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Transportation Infrastructure Plan For Crows Landing Industrial Business Park

August 24, 2018

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Introduction

This report provides an analysis of transportation infrastructure needs related to the development of the proposed Crows Landing Industrial Business Park (CLIBP). This development is located south of the City of Patterson and is generally bounded by Marshall Road on the north, State Route (SR) 33 and Bell Road on the east, Fink Road on the south and Davis Road on the west. Figure 1 shows the regional location of CLIBP while Figure 2 provides a local context.

The Project

CLIBP is proposed to be a regional employment center occupying the land previously used as the Crows Landing Naval Air Station. It contains two runways, one of which will be retained for the industrial park. The site has 1,274 developable acres that are currently planned to contain over 14 million square feet of governmental, logistical/ distribution, aviation, industrial and business park uses. CLIBP is intended to be developed in phases over a number of years.

Purpose of this Report

The purpose of this report is to determine the preliminary transportation infrastructure improvements that are required to accommodate the proposed development. The infrastructure needs include the following categories:

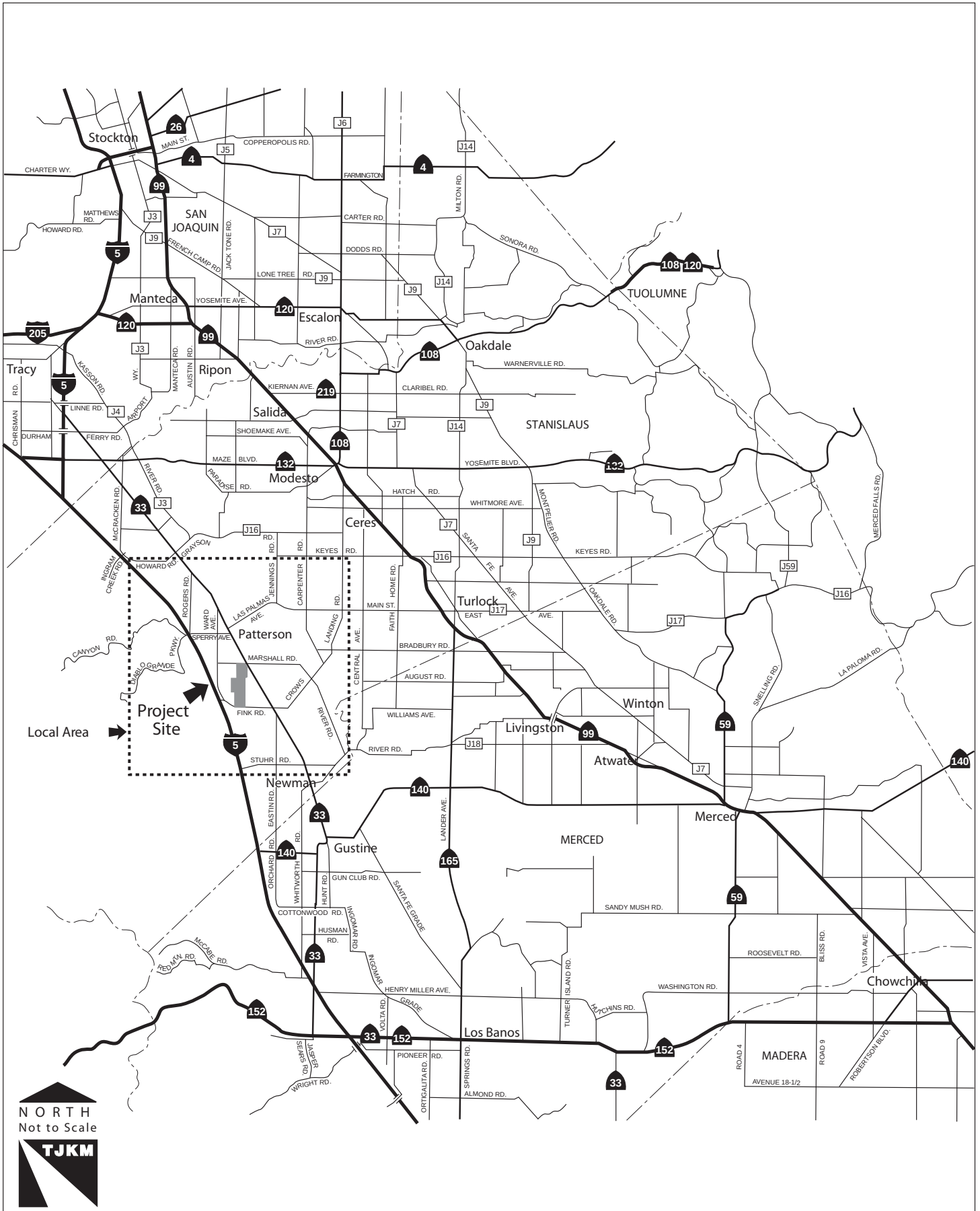
- On-site backbone street requirements
- Off-site two lane streets requiring reconstruction, but not widening
- Off-site two lane streets requiring widening to four lanes
- Off-site traffic signals needed
- Fink Road interchange improvements needed

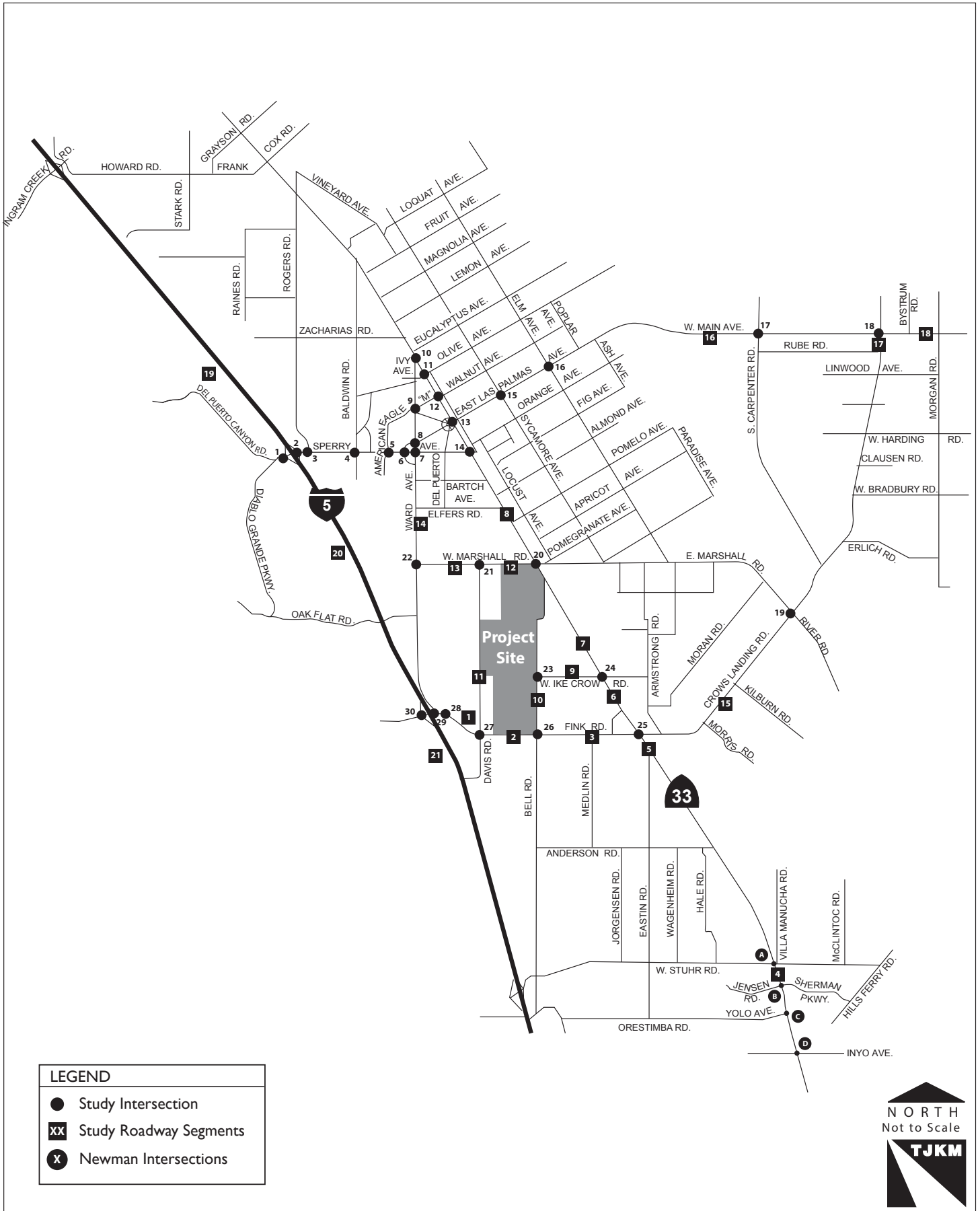
Identification of transportation infrastructure needs is important in order to determine the order of magnitude of costs associated with the development of the site by the County of Stanislaus.

TJKM conducted the required study for this report by measuring existing traffic, determining the vehicular trip generation associated with the site, and combining the site traffic with both existing conditions and with 2035 conditions, based on the use of the Stanislaus Council of Governments (StanCOG) Tri-County Traffic Forecasting Model. The project itself is intended to be developed over three 10-year increments, so the 2035 conditions that assume full project buildout, represent a conservative analysis.

Future Analyses

Stanislaus County will be preparing an Environmental Impact Report (EIR) to provide a comprehensive analysis of the proposed CLIBP. As a part of the EIR, a transportation analysis will be prepared. The report contained in this document and the future EIR transportation analysis are companion studies; the EIR analysis will be based on the same basic data considered in this report.





Executive Summary

This Transportation Infrastructure Master Plan for CLIBP describes the results of a traffic analysis conducted by TJKM Transportation Consultants. CLIBP is a proposed 1,528 acre, mixed-use industrial development located at the former site of the Crows Landing Naval Air Station just south of the City of Patterson.

Impact Analysis This report examines traffic impacts under existing conditions, existing plus full project conditions, 2035 conditions and 2035 plus full project conditions. TJKM examined existing conditions at 30 study intersections and 21 roadway segments to determine the transportation improvements that would be required as a result of the proposed CLIBP development. For this analysis, traffic conditions were compared with daily traffic roadway capacity values established for the agencies that have jurisdiction over roadways in the project vicinity – Stanislaus County, the City of Patterson and Caltrans. Stanislaus County's level of service (LOS) standard is LOS C for intersections and LOS D for road segments while the City of Patterson utilizes LOS D as its standard. Caltrans utilizes a LOS standard at the C/D transition.

Existing Conditions This study examines the existing roadway network near CLIBP. Nearly all roadways in the area are two-lane roadways serving agricultural activities and the incorporated areas. TJKM found that all 30 study intersections currently operate at acceptable conditions; of the 19 study intersections that are not signalized none currently meet signal warrants. The 18 roadway segments evaluated all currently have two lanes and none of the sections requires four lanes. The three freeway segments on I-5 are four lanes each, and additional lanes are not needed.

Project Traffic TJKM determined that the proposed project will likely contain over 14 million square feet of development and employ up to 14,447 persons at full buildout. The daily trip generation for the project will be 52,422 trips while the a.m. and p.m. peak hour generation will be 5,653 trips and 6,344 trips, respectively. Because of the large size and likely area of impact of the project, TJKM utilized the Tri-County model to evaluate traffic conditions. The traffic models for StanCOG, the San Joaquin Councils of Government (SJCOC) and the Merced County Association of Governments (MCAG) were recently combined to create this model. The model was utilized to evaluate Existing Plus project, 2035 no project, and 2035 Plus Project conditions.

It is TJKM's judgment that the existing plus project scenario is the most appropriate tool to evaluate the transportation improvements triggered by the CLIBP project. Although the project is likely to be built over many years and other, non-project, development and its traffic will come on line during this same time period, TJKM utilized near-term conditions to determine project responsibilities. A comprehensive EIR is being prepared for this project, and this traffic study forms the basis for the EIR transportation analysis. Fair-share responsibilities of all improvements will be presented as part of the EIR analysis. This study thereby focuses on the "up-front" requirements of the project and those additional needs during the life of the project. The following needed improvements have been identified:

On-site backbone street requirements – Nearly all on-site streets, including the backbone streets required during the first phase of the development, are recommended for a three- lane cross section.

Off-site two-lane roadways not requiring widening but needing to be rebuilt or resurfaced – Roadways in this category are portions of Bell Road, Davis Road, Ike Crow Road, Fink Road and Marshall Road.

Off-site roadways requiring four lanes – Portions of Marshall Road adjacent to the project, SR 33 from Patterson to Marshall Road, and a section of Crows Landing Road crossing the San Joaquin River will eventually need to be widened to four lanes. The four-lane river crossing on Crows Landing Road is not likely to be needed for many years – the County is currently considering rebuilding the existing two-lane bridge to bring it to current design and structural standards. The four-lane bridge is likely to be required near the end of the 30-year project development phase.

Off-site signals needed – TJKM has identified 11 intersections in the vicinity of the project that will eventually need to be signalized.

Fink Road interchange improvements needed – Although the Fink Road/I-5 interchange is basically a low-capacity rural interchange, it will not be an attractive route for employee travel to CLIBP. Employee traffic will make up the majority of trips generated by the project. Fink Road will, however, be an important link for truck and other business-travel to and from the project. Some widening under the freeway, off-ramp widening, and ramp traffic signals will need to be phased improvements for the interchange.

2035 Analysis TJKM determined additional intersection and roadway improvements that will be required by a combination of regional growth and the development of CLIBP. Additional traffic signals will be required, and more roadway sections will eventually need to be widened to four lanes. An analysis of impacts within the City of Newman reflects recent General Plan and other studies conducted in the City. It is recommended that a traffic impact fee be calculated to determine the fair share of required improvements so that the County can be reimbursed for other projects that have been “fronted” by CLIBP.

The Sperry Road interchange already requires improvement, and it is assumed that others will provide for its improvement. The City of Patterson, Stanislaus County, StanCOG and others have assigned this interchange improvement as a high priority for construction, possibly on a phased basis.

Project linkages to Stanislaus Regional Transit and other transit providers are recommended to serve the project. Also, as a part of the environmental review of the project, when specific transportation demand management (TDM) measures are identified, it will be possible to reduce the actual expected vehicular trips on certain roadway segments to reflect the programs and measures. Ridesharing and employee transit usage offer the greatest potential for trip reduction.

Analysis Methodology

Study Intersections

The County of Stanislaus staff has identified a list of 30 study intersections that will be included in the level of service (LOS) analysis. These intersections are under the jurisdiction of the City of Patterson, the County of Stanislaus or Caltrans. The list of intersections and applicable jurisdictions are as shown below and included in Figure 2:

1. I-5 SB Ramps / Sperry Avenue (Caltrans)
2. I-5 NB Ramps / Sperry Avenue (Caltrans)
3. Rogers Road / Sperry Avenue (City of Patterson)
4. Baldwin Road / Sperry Avenue (City of Patterson)
5. American Eagle Way / Sperry Avenue (City of Patterson)
6. Las Palmas Avenue / Sperry Avenue (City of Patterson)
7. Ward Avenue / Sperry Avenue (City of Patterson)
8. Ward Avenue / Las Palmas Avenue (City of Patterson)
9. Ward Avenue / M Street (City of Patterson)
10. Ward Avenue / SR 33 (Caltrans)
11. Olive Avenue / SR 33 (Caltrans)
12. Walnut Avenue / SR 33 (Caltrans)
13. Las Palmas Avenue / SR 33 (Caltrans)
14. Sperry Avenue / SR 33 (Caltrans)
15. Sycamore Avenue / Las Palmas Avenue (Stanislaus County)
16. Elm Avenue / Las Palmas Avenue (Stanislaus County)
17. Carpenter Road / W. Main Street (Stanislaus County)
18. Crows Landing Road / W. Main Street (Stanislaus County)
19. Crows Landing Road / Marshall Road (Stanislaus County)
20. Marshall Road / SR 33 (Caltrans)
21. Marshall Road / Davis Road (Stanislaus County)
22. Marshall Road / Ward Ave (Stanislaus County)
23. Ike Crow Road / Bell Road (Stanislaus County)
24. Ike Crow Road / SR 33 (Caltrans)
25. Fink Road / SR 33 (Caltrans)
26. Fink Road / Bell Road (Stanislaus County)
27. Fink Road / Davis Road (Stanislaus County)
28. Fink Road / Ward Avenue (Stanislaus County)
29. I-5 NB Ramps / Fink Road (Caltrans)
30. I-5 SB Ramps / Fink Road (Caltrans)

TJKM also evaluated four intersections in and near the City of Newman

- A. Stuhr Road / SR 33
- B. Jensen Road / SR 33
- C. Yolo Avenue / SR 33
- D. Inyo Avenue / SR 33

The intersection LOS analysis results for all the intersections are included in this report, while the mitigation measures also will be a part of the EIR transportation analysis as provided in this report. Peak hour signal warrant analyses were conducted for all the unsignalized study intersections and the results are included in this report.

In addition, the Fink Road interchange intersections with I-5 also were analyzed in this report.

Study Roadway Segments

Potential impacts from the proposed development for local roadway segments and freeway segments in the project vicinity are also evaluated. The selected study roadway segments are shown below and also included in Figure 2.

Roadway Segments

1. Fink Road between Ward Avenue and Davis Road (Stanislaus County)
2. Fink Road between Davis Road and Bell Road (Stanislaus County)
3. Fink Road between Bell Road and SR-33 (Stanislaus County)
4. SR-33 south of Stuhr Road north of Newman (Caltrans)
5. SR-33 between Stuhr Road and Fink Road (Caltrans)
6. SR-33 between Fink Road and Ike Crow Road (Caltrans)
7. SR-33 between Ike Crow Road and Marshall Road (Caltrans)
8. SR-33 between Marshall Road and Sperry Avenue (Caltrans)
9. Ike Crow Road between SR-33 and Bell Road (Stanislaus County)
10. Bell Road between Fink Road and Ike Crow Road (Stanislaus County)
11. Davis Road south of Marshall Road (Stanislaus County)
12. Marshall Road between SR-33 and Davis Road (Stanislaus County)
13. Marshall Road between Davis Road and Ward Avenue (Stanislaus County)
14. Ward Avenue between Marshall Road and Patterson (Stanislaus County)
15. Crows Landing Road between SR 33 and Marshall Road (Stanislaus County)
16. W. Main Street / Las Palmas Avenue west of Carpenter Road (Stanislaus County)
17. Crows Landing Road between Carpenter Road and W. Main Street (Stanislaus County)
18. W. Main Street east of Crows Landing Road (Stanislaus County)

Freeway Segments

1. I-5 north of Sperry Avenue (Caltrans)
2. I-5 between Sperry Avenue and Fink Road (Caltrans)
3. I-5 south of Fink Road (Caltrans)

Analysis Scenarios

The following traffic analysis scenarios were addressed in this study:

1. *Existing Conditions* – This scenario evaluates existing (2014) traffic volumes and roadway conditions based on existing counts.
2. *Existing plus CLIBP Buildout Conditions* – This scenario adds traffic generated by the proposed CLIBP to the previous scenario.
3. *2035 No CLIBP Project Conditions* – A Crows Landing Project-Specific Model was developed based on the latest Tri-County Travel Demand model and City of Patterson Travel Demand Model. This scenario assumes vacant land at the Crows Landing Project area.
4. *2035 plus CLIBP Build Out Conditions* – This scenario adds traffic generated by the proposed Project to the previous scenario.

Level of Service Analysis Methodology and Thresholds

Level of service (LOS) is a qualitative description of intersection operations using an A through F letter rating system to describe travel delay and congestion. LOS A indicates free flow conditions with little or no delay, and LOS F indicates jammed conditions with excessive delays and long back-ups.

This report analyzes 16 intersections within the City of Patterson and 14 intersections in unincorporated areas. Twelve of the unincorporated intersections are in the general vicinity of the project site; the remaining two intersections are on W. Main Street. Although all 21 roadway segments are outside of Patterson, comments are made on impacts for existing two lane streets in the City. The City has already identified which two-lane streets will eventually need to be widened to four lanes, to resolve level of service issues. In the County, project and other growth traffic will determine which County roads will need widening in the future.

Intersections: Operating conditions at the study intersections were evaluated using the 2000 Highway Capacity Manual (HCM 2000) Operations methodology. Peak hour traffic operational conditions for signalized intersections are reported as average control delay for the overall intersection in seconds per vehicle with corresponding LOS. Table I shows the control delay ranges for each level of service category. These are also the LOS ranges utilized by the City of Patterson.

The County of Stanislaus threshold of significance for intersections is LOS C, indicating LOS D or worse conditions are unacceptable. The City of Patterson utilizes LOS D as its standard of significance for intersections, indicating LOS E or F conditions are unacceptable. In this report intersections within the City of Patterson are evaluated with the LOS D standard; all other intersections are evaluated with the LOS C standard.

Roadway segments: For county roadway segments and conventional state highways, TJKM utilized the LOS thresholds contained in Table 3-12, "Roadway Segment Level of Service Criteria," contained in the County's *Standards and Specifications, 2014 Edition*. For Patterson city streets, TJKM used LOS tables developed by the Florida Department of Transportation for signalized

roadways. For freeway segments, TJKM used Florida standards as well. The Florida LOS tables are recognized as a standard reference source for using daily traffic volumes as an indicator of roadway adequacy. The standards for various roadway sections are shown in Table II.

The minimum acceptable level of service standard for Stanislaus County and Patterson roadway segments is LOS D. Therefore, this report uses LOS D as the minimum acceptable standard to determine the number of lanes required along City, County and State roadways within the study area.

Table I: Level of Service for Signalized Intersections

Level of Service	Description
A	Very low control delay, up to 10 seconds per vehicle. Progression is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation, arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: Highway Capacity Manual 2000

Table II: Generalized Annual Average Daily Volumes LOS Thresholds

Facility Type	No. of Lanes	Median	Level of Service (LOS)			
			B	C	D	E
City Streets	2	Undivided	-	14,400	16,040	-
	4	Divided	-	30,600	32,000	-
	6	Divided	-	46,900	48,150	-
County and State Roads	2	Undivided	-	11,800	20,000	-
	4	Divided	-	28,440	40,000	-
	6	Divided	-	56,700	67,500	-
Freeways	4		44,100	57,600	68,900	71,700
	6		65,100	85,600	102,200	111,000
	8		85,100	113,700	135,200	150,000

Source: 2012 Florida DOT Quality/Level of Service Handbook, Table 2, Florida DOT
Stanislaus County Department of Public Works, 2014 Standards and Specifications

Caltrans Facilities

Facilities under the jurisdiction of Caltrans include freeway segments, ramps, ramp terminals, and state routes. Caltrans standards strive to maintain acceptable traffic operations on state facilities between LOS C and LOS D. This report uses LOS D as the minimum acceptable standard to determine the number of lanes required along freeway segments and state highway segments.

Therefore, a Caltrans four-lane freeway has six lanes triggered at 68,900 vehicles per day, a two-lane City street has four lanes triggered at 16,040 vehicles per day, and Stanislaus County roadways and State Highways have four lanes triggered at 20,000 vehicles per day.

Existing Conditions

Roadway Network

The project site is located south of the City of Patterson in Stanislaus County, as shown in Figures 1 and 2. Important roadways serving the project site are discussed below.

Interstate 5 (I-5) is a major north-south freeway that runs through the western portion of Stanislaus County. It is generally a four-lane freeway with two travel lanes in each direction through the Central Valley of California. The average daily traffic volume on I-5 through Stanislaus Counties is about 40,000 vehicles per day (vpd). I-5 has existing interchanges with Fink Road in the vicinity of the project and with Sperry Avenue in the City of Patterson.

The interchange of I-5/Sperry Avenue is a tight diamond interchange with a narrow, local road underpass and a steep drop in grade next to the northbound on-ramp. The ramps are one lane in all directions; the off-ramps are currently controlled by stop signs. The City of Patterson and Stanislaus County have embarked upon a comprehensive study of the interchange, which could result in improvements such as signalizing the ramp intersections at Sperry Avenue and the widening of intersection approaches.

The interchange of I-5/Fink Road is a diamond interchange with a narrow local road undercrossing. The Fink Road undercrossing is constrained by columns that support the I-5 Bridge; the off-ramps are currently controlled by stop signs.

State Route 33 (SR 33) is a north-south arterial roadway that runs parallel to the Union Pacific Rail Road (UPRR) with an at-grade rail crossing north of the intersection with Ward Avenue. SR 33 is located on the eastern edge of the Project area, approximately three miles to the east of I-5 and provides access to Westley and beyond to the north and the City of Newman and beyond to the south. SR 33 carries approximately 3,550 vpd in the project area and 7,500 vpd in the City of Patterson.

Sperry Avenue is a two-lane, east-west arterial roadway that serves as the major route running through the City of Patterson between I-5 to the west and SR 33 to the east, a three-mile distance. The segment of Sperry Road between Baldwin Road and Ward Avenue consists of four lanes. Sperry Avenue carries approximately 12,200 vpd near the I-5 freeway.

Las Palmas Avenue is a three-lane, east-west arterial roadway that includes a center two-way left-turn lane. West of SR 33, four streets form a roundabout at Las Palmas Avenue. Traffic destined for Modesto currently uses either Las Palmas Avenue or SR 33. Las Palmas Avenue carries approximately 13,000 vpd. Outside of the Patterson city limits, Las Palmas Avenue is a two-way roadway and becomes W. Main Street east of the San Joaquin River.

Sycamore Avenue is a two-lane, north-south collector roadway in the City of Patterson. Sycamore Avenue links Loquat Avenue to the north and East Marshall Road to the south, a distance of seven miles.

Del Puerto Canyon Road a two-lane, east-west local roadway in Stanislaus County that connects Santa Clara County in the west with the I-5 southbound ramps, where it continues easterly as Sperry Avenue.

Rogers Road is a north-south collector roadway that provides access between SR 33 in the north and Sperry Avenue in the south. From Sperry Avenue to approximately 0.35 miles north, Rogers Road is a five-lane roadway that includes a two-way left-turn lane. Further north, Rogers Road reduces to two lanes.

Baldwin Road is a two-lane, north-south collector roadway that provides access from Vineyard Avenue in the north to just south of Azalea Drive in the south, where it terminates.

American Eagle Avenue is a two-lane, north-south collector roadway that runs between Sweet Briar Drive in the south to Ward Avenue in the north, where it continues northeasterly as M Street.

Ward Avenue is a two-lane, north-south collector roadway that runs between Fink Road outside of the Patterson city limits in the south and SR 33 in the north.

M Street is a two-lane, east-west local roadway that links Ward Avenue in the west and SR 33 in the east, where it continues easterly as Walnut Avenue.

Olive and Walnut Avenues are two-lane, east-west roadways that link SR 33 in the west with Poplar Avenue in the east. Olive Avenue continues as Ivy Avenue west of SR 33, and terminates just past Poplar Avenue in the east. Walnut Avenue continues as M Street west of SR 33 and terminates at Poplar Avenue in the east.

Elm Avenue is a two-lane, north-south local roadway that runs between Marshall Avenue in the south to just north of Loquat Avenue, where it terminates.

Carpenter Road is a two-lane, north-south collector roadway that links the City of Modesto in the north with Crows Landing Road in the south.

Fink Road is a two-lane east-west arterial roadway that links I-5 in the west with the unincorporated community of Crows Landing in the east. East of SR 33, Fink Road becomes Crows Landing Road, which continues northerly to the City of Modesto.

Marshall Road is a two-lane east-west collector roadway that runs along the project site's northern boundary, and links Ward Avenue in the west with Crows Landing Road in the east within unincorporated Stanislaus County. East of Crows Landing Road, Marshall Road becomes River Road and continues southerly to its terminus at Hills Ferry Road northeast of the City of Newman.

Davis Road is a two-lane north-south collector roadway that runs along the project site's western boundary, and provides access between Marshall Road in the north and Fink Road in the south. Davis Road continues 0.75 miles south of Fink Road before turning west to cross I-5 and terminating at an adjacent rural/residential development.

Ike Crow Road is a two-lane, east-west collector roadway that links the project site with SR 33 and Armstrong Road to the east within unincorporated Stanislaus County.

Bell Road is a two-lane, north-south collector roadway that runs along the project site's eastern boundary, and links SR 33 in the north with Orestimba Road in the south within unincorporated Stanislaus County.

Existing Peak Hour and Daily Traffic

TJKM collected existing 24-hour daily tube counts for 18 Stanislaus County study roadway segments in January 2014. These are shown on Table III. In addition, turning movement counts at 30 study intersections were collected during both a.m. peak period (7 a.m. to 9 a.m.) and p.m. peak period (4 p.m. to 6 p.m.) in January 2014. Volumes on I-5 were obtained from Caltrans documents.

Level of Service Analysis - Existing Conditions

Table III summarizes the results of the intersection level of service analysis for Existing Conditions. Currently, all existing study intersections and study roadway segments operate at acceptable levels of service based on applicable jurisdictional standards.

Table III also summarizes whether the peak hour warrant is met for all the unsignalized study intersections during both a.m. and p.m. peak hours. As shown, no unsignalized study intersections meet peak hour signal warrants under existing conditions.

Table III: Intersection Levels of Service – Existing Conditions

ID	Intersection	Type of Control	A.M. Peak Hour			P.M. Peak Hour		
			Delay	LOS	Meet Signal Warrant	Delay	LOS	Meet Signal Warrant
1	I-5 SB Ramps / Sperry Ave	OWSC	11.6	B	N	22.2	C	N
2	I-5 NB Ramps / Sperry Ave	OWSC	9.8	A	N	13.4	B	N
3	Rogers Rd / Sperry Ave	Signalized	13.5	B	-	13.7	B	-
4	Baldwin Rd / Sperry Ave	Signalized	18.5	B	-	16.0	B	-
5	American Eagle Way / Sperry Ave	Signalized	16.5	B	-	13.1	B	-
6	Las Palmas Ave / Sperry Ave	Signalized	13.8	B	-	16.2	B	-
7	Ward Ave / Sperry Ave	Signalized	33.4	C	-	21.6	C	-
8	Ward Ave / Las Palmas Ave	Signalized	13.2	B	-	9.8	A	-
9	Ward Ave / M St	Signalized	42.4	D	-	26.1	C	-
10	Ward Ave / SR 33	OWSC	13.3	B	N	13.9	B	N
11	Olive Ave / SR 33	TWSC	14.2	B	N	14.6	B	N
12	Walnut Ave / SR 33	Signalized	24.4	C	-	18.7	B	-
13	Las Palmas Ave / SR 33	Signalized	16.5	B	-	15.6	B	-
14	Sperry Ave / SR 33	TWSC	23.3	C	N	37.2	E	N
15	Sycamore Ave / Las Palmas Ave	Signalized	18.0	B	-	14.5	B	-
16	Elm Ave / Las Palmas Ave	Signalized	10.5	B	-	10.6	B	-
17	Carpenter Rd / W. Main St	AWSC	11.0	B	N	12.2	B	N
18	Crows Landing Rd. / W. Main St	AWSC	14.5	B	N	16.0	C	N
19	*Crows Landing Rd / Marshall Rd	AWSC	8.9	A	N	10.1	B	N
20	Marshall Rd / SR 33	TWSC	11.4	B	N	11.3	B	N
21	Marshall Rd / Davis Rd	OWSC	8.6	A	N	8.8	A	N
22	Marshall Rd / Ward Ave	OWSC	8.7	A	N	8.8	A	N
23	Ike Crow Rd / Bell Rd	TWSC	8.8	A	N	0.0	A	N
24	Ike Crow Rd / SR 33	TWSC	10.3	B	N	10.9	B	N
25	Fink Rd / SR 33	AWSC	11.5	B	N	9.7	A	N
26	Fink Rd / Bell Rd	TWSC	10.1	B	N	9.5	A	N
27	Fink Rd / Davis Rd	TWSC	9.8	A	N	9.7	A	N
28	Fink Rd / Ward Ave	OWSC	9.4	A	N	9.2	A	N
29	I-5 NB Ramps / Fink Rd	OWSC	8.8	A	N	8.8	A	N
30	I-5 SB Ramps / Fink Rd	OWSC	9.4	A	N	9.6	A	N

Notes: OWSC = One Way Stop Control, TWSC = Two Way Stop Control, AWSC = All Way Stop Control, LOS = Level of Service

Bold values indicate unacceptable LOS conditions and signal warrant met

*Intersection 19 is currently TWSC but has been approved and is analyzed as AWSC

Source: TJKM Transportation Consultants, January 2015

Table IV summarizes the results of the roadway segment/freeway segment level of service analysis for Existing Conditions. Currently, all existing study roadway segments operate at acceptable levels of service. No additional lanes are required to meet the LOS threshold.

Table IV: Roadway/Freeway Segment Levels of Service – Existing Conditions

ID	Roadway Segments	Existing Number of Lanes	Jurisdiction	LOS Threshold	Existing Conditions		
					ADT	LOS	# of Lanes Required
1	Fink Rd between Ward Ave and Davis Rd	2	County	D	1,638	C or Better	2
2	Fink Rd between Davis Rd and Bell Rd	2	County	D	1,490	C or Better	2
3	Fink Rd between Bell Rd and SR-33	2	County	D	1,661	C or Better	2
4	SR-33 south of Stuhr Rd north of Newman	2	Caltrans	C-D	8,197	C or Better	2
5	SR-33 between Stuhr Rd and Fink Rd	2	Caltrans	C-D	5,123	C or Better	2
6	SR-33 between Fink Rd and Ike Crow Rd	2	Caltrans	C-D	3,619	C or Better	2
7	SR-33 between Ike Crow Rd and Marshall Rd	2	Caltrans	C-D	3,545	C or Better	2
8	SR-33 between Marshall Rd and Sperry Ave	2	Caltrans	C-D	4,161	C or Better	2
9	Ike Crow Rd between SR-33 and Bell Rd	2	County	D	27	C or Better	2
10	Bell Rd between Fink Rd and Ike Crow Rd	2	County	D	50	C or Better	2
11	Davis Rd south of Marshall Rd	2	County	D	77	C or Better	2
12	Marshall Rd between SR-33 and Davis Rd	2	County	D	656	C or Better	2
13	Marshall Rd between Davis Rd and Ward Ave	2	County	D	641	C or Better	2
14	Ward Ave between Marshall Rd and Patterson City Limits	2	County	D	1,246	C or Better	2
15	Crows Landing Rd between Fink Rd and Marshall Rd	2	County	D	2,396	C or Better	2
16	W. Main St west of Carpenter Rd	2	County	D	7,342	C or Better	2
17	Crows Landing Rd between Carpenter Rd and W. Main St	2	County	D	5,237	C or Better	2
18	W. Main St east of Crows Landing Rd	2	County	D	6,392	C or Better	2
	Freeway Segments						
19	I-5 n/o Sperry Ave	4	Caltrans	C-D	40,000	B or Better	4
20	I-5 between Fink Rd and Sperry Ave	4	Caltrans	C-D	38,000	B or Better	4
21	I-5 s/o Fink Rd	4	Caltrans	C-D	37,000	B or Better	4

Notes: LOS = Level of Service, n/o = north of, s/o = south of
Source: TJKM Transportation Consultants, January 2015

Project Description

Project Location

The proposed CLIBP Project will be located entirely on the former 1,528-acre Crows Landing Naval Air Station located north of Fink Road, east of Davis Road, west of SR 33 and Bell Road and south of Marshall Road in an unincorporated area of Stanislaus County, California. The project vicinity is shown in Figures 1 and 2.

Site Layout

The proposed CLIBP is envisioned to include approximately 14 million square feet of governmental, logistical/distribution, aviation, industrial and business park uses. The CLIBP will be developed in three phases over an approximate 30-year period.

The distribution of land uses includes 370 acres devoted to general aviation uses, 68 acres to various municipal uses, 349 acres for logistics/distribution, 350 acres for industrial uses, 78 acres for business park uses, 46 acres for aviation-related uses, and 13 acres for multi-modal uses. The remaining acreage will be associated with the necessary infrastructure. Figure 3 shows the CLIBP site plan, including phasing.

Regional Significance of Project

The CLIBP will be located within commute distance of many Central Valley communities. The project will potentially attract employees from the Stanislaus County communities of Patterson, Newman, Modesto, Ceres and Turlock but could draw employees and visitors from nearby Merced and San Joaquin counties. Most of the employee trips are drawn either from Patterson to the north or from the communities to the east such as Turlock and Modesto. The project area is currently served by state and county highway facilities. A few area roadways are expected to be widened to accommodate future project-related traffic.

Trip Generation

Table V shows trip generation estimates for the proposed CLIBP Project. Trip generation for the Project was estimated based on rates provided in *Trip Generation* (9th Edition) published by the Institute of Transportation Engineers (ITE).

In traffic studies for proposed development projects, a specific project proposal is evaluated in which building square footage is known. In such cases, it is generally considered that the traffic generating characteristics of the building square footage, using ITE rates, is more reliable than using employment data, which is more speculative. The available factors in this case are planned land use designations, floor area ratios, and employee densities. Based on this information, the number of employees for each land use category for each development phase was calculated. The corresponding ITE trip generation rates for each category were utilized to produce the total Project trip generation on a daily and peak hour basis.

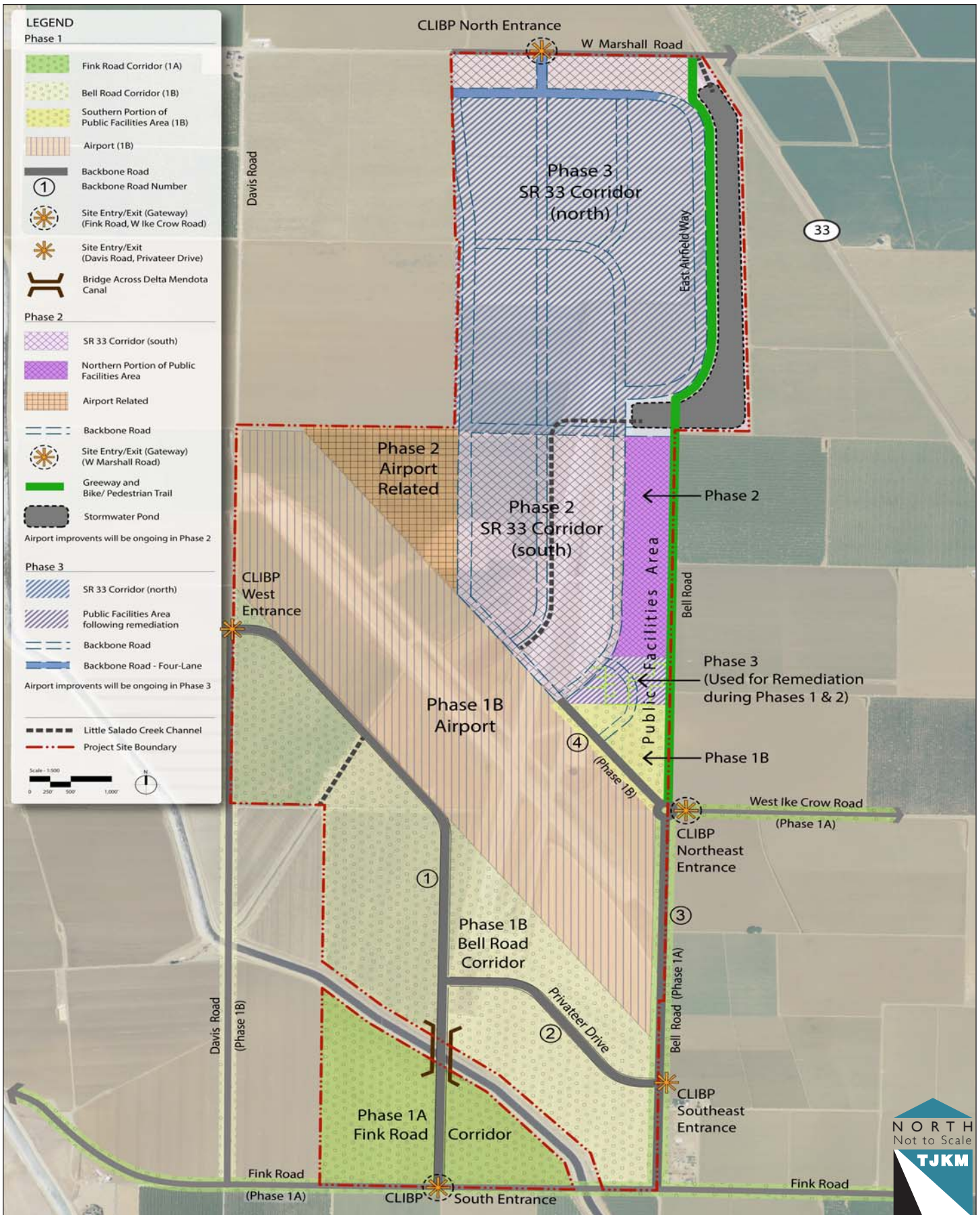
The proposed Project is expected to produce up to 14,447 employees that will generate a total of approximately 52,422 daily trips, 5,653 a.m. peak hour trips and 6,344 p.m. peak hour trips.

Table V: Proposed Crows Landing Industrial Business Park Land Use and Trip Generation Estimates

Proposed Land Use						Trip Generation Estimate														
Corridor/Use (Developable Land)	Developable Acres	Floor- Area Ratio (FAR)	Building Area, (per KSF)	Employees (per KSF)	Total Employees	ITE Land Use Code	Daily		AM Peak Hour						PM Peak Hour					
							Rate / Equation	Total Trips	Rate / Equation	Total Trips	In %	Out %	In	Out	Rate / Equation	Total Trips	In %	Out %	In	Out
PHASE I (764 Acres)																				
PHASE 1A: Fink Rd Corridor																				
Logistics/Distribution	52	0.35	785	0.35	275	High-Cube Warehouse/Distribution Center (152) *	Equ. E	1,168	KSF-based Trip Rates AM PH/Daily Ratio	77	69%	31%	53	24	KSF-based Trip Rates PM PH/Daily Ratio	84.127	31%	69%	26	58
Industrial	41	0.35	628	0.97	609	General Light Industrial (110)	Equ. B	1,827	Equ. C	235	83%	17%	195	40	Equ. D	235	21%	79%	49	185
Business Park	10	0.35	157	2.80	440	Business Park (770)	Equ. F	2,332	Equ. G	246	85%	15%	209	37	Equ. H	238	22%	78%	52	185
Phase 1A: Fink Rd Corridor Subtotal	103		1,570		1,324			5,328		558			457	101		556			128	429
PHASE 1B: Bell Rd Corridor																				
Logistics/Distribution	138	0.35	2,104	0.35	736	High-Cube Warehouse/Distribution Center (152) *	Equ. E	2,568	KSF-based Trip Rates AM PH/Daily Ratio	169.5052	69%	31%	117	53	KSF-based Trip Rates PM PH/Daily Ratio	184.915	31%	69%	57	128
Industrial	110	0.35	1,683	0.97	1,633	General Light Industrial (110)	Equ. B	4,848	Equ. C	511	83%	17%	424	87	Equ. D	532	21%	79%	112	420
Business Park	28	0.35	421	2.80	1,178	Business Park (770)	Equ. F	4,687	Equ. G	573	85%	15%	487	86	Equ. H	527	22%	78%	116	411
Bell Rd Corridor Subtotal	276		4,208		3,547			12,103		1,254			1,029	225		1,244			285	959
Aviation - Phases 1 through 3 (Part of Phase 1 Infrastructure)	370	NA	NA	NA	1	General Aviation Airport (022)**	Equ. A	116	1.29	1	50%	50%	1	1	Equ. L	3	55%	45%	2	1
Public Facilities - Law Enforcement, Fire, Municipal Offices, etc.	15	0.25	163	2.80	457	General Office Building (710)	Equ. I	1,595	Equ. J	246	88%	12%	217	30	Equ. K	229	17%	83%	39	190
Phase 1B Subtotal	661		4,371		4,005			13,814		1,502			1,246	256		1,476			326	1,150
PHASE I TOTAL	764		5,941		5,329			19,142		2,060			1,703	356		2,032			453	1,579
PHASE 2 (236 Acres)																				
SR 33 Corridor (South)																				
Logistics/Distribution	57	0.40	990	0.69	683	High-Cube Warehouse/Distribution Center (152) *	Equ. E	2,419	KSF-based Trip Rates AM PH/Daily Ratio	160	69%	31%	110	49	KSF-based Trip Rates PM PH/Daily Ratio	174	31%	69%	54	120
Industrial	71	0.40	1,237	0.97	1,200	General Light Industrial (110)	Equ. B	3,571	Equ. C	394	83%	17%	327	67	Equ. D	406	21%	79%	85	321
Business Park	14	0.40	247	2.80	693	Business Park (770)	Equ. F	3,140	Equ. G	363	85%	15%	309	54	Equ. H	343	22%	78%	75	268
SR 33 Corridor (South) Subtotal	142		2,474		2,576			9,129		917			746	171		1,721			215	709
Aviation-Related Use	46	0.40	802	0.35	281	General Aviation Airport (022)**	Equ. A	3,837	1.29	362	50%	50%	181	181	Equ. L	355	55%	45%	195	160

Proposed Land Use						Trip Generation Estimate														
Multimodal Transportation (Bike/Ped Trail + Monument)	13	NA	NA	NA	2															
Public Facilities - Law Enforcement, Fire, Municipal Offices, etc.	35	0.25	381	2.80	1,067	General Office Building (710)	Equ. I	3,252	Equ. J	511	88%	12%	450	61	Equ. K	455	17%	83%	77	378
PHASE 2 TOTAL	236		3,657		3,926			16,219		1,791			1,377	414		2,531			487	1,246
PHASE 3 (274 Acres)																				
SR 33 Corridor (North)																				
Logistics/Distribution	102	0.40	1,784	0.69	1,231	High-Cube Warehouse/Distribution Center (152) *	Equ. E	3,876	KSF-based Trip Rates AM PH/Daily Ratio	256	69%	31%	176	79	KSF-based Trip Rates PM PH/Daily Ratio	279	31%	69%	87	193
Industrial	128	0.40	2,230	0.97	2,163	General Light Industrial (110)	Equ. B	6,411	Equ. C	654	83%	17%	543	111	Equ. D	685	21%	79%	144	541
Business Park	26	0.40	446	2.80	1,249	Business Park (770)	Equ. F	4,913	Equ. G	603	85%	15%	513	90	Equ. H	553	22%	78%	122	431
SR 33 Corridor (North) Subtotal	256		4,460		4,643			15,200		1,513			1,232	281		1,517			352	1,165
Public Facilities - Law Enforcement, Fire, Municipal Offices, etc.	18	0.25	196	2.80	549	General Office Building (710)	Equ. I	1861	Equ. J	289	1	0	254	35	Equ. K	263	0	1	45	218
PHASE 3 TOTAL	274		4,656		5,192			17,061		1,802			1,486	316		1,781			397	1,384
GRAND TOTAL	1,274		14,254		14,447			52,422		5,653			4,567	1,086		6,344			1,337	4,209

Notes: * Employee-Based Rates missing : Daily rates base on Industrial Park (130), AM/PM Peak Hour based on KSF-based rates Peak to Daily Ratio
 ** Peak Hour Trip Rates for Aviation are for peak hour of the generator
 Equ. = Equation from ITE Trip Generation. T=Total Trips, X=Total Employees
 Equ. A: T=13.29*X+102.99; Equ. B: T=2.95*X+30.57; Equ. C: T=0.27*X+70.47; Equ. D: T=0.29*X+58.03; Equ. E: Ln (T) =0.8*Ln(X)+2.57; Equ. G: Ln (T)=0.86*Ln(X)+0.27; Equ. H: Ln (T) =0.81 Ln(X) +0.54; Equ. I: Ln (T) =0.84 Ln(X) +2.23; Equ. J: Ln (T) =0.86 Ln(X) +0.24
 Equ. K: T=0.37(X) +60.08; Equ. L: Ln (T) = 0.85 Ln(X) + 1.08
 AM Peak to Daily Ratio = 0.066, PM Peak to Daily Ratio = 0.072
Source: Mead & Hunt, Inc., July 2014 (Land Use); TJKM Transportation Consultants, July 2014 (Trip Generation); ITE Trip Generation 9th Edition, 2012



Travel Demand Model

Description of Daily Study Model

A long-range traffic-forecasting model was used to assess the impact of the proposed Crows Landing Industrial Business Park. The StanCOG (Stanislaus County Council of Governments) countywide gravity based model was used in the study.

TJKM used the most current StanCOG model for the study. The StanCOG model is used for the Stanislaus County Regional Transportation Plan (RTP) and other purposes. The current model, known as the Three-County Model, combines the StanCOG model with those used in San Joaquin County (SJCOG model) and Merced County (MCAG model). The combined model provides very good coverage of the study area, extending from Tracy-Stockton to the north of and Los Banos to the south of the Project area.

All of the modeling done recently in Stanislaus County has been based on the then-most recent version of the StanCOG model. This includes the Patterson General Plan, the current CLIBP study, the South County Corridor Study, the Sperry Road interchange analysis, and the current Crows Landing Road study.

A detailed model calibration was made based on the counts collected at the study intersections and study roadway segments. Detailed Traffic Analysis Zones (TAZs) are used to represent geographical locations in the model. Trips are generated at the TAZ level and distributed onto the roadway network. TJKM developed three new traffic analysis zones (TAZs) for the project area and loaded the ITE trip generation volumes into the model for distribution and assignment.

Model calibration is a process to adjust the model estimates to the existing traffic condition as reflected in the traffic counts. Demand forecasting models need to be demonstrably reliable and credible after the model calibration before being used for analysis on a project. It is important that the analysis tools not become a point of contention, so that the real issues can be properly understood and addressed both within the design team and public meetings. The calibration effort of the Patterson model was pursued with this goal in mind. Since the R^2 (which is a measure of the accuracy of the traffic estimates) is nearly 0.9 after model calibration (verses 0.5 or less before calibration), it can be concluded that TJKM has calibrated the model to a very high level of accuracy.

After the model was calibrated, the difference method ¹(Wu & Thnay, ITE 2001) was used to obtain future link level and intersection turning movement volumes based on the calibrated OD matrices. These volumes were used to calculate the level of service for the study intersections in this project.

In this study, TJKM used the model to determine a.m. and p.m. peak hours and daily trips. TJKM used the model to develop forecasts for Existing Plus Project, 2035 No Project and 2035 Plus project conditions.

Appendix A contains plots showing project traffic assignment to the street network during a.m. and p.m. peak hours.

¹ Wu, J.H. and C. Thnay (2001), "An OD Based Method for Estimating Link and Turning Volume Based on Counts", *Proceedings of Institute of Transportation Engineers (ITE) District 6 Annual Conference, July 9-12, 2001*.

South County Corridor

The South County Corridor (SCC) Feasibility Study was a recently completed cooperative planning effort between the Stanislaus Council of Governments (StanCOG), Stanislaus County, and the Cities of Patterson, Turlock and Newman, to assess the feasibility of a new east-west four lane divided expressway that would provide a direct travel route between State Route 99 and Interstate 5 (I-5) in the southern part of Stanislaus County. The study was completed in 2016.

Although there appears to be a consensus that such a roadway should be constructed, there is not yet a single preferred alternative for the SCC. Several alternatives are still being considered. A Project Study Report is the next planned step in the SCC, which will provide more detailed environmental and traffic analyses. This may result in the selection of a preferred alternative.

The City of Patterson General Plan includes a proposed new interchange on I-5 at the Zacharias Road alignment north of the City. This is one version of the western terminus of the SCC. From Zacharias Road, the SCC could follow the W. Main Street corridor to the City of Turlock. Because of its status it was not possible to include the SCC in the CLIBP analysis.

However, the SCC is likely to ultimately provide some traffic relief to Patterson streets, particularly Sperry Road and Las Palmas Avenue. In the description of future traffic impacts in Patterson, with and without the CLIBP, a discussion of potential SCC benefits is included in a qualitative fashion.

Existing plus Project Conditions

This section analyzes 2014 traffic conditions in the study area with the proposed CLIBP project. TJKM utilized the existing transportation network upon which to assign project trips. Traffic volumes from 2014 were the latest available during the preparation of this report. However, 2015 Caltrans volumes are now available; on I-5 and SR 33 in Patterson, 2015 volumes are unchanged from 2014 volumes. The report volumes are still representative of baseline conditions.

Table VI summarizes the results of the intersection level of service analysis under Existing plus Project conditions. The table shows the delay at each intersection, whether traffic signal warrants are satisfied, and the change in delay resulting from the addition of project traffic.

Table VII summarizes the results of the segment level of service analysis under Existing plus Project conditions. The table shows both existing number of lanes and the expected number of lanes required for acceptable roadway operations under existing conditions with and without the project.



Fink Road / I-5 Interchange

Table VI: Intersection Levels of Service - Existing plus Project Conditions

ID	Intersection Name	Type of Control	A.M. Peak Hour			P.M. Peak Hour			Delay Diff from Existing Conditions	
			Delay	LOS	Meet Signal Warrant	Delay	LOS	Meet Signal Warrant	A.M. Peak Hour	P.M. Peak Hour
1	I-5 SB Ramps / Sperry	OWSC	67.3	F	N	28.6	D	N	55.7	6.4
2	I-5 NB Ramps / Sperry	OWSC	11.9	B	N	16.2	C	N	2.1	2.8
3	Rogers Rd / Sperry	Signalized	11.6	B	-	11.9	B	-	1.1	0.4
4	Baldwin Rd / Sperry	Signalized	22.9	C	-	19.6	B	-	4.4	3.6
5	American Eagle Way / Sperry Ave	Signalized	18.1	B	-	13.8	B	-	1.6	0.7
6	Las Palmas / Sperry	Signalized	22.1	C	-	18.3	B	-	8.3	2.1
7	Ward Ave / Sperry	Signalized	>150	F	-	99.4	F	-	-	76.9
8	Ward / Las Palmas	Signalized	64.4	E	-	34.9	C	-	31.0	13.8
9	Ward Ave / M St	Signalized	47.5	D	-	8.3	a	-	5.1	-
10	Ward Ave / SR 33	OWSC	18.4	C	N	16.7	C	N	5.1	2.8
11	Olive Ave / SR 33	TWSC	18.8	C	N	16.5	C	N	4.6	1.9
12	Walnut Ave / SR 33	Signalized	34.6	C	-	22.6	C	-	10.2	3.9
13	Las Palmas / SR 33	Signalized	36.8	D	-	22.8	C	-	20.3	7.2
14	Sperry Ave / SR 33	TWSC	>150	F	Y	>150	F	Y	-	-
15	Sycamore / Las Palmas	Signalized	25.2	C	-	24.3	C	-	7.2	9.8
16	Elm Ave / Las Palmas	Signalized	22.4	C	-	19.7	B	-	11.9	9.1
17	Carpenter/ W. Main	AWSC	>150	F	Y	105	F	Y	-	92.8
18	Crows Landing Rd / W. Main St	AWSC	>150	F	Y	>150	F	Y	-	-
19	Crows Landing Rd / Marshall Rd	AWSC	>150	F	Y	>150	F	Y	-	-
20	Marshall Rd / SR 33	TWSC	>150	F	Y	>150	F	Y	-	-
21	Marshall Rd / Davis Rd	OWSC	-	Note: Davis discontinued with project in place						
22	Marshall Rd / Ward	OWSC	>150	F	N	>150	F	Y	-	.150
23	Ike Crow Rd / Bell Rd	TWSC	30.3	D	N	42.3	E	N	21.5	42.3
24	Ike Crow Rd / SR 33	TWSC	>150	F	N	>150	F	Y	-	-
25	Fink Rd / SR 33	AWSC	>150	F	Y	>150	F	Y	-	-
26	Fink Rd / Bell Rd	TWSC	>150	F	Y	>150	F	Y	-	-
27	Fink Rd / Davis Rd	TWSC	40.7	E	N	15.2	C	N	30.9	5.5
28	Fink Rd / Ward Ave	OWSC	>150	F	N	17.7	C	N	-	8.5
29	I-5 NB Ramps / Fink	OWSC	139.3	F	Y	9.5	A	N	130.5	0.7
30	I-5 SB Ramps / Fink Rd	OWSC	14.2	B	N	23.4	C	N	4.8	13.8

Notes: OWSC = One Way Stop Control, TWSC = Two Way Stop Control, AWSC = All Way Stop Control, LOS = Level of Service

Bold values indicate unacceptable LOS conditions

Bold values indicate unacceptable LOS conditions and signal warrant met

Source: TJKM Transportation Consultants, January 2015

Table VII: Roadway Segment Level of Service - Existing plus Project Conditions

ID	Roadway Segment	Existing # of Lanes	Jurisdiction	LOS Threshold	Existing Conditions			Existing plus Project Conditions		
					ADT	LOS	# of Lanes Required	ADT	LOS	# of Lanes Required
1	Fink Rd between Ward Ave and Davis Rd	2	County	D	1,638	D or Better	2	4,459	D or Better	2
2	Fink Rd between Davis Rd and Bell Rd	2	County	D	1,490	D or Better	2	3,251	D or Better	2
3	Fink Rd between Bell Rd and SR-33	2	County	D	1,661	D or Better	2	10,225	D or Better	2
4	SR-33 south of Stuhr Rd north of Newman	2	Caltrans	C-D	8,197	C or Better	2	15,957	D	2
5	SR-33 between Stuhr Rd and Fink Rd	2	Caltrans	C-D	5,123	C or Better	2	13,954	D	2
6	SR-33 between Fink Rd and Ike Crow Rd	2	Caltrans	C-D	3,619	C or Better	2	10,769	C or Better	2
7	SR-33 between Ike Crow Rd and Marshall	2	Caltrans	C-D	3,545	C or Better	2	14,825	D	2
8	SR-33 between Marshall Rd and Sperry Ave	2	Caltrans	C-D	4,161	C or Better	2	17,705	D	2
9	Ike Crow Rd between SR-33 and Bell Rd	2	County	D	27	D or Better	2	4,171	D or Better	2
10	Bell Rd between Fink Rd and Ike Crow Rd	2	County	D	50	D or Better	2	6,755	D or Better	2
11	Davis Rd south of Marshall Rd	2	County	D	77	D or Better	2	-	-	-
12	Marshall Rd between SR-33 and CLIBP Entrance	2	County	D	656	D or Better	2	29,721	E	4
13	Marshall Rd between Davis Rd and Ward Ave	2	County	D	641	D or Better	2	2,746	D or Better	2
14	Ward Ave between Marshall Rd and Patterson City Limits	2	County	D	1,246	D or Better	2	3,959	D or Better	2
15	Crows Landing Rd between Fink Rd and Marshall Rd	2	County	D	2,396	D or Better	2	6,704	D or Better	2
16	W. Main St west of Carpenter Rd	2	County	D	7,342	D or Better	2	10,982	D or Better	2
17	Crows Landing Rd between Carpenter Rd and W. Main St	2	County	D	5,237	D or Better	2	11,010	D or Better	2
18	W. Main St east of Crows Landing Rd	2	County	D	6,392	D or Better	2	9,444	D or Better	2
	Freeway Segment									
19	I-5 n/o Sperry Ave	4	Caltrans	C-D	40,000	A	4	41,341	C or Better	4
20	I-5 -- Fink to Sperry	4	Caltrans	C-D	38,000	A	4	39,121	C or Better	4
21	I-5 s/o Fink Rd	4	Caltrans	C-D	37,000	A	4	37,878	C or Better	4

Notes: LOS = Level of Service

Bold values indicate unacceptable LOS conditions

Shading indicates four lanes are triggered. State highway 4 lane trigger is 20,000 ADT, non-state highway is 16,040 ADT

Source: TJKM Transportation Consultants, January 2015

Near Term Improvements Triggered by CLIBP Project

Improvement Categories

This document examines transportation improvement categories as follows:

- On-site backbone street requirements
- Off-site two lane streets with poor structural conditions and no additional lanes needed
- Off-site two lane streets needing widening to four lanes
- Off-site traffic signals needed
- Fink Road interchange improvements

TJKM utilized the County of Stanislaus Public Works Department 2014 Standards and Specifications to determine various road standards.

Phasing of Improvements

In this document, TJKM recommends roadway improvements to be timed with, or triggered by, one of three project phases described earlier. TJKM has not conducted phase by phase traffic studies, only an analysis of the entire project under near term (existing plus project) or long term (2035 plus project) conditions. In reality, the three project phases are the best estimate of how the project may develop over time based on a variety of considerations. TJKM has estimated which phase each needed roadway project is associated with, but this also is the best estimate possible at this time. In reality, the timing of roadway improvements should be based on monitoring of roadway conditions during the life of the buildout of the project. Since roadway improvements need to be planned, designed and constructed over a long time period, the monitoring will need to look forward from then-existing conditions for an approximate three to five year period to allow for sufficient time to implement needed improvements.

On-site Backbone Street Requirements

Figure 4 shows the planned layout and phasing of the CLIBP along with the backbone roads. For the purposes of this analysis, all backbone roadway segments have been numbered. TJKM assumes that two-lane backbone streets will utilize a standard recommended by the Stanislaus County Public Works Department. This roadway has a 60-foot curb-to-curb width, which is ideal for two 12-foot through lanes, one 12-foot two-way-left-turn (TWLT) center lane and two additional 12-foot wide lanes for parking. This street has a total right of way width of 120 feet, which includes a 30-foot section on each side of the road for drainage and a six-foot sidewalk.

For streets with greater traffic demands, a four-lane roadway with a median to accommodate left turn lanes is recommended.

Most backbone streets for this project need to be two lanes. At the design stages, some widening near important intersections can be expected. The following cross-sections are recommended for backbone streets:

Four-lane Roadway

Segment 5

Three-lane Roadway

All other backbone streets including segments 1 – 4.

Off-site Two Lane Streets – No Widening Required

There are some streets near the CLIBP that either will not need widening beyond two lanes in the near term, or widening to four lanes, if and when needed, is in the distant future. Some roadways may need minor widening to shoulders or to increase lane widths. The streets listed below are in that category, and have poor surface (likely structural) conditions.

- W. Ike Crow Road – Bell Road to SR 33. The approximate length of this roadway is 6,525 feet. This roadway should likely be improved beginning during Phase 1A of CLIBP.
- Davis Road – Fink Road to Backbone Roadway 1. The approximate length of this roadway is 8,150 feet. This roadway is associated with Phase 1B of CLIBP and crosses the Delta Mendota Canal. The bridge crossing of the canal appears to have adequate width to accommodate the future improvements.
- Bell Road – W. Ike Crow Road to Fink Road. For the purposes of this analysis, this portion of Bell Road is considered segment 3 of the Backbone road system, which is in poor condition. It should likely be improved during Phase 1A of CLIBP.
- Marshall Road – Ward Avenue to CLIBP entrance. The approximate length of this roadway is 9,600 feet. (The section from CLIBP entrance to SR 33 requires four lanes as noted in the next improvement category.) This roadway is characterized by having a series of substantial power poles on the north side of the roadway, which can presumably be considered immovable objects. The poles switch to the south side west of the substation located alongside the east edge of the Delta Mendota Canal. The roadway crossing of the Delta Mendota Canal has a bridge width on Marshall is about 20 to 22 feet, which appears to be marginally acceptable, at least initially. This two-lane improvement should occur in Phases 2 or 3 of CLIBP.
- Fink Road – The County will improve Fink Road between I-5 and Bell Road with an added overlay and striping during Phase 1A to ensure a clean functional entrance to the CLIBP.



Ike Crow Road and Marshall Road near CLIBP

Off-site Two Lane Roadways Needing Widening to Four Lanes

As noted above, some roadways need widening to four lanes as a result of project-only traffic, some need widening because of regional growth to 2035, while others need widening by a combination of traffic from the project and regional growth. For this purpose, the emphasis is on existing plus project traffic. See Figure 5 for off-site improvement recommendations and phasing.

Marshall Road – CLIBP entrance to SR 33. The approximate length of this roadway is 2,000 feet. Four lanes will be needed by the midpoint of Phase 2 development. This is the only roadway needing widening to four lanes as a result of the CLIBP project.

Off-site Traffic Signals Needed

The following locations are expected to satisfy peak hour signal warrants. The affected agencies may wish to consider the applicability of roundabouts in lieu of traffic signals when the warrants are met.

- 14. Sperry Ave at SR 33
- 17. Carpenter Rd at W. Main St
- 18. Crows Landing Rd at W. Main St
- 19. Crows Landing Rd and Marshall Road
- 20. Marshall Rd at SR 33
- 22. Marshall Rd at Ward Ave
- 24. W. Ike Crow Rd at SR 33
- 25. Fink Rd at SR 33
- 26. Fink Rd at Bell Rd
- 29. Fink Rd at I-5 NB ramps
- A. Marshall Rd at North CLIBP entrance
- B. Fink Rd at South CLIBP entrance

Some of these intersections have been included in the City of Patterson General Plan as locations eventually needing traffic signals. These locations satisfy warrants based on existing traffic plus CLIBP traffic. Of these locations, intersections 14, 24, 26 and B are the highest priority, likely needed during the later stages of Phase 1 or the beginning of Phase 2 conditions.

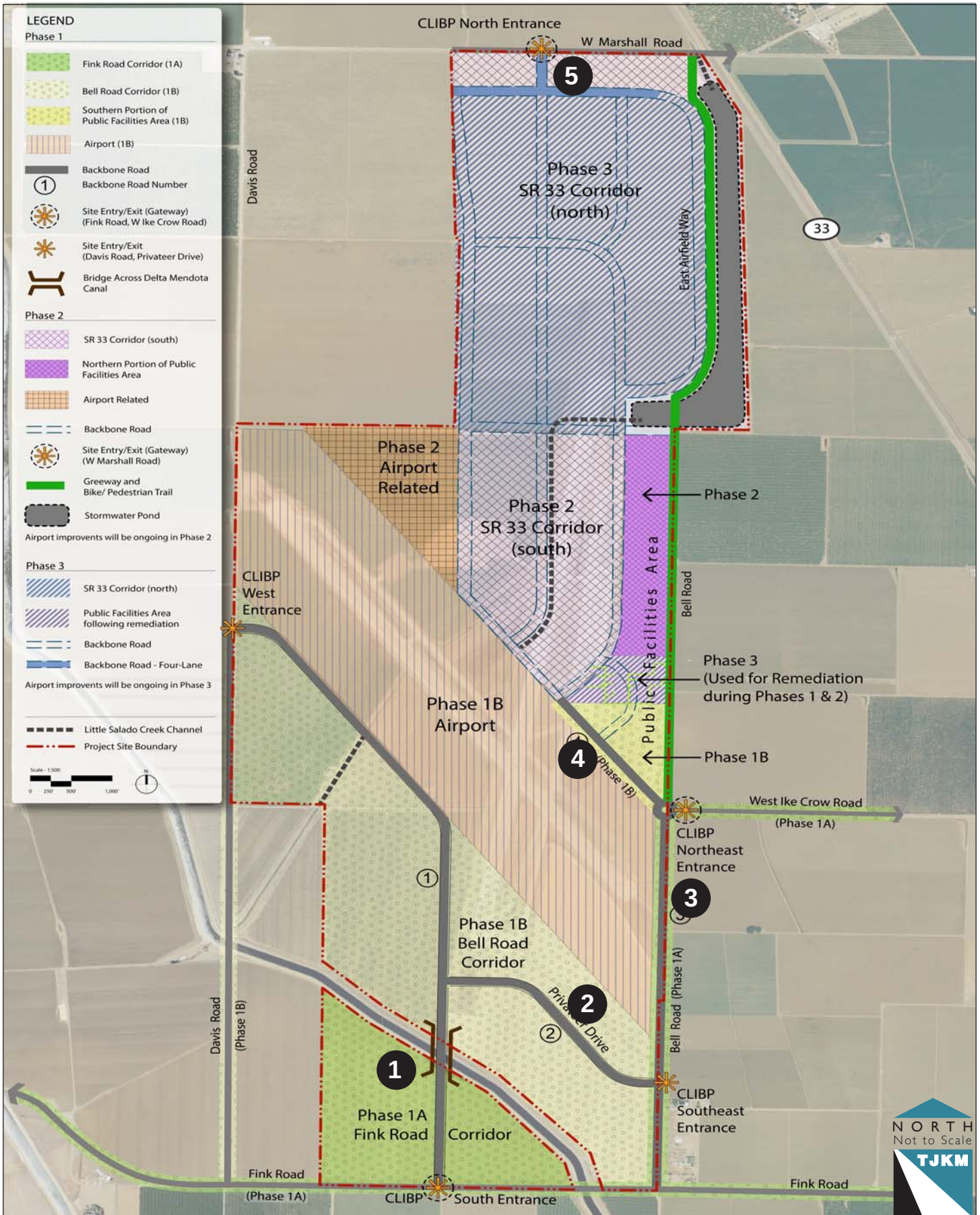
Fink Road Interchange Improvements

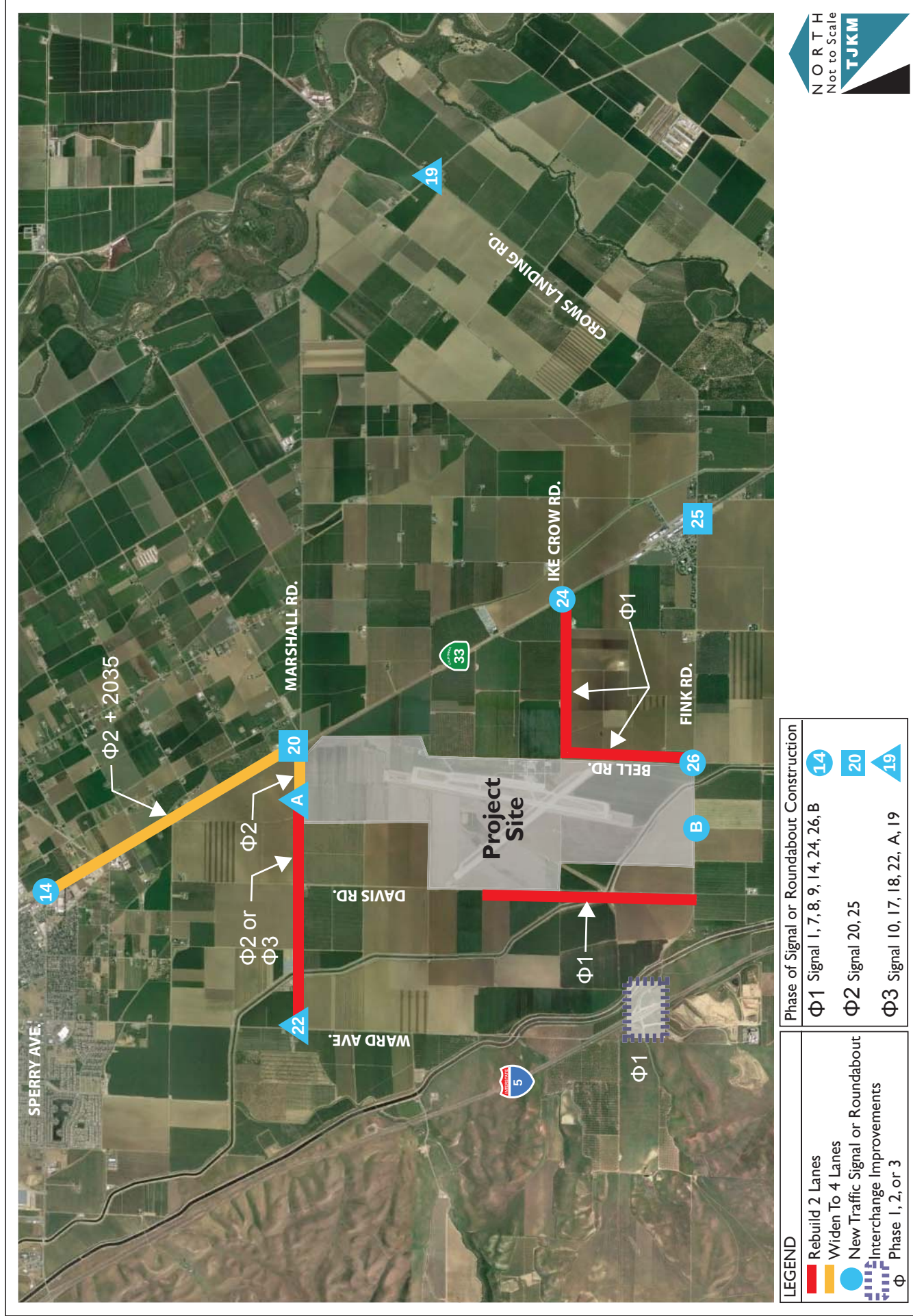
The Fink Road interchange is less likely to be used by CLIBP employee traffic because it does not lead to the major locations where employees are likely to live – Patterson, Newman, Gustine and SR 99 Corridor cities in Stanislaus County. The interchange is likely to be used by trucks from CLIBP. Improvements recommended for the Fink Road interchange include signaling the northbound ramps by Phase 1B conditions along with widening the roadway beneath the freeway as much as possible to create a westbound left turn lane at the southbound ramps intersection. By the completion of the CLIBP, the southbound ramp intersection will also need to be signaled. It is worth noting that there are physical constraints for expanding capacity at this interchange. Widening the Fink Road undercrossing will be difficult due to the location of existing underpass support columns. The situation is compounded by the limited space within the interchange vicinity for possible construction detours. However, no improvements beyond those identified above appear necessary. Figure 5 summarizes the recommended infrastructure phasing in the vicinity of the project.

City of Patterson Impacts

There are two intersections in the City of Patterson that have unacceptable levels of service under existing plus project conditions.

- I-5 SB Ramps / Sperry Avenue – This intersection is part of interchange improvements now being planned as a joint City/County/State project.
- Ward Avenue / Sperry Avenue – This intersection registers LOS F in the a.m. and p.m. with project traffic added, as was predicted in the Patterson General Plan. This is difficult to improve due to the narrow roadway hemmed in by development on the south leg. Eventually, the construction of the South County Corridor north of Patterson will likely relieve Sperry Avenue of some through traffic. (See the discussion elsewhere on the status of the South County Corridor.) The General Plan calls for additional lanes at the intersection, but these may be difficult to achieve.





2035 Conditions

This section analyzes 2035 traffic conditions in the study area both with and without the CLIBP Project.

Modeling Network

The 2035 network for the Tri-County model reflects all existing and anticipated new roadway segments in San Joaquin, Stanislaus and Merced Counties. The future I-5/Zacharias Road interchange was not assumed for the 2035 networks since CLIBP does not contribute to future traffic at this location.

Proposed Project Description

The identical project described earlier was included in the 2035 Plus CLIBP scenario. The layout, land use, building square footage and employee estimates are unchanged. The project trip generation is also unchanged.

Analysis Results

Table VIII shows the results of the intersection level of service analysis for 2035 conditions without the proposed project.



Crows Landing Road at San Joaquin River

Table VIII: Intersection Levels of Service - 2035 without the Project

ID	Intersection Name	Control	A.M. Peak Hour			P.M. Peak Hour		
			Delay	LOS	Meet Signal Warrant	Delay	LOS	Meet Signal Warrant
1	I-5 SB / Sperry Ave	OWSC	>150	F	Y	>150	F	Y
2	I-5 NB Ramps / Sperry Ave	OWSC	>150	F	Y	>150	F	Y
3	Rogers Rd / Sperry Ave	Signal	26.1	C	-	25.2	C	-
4	Baldwin Rd / Sperry Ave	Signal	25.4	C	-	30.2	C	-
5	American Eagle / Sperry Ave	Signal	19.5	B	-	11.9	B	-
6	Las Palmas Ave / Sperry	Signal	16.8	B	-	18.7	B	-
7	Ward Ave / Sperry Ave	Signal	59.4	E	-	33.3	C	-
8	Ward Ave / Las Palmas	Signal	30.1	C	-	22.9	C	-
9	Ward Ave / M Street	Signal	35.5	-D	-	33.3	C	-
10	Ward Ave / SR 33	OWSC	230	F	Y	107.3	F	Y
11	Olive Ave / SR 33	TWSC	>150	F	Y	>150	F	Y
12	Walnut Ave / SR 33	Signal	37.4	D	-	29.7	C	-
13	Las Palmas Ave / SR 33	Signal	21.0	C	-	21.0	C	-
14	Sperry Ave / SR 33	TWSC	>150	F	Y	>150	F	Y
15	Sycamore / Las Palmas Ave	Signal	37	D	-	20.2	C	-
16	Elm Ave / Las Palmas Ave	Signal	16.3	B	-	15.6	B	-
17	Carpenter Rd / W. Main	AWSC	143.0	F	Y	98.9	F	Y
18	Crows Landing / W. Main St	AWSC	>150	F	Y	>150	F	Y
19	Crows Landing / Marshall Rd	AWSC	>150	F	Y	>150	F	Y
20	Marshall Rd / SR 33	TWSC	>150	F	Y	>150	F	Y
21	Marshall Rd / Davis Rd	OWSC	8.5	A	N	9.8	A	N
22	Marshall Rd / Ward Ave	OWSC	16.1	C	N	12.1	B	N
23	Ike Crow Rd / Bell Rd	TWSC	8.8	A	N	8.9	A	N
24	Ike Crow Rd / SR 33	TWSC	16	C	N	15.4	C	N
25	Fink Rd / SR 33	AWSC	>150	F	Y	118.2	F	Y
26	Fink Rd / Bell Rd	TWSC	13.2	B	N	12.1	B	N
27	Fink Rd / Davis Rd	TWSC	13.9	B	N	12.8	B	N
28	Fink Rd / Ward Ave	OWSC	26.2	D	N	14.7	B	N
29	I-5 NB Ramps / Fink Rd	OWSC	14.2	B	N	12.7	B	N
30	I-5 SB Ramps / Fink Rd	OWSC	14.4	B	N	61	F	N

Notes: OWSC = One Way Stop Control, TWSC = Two Way Stop Control, AWSC = All Way Stop Control, LOS = Level of Service

Bold values indicate unacceptable LOS conditions

Bold and Shaded values indicate unacceptable LOS conditions and signal warrant met with 2035 conditions

Source: TJKM Transportation Consultants, January 2015.

Table IX summarizes the results of the roadway segment level of service analysis. The table shows both existing number of lanes and the number of lanes required to operate a roadway facility acceptably under 2035 Conditions without the proposed project.

Table IX: Roadway Segment Level of Service - 2035 without the Project

ID	Roadway Segment	Existing # of Lanes	Jurisdiction	LOS Threshold	2035 Baseline Conditions		
					ADT	LOS	Lanes required
1	Fink Rd between Ward Ave and Davis Rd	2	County	C	5,767	C or Better	2
2	Fink Rd between Davis Rd and Bell Rd	2	County	C	5,619	C or Better	2
3	Fink Rd between Bell Rd and SR 33	2	County	C	5,764	C or Better	2
4	SR-33 south of Stuhr Rd north of Newman	2	Caltrans	C-D	16,757	D	2
5	SR-33 between Stuhr Rd and Fink Rd	2	Caltrans	C-D	10,296	C or Better	2
6	SR-33 between Fink Rd and Ike Crow Rd	2	Caltrans	C-D	5,588	C or Better	2
7	SR-33 between Ike Crow Rd and Marshall Rd	2	Caltrans	C-D	5,516	C or Better	2
8	SR-33 between Marshall Rd and Sperry Ave	2	Caltrans	C-D	10,297	C or Better	2
9	Ike Crow Rd between SR-33 and Bell Rd	2	County	C	23	C or Better	2
10	Bell Rd between Fink Rd and Ike Crow Rd	2	County	C	44	C or Better	2
11	Davis Rd south of Marshall Rd	2	County	C	74	C or Better	2
12	Marshall Rd between SR-33 and Davis Rd	2	County	C	1,327	C or Better	2
13	Marshall Rd between Davis Rd and Ward Ave	2	County	C	1,309	C or Better	2
14	Ward Ave between Marshall Rd and Patterson City Limits	2	County	C	5,347	C or Better	2
15	Crows Landing Rd between Fink Rd and Marshall Rd	2	County	C	4,334	C or Better	2
16	W. Main St west of Carpenter Rd	2	County	C	21,196	E	4
17	Crows Landing Rd between Carpenter Rd and W. Main St	2	County	C	10,626	C or Better	2
18	W. Main St east of Crows Landing Rd	2	County	C	14,805	E	2
Freeway Segment							
19	I-5 n/o Sperry Ave	4	Caltrans	C-D	70,368	E	6
20	I-5 between Fink Rd and Sperry Ave	4	Caltrans	C-D	66,883	D	4
21	I-5 s/o Fink Rd	4	Caltrans	C-D	64,328	D	4

Notes: LOS = Level of Service

Bold values indicate unacceptable LOS conditions

Shading indicates widening not required in earlier scenarios. State highway 4-lane trigger is 20,000 ADT, non-state highway is 16,040 ADT. Freeway trigger for six lanes is 68,900 ADT.

Source: TJKM Transportation Consultants, January 2015.

Table X shows the results of the intersection level of service analysis for 2035 conditions with the proposed project. Table XI summarizes the results of the roadway segment level of service analysis.

Table X: Intersection Levels of Service - 2035 plus Project Conditions

ID	Intersection	Type of Control	A.M. Peak Hour			P.M. Peak Hour		
			Delay In Sec.	LOS	Meet Signal Warrant?	Delay In Sec.	LOS	Meet Signal Warrant?
1	I-5 SB Ramps / Sperry Ave	OWSC	>150	F	Y	>150	F	Y
2	I-5 NB Ramps / Sperry Ave	OWSC	>150	F	Y	>150	F	Y
3	Rogers Rd / Sperry Ave	Signalized	38.9	D	-	32.3	C	-
4	Baldwin Rd / Sperry Ave	Signalized	45	D	-	53	D	-
5	American Eagle Way / Sperry Ave	Signalized	24	C	-	12	B	-
6	Las Palmas Ave / Sperry Ave	Signalized	29	C	-	21	C	-
7	Ward Ave / Sperry Ave	Signalized	144	F	-	100	F	-
8	Ward Ave / Las Palmas Ave	Signalized	35.1	D	-	31.4	C	-
9	Ward Ave / M St	Signalized	48.0	D	-	38.9	D	-
10	Ward Ave / SR 33	OWSC	>150	F	Y	>150	F	Y
11	Olive Ave / SR 33	TWSC	>150	F	Y	>150	F	Y
12	Walnut Ave / SR 33	Signalized	44.5	D	-	39.5	D	-
13	Las Palmas Ave / SR 33	Signalized	30.6	C	-	24.1	C	-
14	Sperry Ave / SR 33	TWSC	>150	F	Y	>150	F	Y
15	Sycamore Ave / Las Palmas Ave	Signalized	44	D	-	20	C	-
16	Elm Ave / Las Palmas Ave	Signalized	21	C	-	17	B	-
17	Carpenter Rd / W. Main St	AWSC	>150	F	Y	>150	F	Y
18	Crows Landing Rd / W. Main St	AWSC	>150	F	Y	>150	F	Y
19	Crows Landing Rd / River Rd	AWSC	>150	F	Y	>150	F	Y
20	Marshall Rd / SR 33	TWSC	>150	F	Y	>150	F	Y
21	Marshall Rd / Davis Road	OWSC	<i>Note: Davis discontinued with project in place</i>					
22	Marshall Rd / Ward Ave	OWSC	>150	F	Y	>150	F	Y
23	Ike Crow Rd / Bell Rd	TWSC	37	E	N	17	C	N
24	Ike Crow Rd / SR 33	TWSC	>150	F	Y	>150	F	Y
25	Fink Rd / SR 33	AWSC	>150	F	Y	>150	F	Y
26	Fink Rd / Bell Rd	TWSC	>150	F	Y	>150	F	Y
27	Fink Rd / Davis Rd	TWSC	>150	F	Y	45	E	N
28	Fink Rd / Ward Ave	OWSC	>150	F	Y	>150	F	Y
29	I-5 NB Ramps / Fink Rd	OWSC	>150	F	Y	15	C	N
30	I-5 SB Ramps / Fink Rd	OWSC	>150	F	Y	>150	F	N

Notes: OWSC = One Way Stop Control, TWSC = Two Way Stop Control, AWSC = All Way Stop Control, LOS = Level of Service

Bold values indicate unacceptable LOS conditions

Shading indicates signals not warranted under 2035 Baseline scenario

Source: TJKM Transportation Consultants, January 2015.

Table XI: Roadway Segment Level of Service - 2035 plus Project Conditions

ID	Roadway Segment	Existing # of Lanes	2035 Baseline Conditions			2035 plus Project Conditions		
			ADT	LOS	# of Lanes Required	ADT	LOS	# of Lanes Required
1	Fink Rd between Ward Ave and Davis Rd	2	5,767	C or Better	2	10,902	C or Better	2
2	Fink Rd between Davis Rd and Bell Rd	2	5,619	C or Better	2	8,032	C or Better	2
3	Fink Rd between Bell Rd and SR 33	2	5,764	C or Better	2	13,709	D	2
4	SR-33 south of Stuhr Rd north of Newman	2	16,757	D	2	23,599	E	4
5	SR-33 between Stuhr Rd and Fink Rd	2	10,296	C or Better	2	18,000	D	2
6	SR-33 between Fink Rd and Ike Crow Rd	2	5,588	C or Better	2	12,183	C or better	2
7	SR-33 between Ike Crow Rd and Marshall Rd	2	5,516	C or Better	2	14,986	D	2
8	SR-33 between Marshall Rd and Sperry Ave	2	10,297	C or Better	2	25,030	F	4
9	Ike Crow Rd between SR-33 and Bell Rd	2	23	C or Better	2	2,865	C or better	2
10	Bell Rd between Fink Rd and Ike Crow Rd	2	44	C or Better	2	6,806	C or better	2
11	Davis Rd south of Marshall Rd	2	74	C or Better	2	-	-	-
12	Marshall Rd between SR-33 and Davis Rd	2	1,327	C or Better	2	32,663	D	2
13	Marshall Rd between Davis Rd and Ward Ave	2	1,309	C or Better	2	5,006	C or better	2
14	Ward Ave between Marshall Rd and Patterson City Limits	2	5,347	C or Better	2	9,103	C or better	2
15	Crows Landing Rd between Fink Rd and Marshall Rd	2	4,334	C or Better	2	9,715	C or better	2
16	W. Main St west of Carpenter Rd	2	21,196	E	4	22,318	E	4
17	Crows Landing Rd between Carpenter Rd and W. Main St	2	10,626	C or Better	2	17,849	D	2
18	W. Main St east of Crows Landing Rd	2	14,805	D	2	17,213	D	2
Freeway Segment								
19	I-5 n/o Sperry Ave	4	70,368	E	6	71,690	E	6
20	I-5 between Fink Rd and Sperry Ave	4	66,883	D	4	69,628	E	6
21	I-5 s/o Fink Rd	4	64,328	D	4	65,338	D	4

Notes: Using Florida Capacity Method 2012

LOS = Level of Service

Bold values indicate unacceptable LOS conditions

Shading indicates widening not justified under any earlier scenarios. State highway 4-lane trigger is 16,000 ADT, non-state highway is 14,580 ADT. Freeway trigger for 6 lanes is 68,900 ADT.

Source: TJKM Transportation Consultants, January 2015.

Additional Patterson Segment Analysis

The City of Patterson requested that additional roadway segments in or near the City be evaluated under 2035 conditions. These are described below:

1. Sperry Road between Rogers Road and Ward Avenue: This is planned to be a four lane roadway. This is expected to have a daily count of 19,300 vehicles per day in 2035 with project volumes. The project contributes 24.6 percent of these volumes. With four lanes, this section will operate at LOS C without the project and LOS D with the project.
2. Sperry Road from Ward Avenue to SR 33: As a two-lane roadway the expected 2035 plus project volumes will be 9,015 vehicles per day, of which 38.6 percent are project volumes. This roadway operates at LOS B with and without the project.
3. Ward Avenue from SR 33 to Patterson City Limits: This two-lane roadway is expected to carry 4,145 vehicles per day under 2035 plus project conditions, of which 31.4 percent are contributed by the project. This roadway operates at LOS A with and without the project.
4. SR 33 south of Las Palmas Avenue: This four-lane roadway is expected to have 15,445 vehicles per day in 2035 with project conditions, of which 25.3 percent are contributed by the project. This roadway operates at LOS B without the project and LOS C with the project.
5. SR 33 from Zacharias Road to M Street: This two-lane roadway will carry 7,870 vehicles in 2035 with the project, of which 18.8 percent are contributed by the project. The roadway operates at LOS B with and without the project.

Additional Newman Analysis

The City of Newman called attention to information in the City of Newman General Plan and the Northwest Newman Master Plan and their traffic studies.

Included in the two traffic studies, Table 6 of the General Plan traffic report indicates that within the City SR 33 will average 36,000 vpd at buildout. The General Plan indicates that within the City SR 33 will eventually be widened to four lanes. With 8,200 vpd existing, SR 33 will grow by 27,800 vpd. The Specific Plan study notes that at the busiest location along SR 33, the Specific Plan will contribute approximately 7,700 vehicles per day (vpd). In this case, Specific Plan volumes constitute 28 percent of the growth. It is recognized that a major portion of the growth in trips will be current and future residents of Newman who will be employed within the Specific Plan Area. If the traffic is split 50-50 to account for one trip end in Newman and one trip end in the Specific Plan Area, a reasonable fair share for Newman impacts caused by Specific Plan traffic is approximately 14 percent.

The Newman traffic studies indicate that future traffic signals in the SR 33 corridor in and near Newman will include intersections at Stuhr Road, Jensen Road, Yolo Street, and Inyo Street. Traffic from the Specific Plan will contribute to all four of the new traffic signals. These studies seem reasonable; they are based on generalized information of traffic signals being warranted when total intersection volumes reach 24,000 vpd with at least 3,000 vehicles on one leg of the side street. All four of the signals may not be warranted for many years. However, about 28 percent of the future traffic will be related to Specific Plan buildout. As noted, one half of these trips are generated locally from homes or businesses. For this reason, the Specific Plan's fair share of these impacts is about 14 percent.

Inyo Street is one of the four locations along SR 33 identified as likely to meet traffic signal warrants as a result of growth in traffic. When the General Plan traffic studies were conducted, Inyo Street at SR 33 appeared to be the most congested downtown intersection on SR 33. Therefore, it is likely that it may be the first to meet signal warrants. When these and other SR 33 intersections meet signal warrants, the 14 percent fair share described above would be a reasonable contribution from the Specific Plan.

2035 Triggers

2035 No Project

Tables VIII and IX show the level of service results for 2035 No Project conditions. In this scenario, four additional intersections not previously identified meet traffic signal warrants during one or more of the peak hours. These are:

1. I-5 SB /Sperry Avenue
2. I-5 NB/ Sperry Avenue
10. Ward Avenue/ SR 33
11. Olive Avenue/ SR 33

Two roadway segments require widening for the first time:

16. W. Main Street west of Carpenter Road
19. I-5 north of Sperry Avenue needs widening to six lanes

These are intersections and roadways whose signalization or widening are not triggered by CLIBP.

2035 Plus CLIBP

Tables X and XI show the level of service results for 2035 Plus CLIBP conditions. In this scenario four additional intersections not previously identified meet signal warrants during one or more peak hour periods. These are:

27. Fink Road / Davis Road
28. Fink Road / Ward Avenue
29. I-5 NB Ramps / Fink Road
30. I-5 SB Ramps / Fink Road

Three roadway segments require widening for the first time:

8. SR 33 between Marshall Road and Sperry Avenue
4. SR 33 between Stuhr Road and Fink Road
20. I-5 between Fink Road and Sperry Avenue

Comments on 2035 and 2035 plus Project Widening

E. Las Palmas / W. Main Street – SR 33 to S. Carpenter Road. This western section of this roadway – from SR 33 to Poplar Avenue – is approximately 13,200 feet in length and has three lanes. This three-lane section should be adequate to accommodate CLIBP traffic plus regional growth, particularly since the local agencies are considering the South County Corridor expressway, which may be on a different alignment. The two-lane section of West Main Street between Poplar Avenue and S. Carpenter Road is 17,500 feet long. Again, because of the possibility that the South County Corridor expressway may be on a different alignment, the need for widening is not certain. This section of roadway includes a 750-foot long bridge over the San Joaquin River. (There is a current Stanislaus County project to investigate upgrading this bridge to meet current standards.) TJKM recommends that improvements to this corridor not be included in the initial CLIBP requirements but be handled with a traffic fee arrangement.

SR 33 – From Marshall Road to Sperry Avenue. The approximate length of this roadway is 12,300 feet. In Patterson, the four-lane section of SR 33 has a width of about 60 feet for four-lanes undivided plus parking on one side. The ideal width in this section has four through lanes, about 14 feet for a median or TWLT, and two eight-foot shoulders, or 78 feet of pavement. This corresponds to County standard “110 FT MINOR ARTERIAL 4-LANE RURAL, shown on Plate 3-A15. Widening is needed by the completion of Phase 2 of the development when combined with 2035 growth traffic. During Phases 2 and 3, the State and the County may wish to consider spot improvements consisting of a third center left turn lane at existing public and selected private intersections. Such improvements would enhance both the safety and capacity of SR 33 and delay the need for four lanes.

SR 33 – South of Stuhr Road north of Newman. This section of roadway will exceed two-lane capacity by the end of Phase 3 when combined with 2035 growth traffic. SR 33 through Newman is projected in its General Plan to have an ultimate width of four lanes south of Stuhr Road in and north of the existing city limits. Note the earlier section of this report (*Additional Newman Analysis*) for additional details.

Fair Share Analysis

Tables XII and XIII list all of the projects for which CLIBP has at least partial responsibility. The project share is calculated based on each project's share of the total growth in traffic defined as 2035 plus project less existing conditions. In this case, TJKM utilized the summation of all intersection approach volumes, a.m. plus p.m., in existing, 2035 no project, and 2035 plus project scenarios to determine the components of the calculation.

The same approach is used for segment analyses – in which daily segment volumes are determined for existing, 2035 no project, and 2035 plus project conditions at a point in a roadway segment. This is the methodology recommended by Caltrans.

Table XII: Fair Share Analysis - Intersections

No.	Intersection Improvements	Existing (A)	2035 + P (B)	Project (C)	Project Share = (C) / (B-A)	LOS Before	LOS After
14	Sperry Avenue / SR 33	1667	4553	1513	52%	F	A - C
17	Carpenter Road / Main Street	1490	3696	810	37%	F	"
18	Crows Landing Rd / Main Ave	1829	5793	1142	29%	F	"
22	Marshall Road / Ward Ave	239	4743	3354	74%	F	"
20	Marshall Road / SR 33	758	8417	6015	79%	F	"
-	Marshall Road/ Project Entrance				100%	F	"
24	Ike Crow Road / SR 33	630	3840	2409	75%	F	"
26	Fink Road / Bell Road	267	3333	2461	80%	F	"
-	Fink Road / Project Entrance				100%	F	"
19	Crows Landing Rd / Marshall Rd	1131	9211	3838	48%	F	"
25	Fink Road / SR 33	1126	6284	2935	57%	F	"
29	I-5 NB Ramps / Fink Road	262	2549	1075	47%	F	"
1	I-5 SB Ramps / Del Puerto Cyn. Rd	842	3736	479	17%	F	"
2	I-5 NB Ramps / Sperry Ave	1412	4926	707	20%	F	"
10	Ward Avenue / SR 33	1155	3060	363	19%	F	"
11	Olive Avenue / SR 33	1101	2860	322	18%	F	"
27	Fink Road / Davis Road	263	2154	1290	68%	F	"
28	Fink Road / Ward Avenue	310	3247	1693	58%	F	"
30	I-5 SB Ramps / Fink Road	181	1292	548	49%	F	"

Table XIII: Fair Share Analysis - Segments

No.	Roadway Improvements (lanes)	Existing (A)	2035 + P (B)	Project (C)	D = (C) / (B-A)	LOS Before	LOS After
12	Marshall Rd - SR 33 to Entrance (4)	656	32,663	31,336	98%	E	D
9	Ike Crow Rd - SR 33 to Bell Rd (2)	27	2,865	2,842	100%	B	B
10	Bell Rd - Ike Crow to Fink Rd (2)	50	6,806	6,762	100%	B	B
13	Marshall Rd - Ward to Entrance (2)	641	5,006	3,697	85%	B	B
8	SR 33 - Marshall Rd to Sperry (4)	4,161	25,030	14,733	71%	F	D
4*	SR 33 - Stuhr Road to Newman (4)	8,200	36,000	7,700	28%	F	E
16	W. Main - West of Carpenter (4)	7,342	22,318	1,122	7%	E	B
F1	I-5 - North of Sperry Road (6)	40,000	71,690	1,322	4%	E	B
F2	I-5 - Fink Rd to Sperry Ave (6)	38,000	69,628	2,745	9%	E	B

* See *Additional Newman Analysis* for more details.

City of Patterson Cumulative Impacts

Under cumulative conditions, there are five signalized intersections in Patterson that will have unacceptable levels of service without project traffic and one additional signalized intersection in which the combination of project traffic and cumulative traffic causes the intersection to operate under unacceptable conditions. The intersections with unacceptable conditions without the project are as follows:

- Ward Avenue / Sperry Avenue – This intersection was cited as a problem under near term plus project conditions. However, even without CLIBP, this intersection fails. The development of the South County Corridor, an expressway linking SR 99 and I-5 immediately north of Patterson, should reduce traffic pressures in most of the problem intersections. See the discussion on the status of the South County Corridor.

No Patterson intersections degrade to unacceptable conditions when CLIBP traffic is added to cumulative traffic.

Transportation Demand Management

Transportation Demand Management (TDM) is a general term referring to strategies that result in more efficient use of transportation resources. The overall goal of TDM is to influence traveler behavior in order to reduce or redistribute travel demand. Strategies can be developed based on such overall TDM objectives as congestion reduction; energy conservation and emission reduction; health and fitness; improving equity; community livability; parking solutions; safety; and transportation affordability.

TJKM recommends that prior to the occupancy of the first building within the Crows Landing Industrial Business Park a TDM program shall be prepared which includes the following elements:

1. Establishment of a comprehensive strategy to reduce solo occupant vehicle travel by employees, business vehicles including trucks, and visitors.
2. The County shall establish TDM goals for CLIBP which include the reduction of daily travel and the reduction of daily travel within a.m. and p.m. peak periods.
3. The TDMP shall establish a TDM organization that requires mandatory involvement by all companies within the CLIBP. There shall be person(s) assigned representing CLIBP on an ongoing basis to coordinate with individual businesses.
4. Each individual business shall establish a designated TDM company representative.
5. The CLIBP TDM organization shall include mandatory annual employee surveys with a required response of at least 90 percent of the employees. The surveys will include as a minimum mode and time of travel by employees.
6. The CLIBP TDM organization shall prepare an annual report indicating status of compliance with the TDM goals established by the County.
7. The individual companies and the CLIBP TDM organization shall consider the following items to achieve compliance with the TDM goals:
 - a. Encourage employers to utilize flex-time
 - b. Carpool matching programs
 - c. Preferred parking for carpoolers
 - d. Van pool programs
 - e. On-site facilities such as break rooms and shower facilities
 - f. Establishment of employer sponsored shuttles from Turlock and Modesto

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- g. On-site secure bicycle racks
 - h. Bike share programs for employee usage at lunchtime
 - i. Other measures

CLIBP includes a bicycle and pedestrian trail that extends between Fink Road and Marshall Road. This facility is intended to be an auxiliary transportation facility rather than a recreational facility. The County and the City of Patterson should make efforts to extend the facility to Patterson to facilitate commute options.

Study Participants

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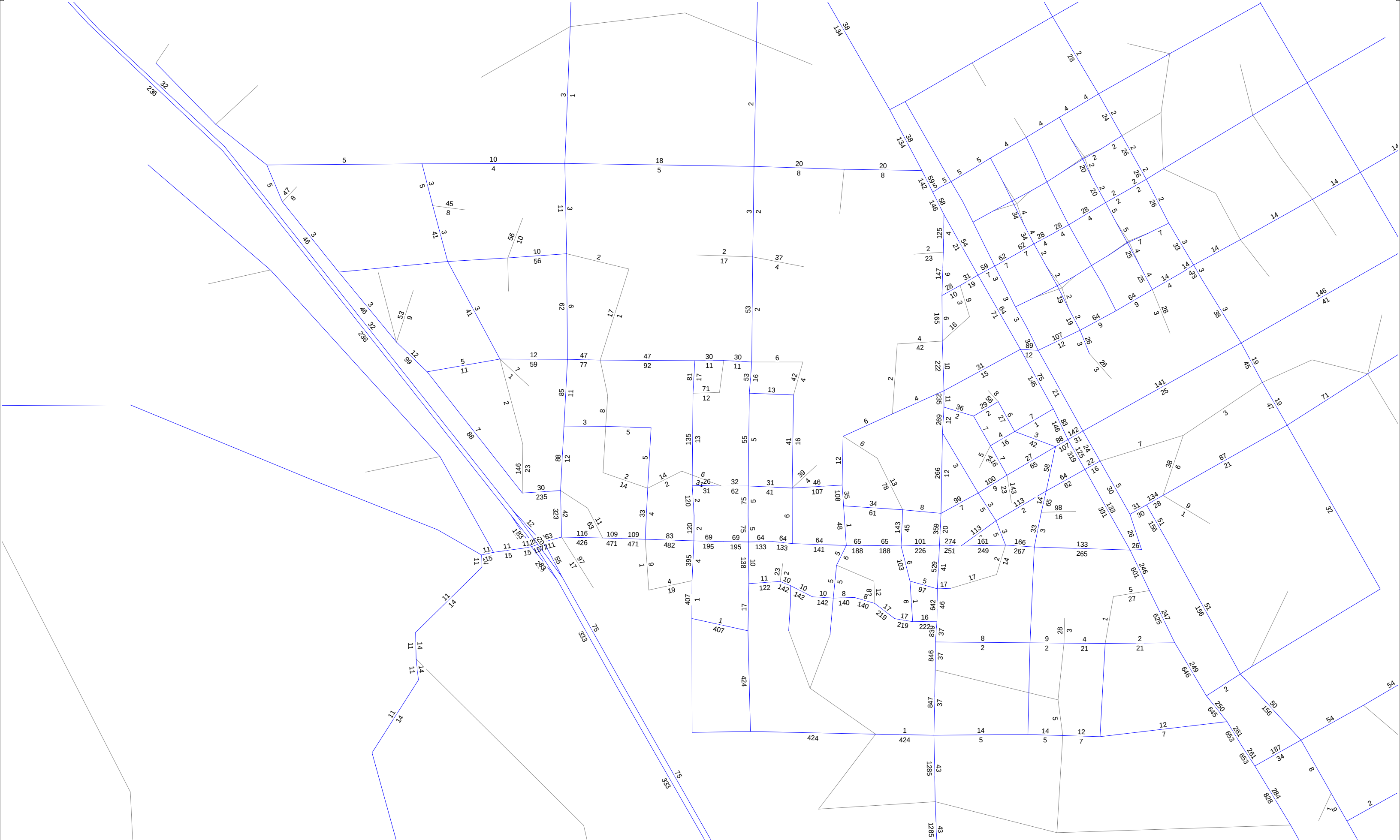
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Appendix A

A.M. and P.M. Plots of Project Traffic

Crows Landing 2035 Model
AM PH Select Zone Volume



Crows Landing 2035 Model
PM PH Select Zone Volume

