10-4: PROPOSED PROJECT TRIP GENERATION

PEAK HOUR	TRUCKS ENTERING	TRUCKS DEPARTING	PASSENGER CARS ENTERING	PASSENGER CARS DEPARTING
AM	3	3	3	3
PM	3	3	3	3

Source: *OMNI-MEANS, 2008*

The assumed project trip generation in Table 3.10-4 is a conservative estimate. It assumes that all three delivery trucks enter and leave the facility both in the AM and PM peak hours. In reality, these trips will be distributed throughout the day. It also assumes that each additional employee will generate an additional trip entering (3 going to work) and departing (3 leaving work) the facility in the peak hours. Based on information contained in the Institute of Transportation Engineers (ITE) Publication *Trip Generation (Seventh Edition),* for General Heavy Industrial (ITE Code 120) there is not a one to one ratio between number of employees and trips generated in the peak hours. On average, each employee at industrial uses generates less than one peak hour trip both in the AM and PM peak hours.

This analysis assumes that all of the additional fuel will be supplied by the SPI facility in the City of Shasta Lake. This assumption will burden the I-5/Riverside Ave interchange to the greatest degree; therefore creating a "worst case scenario". The additional employee trips are assumed to originate from the Redding area since it is the largest residential area in the vicinity of the project site. For a "worst case scenario", the employee trips were assumed to utilize Interstate 5 and Riverside Avenue.

3.10.4 REGULATORY SETTING

As described previously, LOS is a measure of the level of congestion ranging from LOS A to LOS F. Most cities and counties in California have established LOS standards of significance for

intersections and other roadway facilities within their limits. Caltrans also has LOS standards for their facilities. The applicable county and Caltrans policies for this analysis are described in this section.

Shasta County General Plan

Overall County Transportation Goal

Shasta County shall strive to develop a balanced, integrated, and diversified transportation system that addresses the regional needs (both urban and rural) of its citizens for a convenient, affordable, safe, and efficient multimodal transportation system to move goods and people.

Policies

Policy C-6d: New commercial and industrial development accessing arterial and collectors shall provide access controls for public safety by means such as limiting the location and number of driveway access points and controlling ingress and egress turning movements.

Policy C-6e: Discretionary uses located in areas designated Mixed Use (MU), Commercial (C), or Industrial (I) shall be served by a paved road. The County shall obtain street right-of-way dedications with the approval of subdivisions, use permits, and other discretionary actions. All other non-residential discretionary uses not located in a General Plan area described above, excepting resource designations, shall ultimately be served by a paved road, unless deferred or waived, based on traffic generation factors.

Policy C-6h: Development adjacent to arterial and collectors should be designed to minimize the noise impact received from traffic. The circulation system shall also be designed with consideration given to minimizing noise impacts on adjacent development.

Policy C-6l New development which may result in exceeding LOS E on existing facilities shall demonstrate that all feasible methods of reducing travel demand have been attempted to reach LOS C. New development shall not be approved unless traffic impacts are adequately mitigated. Such mitigation may take the form of, but not limited to, the following:

- provision of capacity improvements to the specific road link to be impacted, the transit system, or any reasonable combination;
- provision of demand reduction measures included as part of the project design or project operation or any feasible combination.

Caltrans

According to Caltrans' *Guide for the Preparation of Traffic Impact Studies,* Caltrans attempts to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities. In areas where the LOS C or D standard is not feasible, the lead agency in that area should consult with Caltrans to determine the appropriate LOS target. For existing State highway facilities that operate at a less than appropriate target service level, the existing measure of effectiveness (i.e. density for freeways) should be maintained.

3.10.5 IMPACTS AND MITIGATION MEASURES

LOS Threshold

Shasta County uses LOS "E" as the threshold for determining whether or not project traffic impacts on existing facilities requires mitigation. If mitigation is required, LOS "C" would be the desired post project roadway operational performance condition. The City of Anderson uses LOS "D". Project traffic impacts would likely affect roadway operational performance across jurisdictional boundaries. Therefore, LOS "D" will be utilized because evaluating project impacts at this level of service would ensure acceptable roadway operational performance across jurisdictions. Base improvements and project-related mitigation measures will be recommended for all instances where appropriate LOS standards are not met.

SIGNIFICANCE THRESHOLD

In accordance with current industry practice, the following thresholds of significance are used to determine if an impact is significant and requires mitigation:

A) Signalized Intersections: The project is considered to have a significant effect if it would:

- Result in a signalized intersection currently operating at an acceptable LOS to deteriorate to an unacceptable LOS; or
- Increase the delay by more than 5 seconds at a signalized intersection that is/will operate at an unacceptable level without the project.

B) Unsignalized Intersections: The project is considered to have a significant effect if it would:

- Result in an unsignalized intersection movement/approach currently operating at an acceptable LOS to deteriorate to an unacceptable LOS, and also cause the intersection to meet the peak hour signal warrant; or
- For an unsignalized intersection that meets the peak hour signal warrant, increase the delay by more than 5 seconds at a movement/approach that is operating at an unacceptable LOS without the project.

C) Creates a significant impact on local streets based on the standards set out in the County's General Plan policies or Subdivision Ordinance, or based on other established standards, which, in the consultant's professional judgment, should be applied.

D) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

E) Substantially increase hazards due to a design feature (e.g., sharp curves, or dangerous intersections) or incompatible uses (e.g., farm equipment).

F) Result in inadequate emergency access.

G) Result in inadequate parking capacity.

H) Conflict with adopted polices, plans or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

The analysis presented in the Initial Study/Notice of Preparation prepared by the County determined that items D through H, as listed above, would result in either a less than significant impact or no impact as a result of project implementation. Therefore, these items are not addressed further in this Draft EIR.

IMPACTS AND MITIGATION MEASURES

Impact 3.10-1: Project implementation could result in unacceptable levels of service at study area intersections under Existing Plus Project Conditions (Less than Significant)

Existing Plus Project AM and PM peak hour intersection traffic operations have been quantified utilizing the existing traffic volumes (shown in Figure 3.10-1) plus the project-generated trips in Table 3.10-4, and the existing intersection lane geometrics and controls (shown in Figure 3.10-1). Table 3.10-5 contains a summary of the Existing Plus Project intersection LOS conditions.

TABLE 3.10-5: EXISTING PLUS PROJECT CONDITIONS, INTERSECTION LEVELS OF SERVICE

			AM PEAK HOUR			PM PEAK HOUR		
Intersection		Control	Delay (sec/veh)	LOS	Warrant Met?	Delay (sec/veh)	LOS	Warrant Met?
1.	Ox Yoke Rd./Riverside Ave.	TWSC	15.0	B	No	19.6	C	No
2.	I-5 SB Ramps/Riverside Ave.	TWSC	15.4	C	No	53.1	**F**	**Yes**
3.	I-5 NB Ramps/Riverside Ave.	TWSC	32.4	**D**	No	25.6	D	No

Note: Results in **bold** represent unacceptable levels of service.
TWSC- Two Way Stop Control Intersection
LOS- Minor Street Approach Level of Service for TWSC intersections
Delay- Minor Street Approach Delay for TWSC intersections
Warrant- MUTCD Peak Hour Warrant-3
Source: OMNI-MEANS, 2008.

Ox Yoke Road/Riverside Avenue: As shown in Table 3.10-5, the intersection of Ox Yoke Road/Riverside Avenue would continue to operate at an acceptable LOS (LOS B and LOS C) during the AM and PM peak hour periods with the addition of traffic generated by the proposed project. This is a **less than significant** impact, and no mitigation is required.

I-5 SB Ramps/Riverside Avenue: As shown in Table 3.10-5, the intersection of I-5 SB Ramps/Riverside Avenue would operate at an acceptable LOS (LOS C) during the AM peak hour

with the addition of traffic generated by the proposed project, and an unacceptable LOS (LOS F) during the PM peak hour with the addition of traffic generated by the proposed project. As shown in Table 3.10-3, this intersection is currently operating at an unacceptable LOS during the PM peak hour under Existing Conditions, with an LOS F and a maximum delay of 52.2 seconds per vehicle. With the addition of project generated traffic, the PM peak hour LOS would remain LOS F, and the maximum vehicle delay would increase to 53.1 seconds, which is an increase of 0.9 seconds as a result of the addition of project generated traffic. This increase in delay is below the threshold of five (5) seconds, which is used to determine whether or not a significant impact would occur. Because the increase in delay as a result of project generated traffic is less than five seconds, this impact is considered to be **less than significant**.

I-5 NB Ramps/Riverside Avenue: As shown in Table 3.10-5, the intersection of I-5 NB Ramps/Riverside Avenue would operate at an acceptable LOS during both the AM and PM peak hour periods with the addition of traffic generated by the proposed project (LOS D). As shown in Table 3.10-3, this intersection is currently operating at an acceptable LOS under Existing Conditions during both the AM and PM peak hours. The AM peak hour LOS is currently LOS D, with a maximum delay of 32.1 seconds per vehicle, and the PM peak hour LOS is currently LOS D with a maximum delay of 25.4 seconds per vehicle. As shown in Table 3.10-5, with the addition of project generated traffic, the AM peak hour LOS would remain LOS D, and the maximum vehicle delay would increase to 32.4 seconds, which is an increase of 0.3 seconds as a result of the addition of project generated traffic. As shown in Table 3.10-5, with the addition of project generated traffic, the PM peak hour LOS would remain LOS D, and the maximum vehicle delay would increase to 25.6 seconds, which is an increase of 0.2 seconds as a result of the addition of project generated traffic. These increases in delay are below the threshold of five (5) seconds, which is used to determine whether or not a significant impact would occur. Because the increase in delay as a result of project generated traffic is less than five seconds, this impact is considered to be **less than significant**.

The project would result in **less than significant** impacts to study area intersections in Existing Plus Project conditions, and no mitigation is required.

Impact 3.10-2: Project implementation would result in unacceptable levels of service at study area intersections under Cumulative Plus Project Conditions (Significant and Unavoidable)

CUMULATIVE CONDITIONS

Cumulative Conditions refer to analysis scenarios that would exist following assumed build out of the local General Plans, and typically refer to analysis scenarios approximately 20 years in the future. Within this analysis, Cumulative Conditions are assumed as those that will exist in the year 2030 consistent with the Shasta County Regional Travel Demand Model. Cumulative No Project Conditions assume that the proposed project would not be implemented. Cumulative Plus Project Conditions were then simulated by superimposing the proposed project-generated traffic on top of the Cumulative No Project traffic volumes. Lane configurations and cumulative traffic volumes are shown in Figure 3.10-1. Table 3.10-6 contains a summary of the Cumulative conditions (without the proposed project) peak hour intersection levels of service.

TABLE 3.10-6: CUMULATIVE (NO PROJECT) CONDITIONS, INTERSECTION LEVELS OF SERVICE

			AM PEAK HOUR			PM PEAK HOUR		
Intersection		Control	Delay (sec/veh)	LOS	Warrant Met?	Delay (sec/veh)	LOS	Warrant Met?
1.	Ox Yoke Rd./Riverside Ave.	TWSC	27.4	D	No	48.0	**E**	**Yes**
2.	I-5 SB Ramps/Riverside Ave.	TWSC	OVR	**F**	**Yes**	OVR	**F**	**Yes**
3.	I-5 NB Ramps/Riverside Ave.	TWSC	OVR	**F**	**Yes**	OVR	**F**	**Yes**

Note: Results in **bold** represent unacceptable levels of service.
TWSC- Two Way Stop Control Intersection
LOS- Minor Street Approach Level of Service for TWSC intersections
Delay- Minor Street Approach Delay for TWSC intersections
Warrant- MUTCD Peak Hour Warrant-3
OVR- Represents "overflow" conditions, where reported delay is greater than 999 seconds.
Source: OMNI-MEANS, 2010.

As shown in Table 3.10-6, the following intersections would operate at unacceptable LOS conditions under cumulative conditions, without the addition of project generated traffic:

Ox Yoke Road/Riverside Avenue: This two-way stop controlled unsignalized intersection would operate at unacceptable LOS during the PM peak hour period under Cumulative conditions. This unacceptable LOS would be caused by the delay experienced by vehicles on Riverside Avenue that are waiting to find gaps in the uncontrolled traffic flow on Riverside Avenue/Ox Yoke Road. This intersection would meet the peak hour signal warrant under the PM peak hour condition.

I-5 SB Ramps/Riverside Avenue: This two-way stop controlled unsignalized intersection would operate at unacceptable LOS during both the AM and PM peak hour periods under Cumulative conditions. This unacceptable LOS would be caused by the delay experienced by vehicles existing

I-5 that are waiting to find gaps in the uncontrolled traffic flow on Riverside Avenue. This intersection would meet the peak hour volume signal warrant under the AM and PM peak hour conditions.

I-5 NB Ramps/Riverside Avenue: This two-way stop controlled unsignalized intersection would operate at unacceptable LOS during both the AM and PM peak hour period under Cumulative conditions. This unacceptable LOS would be caused by the delay experienced by vehicles existing I-5 that are waiting to find gaps in the uncontrolled traffic flow on Riverside Avenue. This intersection would meet the peak hour volume signal warrant under the AM and PM peak hour conditions.

CUMULATIVE PLUS PROJECT CONDITIONS

Cumulative Plus Project AM and PM peak hour intersection traffic operations have been quantified utilizing the Cumulative traffic volumes described in Table 3.10-6, plus the project trips shown in Table 3.10-4, and the existing intersection lane geometrics and controls shown in Figure 3.10-1. Table 3.10-7 contains a summary of Cumulative Plus Project intersection LOS conditions.

TABLE 3.10-7: CUMULATIVE PLUS PROJECT CONDITIONS, INTERSECTION LEVELS OF SERVICE

			AM PEAK HOUR			PM PEAK HOUR		
Intersection		Control	Delay (sec/veh)	LOS	Warrant Met?	Delay (sec/veh)	LOS	Warrant Met?
1.	Ox Yoke Rd./Riverside Ave.	TWSC	28.8	D	No	52.3	**F**	**Yes**
2.	I-5 SB Ramps/Riverside Ave.	TWSC	OVR	**F**	**Yes**	OVR	**F**	**Yes**
3.	I-5 NB Ramps/Riverside Ave.	TWSC	OVR	**F**	**Yes**	OVR	**F**	**Yes**

Note: Results in **bold** represent unacceptable levels of service.
TWSC- Two Way Stop Control Intersection
LOS- Minor Street Approach Level of Service for TWSC intersections
Delay- Minor Street Approach Delay for TWSC intersections
Warrant- MUTCD Peak Hour Warrant-3
OVR- Represents "overflow" conditions, where reported delay is greater than 999 seconds.
Source: OMNI-MEANS, 2010.

As shown in Table 3.10-7, the following study intersections would operate at unacceptable LOS conditions:

Ox Yoke Road/Riverside Avenue: As shown in Table 3.10-7, the intersection of Ox Yoke Road/Riverside Avenue would continue to operate at an acceptable LOS (LOS D) under AM peak hour periods, and an unacceptable LOS under PM peak hour periods with the addition of traffic generated by the proposed project (LOS D and F, respectively). As shown in Table 3.10-6, this intersection, under Cumulative No Project Conditions, would operate at an unacceptable LOS during both the AM and PM peak hours. The AM peak hour LOS under Cumulative No Project

conditions would be LOS D, with a maximum delay of 27.4 seconds per vehicle, and the PM peak hour would be LOS F with a maximum delay of 48.0 seconds per vehicle. As shown in Table 3.10-7, with the addition of project generated traffic, under Cumulative Plus Project conditions, the AM peak hour LOS would remain LOS D, and the maximum vehicle delay would increase to 28.8 seconds, which is an increase of 1.4 seconds as a result of the addition of project generated traffic. As shown in Table 3.10-7, with the addition of project generated traffic, under Cumulative Plus Project conditions, the PM peak hour LOS would degrade to LOS F, and the maximum vehicle delay would increase to 52.3 seconds, which is an increase of 4.3 seconds as a result of the addition of project generated traffic. These increases in delay are below the threshold of five (5) seconds, which is used to determine whether or not a significant impact would occur. Because the increase in delay as a result of project generated traffic is less than five seconds, this impact is considered to be **less than cumulatively considerable**.

I-5 SB Ramps/Riverside Avenue: This two-way stop controlled unsignalized intersection would operate at unacceptable LOS during both the AM and PM peak hour periods under Cumulative Plus Project conditions. This unacceptable LOS would be caused by the delay experienced by vehicles exiting I-5 that are waiting to find gaps in the uncontrolled traffic flow on Riverside Avenue. This intersection would meet the peak hour signal warrant volume under both AM and PM peak hour conditions. The addition of project generated traffic would increase the delay at this intersection by more than 5 seconds (the delay was reported as overflow, because calculated delay is over 999 seconds) under AM and PM peak hour periods. This is considered a **potentially significant** impact.

I-5 NB Ramps/Riverside Avenue: This two-way stop controlled unsignalized intersection would operate at unacceptable LOS during both the AM and PM peak hour periods under Cumulative Plus Project conditions. This unacceptable LOS would be caused by the delay experienced by vehicles exiting I-5 that are waiting to find gaps in the uncontrolled traffic flow on Riverside Avenue. This intersection would meet the peak hour signal warrant volume under both AM and PM peak hour conditions. The addition of project generated traffic would increase the delay at this intersection by more than 5 seconds (the delay was reported as overflow, because calculated delay is over 999 seconds) under AM and PM peak hour periods. This is considered a **potentially significant** impact.

MITIGATION MEASURES

Mitigation Measure 3.10-1*: The following improvements to the intersection of I-5 SB Ramps/Riverside Avenue would improve intersection operations to acceptable levels under Cumulative Plus Project conditions:*

- *Install Actuated-Coordinated Signal (coordinate with I-5 NB Ramps/Riverside Avenue intersection);*
- *Widen eastbound approach to construct a dedicated right-turn pocket; and*
- *Widen southbound approach to construct a free-right "channelized" right-turn pocket with appropriate westbound receiving lane.*

Shasta County, in consultation with the County RTPA shall determine the applicant's fair share fee based on the traffic generated by the proposed project. The project applicant shall pay fees for project impacts, under cumulative conditions, to the intersections of I-5 SB Ramps/Riverside Ave. The project would contribute approximately 1.0 percent of the total cumulative traffic volumes at this intersection.

***Mitigation Measure 3.10-2**: The following improvements to the intersection of I-5 NB Ramps/Riverside Avenue would improve intersection operations to acceptable levels under Cumulative Plus Project conditions:*

Shasta County, in consultation with the County RTPA shall determine the applicant's fair share fee based on the traffic generated by the proposed project. The project applicant shall pay fees for project impacts, under cumulative conditions, to the intersections of I-5 NB Ramps/Riverside Ave. The project would contribute approximately 0.5 percent of the total cumulative traffic volumes at each of these intersections. The project would contribute approximately 0.5 percent of the total cumulative traffic volumes at this intersection.

SIGNIFICANCE AFTER MITIGATION

As shown in Table 3.10-8, construction of the improvements described in the mitigation measures above would result in acceptable LOS operations during Cumulative Plus Project conditions.

TABLE 3.10-8: CUMULATIVE PLUS PROJECT CONDITIONS, MITIGATED INTERSECTION LEVELS OF SERVICE

			AM PEAK HOUR			PM PEAK HOUR		
Intersection		Control	Delay (sec/veh)	LOS		Delay (sec/veh)	LOS	
2.	I-5 SB Ramps/Riverside Ave.	Signal	10.2	B		24.4	C	
3.	I-5 NB Ramps/Riverside Ave.	Signal	19.9	B		18.3	B	

Note: LOS- Average LOS for all approaches at signalized intersections
Delay- Average delay for all approaches at signalized intersections
Source: OMNI-MEANS, 2010.

Implementation of the improvements identified above would require approval from Caltrans, as the facilities in question are under Caltrans' jurisdiction. Shasta County, which is the lead agency for this EIR, cannot guarantee that these improvements will ultimately be constructed, even if fair-share fee payments are collected from the project applicant. Additionally, the improvements identified above are not currently part of a funded traffic improvement program being implemented by Caltrans. Due to the current and projected lack of total funding for these improvements, combined with the fact that Shasta County cannot ensure that these improvements will be implemented, this is considered to be a **cumulatively considerable and significant and unavoidable** impact.

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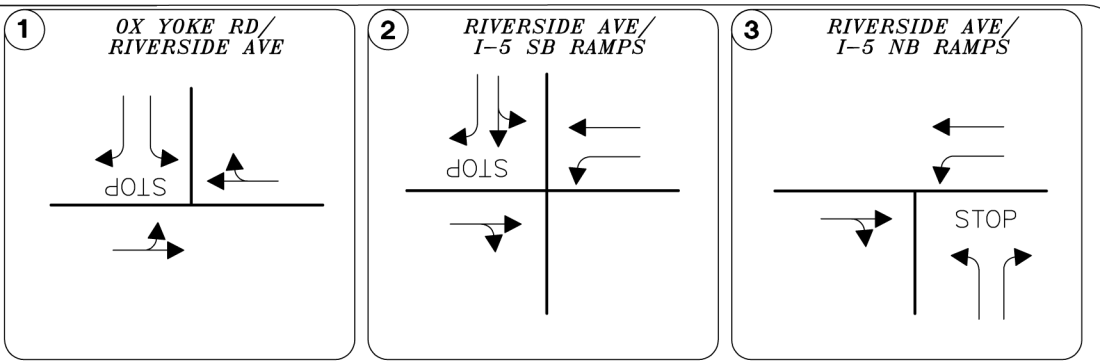
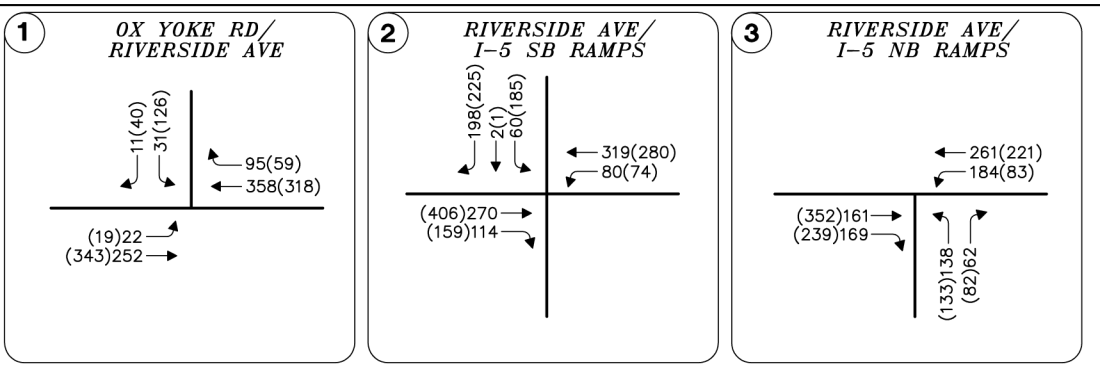
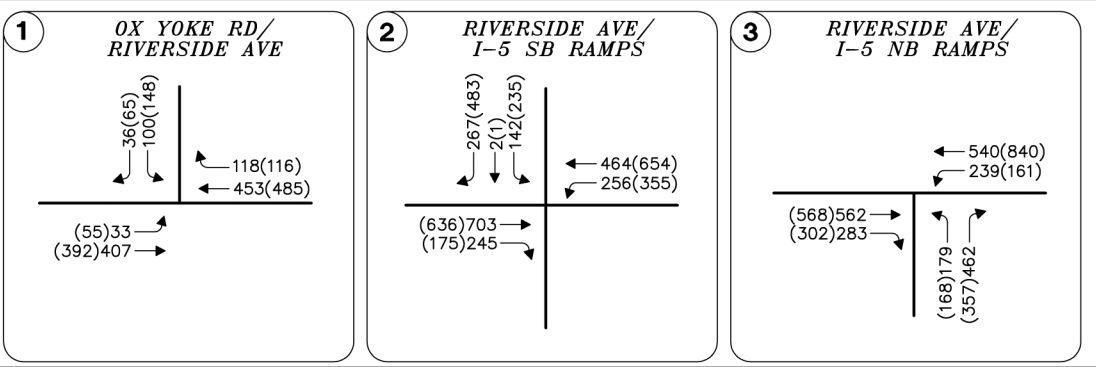
LANE GEOMETRICS & CONTROL



EXISTING TRAFFIC VOLUMES (WITHOUT PROJECT)



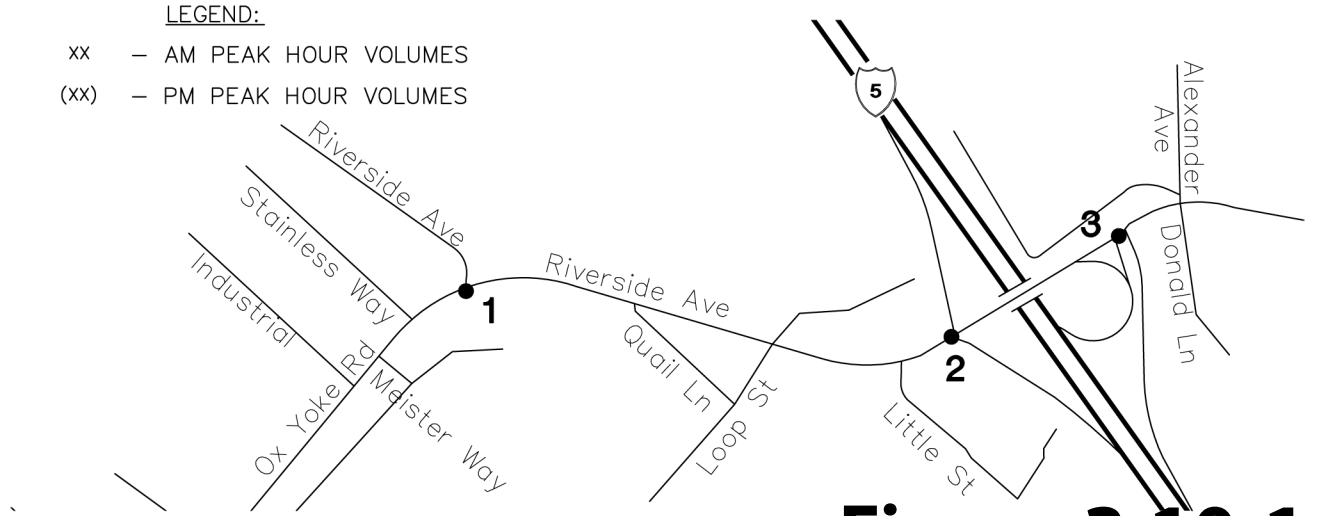
CUMULATIVE TRAFFIC VOLUMES (WITHOUT PROJECT)



LEGEND:

XX – AM PEAK HOUR VOLUMES

(XX) – PM PEAK HOUR VOLUMES



SPI Cogeneration Plant Expansion TIAR

Figure 3.10-1

Figure 2

Intersection Geometrics, Control & Volumes

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