I-80 Eastbound Cordelia Truck Scales Relocation Project

Qualitative PM2.5 Hot Spot Analysis

Interstate 80 and State Route 12 East in the Vicinity of Fairfield

Solano County, California

04-SOL-80 PM 13.8-15.7 and 04-SOL-SR 12E PM L1.8-L2.0

EA-04-0A5350

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STATE OF CALIFORNIA
Department of Transportation

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Chapter 1 Introduction

This project-level particulate matter impact hot spot analysis for the I-80 Eastbound Cordelia Truck Scales Relocation Project responds to the United States Environmental Protection Agency's (EPA) requirement for a hot spot analysis for particulate matter of diameter less than or equal to 2.5 microns (PM2.5), as required in the EPA's March 10, 2006 Final Transportation Conformity Rule (71 FR 12468). The effects of localized PM2.5 hot spots were evaluated using the EPA and FHWA's guidance manual, *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration, and U.S. Environmental Protection Agency 2006).

The I-80 Eastbound Cordelia Truck Scales Relocation project was included in the regional emissions analysis conducted by Metropolitan Transportation Commission (MTC) for the conforming Transportation 2035 Plan for the San Francisco Bay Area (adopted by MTC on April 22, 2009). The project's design concept and scope have not changed significantly from what was analyzed in the Transportation 2035 Plan. This analysis found that the plan and, therefore, the individual projects contained in the plan, are conforming projects, and will have air quality impacts consistent with those identified in the state implementation plans (SIPs) for achieving the National Ambient Air Quality Standards (NAAQS). FHWA determined the RTP to conform to the SIP on May 29, 2009.

The I-80 Eastbound Cordelia Truck Scales Relocation project is also included in the federal 2009 Transportation Improvement Plan. The project's open to the public year is consistent with (within the same regional emission analysis period as) the construction completion date identified in the federal TIP and/or RTP. The federal TIP gives priority to eligible Transportation Control Measures (TCMs) identified in the SIP and provides sufficient funds to provide for their implementation. FHWA determined the TIP to conform to the SIP on May 29, 2009.

Chapter 2 Project Description

The California Department of Transportation (the Department) proposes to rebuild the eastbound Cordelia Truck Scales at a new location on Interstate 80 (I-80) in Solano County, California. The I-80 Eastbound Cordelia Truck Scales Relocation Project (project) would consist of the construction of a larger truck scale facility with more capacity, a longer off-ramp, and braided highway on-ramps that provide access to I-80 and State Route (SR) 12 East (SR 12E). The truck scale facility is less than 0.1 mile long, but the length of the project area with the ramps and utilities is approximately two miles.

The existing truck scales were constructed in 1958. They lack sufficient capacity to accommodate the current volume of truck traffic, and trucks entering and exiting the existing facility contribute to congestion and weaving, reducing the operating efficiency of I-80. Truck traffic on this stretch of I-80 is anticipated to increase dramatically over the next 30 years. As a result, the new truck scales facility would be designed with increased capacity to accommodate future truck traffic and to improve the enforcement of weight and safety requirements. The new off-ramp and braided on-ramps would address the issues related to weaving trucks and would improve safety along this stretch of I-80.

Due to the importance of I-80 and the Cordelia Truck Scales Facilities in freight movement, the project has been included by the California Transportation Commission (CTC) in the Proposition 1B Trade Corridors Improvement Fund (TCIF) program for infrastructure improvements along corridors that have a high volume of freight movement. The project is included in the Metropolitan Transportation Commission (MTC) 2005 Regional Transportation Plan (RTP) and the 2009 Transportation Improvement Program (TIP). It was previously recommended as a mid-term project (ranked 10 out of 50 projects) in the I-80/I-680/I-780 MIS and Corridor Study (July 14, 2004). It was also included in the Cordelia Truck Scales Relocation Study: Summary Report and Recommendations (Solano Transportation Authority 2005a) that was prepared by the Solano Transportation Authority (STA), in coordination with the Department and the California Highway Patrol (CHP). This study identified the need to construct replacement scales and evaluated several alternative locations. It was concluded from this study that the best location was within the existing I-80/Interstate 680 (I-680)/SR 12 interchange complex.

2.1 Purpose and Need

The project area is located south of I-80 between the I-80/Suisun Valley Road interchange and the I-80/SR 12E interchange within Solano County. The project includes the relocation and reconstruction of the eastbound Cordelia Truck Scales and associated on- and off-ramps.

2.1.1 Purpose for the Project

The purpose of the project is to accommodate anticipated growth in truck traffic in the corridor by 2040. The project will improve the reliability of the truck weight and safety inspection and enforcement system and thereby protect the structural integrity of California roads. The project

will also improve mainline safety by reducing truck/auto weaving and queuing and will provide traffic congestion relief along this segment of I-80. The proposed project will:

- **Accommodate anticipated growth in truck traffic:** The new scales facility will be sized to accommodate anticipated truck traffic growth to at least 2040, ensuring that all trucks are weighed and inspected according to CHP requirements. The new facility is designed to process 1,000 trucks per hour, compared to 400 per hour processed through the current facility.
- **Improve the reliability of the truck weight and safety inspection and enforcement system**: The new scales will improve reliability by processing trucks with more redundancy and fewer unplanned closures of the facility. The project also will improve overall system reliability by reducing congestion and improving safety in an unreliable section of the regional highway corridor.
- **Improve mainline safety:** By providing adequately-sized off- and on-ramps to serve truck merge and diverge movements, and adequately sized scales to serve the projected 2040 truck volume, the proposed project would reduce collisions and improve highway safety in the area.
- **Provide traffic congestion relief:** The scales are intended to reduce truck-related traffic congestion upstream and downstream of the facility, by providing adequate truck storage on the higher-capacity scales facility, standard-length off-ramp and on-ramps, and braided on-ramps to I-80 and SR 12E. The facility capacity and ramp lengths and design are being designed to serve 2040 traffic and truck volumes.

2.1.2 Need for the Project

Overview of Project Need

The Cordelia Truck Scales are located within the I-80/I-680/SR 12 interchange, a point at which two major interstate freeways and one state highway converge. When the facility was constructed in 1958, the interchange and truck scales were located in a relatively rural setting immediately surrounded by agricultural lands, with mountains to the north and the vast Suisun Marsh to the south.

Since 1958, the San Francisco Bay Area (Bay Area) and northern California region have experienced rapid population growth. The Bay Area's population has increased by more than 86% during this time, and Solano County's population has more than tripled. This tremendous growth has resulted in substantial increases in truck and regional traffic passing through the interchange area, as well as substantial changes in the land uses immediately surrounding the interchange.

The truck scales significantly contribute to the congestion on I-80 because of the large number of trucks exiting and entering I-80 and the close proximity of the scales to the Suisun Valley Road, I-680, and SR 12E interchanges. The location of the truck scales is ideal for monitoring and enforcing truck weight and safety requirements because it provides one location that can monitor truck traffic on I-80, I-680, and SR 12. However, because of the high volume of trucks within the

corridor, it is frequently necessary for the CHP to close the scales when queuing trucks begin to back up onto the mainline freeway. The large volume of trucks exiting and entering the highway creates a severe weaving problem, which is made worse by the size, limited maneuverability, and lower speeds of large trucks.

The specific deficiencies to be addressed by the project are described below.

Deficiencies to be Addressed by the Project

Inadequate Enforcement

The Cordelia Truck Scales are currently in an optimum location for truck inspections and weight enforcement, capturing virtually all freeway truck traffic traveling on I-80, I-680, and SR 12. These inspections are an important function of a truck scales facility. Because the existing facility has inadequate inspection capacity and a substandard-length off-ramp, the queue of waiting trucks periodically extends back onto the I-80 mainline, causing a traffic safety hazard. When the queue gets too long, the CHP, which controls operations at the facility, temporarily closes the scales. Although the closures are necessary for traffic safety, allowing trucks to bypass the scales altogether compromises the enforcement of weight and safety requirements. These closures typically occur about 15 times per week, according to the CHP.

The current facility cannot reliably serve *existing* truck volumes, and it will be even less able to serve the projected volume of trucks in the future, to the year 2040. The volume of trucks traveling on the regional freeway and highway system has increased dramatically as the economy in northern California has grown. Within the project area, trucks constitute about 5% of the total daily traffic volume. The total daily truck volume in 2003 passing through the interchange area was 11,800. Truck traffic is forecast to increase by 70% by 2025 and by 115% by 2040 (Solano Transportation Authority 2005a). This increase result in more than 25,300 trucks passing through the interchange area each weekday. Table 2-1 shows the existing and forecast peak hour truck volumes.

Table 2-1. Existing and Forecast Peak Hour Truck Volumes

Location	Existing Peak-Hour Truck Volumes	Year 2025 Peak-Hour Truck Volumes	Year 2025 Peak-Hour Truck Volumes with 15% Reduction Assumed for Increased PrePass Use	Year 2040 Peak-Hour Truck Volumes	Year 2040 Peak-Hour Truck Volumes with 15% Reduction Assumed for Increased PrePass Use
Westbound I-80 at scales	524	890	757	1,127	958
Eastbound I-80 at scales	552	940	799	1,187	1,009
Westbound I-80 at Travis Boulevard	401	680	578	863	734
Eastbound I-80 at Travis Boulevard	417	710	604	897	763

Source: Solano Transportation Authority 2005a.

The STA, the Department, and the CHP have recognized the need to reconstruct the scales to accommodate the current and projected volume of truck traffic. New scales within the interchange area are planned to process 1,000 trucks per hour, which—in combination with the forecasted use of the PrePass system—would accommodate the estimated increase in truck traffic to the year 2040.

Truck-Related Congestion

Although the truck scales are currently in an optimum location to capture virtually all freeway truck traffic traveling on I-80, I-680, and SR 12, they also are located on the most congested freeway segment in Solano County. Trucks slowing to enter the short (approximately 500 feet) off-ramp to the scales, and accelerating to enter I-80 on the short on-ramp from the scales, exacerbate the congestion problem, as do trucks queuing onto the mainline from the short off-ramp to the facility. The *I-80/I-680/I-780 MIS and Corridor Study* states,

> The Cordelia Truck Scales generate significant congestion in Segment 1 [the I-80/I-680/SR 12 Interchange complex] during peak hours. The scales also constrain the widening of I-80 in Segment 1 in their current location, and need to be relocated prior to additional improvements being pursued in this section. The recommendation of the STA Board of Directors is to relocate/reconstruct the scales in a location east of Suisun Creek within Segment 1.

Currently, congestion develops during the commute peak hours as a result of trucks weaving with traffic streams to and from the I-680 connector ramps, the local Suisun Valley/Green Valley ramps, and the SR 12E and SR 12W connector ramps. This congestion will worsen significantly by 2035. The a.m. peak hour congestion in the westbound direction extends from the I-80/I-680 junction to West Texas Street, a distance of nearly 4.5 miles. Heavy westbound on-ramp volumes from the SR 12E and Air Base Parkway interchanges also contribute to the congestion during the a.m. peak period. During the p.m. peak period, heavy eastbound on-ramp volumes from SR 12W, I-680, Suisun Valley Road and the truck scales combine to create congestion on eastbound I-80 in the I-80/I-680/SR 12 interchange.

While the current combination of general vehicle traffic volumes and truck volumes create congestion, the I-80 mainline traffic volume is projected to increase by about 2% per year, to 270,000 daily vehicles, in 2035. Along with the truck traffic increase described above, the traffic increases will severely worsen current congestion and safety conditions if the scales are not expanded to accommodate the higher truck volumes and moved to a location that provides for maximum weaving lengths and for braiding critical traffic streams. Table 2-2 shows the projected 2035 eastbound p.m. weave volumes at the truck scales.

Table 2-2. Eastbound P.M. Weave Volumes, 2035

Location	Total Volume (Weaving Volume Plus Through Volume to Points Farther East)	To Suisun Valley Road	To Truck Scales	To SR 12E
From I-680	3,935	495	95	810
From I-80 west of SR 12W	9,580	340	320	1,765
From Suisun Valley Road	1,985	Not applicable	Not applicable	435
From SR 12W	2,420	5	70	555

Source: Solano-Napa Travel Demand Model, November 2006 (Solano Transportation Authority 2006).

Unreliable Freight Transport

Currently, travel times for truck trips through the corridor are unpredictable due to the queues that develop within the scales facility and congestion that is partially caused by trucks maneuvering into and out of the scales facility, described above. This unpredictability will increase as vehicle and truck volumes grow, also described above. Further unpredictability results from the increased likelihood of breakdowns due to un-inspected trucks that have been allowed to bypass the scales when they are periodically closed due to queues backing up onto the mainline.

Traffic Safety

The combination of high vehicle and truck volumes, truck diverge and merge maneuvers on substandard-length ramps, and substandard distances between adjacent interchanges (all described above) contribute to safety concerns in the project area. The large volume of trucks exiting and entering the highway creates a severe weaving problem, which is compounded by the size, limited maneuverability, and lower speed of large trucks. Additionally, truck traffic sometimes backs up on the off-ramp to the scales, slowing approaching truck traffic further (the scales are closed when the queues reach the mainline).

Recent accident rates demonstrate that accidents occur more frequently along I-80 near the scales than on similar freeway facilities statewide. Accident data for three years, 2004–2006, from the Department's Traffic Accident Surveillance and Analysis System (TASAS) for I-80 in the vicinity of the Cordelia Truck Scales are shown in Table 2-3. Locations where the actual accident rate on I-80 exceeds the statewide average for similar facilities are shaded in the table. The total accident rates for most segments of I-80 between Red Top Road and Air Base Parkway exceed the average rates for similar facilities. Rates for fatal accidents or fatal plus injury accidents, or both, exceed the statewide average on *each* I-80 segment. The highest total accident rate is on I-80 between the I-80/I-680 connector structure and the Suisun Valley Road overcrossing; this segment is located just west of the eastbound off-ramp to the eastbound scales.

Table 2-3. Accident History, January 1, 2004, to December 31, 2006

Location	Post Mile	Number of Accidents			Actual Accident Rate (accidents per million vehicle miles)			Average Accident Rate (accidents per million vehicle miles)		
		Total	Fatal	Fatal plus Injury	Total	Fatal	Fatal plus Injury	Total	Fatal	Fatal plus Injury
I-80—westerly project limit to Red Top Road undercrossing	10.89 to 11.39	86	0	19	1.29	0.000	0.29	0.82	0.004	0.26
I-80—Red Top Road undercrossing to SR 12W/ I-80 connector structure	11.39 to 11.98	83	0	19	1.05	0.000	0.24	0.83	0.004	0.24
I-80—SR 12W/I-80 undercrossing to Green Valley Road overcrossing	11.98 to 12.74	157	1	36	1.20	0.008	0.27	0.94	0.005	0.30
I-80—Green Valley Road overcrossing to I-680/I-80 connector structure	12.74 to 13.09	117	1	24	1.63	0.014	0.33	1.05	0.005	0.33

Location	Post Mile	Number of Accidents			Actual Accident Rate (accidents per million vehicle miles)			Average Accident Rate (accidents per million vehicle miles)		
		Total	Fatal	Fatal plus Injury	Total	Fatal	Fatal plus Injury	Total	Fatal	Fatal plus Injury
I-80—I-680/I-80 connector structure to Suisun Valley Road overcrossing	13.09 to 13.49	158	0	34	1.81	0.000	0.39	1.10	0.006	0.35
I-80—Suisun Valley Road overcrossing to SR 12E/I-80 connector structure	13.49 to 15.81	598	1	137	1.10	0.002	0.25	1.04	0.006	0.34
I-80—SR 12E/I-80 connector structure to Abernathy Road overcrossing	15.81 to 16.17	61	1	18	0.83	0.014	0.24	1.05	0.005	0.33
I-80—Abernathy Road overcrossing to West Texas Street undercrossing	16.17 to 17.20	200	2	63	0.95	0.010	0.30	1.05	0.005	0.33
SR 12E—SR 12E/I-80 connector to Chadbourne Road undercrossing	1.85 to 2.22	7	0	3	0.48	0.000	0.21	0.76	0.008	0.28
SR 12E—Chadbourne Road undercrossing to Beck Avenue	2.22 to 3.20	64	2	31	1.54	0.048	0.75	1.13	0.011	0.44
SR 12E—Beck Avenue to Pennsylvania Avenue	3.20 to 4.07	108	1	50	2.49	0.023	1.15	1.82	0.022	0.84
SR 12E—Pennsylvania Avenue to Civic Center Boulevard	4.07 to 4.74	55	0	25	1.51	0.000	0.68	1.27	0.012	0.50

Source: Caltrans TASAS data, 2004–2006.
Note: Shading denotes locations that exceed the statewide average accident rate.

2.1.3 Logical Termini and Independent Utility

FHWA provides guidance for establishing the logical termini and independent utility of a project (FHWA 1993). The proposed project must satisfy an identified need (e.g., safety, rehabilitation, economic development, or capacity improvements), and should be considered in the context of the local area (e.g., socioeconomics, topography, future travel demand, and other infrastructure improvements in the area). The U.S. DOT/FHWA regulations indentify three general principles used in demonstrating a proposed project's logical termini (or end points) and independent utility (23 CFR 7711.111[f]). To ensure meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated, the proposed project must meet the following criteria:

- **Connect logical termini and be of sufficient length to address environmental matters on a broad scope.** Logical termini for project development are defined as (1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts. The environmental impact review frequently covers a broader geographic area than the strict limits of the transportation improvements. In the past, the most common termini have been points of major traffic generation, especially intersecting roadways. This is due to the fact that in most cases traffic generators determine the size and type of facility being proposed. Choosing a corridor of sufficient length to evaluate all impacts need not preclude staged construction. Construction may be

"staged," or programmed for shorter sections or discrete construction elements as funding permits (FHWA 1993).

- **Have independent utility or significance.** A project that is independent must be usable and be a reasonable expenditure, even if no additional transportation improvements in the area are made. A project is considered “independent” when it can function, or operate, on its own, without further construction of an adjoining segment. The project must serve a significant purpose even if a second, related project is not built.

- **Not restrict consideration of alternatives for other reasonably forseeable transportation improvements.** A project must not foreclose the opportunity to consider alternatives for a future, related transportation improvement. Project termini must be selected to prevent a highway improvement from “forcing” further improvements which may have negative consequences not addressed in environmental studies.

The I-80 Eastbound Cordelia Truck Scales Relocation project meets these criteria as described below.

The project has logical termini and is of sufficient length to address environmental matters on a broad scope. The project involves the relocation of the eastbound truck scale facility and the project area includes the current location of the eastbound truck scales (which will be removed), the site of the new facility, and associated on- and off-ramps of sufficient length to satisfy safety concerns. The western end point on I-80 is at PM 13.8, in the vicinity of the Scandia Family Fun Center. The eastern end point along I-80 and the western end point along SR 12E is at the I-80/SR 12E interchange at I-80 PM 15.7 and SR 12E PM L1.8. The eastern end point along SR 12E is at PM L2.0, just west of Chadbourne Road. As proposed, the project meets the overall objectives and the purpose and need.

The project area encompasses a geographic area of sufficient size and scope for improvements so that environmental issues can be addressed on a comprehensive level. For the traffic and other environmental issues, a study area beyond the project limits was established to ensure that environmental impacts were analyzed beyond the proposed physical improvements/project limits. For traffic, the study area includes components of the regional freeway systems and ramp terminal intersections in the eastbound direction on I-80 from Red Top Road to Air Base Parkway, the northbound direction on I-680 between Gold Hill Road and I-80, and on SR 12E from I-80 to Civic Center Drive.

Other improvements would not be needed for the I-80 Eastbound Cordelia Truck Scales to improve traffic conditions, safety, and enforcement. The project would result in improved network-wide freeway operations in 2015 and improved conditions or no change at most mainline sections and ramps. The construction of the eastbound relocated truck scales would also reduce accidents in the corridor by providing standard length ramps for the truck scales and reducing truck merging movements. Also, the eastbound truck scales are an independent project and a separate facility that functions independently of the highway or westbound facility to improve truck weight and safety inspection.

The I-80 Eastbound Cordelia Truck Scales Relocation project would not impede other foreseeable highway improvement projects. The project is included in the adopted RTP, Transportation 2035 Plan for the San Francisco Bay Area (Metropolitan Transportation Commission 2009a) and adopted TIP, 2009 Transportation Improvement Program (Metropolitan Transportation Commission 2008). Therefore, this project has been considered in conjunction with other planned improvement projects and would not foreclose the implementation of other transportation improvements in the area.

2.2 Project Description

The project area is located within Solano County in the vicinity of the I-80/I-680/SR 12 Interchange. The project consists of constructing a new expanded truck scale facility to accommodate truck traffic in the eastbound direction, constructing associated on- and off-ramps, and removing the existing eastbound truck scales. The construction of the project would reduce truck-related congestion and accommodate anticipated growth in truck traffic, as well as improve mainline safety and improve the reliability of the truck weight and safety inspection enforcement.

The existing eastbound truck scales were constructed in 1958. The facility consists of four inspection bays and limited parking.

2.3 Alternatives

2.3.1 Project Alternatives

Based on extensive planning conducted by the Department, the CHP, and the STA, which is documented in the *Cordelia Truck Scales Relocation Study: Summary Report and Recommendations* (Solano Transportation Authority 2005a), one build alternative for the project is being considered in this environmental impact report/environmental assessment (EIR/EA). The California Environmental Quality Act (CEQA) also requires that a no-project alternative be considered in the EIR. The alternatives are described below.

2.3.2 Build Alternative

The build alternative (the proposed project) would consist of the construction of a new eastbound truck scale facility; the construction of associated ramps, including one bridge and one overcrossing; and the removal of the existing eastbound truck scale facility and associated ramps (Figure 1-2).

Truck Scales

The Eastbound Cordelia Truck Scales facility would be reconstructed approximately 2,500 feet to the east of its present location. The new facility would be a Class B Commercial Vehicle

Enforcement Facility (CVEF) (*Class B* being defined as an independent command facility of the CHP located along a major highway route), which would have the capacity to inspect all eastbound I-80 trucks passing the facility, 24 hours per day, seven days a week. The facility would contain up to four sets of scales to accommodate two lines of empty and loaded trucks. The new facility would contain seven inspection bays, parking for automobiles and semi-truck trailer combinations, and a roadway along the outer edge of an oval to allow weighed trucks to be driven around into the inspection bays or to be reweighed. A single-story operations building would be constructed to facilitate the vehicle inspection and weighing process.

The facility will be designed to be compliant with the Americans with Disabilities Act guidelines. All parts of the building will be accessible to the physically disabled in compliance with the requirements of Chapter 11 of the California Building Code. The only exceptions are the inspection pits, which will not be accessible. In addition, accessible parking for the disabled will be provided.

The facility also will incorporate several energy efficient and environmentally conscious (green) facilities. The project seeks to achieve a USGBC Silver LEED certification. The building will be designed to use approximately 28% less energy and 30% less water than a typically designed building the same size as the truck scales facility. The building will incorporate a solar-voltaic system on the roof which is expected to generate more than 12% of the building's energy needs; day-lighting will be used in 75% of the rooms to reduce the amount of electric lighting needed. The project will use recycled materials, locally available materials, and numerous other energy efficient and environmentally conscious materials and systems.

Associated Ramps

Associated ramps would include an off-ramp providing access to the truck scale facility from eastbound I-80 and on-ramps providing access to eastbound I-80 and SR 12E.

The off-ramp to the new truck scale facility would use the existing off-ramp location and geometry, which consists of a single-lane exit. The new off-ramp would widen to a two-lane facility through the existing truck scale site and would widen to four lanes immediately west of Suisun Creek. The new off-ramp would cross over Suisun Creek on a new bridge before entering the new truck scale facility. Truck traffic would be sorted along the approach roadway into the appropriate lane by means of weigh-in-motion scales and signal bridges.

Trucks leaving the facility would use a new two-lane eastbound roadway that splits approximately 1,300 feet east of the facility, with one lane merging onto eastbound I-80 and the other lane connecting to the eastbound I-80–to–eastbound SR 12E connector.

Eastbound I-80–to–SR 12E Connector

The eastbound I-80–to–eastbound SR 12E connector would be reconstructed as a two-lane ramp crossing over (braided with) the truck scale on-ramp to eastbound I-80. The eastbound I-80–to–eastbound SR 12E connector would consist of a two-lane connection (one dedicated SR 12E lane and a shared through-exit lane) and would be supported by a two-column central support and retaining walls on both approaches as it crosses over the truck scale on-ramp. The new dedicated

lane on I-80 would begin approximately 2,500 feet west of the exit point to the connector. The two-lane connector would continue east, becoming SR 12E, with the truck scale on-ramp joining as an auxiliary lane that would end at the SR 12E/Chadbourne Road interchange off-ramp.

Bridge over Suisun Creek

A four-lane, precast, single-span bridge would be constructed to carry truck traffic on the off-ramp over Suisun Creek. Abutments for the bridge would be located above the ordinary high water mark (OHWM) of the creek.

Utilities

Relocation

As part of the proposed project, several utilities would need to be relocated as identified below. Relocating the utilities would occur during the construction phase of the proposed project. A pole on the 12-kilovolt (kV) line crossing I-80 adjacent to Suisun Creek would be relocated to accommodate the proposed truck scale off-ramp. From this point, the line to the southeast, consisting of seven poles, would be relocated within an easement around the south side of the proposed truck scale inspection and parking facility to the existing warehouses south of the proposed facility. Two parallel 115-kV lines cross I-80 immediately west of the I-80/SR 12E interchange. The two towers (one on each line) on the south side of I-80 would be relocated within the existing tower line easement. A pole on the 12-kV line crossing I-80 immediately west of the I-80/SR 12E interchange near Hale Ranch Road would be relocated to accommodate the proposed eastbound I-80–to–eastbound SR 12E connector. Impacts associated with the various utility relocations are addressed in this EIR/EA pursuant to California Public Utilities Commission (PUC) General Order (GO)-131 D filing requirements. The precise field location of high-risk utilities will be identified during final design in accordance with the Department's procedures.

As part of the proposed project, drainage and irrigation facilities that conflict with the project would be relocated to maintain their existing function, with the exception of the Valine Lateral, which will be abandoned and removed.

The Solano Irrigation District (SID) pipeline beneath Suisun Creek would be extended to accommodate the construction of the new eastbound truck scales off-ramp. Bore and jack technology would be used to relocate the 18-inch diameter SID water pipeline approximately 150 feet to the south of its current location. The boring and receiving pits would be located approximately 30 to 50 feet from Suisun Creek on either side.

Service to Site

Water, sewer, communication, and electrical services for the truck scales would be provided by underground utilities. The underground lines would connect to existing utilities to the west (in the vicinity of the Scandia amusement park) and would follow the road shoulder, remaining entirely within the existing Department right-of-way. It is expected that excavation for these utilities would be approximately eight to 10 feet deep and would parallel existing underground

utilities. The utilities, attached to the I-80 bridges, would cross both Suisun and Dan Wilson Creeks.

Removal of Existing Truck Scales

The existing eastbound facility would be removed after the new facility becomes operational.

Construction Activities

Construction activities would include grading and paving, excavation for bridge foundations and utilities, pile driving, and power pole/tower replacement. Construction equipment would access the project area from the road shoulder on the south side of I-80 or Hale Ranch Road. Staging areas would be located within 20 feet of the new ramp alignments.

Excavation associated with project construction would include grading for the new on- and off-ramp alignments and the new facility location, excavation for the installation of underground utilities and power poles/towers, excavation for retaining wall footings, and excavation for pile caps. Grading is not expected to exceed five feet of cut as part of the project construction. Underground utilities would be located within the Department's right-of-way and the new truck scale facility footprint. Excavation for utilities would extend to a maximum depth of 10 feet.

The clear span bridge over Suisun Creek would be precast and lowered into place. The abutments would be supported by piles that would extend approximately 70 feet below the abutment. The two central columns for the eastbound I-80–to–eastbound SR 12E connector would be supported by pile caps that extend 13 to 15 feet below the ground surface and by piles that extend 70 feet below the bottom of the pile caps.

Construction equipment would not cross Suisun Creek. Access would be from the north, and all creek crossings would occur from I-80.

The new truck scales facility would be constructed on fill. Excavation for building foundations and underground utilities is not expected to extend beyond the fill.

2.3.3 No-Build (No Action) Alternative

Under the no-build alternative, the existing truck scales would remain in operation, and no expanded facility would be constructed. The facility would retain the two dynamic and one static scale and four inspection bays, and the capacity of the existing truck scales would not be enhanced. Truck traffic exceeding the capacity of the facility would continue to result in scale closures. A single lane off-ramp would remain, continuing to contribute to congestion in the area as trucks queued as a result of the limited capacity of the facility and the increasing number of trucks exiting the highway. The single on-ramp with a 705-foot acceleration lane would not be extended or improved and trucks would continue to enter the highway at slow speeds and contribute to safety concerns associated with trucks weaving into highway traffic.

2.3.4 Alternatives Considered but Eliminated from Further Discussion

In February 2005 the STA, in coordination with the Department and the CHP, completed the *Cordelia Truck Scales Relocation Study: Summary Report and Recommendations* (Solano Transportation Authority 2005a). This study identified the need to construct replacement scales and evaluated several alternative locations along the I-80, I-505, SR 12, and SR 113 corridors. The study was conducted as a four-tier technical analysis. Tier 1 initially screened 24 sites for physical size, impact of freeway operations, and environmental fatal flaws. Eleven of the 24 sites were evaluated further in Tier 2, which screened for specific geometric requirements, traffic operations, additional environmental impacts, and right-of-way requirements. Three options were subjected to a detailed technical analysis in Tier 3. The three potential options analyzed are listed below.

- Option 1: relocating and expanding the scales within the I-80/I-680/SR 12 interchange.
- Option 2: building new scales on I-80 between Fairfield and Vacaville and on SR 12 between I-80 and SR 113.
- Option 3: building new scales on I-80 between Vacaville and Dixon, on SR 12 between I-80 and SR 114, and on I-505 between Vacaville and Winters.

The Tier 3 detailed technical analysis of these three options considered the following five criteria:

- Capital cost.
- Thirty-five–year operations and maintenance.
- Right-of-way requirements.
- Environmental considerations.
- Traffic operations.

The initial conclusion from the Tier 3 analysis was that Option 3 provided the best relocation option because it provided the lowest capital investment and the best flexibility in implementation and had the least impact on traffic operations. Additionally, the sites were in relatively rural areas, consistent with similar facilities in the state.

The Tier 4 analysis was initiated by the release of the draft *Cordelia Truck Scales Relocation Study: Summary Report and Recommendations* for public review and comment. This document addressed all three options. In addition to public comments, STA received input from the Department and CHP staff. CHP staff expressed opposition to moving the truck scale facility outside the I-80/I-680/SR 12 Interchange because of concerns about increased operating costs for multiple facilities, as well as concerns regarding capturing all truck traffic.

As a result of public input, Options 1 and 3 were revised, and Option 2 was eliminated. Option 1 was revised to reflect a modified design, developed through a cooperative effort of the STA, the CHP, and the Department, for the scale facilities within the I-80/I-680/SR 12 interchange. The revised design significantly reduced capital costs and increased the peak hour truck throughput

when compared with the original proposed design. The revisions to Option 3 consisted of moving the proposed locations for facilities on I-80 and SR 12.

Based upon the findings of the four-tiered analysis conducted for the *Cordelia Truck Scales Relocation Study: Summary Report and Recommendations*, the STA board of directors recommended to the State of California that the truck scales be relocated as identified in the revised Option 1. Option 1 allowed for a comparable capital investment to Revised Option 3 and was better accepted by the public. Additionally, Option 1 allowed for more reliable enforcement, as fewer alternate routes enabling trucks to avoid the scales would need to be patrolled.

2.3.5 Final Decision Making Process

After the public circulation period, all comments were considered, and the Department selected a preferred alternative and made the final determination of the project's effect on the environment. In accordance with CEQA, the Department will certify that the project complies with CEQA, prepare findings for all significant impacts identified, and certify that the findings had been considered prior to project approval. The Department will file a Notice of Determination with the State Clearinghouse that will identify that the project will have significant impacts, the mitigation measures included as conditions of project approval, and that findings were made. Similarly, the Department, as assigned by FHWA, has determined the NEPA action does not significantly impact the environment, and will issue a Finding of No Significant Impact (FONSI) in accordance with NEPA.

2.4 Funding and Programming

The proposed project is fully funded for $99.6 million, with $49.8 million coming from Transportation Corridor Improvement Funds (TCIF) and $49.8 million coming from Toll Bridge Funds. The proposed action is included in the MTC's 2005 Regional Transportation Program (RTP) and the 2007 Transportation Improvement Program (TIP). The proposed project is also included in STA's I/80/I-680/I-780 Major Investment and Corridor Study (STA 2004) and STA's Cordelia Truck Scales Relocation Study (STA 2005a).

2.4.1.1 Traffic Congestion

Current traffic volumes along segments of I-80 and I-680 in the project area create heavy traffic congestion with an average travel speed of 46 mph during the morning peak period and 33 mph during the afternoon peak period. These average speeds are well below the threshold of 59.7 miles per hour identified by the Highway Capacity Manual as the minimum operating speed associated with acceptable mainline freeway operations. There are several bottlenecks and LOS F (as defined in vehicles per hour per lane) locations within the freeway system as a result of this congestion. Chapter 3.1.6 discusses this in detail, and Tables 3.1.6-1 and 3.1.6-2 illustrate the correlations between congestion and LOS.

2.4.1.2 Traffic Diverting to Local Roads

It is estimated that up to 1,450 vehicles (PM peak hour) currently divert from the northbound I-680 to eastbound I-80 connector to alternate routes to bypass the congestion and re-enter eastbound I-80 or eastbound SR12 at locations east of a bottleneck location. This cut-through traffic creates a series of problems along the local street system such as increase of congestion and delay on local roads; reduction of accessibility for local properties and increase of delay for transit and emergency service vehicles

2.4.1.3 Truck-Related Congestion

The westbound truck scales are located on the most congested freeway segment in Solano County. Trucks slowing to enter the short (approximately 500 feet) off-ramp to the scales, and accelerating to enter I-80 on the short on-ramp from the scales, exacerbate the congestion problem, as do trucks queuing onto the mainline from the short off-ramp to the facility.

2.4.1.4 Unreliable Freight Transport

Travel times for truck trips are unpredictable due to queues and congestion.

2.4.1.5 Traffic Safety

High vehicle volumes, short merge and diverge maneuvers, and short distances between interchanges, all contribute to safety issues in the area. Within the project limits most freeway segments of I-80 (from interchange to interchange) experience a higher total accident rate and a higher fatal and injury rate compared to the statewide averages for similar facilities. Over 60% of the accidents on I-80 were rear-end type collisions. Within the project limits of SR 12 East half of the sections experience higher total accident rates and fatal accident rates than the statewide average for similar facilities. 48% of the accidents on SR 12 East were rear-end type collisions. The majority of accidents on I-80, SR12 West and SR-12 East occurred during commute periods. The combination of high percentages of accidents during commute periods and high percentages of the rear-end type collisions are related to the congestion observed in these sections.

Chapter 3 PM2.5 Hot Spot Analysis

The following is the PM2.5 hot spot analysis for the I-80 Eastbound Cordelia Truck Scales Relocation Project. In accordance with the final Transportation Conformity Rule, 40 CFR 93.116 and 93.123 (b)(1), this project is defined as a Project of Air Quality Concern (POAQC) and requires a qualitative PM2.5 hot spot analysis.

3.1 Regulatory Background

Under 1990 Clean Air Act Amendments, the U.S. Department of Transportation (DOT) cannot fund, authorize, or approve Federal actions to support programs or projects that are not first found to conform to the State Implementation Plan (SIP) for achieving the goals of the Clean Air Act requirements Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and particulate matter (PM). California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTPs) are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as the Metropolitan Transportation Commission (MTC) for Solano County and the appropriate federal agencies, such as the Federal Highway Administration, make the determination that the RTP is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires “hot spot” analysis if an area is “nonattainment” or “maintenance” for carbon monoxide (CO) and/or particulate matter. A region is a “nonattainment” area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called “maintenance” areas. “Hot spot” analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

The concept of transportation conformity was introduced in the CAA 1977 amendments. Transportation conformity requires that no federal dollars be used to fund a transportation project unless it can be clearly demonstrated that the project would not cause or contribute to violations of the NAAQS. Conformity requirements were made substantially more rigorous in the 1990 CAAA, and the transportation conformity regulation that details implementation of the new requirements was issued in November 1993.

DOT and the EPA developed guidance for determining conformity of transportation plans, programs, and projects in November 1993 in the Transportation Conformity Rule (*40 Code of Federal Regulations* [*CFR*] *51* and *40 CFR 93*). The demonstration of conformity to the SIP is the responsibility of the local Metropolitan Planning Organization (MPO), which is also responsible for preparing RTPs and associated demonstration of SIP conformity. Section 93.114 of the Transportation Conformity Rule, states that "there must be a currently conforming regional transportation plan and transportation improvement plan at the time of project approval."

The MTC is the designated federal MPO and state regional transportation planning agency for Solano County. As such, MTC coordinates the region's major transportation projects and programs, and promotes regionalism in transportation investment decisions.

3.1.1 Statutory Requirements for PM Hotspot Analyses

On March 10, 2006, the EPA issued a final transportation conformity rule (40 CFR 51.390 and Part 93) that addresses local air quality impacts in PM10 and PM2.5 nonattainment and maintenance areas. The final rule requires a hot spot analysis to be performed for a POAQC or any other project identified by the PM2.5 SIP as a localized air quality concern. Transportation conformity, under CAA section 176(c) (42 U.S.C. 7506(c)), requires that federally supported highway and transportation project activities conform to the State Implementation Plan (SIP). The rule provides criteria and procedures to ensure that these activities will not create new violations or "worsen" existing violations, or prevent adherence to relevant NAAQS as described in 40 CFR 93.101.

EPA's final rule, 40 CFR 93.123(b)(1) defines a POAQC as:

> (i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;
>
> (ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
>
> (iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;
>
> (iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and
>
> (v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM2.5 or PM10 applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

In March 2006, the Federal Highway Administration (FHWA) and EPA issued a guidance document entitled *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2006). This guidance details a qualitative step-by-step screening procedure to determine whether project-related particulate emissions have a potential to generate new air quality violations, worsen existing violations, or delay attainment of NAAQS for PM2.5 or PM10. The PM10 hot spot analysis is not required for project-level conformity because the area is in attainment or unclassified for the national PM10 standards.

For the assessment of PM10 hotspots, the final rule is that a hotspot analysis is to be performed only for POAQCs. POAQCs are certain highway and transit projects that involve significant levels of diesel traffic or any other project identified in the PM2.5 or PM10 SIP as a localized air quality concern. The following list provides examples of POAQCs.

- A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) where 8% or more of such AADT is diesel truck traffic.
- New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal.
- Expansion of an existing highway or other facility that affects a congested intersection (operated at LOS D, E, or F) that has a significant increase in the number of diesel trucks.
- Similar highway projects that involve a significant increase in the number of diesel transit busses and/or diesel trucks.

The list below provides examples of projects that are not an air quality concern.

- Any new or expanded highway project that primarily services gasoline vehicle traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles), including such projects involving congested intersections operating at LOS D, E, or F.
- An intersection channelization project or interchange configuration project that involves either turn lanes or slots or lanes or movements that are physically separated. These kinds of projects improve freeway operations by smoothing traffic flow and vehicle speeds by improving weave and merge operations, which would not be expected to create or worsen PM2.5 or PM10 violations.
- Intersection channelization projects, traffic circles or roundabouts, intersection signalization projects at individual intersections, and interchange reconfiguration projects that are designed to improve traffic flow and vehicle speeds, and do not involve any increases in idling. Thus, they would be expected to have a neutral or positive influence on PM2.5 or PM10 emissions.

For projects identified as not being a POAQC, qualitative PM2.5 and PM10 (for regions without an approved conformity SIP) hotspot analyses are not required. For these types of projects, state and local project sponsors should briefly document in their project-level conformity determinations that CAA and *40 CFR 93.116* requirements were met without a hotspot analysis, since such projects have been found to not be of air quality concern under *40 CFR 93.123(b)(1).* Because this analysis assumes the area is classified as a nonattainment area for the federal PM2.5 standard, a determination must be made as to whether it would result in a PM2.5 hotspot.

Of these five POAQC types identified above, the project most likely falls into the fourth category of an "expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location." As indicated in Table 3-1, ADT volumes along on the truck scale ramps are anticipated at 8,200 in 2035, which represents a 6.4% increase in truck volumes compared to the no project condition. It is anticipated that trucks comprise 100% of the total volumes on the truck scales, as passenger vehicles and other non-truck vehicles would not be permitted at the truck scales. In addition, Table 3-1 also indicates that traffic volumes along I-80 are anticipated to exceed the EPA and FHWA's POAQC guideline of 125,000, although truck percentages are expected to remain below the POAQC guideline of 8% (i.e., 10,000 truck ADT). Consequently, the project is considered to be a POAQC and a qualitative project-level PM2.5 hot spot analysis was conducted to assess whether the project would cause or contribute to any new localized PM2.5 violations, or increase the frequency or severity of any existing violations, or delay timely attainment of the PM10 or PM2.5 national ambient air quality standards (NAAQS).

Table 3-1. Truck Scale Ramps and Mainline ADT Volume Calculation Assumptions
Cordelia Truck Scales (Worst-Case Traffic Volumes in Project Area)

Truck Scale Ramps[1]	WB		EB		Total			
Condition	am Peak Hour	pm Peak Hour	am Peak Hour	pm Peak Hour	am total Peak Hour	pm total Peak Hour	total Peak Hour	Calculated ADT[2]
Existing	0	0	0	0	0	0	0	0
2015 No Project	463	150	493	234	956	384	1,340	6,700
2015 With Project	464	204	495	216	959	420	1,379	6,895
2035 No Project	503	99	746	193	1,249	292	1,541	7,705
2035 With Project	621	89	741	189	1,362	278	1,640	8,200[3]

Mainline I-80	WB		EB		Total				
Condition	am Peak Hour	pm Peak Hour	am Peak Hour	pm Peak Hour	am total Peak Hour	pm total Peak Hour	total Peak Hour	Calculated ADT[2]	Calculated Truck ADT[4]
Existing	8,470	6,780	5,650	8,080	14,120	14,860	28,980	144,900	5,057
2015 No Project	10,217	7,414	6,329	7,917	16,546	15,331	31,877	159,385	5,563
2015 With Project	10,207	8,164	6,352	8,198	16,559	16,362	32,921	164,605	5,745
2035 No Project	9,238	5,427	8,507	6,116	17,745	11,543	29,288	146,440	5,111
2035 With Project	11,139	5,310	8,461	6,767	19,600	12,077	31,677	158,385	5,528

Notes

[1] All volumes presented are truck volumes traveling on the truck scale on and off ramps

[2] Based on guidance provided by Rabinovitz pers. comm.

[3] Increase in trucks is 6.4%

[4] Assumes 3.49% diesel trucks based on Caltrans 2007 Annual Average Daily Truck Traffic on the California State Highway System data (Attachment D) and methodology from Section B.3.1 of the Caltrans CO Protocol

3.1.2 Ambient Air Quality Standards

- **24-hour Standard:** The old 1997 standard of 65 $\mu g/m^3$ was revised in 2006 to 35 $\mu g/m^3$
- **Annual Standard:** 15 $\mu g/m^3$

The Bay Area was designated as a nonattainment area for the federal PM2.5 standard on October 8, 2009, with an effective date of December 14, 2009. The BAAQMD must submit a SIP to the EPA by December 14, 2012 demonstrating how the Bay Area will achieve the PM2.5 NAAQS by December 14, 2014. (Bay Area Air Quality Management District 2009.)

The 24-hour PM2.5 standard is based on 3-year average of the 98th percentile of 24-hour recorded concentrations; the annual standard is based on 3-year average of the annual arithmetic mean PM2.5 recorded at the monitoring station. A PM2.5 hot-spot analysis must consider both standards, unless it is determined for a given area that meeting the controlling standard would ensure that CAA requirements are met for both standards. The interagency consultation process should be used to discuss how the qualitative PM2.5 hot-spot analysis meets statutory and regulatory requirements for both standards, depending on the factors that are evaluated for a given project

3.2 PM2.5 Hot Spot Analysis

The final Transportation Conformity Rule requires a hot spot analysis to be performed for POAQC, while projects identified as not being a POAQC are not required to undergo a hot spot analysis. As indicated above, data from Table 3-1 indicates that the project is a POAQC and a qualitative PM2.5 hot spot analysis is required.

A hot-spot analysis is defined in Section 93.101 of 40 CFR as an estimation of likely future localized pollutant concentrations and a comparison of those concentrations to the relevant air quality standards. A hot-spot analysis assesses the air quality impacts on a project-level – a scale smaller than an entire nonattainment or maintenance area, such as for congested roadway intersections and highways or transit terminals. Such an analysis is a means of demonstrating that a transportation project meets the federal CAA conformity requirements to support state and local air quality goals with respect to achieving the attainment status in a timely manner. When a hot-spot analysis is required, it is included within the project-level conformity determination that is made by FHWA or the Federal Transit Administration (FTA).

3.2.1 Analysis Methodology and Types of Emissions Considered

The EPA and FHWA established in the *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2006) the following two methods for completing a PM2.5 and PM10 hot-spot analysis:

1. Comparison to another location with similar characteristics – (pollutant trend within the air basin)

2. Air quality studies for the proposed project location – (ambient PM trend analysis in the project area)

This analysis uses a combined approach to demonstrate that the proposed project would not result in a new or worsened PM2.5 or PM10 violation. Method 1 was used to establish that the proposed project area will meet the NAAQS. Method 2 was used to demonstrate that implementation of the proposed project would not delay attainment of the NAAQS.

The analysis was based on directly emitted PM2.5 and PM10 emissions, including tailpipe, brake wear, and tire wear.

The hot spot analysis does not consider PM2.5 re-entrained road dust emissions, since there has been no finding of significance made by the EPA or the California Air Resources Board.

Re-entrained dust caused by vehicles traveling over paved and unpaved roads was not included in the qualitative analysis, as the California Air Resources Board has not made a determination that re-entrained road dust is a significant contributor to ambient PM2.5 concentrations in the project region.

Secondary particles formed through PM2.5 and PM10 precursor emissions from a transportation project take several hours to form in the atmosphere, giving emissions time to disperse beyond the immediate project area of concern for localized analyses; therefore, they were not considered in this hot-spot analysis. Secondary emissions of PM2.5 and PM10 are considered as part of the regional emission analysis prepared for the conforming RTP and Federal Transportation Improvement Program (FTIP).

No phase of construction is anticipated to last more than 5 years at any one location. In addition, the project must comply with Bay Area Air Quality Management District (BAAQMD) construction-related fugitive dust control measures, which will ensure that fugitive dust from construction activities are minimized. Consequently, construction-related PM2.5 emissions were not included in the hot spot analysis per 40 CFR 93123(c)(5).

3.2.2 Air Quality Trend Analysis

Local air quality data was obtained from the Berkeley 6th Street monitoring station to characterize existing air quality and predict future conditions in the project area. In addition to monitoring data, this analysis presents project-level PM2.5 emissions in the future (2015 and 2035) years to help characterize the project's impact on total PM2.5 emissions generated in the project area and the impacts of the project and the likelihood of these impacts interacting with the ambient PM2.5 levels to cause hot spots are discussed.

3.2.2.1 Data Considered

The nearest air quality monitoring station is Fairfield station (1010 Chadbourne Road, Fairfield, California, 94585), which is located approximately 2.25 miles east of the I-80 segment analyzed. However, the Fairfield monitoring station only measures for 1-hour and 8-hour ozone and does

not monitor for PM2.5. The next closest stations that monitor for PM2.5 are the Vallejo station (304 Tuolumne St, Vallejo CA, 94590), which is over 10 miles southwest of the project location and the Napa station (26552 Jefferson Av, CA, 94558), which is over 10 miles northwest of the project location. Both stations are not representative of the project area due to differing geographic characteristics and the lack of a major interstate highway in close proximity to the monitoring station.

Based on consultation with the Air Monitoring Manager in the BAAQMD's Air Monitoring Division to identify a monitoring location representative of the project site, it was determined that the Berkeley monitoring station (1340 Sixth St., Berkeley CA, 94710) could serve as an adequate proxy monitoring station to characterize PM2.5 concentrations at the project site. While the Berkeley monitoring station is located approximately 25 miles to the southwest, the proximity of the Berkeley monitoring station to I-80 would be similar to the conditions in the project site and the westerly wind direction at Berkeley is to similar to the conditions in the project site, sufficient to serve as a surrogate monitoring station for the project area. (Colwell pers. comm.) Given this, the trend analysis in section 3.2.2.3 primarily concerns data from the Berkeley station, but monitoring data from Vallejo are presented for illustrative purposes.

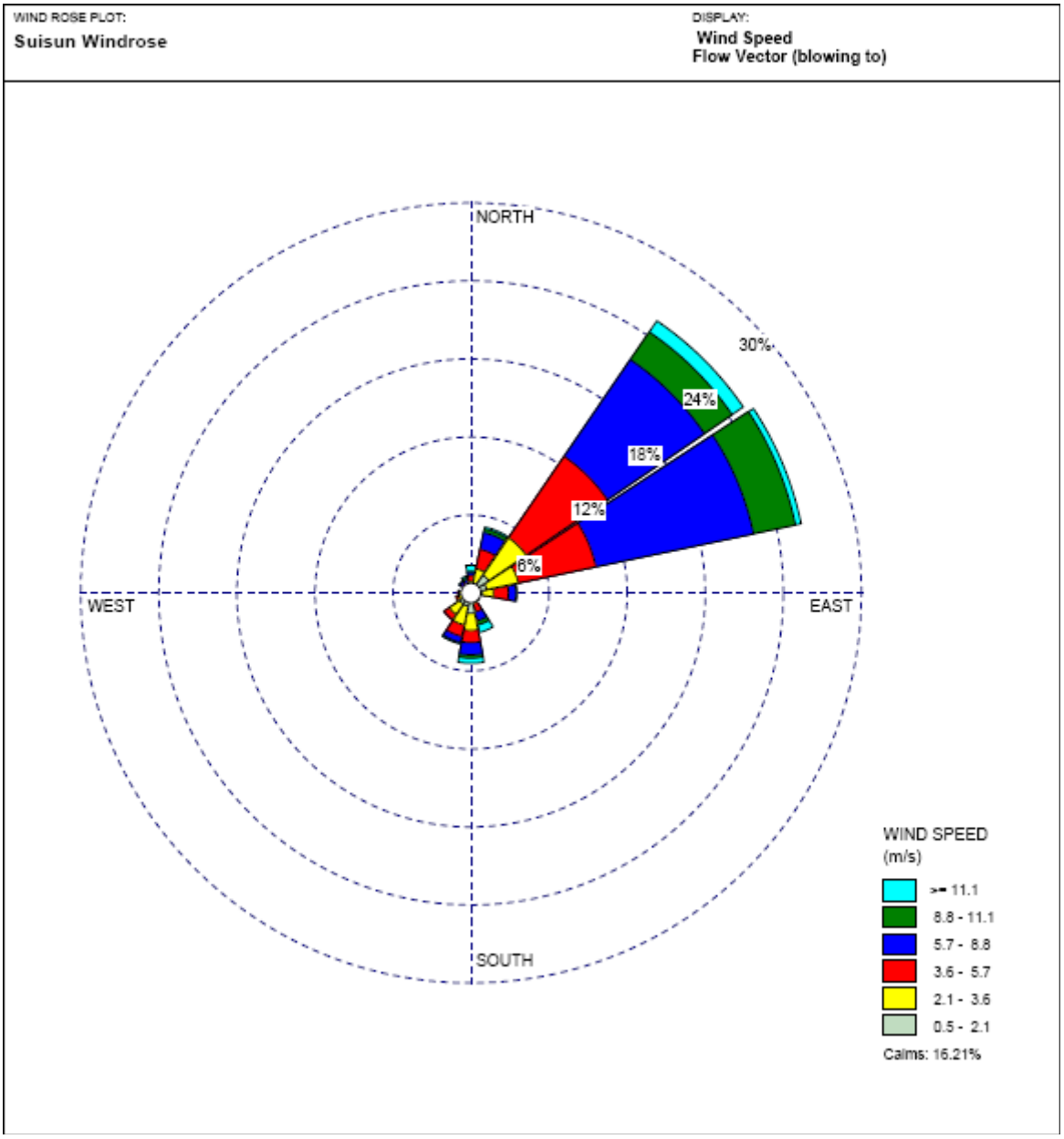
3.2.2.2 Climate and Topography

The proposed project lies within the Carquinez Strait region of the San Francisco Bay Area Air Basin (SFBAAB). The Carquinez Strait is the only sea-level gap between the San Francisco Bay and the Central Valley. Within the region, the prevailing winds are from the west, during the summer and fall months, marine air flows eastward through the Carquinez Strait due to high pressure off shore and low pressure in the Central Valley. Figure 3-1 indicates the predominant wind direction in the region based on meteorological data from Travis Air Force Base (California Air Resources Board 2009). These easterly winds usually contain more pollutants from the Sacramento and San Joaquin Valleys in the east than the cleaner marine air from the west. During summer and fall months, this condition can result in elevated pollutant levels as pollutants move through the strait into the central Bay Area from surrounding areas.

The high-pressure periods during the summer and fall months often are accompanied by low wind speeds, shallow mixing depths, higher temperatures, and little or no rainfall. During the summer, mean maximum temperatures reach about 32.2º C (90º F), while mean minimum temperatures in the winter are typically 1.6 º–4.4º C (35 º–40º F). In distant areas like Fairfield, where the region is sheltered from the moderating effects of the strait, temperature extremes are especially pronounced.

Many industrial facilities, such as chemical plants and refineries, are located within the Carquinez Strait region and generate significant air pollutant emissions. However, the high wind speeds in the region often help moderate the pollution potential of this area. Occasionally, short-term pollution episodes can result from upsets at industrial facilities, while unpleasant odors may occur at any time. The result is that receptors downwind of these facilities could suffer more long-term exposure to air contaminants than individuals elsewhere. Areas of the region that are traversed by major roadways, such as I-80, also may be subject to higher local concentrations of CO and particulate matter, as well as certain toxic air contaminants (TACs), such as benzene.

Figure 3-1. Predominant Wind Direction at Travis Air Force Base



Source: California Air Resources Board 2009

3.2.2.3 Trends in PM2.5 Concentrations

Monitored PM2.5 concentrations at the Berkeley 6th Street monitoring station for the past 3 years (2007-2009) are presented in Table 3-2. The period of 2007-2009 represents the full time period in which the Berkeley monitoring station has been operational; annual PM2.5 data is not available for 2007. This data indicate that the 24-hour average PM2.5 concentrations have exceeded the NAAQS for the past two years. However, the national annual average standard was not exceeded at the monitoring station in any of the past three years. While not indicated in Table 3-2, the Berkeley monitor recorded two days in 2008 in which the national 24-hour PM2.5

standard was exceeded, and one day in 2009. Because the Berkeley station is not a federally recognized monitoring station, the data cannot be used to determine violations of the national PM2.5 standards, or its attainment status. However, based on the Berkeley station is an appropriate proxy station to characterize PM2.5 concentrations and evaluate emission trends in the vicinity of the project area.

Monitored PM2.5 concentrations at the Vallejo Tuolumne Street monitoring station for the past 3 years (2007-2009) are also presented in Table 3-2. This data indicate that the 24-hour average PM2.5 concentrations exceeded the NAAQS for in 2007 and 2008 but not in 2009. However, the national annual average standard was not exceeded at the monitoring station in any of the past three years. While not indicated in Table 3-2, the Vallejo monitor recorded national 24-hour PM2.5 standards exceeded for four days in 2007, seven days in 2008, and five days in 2009. The Vallejo station is a federally recognized monitoring station and is used to determine violations of the national PM2.5 standards. In addition, the Vallejo station is another proxy station to characterize PM2.5 concentrations and evaluate emission trends in the vicinity of the project area.

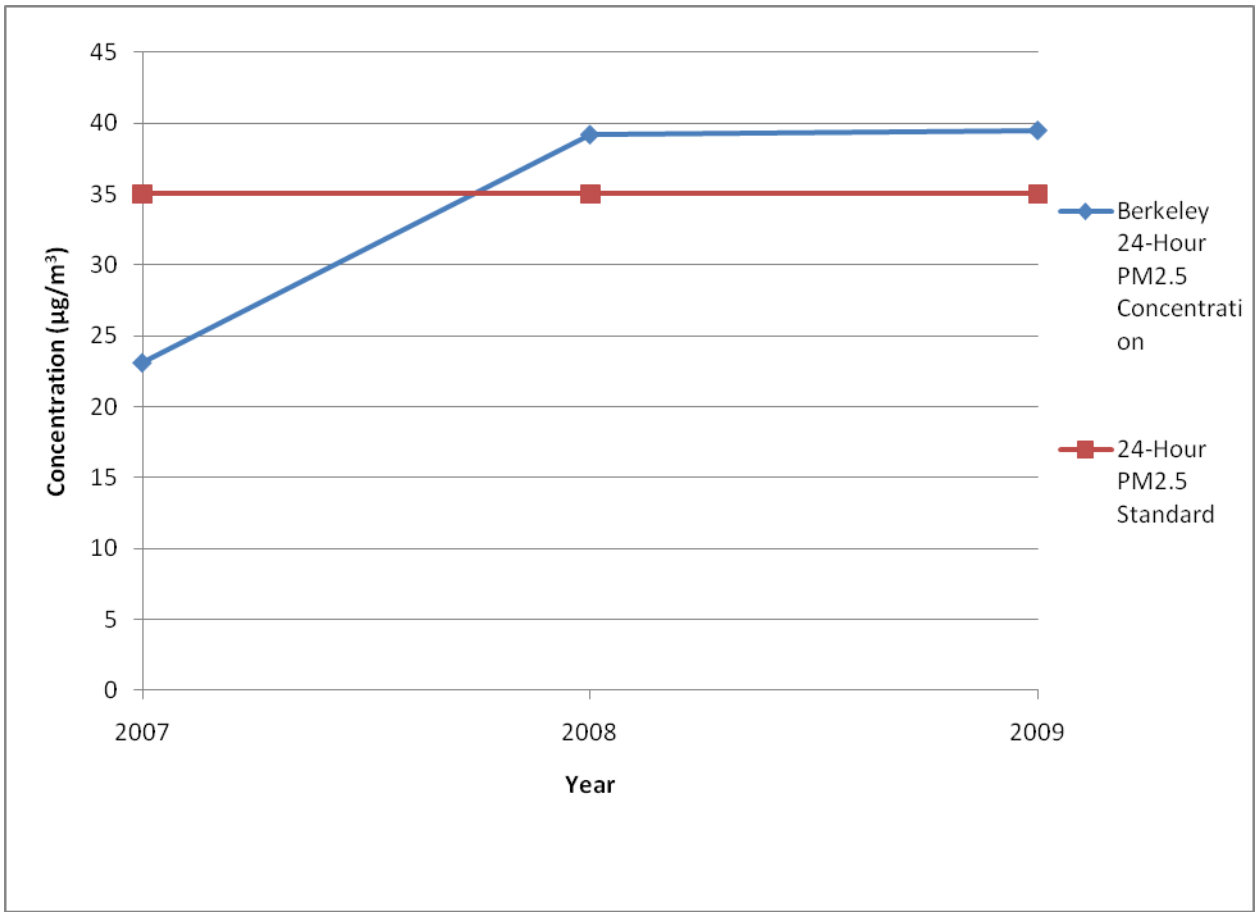
Table 3-2. Ambient PM2.5 Monitoring Data (µg/m3) at the Berkeley 6th Street and Vallejo Tuolumne Street Monitoring Station (2007-2009)

Metric	**2007**	**2008**	**2009**
Berkeley 6th Street			
24-Hour Standard 98th Percentile	23.1	39.2	39.5
Exceeds the federal 24-hour standard (35 µg/m^3)?	No	Yes	Yes
National annual average	NA	12.9	9.9
Exceeds the federal annual average standard (15 µg/m^3)?	No	No	No
Vallejo Tuolumne Street			
24-Hour Standard 98th Percentile	38.6	36.3	33.5
Exceeds the federal 24-hour standard (35 µg/m^3)?	Yes	Yes	No
National annual average	9.7	9.9	9.9
Exceeds the federal annual average standard (15 µg/m^3)?	No	No	No
Source: California Air Resources Board NA			

As required by the applicable transportation conformity regulations for PM2.5, a trend analysis has been conducted and compared to the current 24-hour and annual average NAAQS. The current 24-hour standard is based on the 3-year average of the 98th percentile of 24-hour average PM2.5 concentrations. The current annual standard is based on a three-year average of annual mean PM2.5 concentrations.

As shown in Figure 3-2, 24-hour average PM2.5 concentrations at the Berkeley 6th Street monitoring station increases between 2007 (23.1 µg/m^3) and 2008(39.2 µg/m^3), and remained relatively constant between 2008 (39.2 µg/m^3) and 2009 (39.5 µg/m^3). These values have remained above the current national standard of 35 µg/m^3, but below the old standard of 65 µg/m^3.

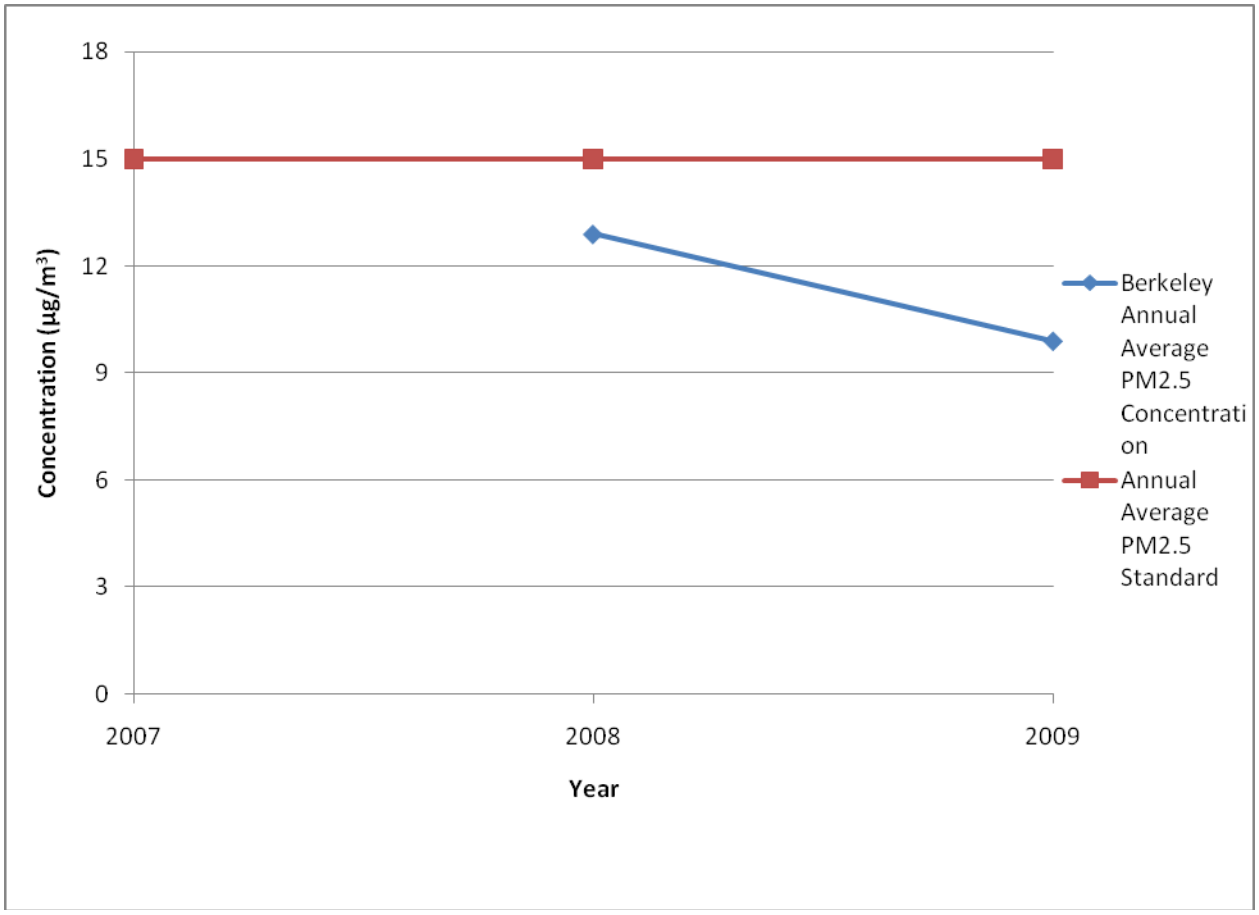
Figure 3-2. 24-Hour Average PM2.5 Concentrations (µg/m^3) at the Berkeley 6th Street Monitoring Station (2007-2009)



Source: California Air Resources Board 2010a

Figure 3-3 indicates that Annual average PM2.5 concentrations recorded at the Berkeley 6th Street motioning station decreased from 2008 (12.9 µg/m^3) to 2009 (9.9 µg/m^3). These values have remained below the current national standard of 15.0 µg/m^3.

Figure 3-3. Annual Average PM2.5 Concentrations (µg/m^3) at the Berkeley 6th Street Monitoring Station (2007-2009)



Source: California Air Resources Board 2010a

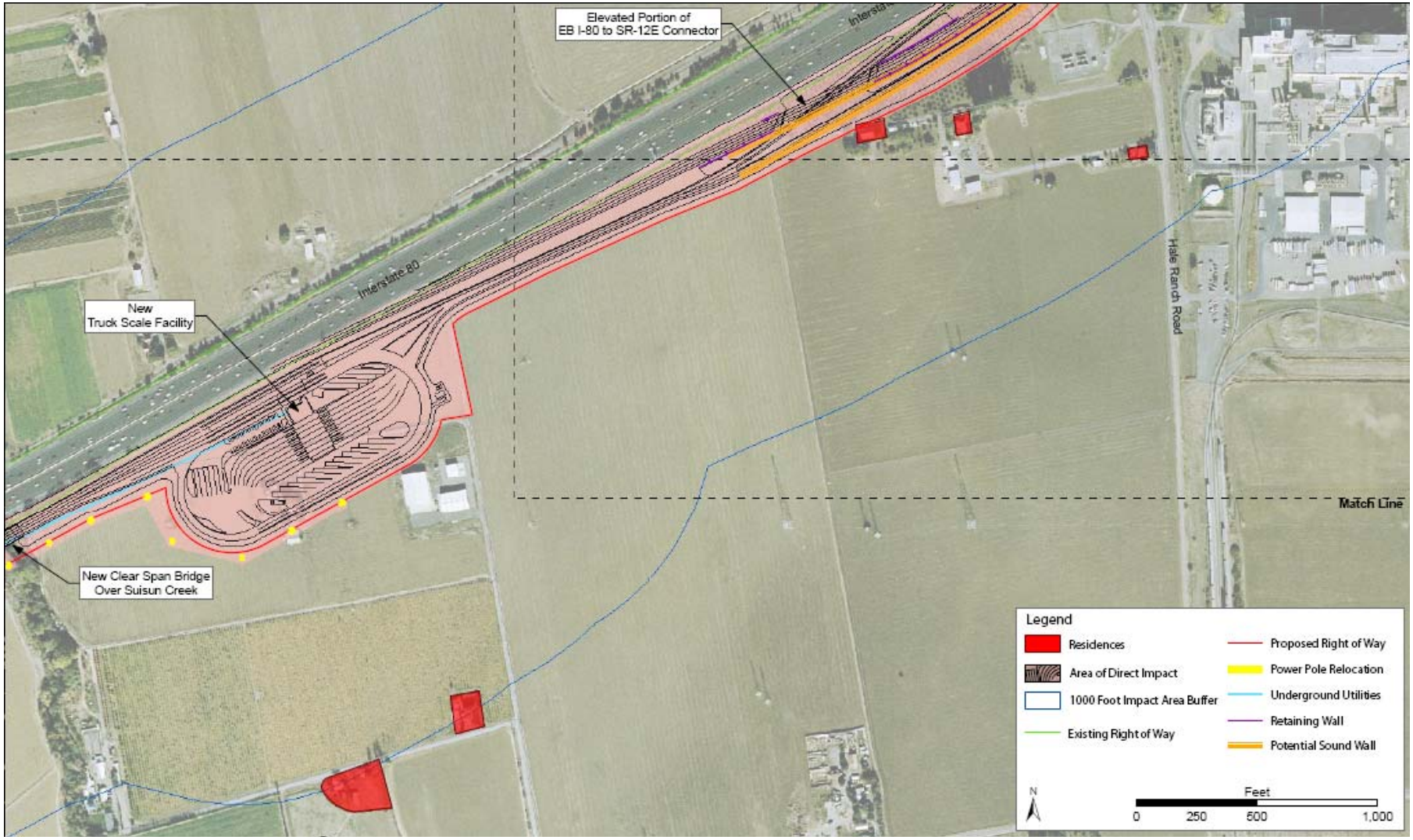
3.2.2.4 Surrounding Land Uses

The Bay Area Air Quality Management District (BAAQMD) generally defines a sensitive receptor as a facility or land use that houses or attracts members of the population, such as children, the elderly, and people with illnesses, who are particularly sensitive to the effects of air pollutants.

There are six single-family residences within 1,000 feet south of the project site and two of these single-family residences are within 500 feet of the proposed truck scale on-ramps to the freeways (See Figure 3-4).

The build alternative would construct off- and on-ramps to provide access to the truck scale facility from eastbound I-80 and access to eastbound I-80 and SR 12E freeway, respectively. The new off-ramp would widen the existing ramp from a one-lane facility to a two-lane facility through the truck scale site. Single-family residences identified in Figure 3-4 will locate sensitive receptors within 170 feet of the traveled way, whereas the sensitive receptors is currently located approximately 500 feet from the traveled way.

Figure 3-4. Sensitive Land Uses in the Project Vicinity



3.2.2.5 Future Trends

Emission trend data for the San Francisco Bay Area Air Basin published in the 2009 edition of *The California Almanac of Emissions and Air Quality* published by the ARB was used to provide an estimate of potential PM2.5 trends in the vicinity of the project area. While the ARB's Almanac does not provide emission trend data on the county level, the regional trend data can be used to provide insight on the general trends of air quality in the region, as implementation of emission standards and control requirements that have an effect on regional pollutant concentrations are likely to result in similar trends at the local level.

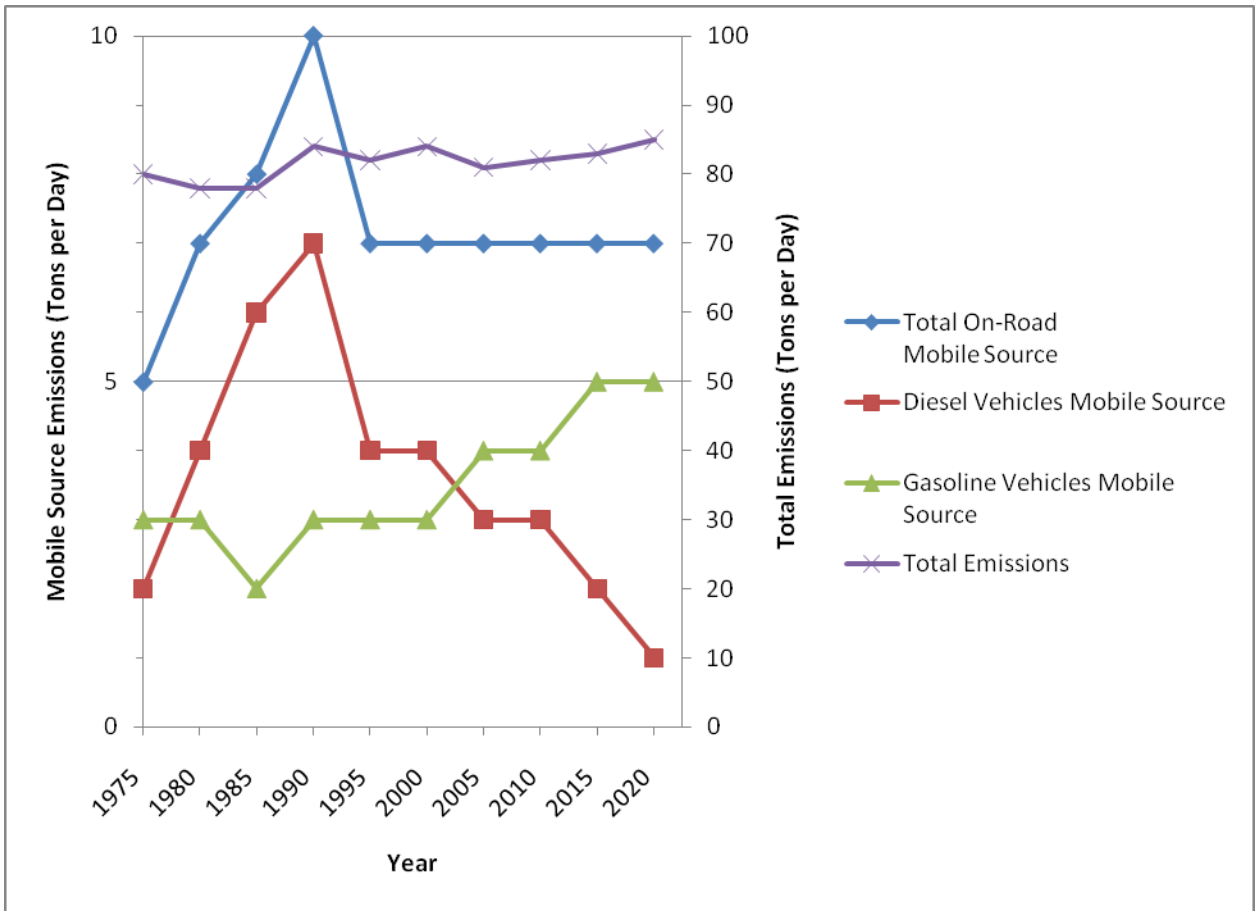
Table 3-3 presents emission trends in the San Francisco Bay Area Air Basin for the years 1975-2020. Total PM2.5 emissions, emissions from on-road gasoline vehicles, on-road diesel vehicles, and total on-road emissions are presented in Table 3-3.

Table 3-3. PM2.5 Emission trends in the San Francisco Bay Area Air Basin (tons per day)

Year	Total Emissions	Total On-Road Mobile Source	Diesel Vehicles Mobile Source	Gasoline Vehicles Mobile Source
1975	80	5	2	3
1980	78	7	4	3
1985	78	8	6	2
1990	84	10	7	3
1995	82	7	4	3
2000	84	7	4	3
2005	81	7	3	4
2010	82	7	3	4
2015	83	7	2	5
2020	85	7	1	5
California Air Resources Board 2010b				

Figure 3-5 presents emissions associated with on-road emissions and indicates that total on-road emissions are expected to remain constant through 2020, with increases in emissions from on-road gasoline vehicles offset by substantial decreases in emissions from on-road diesel vehicles. Emissions of directly emitted PM2.5 from diesel motor vehicles have been decreasing since 1990 even though population and vehicle miles traveled (VMT) are increasing, due to adoption of more stringent emission standards. Figure 3-5 indicates that total PM2.5 emissions have remained relatively constant in the San Francisco Bay Area Air Basin between 1975 and 2005 and are projected to increase slightly through 2020. However, because total on-road emissions are expected to remain constant, the slight increases expected in overall PM2.5 are likely not the result of on-road sources.

Figure 3-5. PM2.5 Emission trends in the San Francisco Bay Area Air Basin (tons per day)



Source: California Air Resources Board 2010b

3.2.3 Transportation and Traffic Analysis

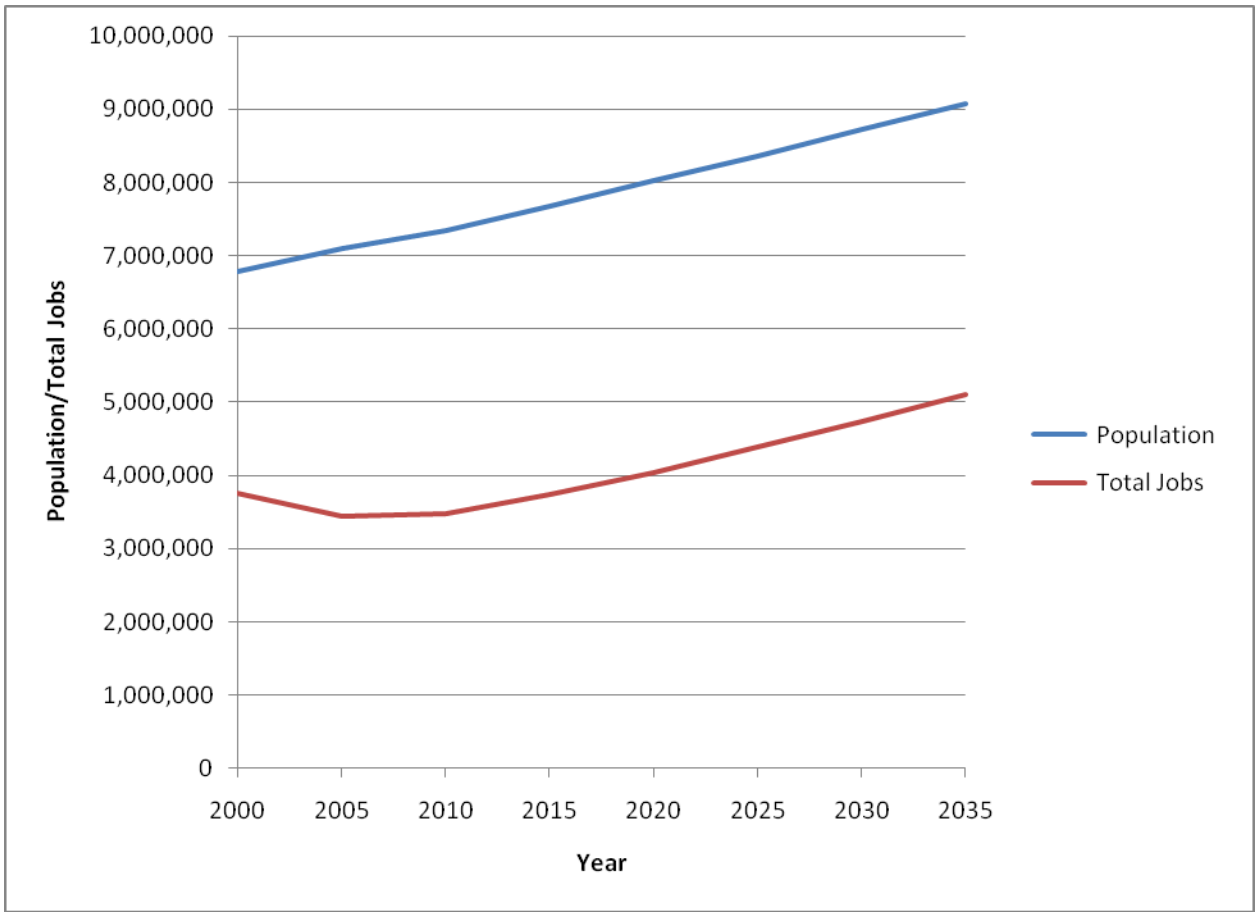
3.2.3.1 Regional Growth

As indicated in Table 3-3 and Figure 3-5, total PM2.5 emissions are projected to increase slightly through 2020, although total on-road emissions are expected to remain constant through 2020. This trend is despite the fact that regional population is anticipated to increase from 6,783,762 in 2000 to 8,018,000 in 2020 and jobs are anticipated to increase from 3,753,460 in 2000 to 4,040,690 in 2020, as indicated in Table 3-4 and Figure 3-6.

Table 3-4. ABAG Regional Population and Housing Projections

	2000	2005	2010	2015	2020	2025	2030	2035
Population	6,783,762	7,096,500	7,341,700	7,677,500	8,018,000	8,364,900	8,719,300	9,073,700
Total Jobs	3,753,460	3,449,740	3,475,840	3,734,590	4,040,690	4,379,900	4,738,730	5,107,390
Source: Association of Bay Area Governments 2009								

Figure 3-6. ABAG Regional Population and Housing Projections



Source: Association of Bay Area Governments 2009

3.2.3.2 Transportation and Traffic

With population and employment growth expected to occur regionally (Table 3-4 and Figure 3-6), it is anticipated that this anticipated growth could result in increased traffic within the project area. Modeled traffic volumes and operating conditions were obtained from the traffic data for both the truck scale off-ramps and on-ramps and regional traffic volumes prepared by the project traffic engineers, Fehr & Peers (Fehr & Peers 2008). Traffic data used in the model included VMT and the average speed for morning and afternoon peak traffic hours. Daily VMT were calculated as the sum of morning and afternoon peak traffic volume multiplied by five. Table 3-5 presents truck scale ramp traffic data, while Table 3-6 presents regional traffic data. A comparison of build to no build conditions indicates that that implementation of the build alternative is expected to result in speed increases for in both 2015 and 2035, while VMT is expected to decrease in 2015 and increase in 2035(Table 3-6).

Table 3-5. Truck Scale Ramp Traffic Inputs for Pollutant Modeling

Build / No-Build Alternative	Peak		Off-Peak		Daily Total	
	Vehicle Miles Traveled (per hour)	Speed (miles per hour)	Vehicle Miles Traveled (per hour)	Speed (miles per hour)	Vehicle Miles Traveled (per day)	Speed (miles per hour)

Year 2015 Alternative	495	5	279	5	7,995	5
Year 2035 Alternative	770	5	388	5	11,604	5

Table 3-6. Regional Traffic Inputs for Pollutant Modeling

Alternative	A.M. Peak		P.M. Peak		Daily Total	
	Vehicle Miles Traveled (per hour)	Speed (miles per hour)	Vehicle Miles Traveled (per hour)	Speed (miles per hour)	Vehicle Miles Traveled (per day)	Speed (miles per hour)
2015 No-Build Alternative	116,055	57	176,960	36	1,465,075	47
2015 Build Alternative	116,095	60	176,490	37	1,462,925	49
2015 Build Alternative minus 2015 No-Build Alternative	40	3	-470	1	-2,150	2
2035 No-Build Alternative	153,660	54	160,445	24	1,570,525	39
2035 Build Alternative	152,570	57	172,395	27	1,624,825	42
2015 Build Alternative minus 2015 No-Build Alternative	-1,090	3	11,950	3	54,300	3

Mainline Average Daily Traffic Volumes

Table 3-1 presents calculated Average Daily Traffic (ADT) volumes for the I-80 corridor in the vicinity of the Cordelia truck scales. The ADT data presented in Table 3-1 was calculated from a.m. and p.m. peak hour volumes along the I-80, as the project traffic study only presented an analysis of mainline peak hour traffic volumes and did not present mainline ADT volumes (Fehr & Peers 2008). Appendix A presents peak hour data for the I-80 segment that were used to calculate ADT volumes.

Based on consultation with the project traffic engineers, Fehr & Peers, ADT volumes were calculated from peak hour volumes presented in Appendix A by summing total a.m. and p.m. peak hour volumes and multiplying the resulting total peak hour volumes by a factor of 5 (Rabinovitz pers. comm.).

Mainline Truck Volumes

An evaluation of truck percentages and truck ADT was not conducted as part of the project traffic study. Consequently, based on guidance from Caltrans staff (Kinoshita pers. comm.), truck percentages were estimated using truck data for the study region published in *Caltrans 2007 Annual Average Daily Truck Traffic on the California State Highway System* (California Department of Transportation 2008) using methodology from Section B.3.1 of the Caltrans *Transportation Project-Level Carbon Monoxide Protocol* (CO Protocol) (Garza et. Al. 1997). Section B.3.1 from Caltrans' CO Protocol presents a methodology to estimate vehicle mix, including heavy duty diesel trucks (HDDT) for use in emissions modeling. Table 3-7 presents the traffic volumes used to estimate truck percentages, while Table 3-8 presents the truck percentage calculations based on methodology from the Caltrans CO Protocol. Based on the calculations presented in Table 3-8, it is anticipated that diesel trucks would represent 3.49% of the total traffic volumes in the area.

Table 3-7. Caltrans Truck Percentage Data

Route	Route Suffix	District	County	Postmile Prefix	Postmile	Leg	AADT Total	Total Trucks	Total Truck %	2 Axle Volume	2 Axle Percent	3 Axle Volume	3 Axle Percent	4 Axle Volume	4 Axle Percent	5 Axle Volume	5 Axle Percent	Description
12		4	SOL	R	2.794	B	32500	2340	7.2	719	30.71	214	9.13	118	5.05	1290	55.11	JCT. RTE. 80 WEST
12		4	SOL	L	1.801	A	35500	1807	5.09	460	25.47	150	8.32	36	2	1160	64.22	JCT. RTE. 80 EAST
80		4	SOL	R	11.976	B	120000	6720	5.6	2218	33	551	8.2	222	3.3	3730	55.5	JCT. RTE. 12 WEST
80		4	SOL	R	11.976	A	156000	8112	5.2	2344	28.9	625	7.7	251	3.1	4892	60.3	JCT. RTE. 12 WEST
80		4	SOL		12.839	B	156000	10234	6.56	2576	25.17	677	6.62	788	7.7	6193	60.51	JCT. RTE. 680 SOUTH
80		4	SOL		12.839	A	197000	11308	5.74	2925	25.87	704	6.23	1083	9.58	6596	58.33	JCT. RTE. 680 SOUTH
80		4	SOL		15.815	B	213000	9819	4.61	2905	29.59	633	6.45	468	4.77	5813	59.2	FAIRFIELD, EAST JCT. RTE. 12
680		4	SOL		13.126	B	60000	3126	5.21	1097	35.1	273	8.72	258	8.25	1498	47.93	CORDELIA WYE, JCT. RTE. 80
Total							**970,000**	**53,466**		**15,244**		**3,827**		**3,224**		**31,172**		

Table 3-8. Diesel Truck Calculations

Vehicle Mix Calculation Sheet.

VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOTAL VEHICLE	TRUCK AADT TOTAL BY AXLE TWO	THREE	FOUR	FIVE+	% TRUCK AADT BY AXLE TWO	THREE	FOUR	FIVE+
970000	53466	5.51%	15244	3827	3224	31172	28.51%	7.16%	6.03%	58.30%

Step 1. Find the mix for the given AADT.

Non-HDT is equal to 100% minus the TRUCK % TOTAL

A. Non-HDT :	0.94488041
b. 2-axle:	0.01571546
c. 3-axle:	0.00394536
d. 4-axle:	0.00332371
e. 5+-axle:	0.03213608
SUM =	1.00000103

STEP 2. Adjust the mix for time of day.

Multiply the percent of each class from step 1 by the non-urban, morning factors from Table B.4 from Caltrans CO Protocol

	Morning factors	
Non-HDT	1.36	1.28503736
2-axle	1.41	0.0221588
3-axle	1.47	0.00579968
4-axle	1.2	0.00398845
5+-axle	0.87	0.02795839
Sum the results		1.34494269

Normalize back to unity by dividing each class by the sum:

Non-HDT	95.55%
2-axle	1.65%
3-axle	0.43%
4-axle	0.30%
5+-axle	2.08%
Sum =	10000.00%

STEP 3. Convert to the vehicle classes used in EMFAC7

Substitute the percentages from STEP 2 g-k into the equations in table B.5 from Caltrans CO Protocol

A. % LDA	76.44%	
B. % LDT	13.38%	
C. % MDT	4.78%	
D. % HDGT	0.96%	
E. %HDDT	3.49%	<--- Calculated Diesel Trucks
F. % MC	0.96%	

Because the build alternative involves improvements to existing freeways and local roadways, it is not anticipated to have an effect on truck volumes and fleet mix in the region, and that the percentage of diesel trucks on the I-80 mainline would remain constant at 3.49% for the no-build and build scenarios, as well as for future years. Table 3-1 presents calculated truck ADT data based on anticipated ADT volumes and calculated truck percentages and indicates that implementation of the build alternatives is expected to result in increases in truck scale ramp and I-80 mainline ADT when compared to no-project conditions.

Measures of Effectiveness

Vehicle Hours of Delay (VHD) will decrease 4 to 35 percent during Construction Year (2015) PM and AM Peak Hour conditions, respectively, under With Project Conditions. This will result in a reduction of 135 vehicle hours of delay during weekday peak hour conditions and a minimum reduction of 175,500 vehicle hours of delay on an annual basis.

Vehicle Hours of Delay (VHD) will decrease 7 to 20 percent during Design Year (2035) PM and AM Peak Hour conditions, respectively, under With Project Conditions. This will result in a reduction of 355 vehicle hours of delay weekday peak hour conditions and a minimum reduction of 461,500 vehicle hours of delay on an annual basis. Appendix B presents VHD associated with build to no build conditions for 2015 and 2035.

Network-wide average travel times will also decrease under all scenarios. Under Year 2015 With Project Conditions, travel times will decrease 5 to 21 percent during AM and PM Peak Hour conditions, respectively. Under Year 2035 With Project Conditions, travel times will decrease seven percent during both AM and PM Peak Hour conditions.

During the critical PM peak hour in the eastbound direction, the Project will reduce the average travel time from NB I-680 (near Gold Hill) to EB SR 12 (near Civic Center) and from NB I-680 to EB I-80 (east of Air Base Parkway) under both Construction Year 2015 and Design Year 2035 Conditions. Appendix B presents travel times associated with build to no build conditions for 2015 and 2035.

Level of Service

The Project would reduce the number of study locations operating at LOS E or F conditions under all Year 2035 study scenarios, ranging from 1 to 2 locations improving under each scenario. This will result in improved traffic flow, reduced congestion and a potential decrease in certain types of accidents associated with stop-and-go oversaturated LOS F conditions. Appendix C presents LOS associated with build to no build conditions for 2015 and 2035.

Congestion Relief and System-Wide Improvements

3.2.4 Transportation and Traffic Analysis

Modeled traffic volumes and operating conditions were obtained from the traffic data prepared by the project traffic engineers, Fehr & Peers (Fehr & Peers 2008). PM2.5 emissions were modeled for construction interim year (2015) and design-future year (2035) with and without project conditions using the Caltrans' CT-EMFAC model.[1] The CT-EMFAC modeling assumed the SFBAAB Solano County regional traffic data, operating during the summer months. The traffic data used for emissions modeling is summarized in Tables 3-5 and 3-6.

Table 3-9 summarizes the modeled yearly emissions. The differences in emissions between with- and without-project conditions represent emissions generated directly as a result of implementation of the build alternatives. Vehicular emission rates are anticipated to lessen in future years due to continuing improvements in engine technology and the retirement of older, higher-emitting vehicles.

Table 3-9. System-Wide Project-Related Motor Vehicle Emissions

	Pounds per Day				
	ROG	NO_x	CO	PM10	PM2.5
2015 no-project scenario	187	527	2,103	25	23
2015 with the proposed project	124	349	1,248	17	15
2015 with project minus 2015 no project	-63	-178	-855	-8	-8
2035 no-project scenario	84	134	712	18	16
2035 with the proposed project	80	134	683	16	15
2035 with project minus 2035 no project	-4	0	-29	-2	-1

Emissions associated with implementation of the proposed project were obtained by comparing future with-project emissions to future without-project emissions for both the construction-interim year (2015) and design-future year (2035) scenarios. As indicated in Table 3-9, in 2015 and 2035, PM2.5 emissions would decrease when compared to the No-Build Alternative due to improvements in traffic operations and overall system efficiency.

3.3 Conclusion

Table 3-1 indicates that implementation of the project would increase truck volumes at the truck scale ramps by 6.4% compared to no project conditions. In addition, Design year ADT on I-80 is expected to exceed the FHWA and EPA's POAQC threshold of 125,000. However truck

[1] CT-EMFAC is a California-specific project-level analysis tool for modeling criteria pollutant and carbon dioxide emissions from on-road mobile sources. The model uses the latest version of the California Mobile Source Emission Inventory and Emission Factors model, EMFAC2007. While regulations and emissions controls adopted after 2007 are not reflected in the model emission factors, CT-EMFAC is the latest on-road emissions modeling tool and is used as standard practice in air quality technical analyses.

percentages on I-80 are not in excess of the FHWA and EPA's POAQC threshold of 8 percent (10,000 diesel truck ADT), as the current diesel truck percentage of approximately 3.49% within the project area equates to truck AADT between 5,057 and 5,745. As indicated by Table 3-9, project-related emissions of PM2.5 would decrease when compared to the No-Build Alternative in 2015 and 2035. This is primarily due to travel time savings, decreases in hours of delay, and improvements in average network speed under the build alternative when compared to the no build alternative. Finally, the project would not result in increased congestion at nearby intersections resulting from increased diesel vehicle traffic, as diesel traffic would remain the same between the no build and build alternatives. Modeling of PM2.5 exhaust emissions indicate that implementation of proposed project would result in decreases in daily PM2.5 exhaust emissions over no build conditions in 2015 and 2035.

Transportation conformity is required under CAA section 176(c) (42 U.S.C. 7506(c)) and requires that no federal dollars be used to fund a transportation project unless it can be clearly demonstrated that the project would not cause or contribute to violations of the NAAQS. As required by Final EPA rule published on March 10, 2006, this qualitative assessment demonstrates that the I-80 Eastbound Cordelia Truck Scales Relocation Project meets the CAA conformity requirements and will not conflict with state and local measures to improve regional air quality.

Implementation of the propose project will not result in new violations of the federal PM2.5 air quality standards for the following reasons:

- Based on representative monitoring data, ambient PM2.5 concentrations are remaining relatively constant (24-hour PM2.5 standard) or declining (annual PM2.5 standard) (see Figures 3-2 and 3-3).
- Based on representative monitoring data, monitored annual average PM2.5 concentrations have not exceed the national standard of 15.0 $\mu g/m^3$ in the past three years (2007-2009) (see Table 3-2).
- Based on representative monitoring data, monitored 24-hour average PM2.5 concentrations exceeded the federal standard of 35 $\mu g/m^3$ twice in 2008 and once in 2009, indicating that 24-hour PM2.5 concentrations are likely decreasing.
- Vehicle Hours of Delay will decrease 4 to 35% in 2015 and 7 to 20% in 2035
- Travel times will decrease 5 to 21% during AM and PM Peak Hour conditions, respectively, in 2015 and 7% in during both AM and PM Peak Hour conditions in 2035
- The number of study locations operating at LOS E or F conditions in 2035 would be reduced, with improvements at 1 to 2 locations under each scenario
- While sensitive the distance of sensitive receptors to the nearest ramp travel lanes will move from approximately 500 feet under existing conditions to 170 feet under build conditions, project-related PM2.5 emissions are expected to decrease under future build conditions (2015 and 2035) when compared to no build conditions for Alternative C, Phase 1, thereby reducing total PM2.5 emissions generated within the project region (see Table 3-9).

For these reasons, future or worsened PM2.5 violations of any standards are not anticipated. Therefore, the proposed I-80 Eastbound Cordelia Truck Scales Relocation Project meets the conformity hot spot requirements in 40 CFR 93.116 and 93.126 for PM2.5.

Chapter 4 References Cited

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4.2 Personal Communications

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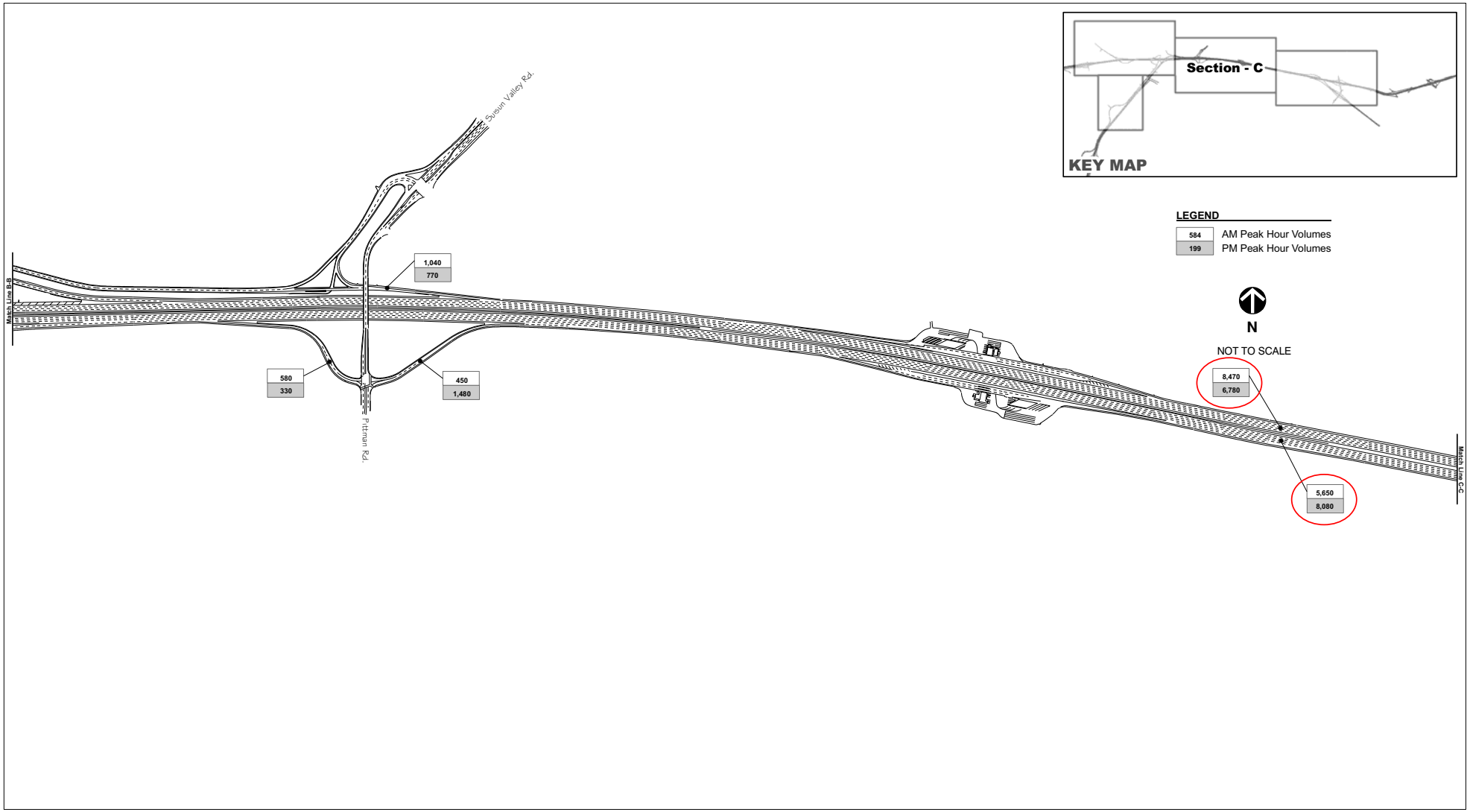
Kinoshita, Glenn. District Branch Chief-Air/Noise Studies. California Department of Transportation, District 4. Oakland, CA. June 23, 2010—email.

Rabinovitz, Joel. Transportation Engineer. Fehr & Peers. Walnut Creek, CA. January 29, 2009 —telephone conversation.

Appendix A

Mainline Peak Hour Volumes used to Calculate Average Daily Traffic



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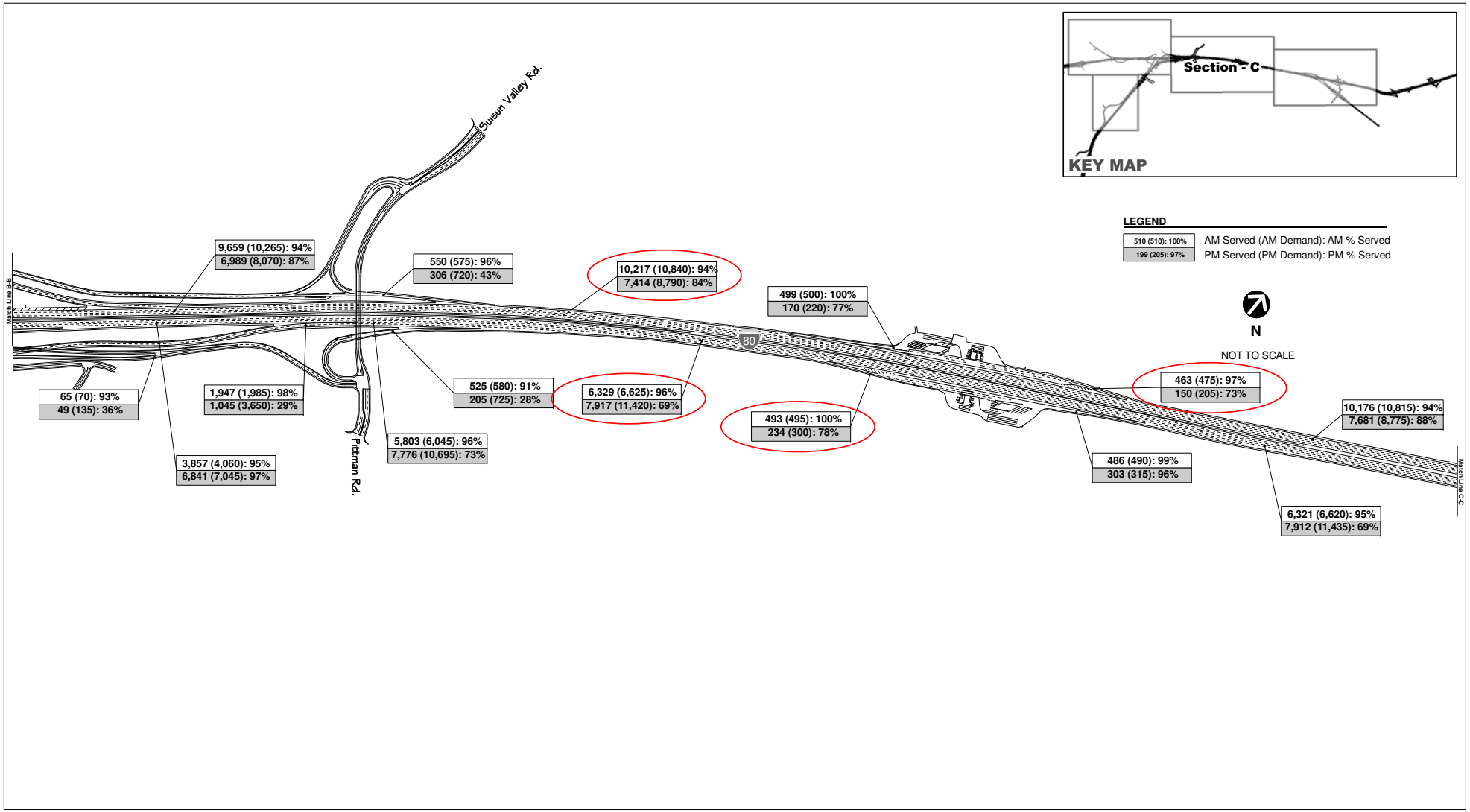
EXISTING CONDITIONS
SECTION - C
FIGURE A3



I-80 Eastbound Cordelia Truck Scales Relocation Project

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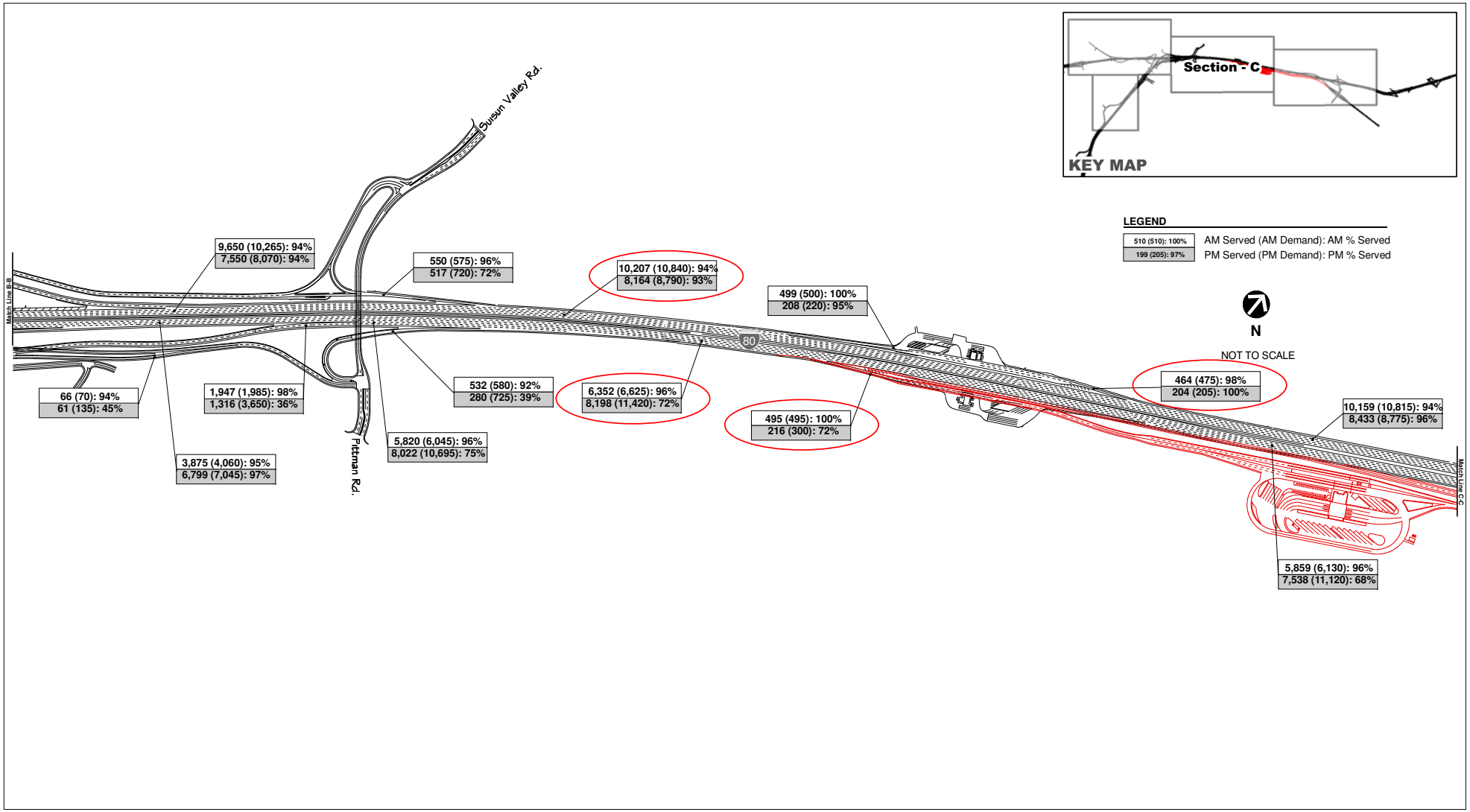
YEAR 2015 NO PROJECT
SECTION - C
FIGURE A7



I-80 Eastbound Cordelia Truck Scales Relocation Project

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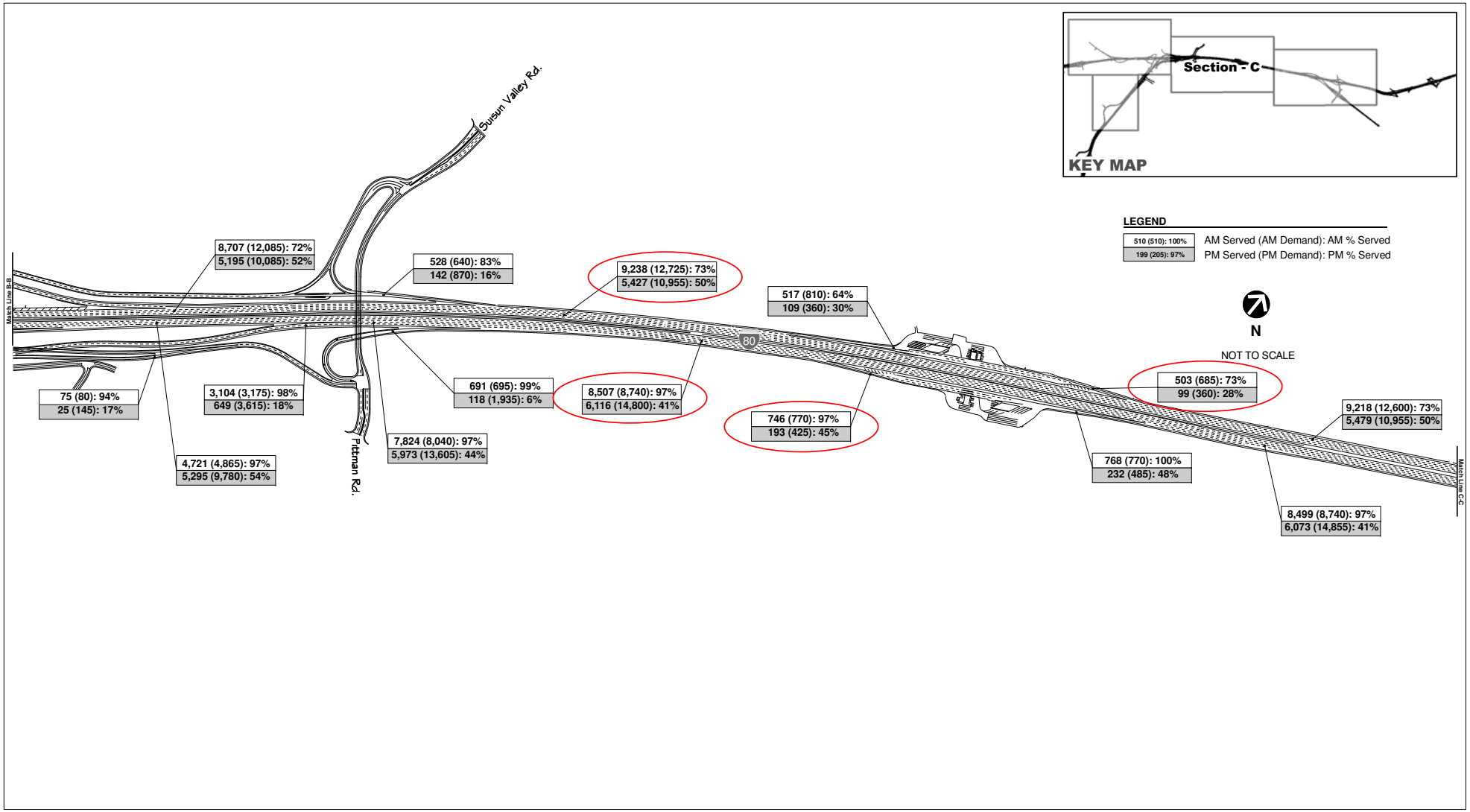
YEAR 2015 WITH PROJECT
SECTION - C
FIGURE A11



I-80 Eastbound Cordelia Truck Scales Relocation Project

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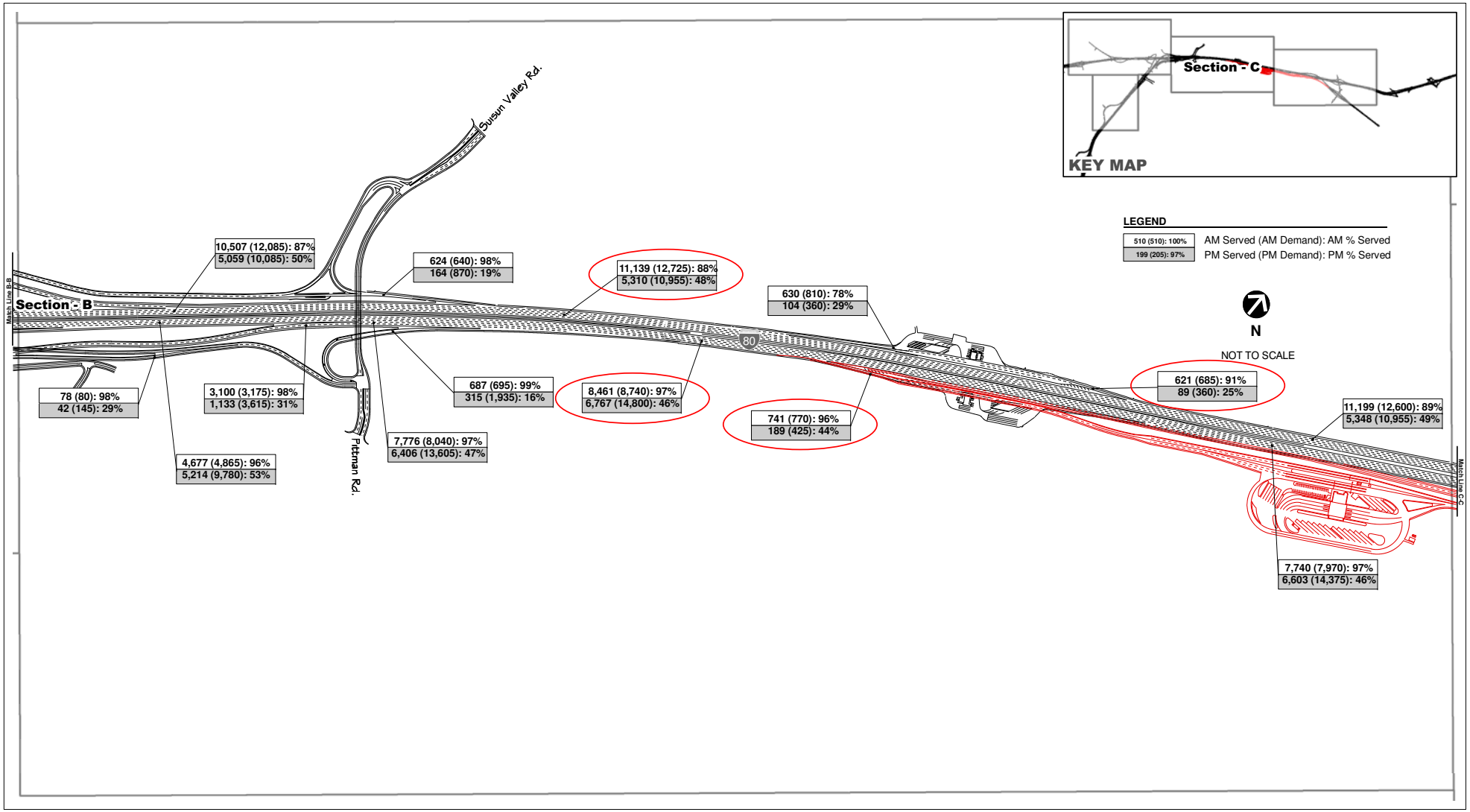
YEAR 2035 NO PROJECT
SECTION - C
FIGURE A15



I-80 Eastbound Cordelia Truck Scales Relocation Project

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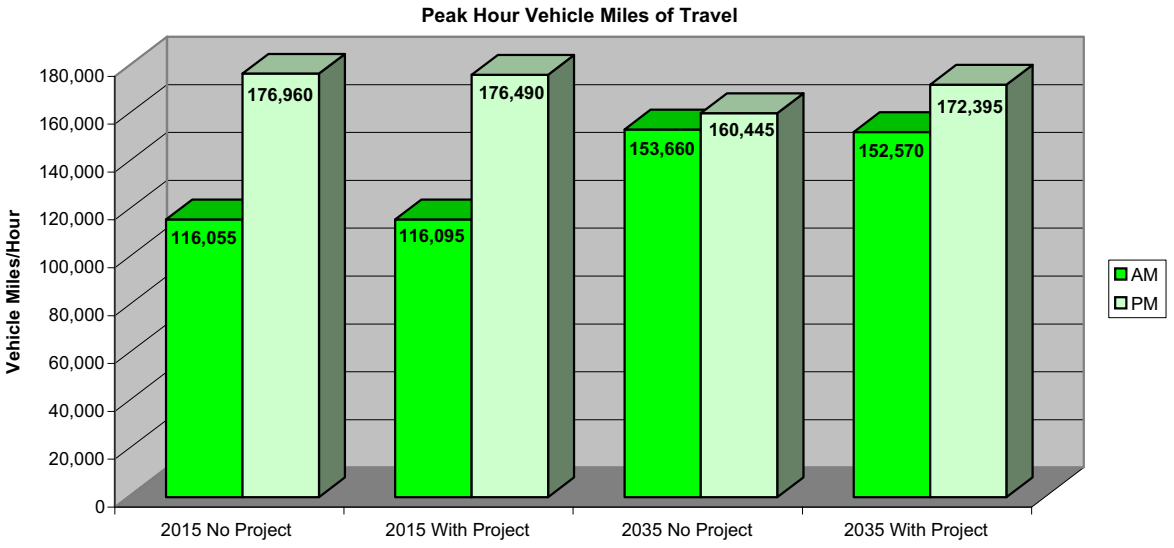
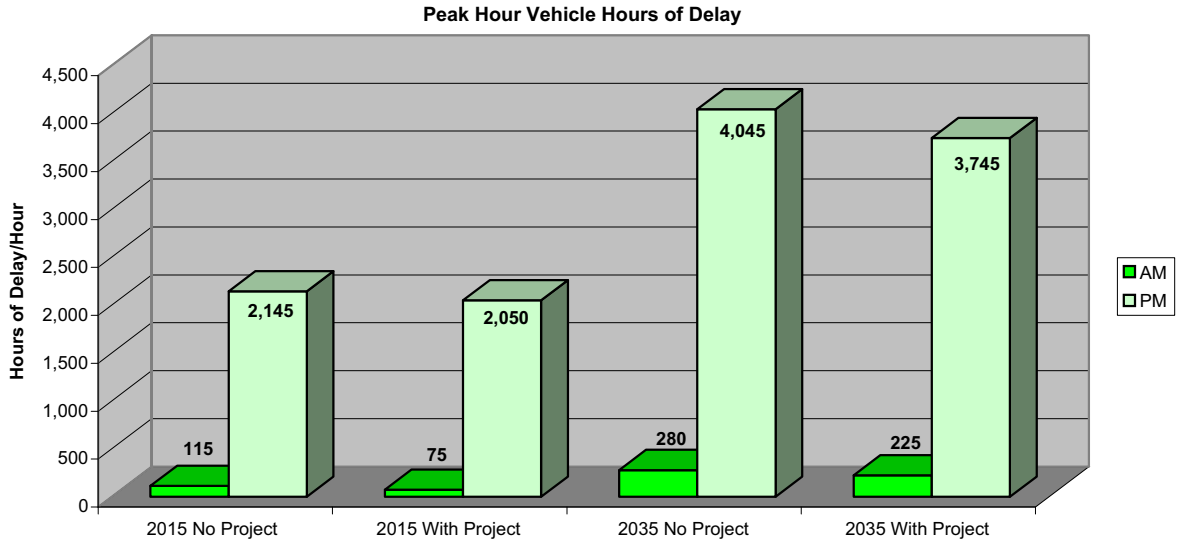
YEAR 2035 WITH PROJECT
SECTION - C
FIGURE A19

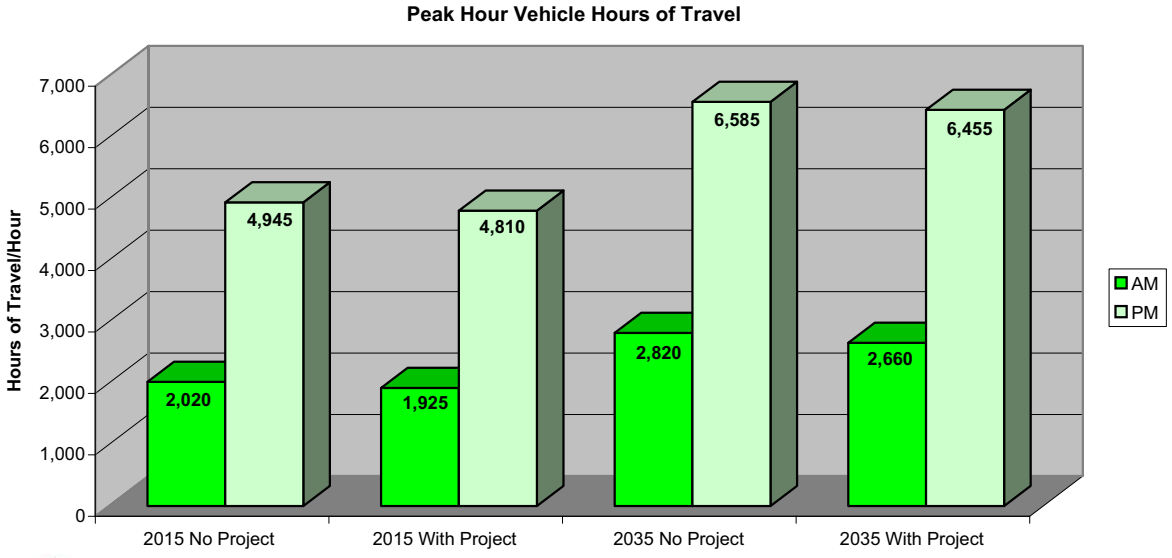
Appendix B

Measures of Effectiveness

- **Vehicle Hours of Delay**
- **Vehicle Hours of Travel**
- **Travel Times**







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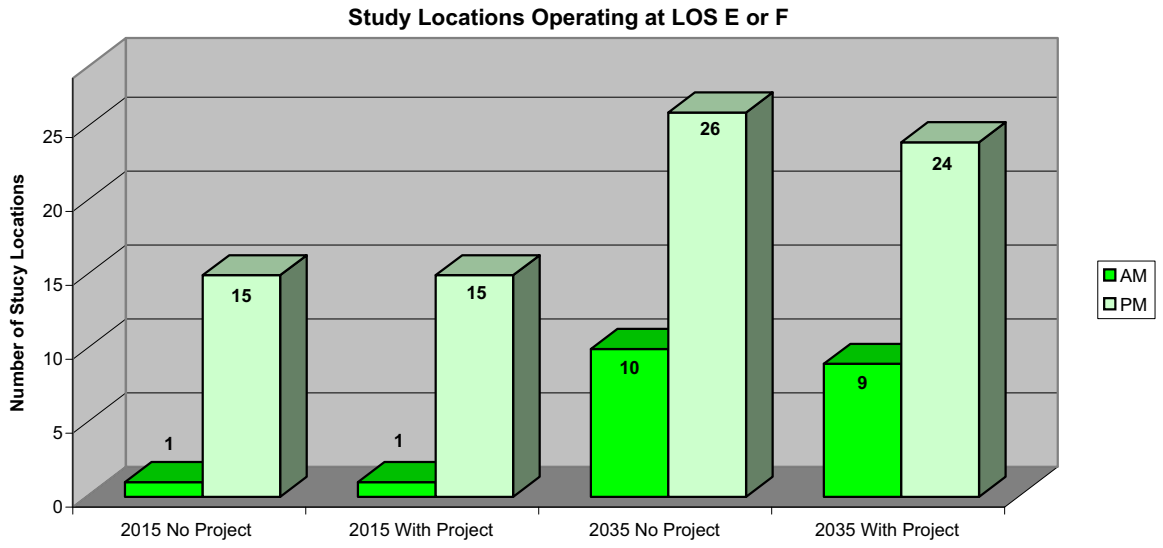
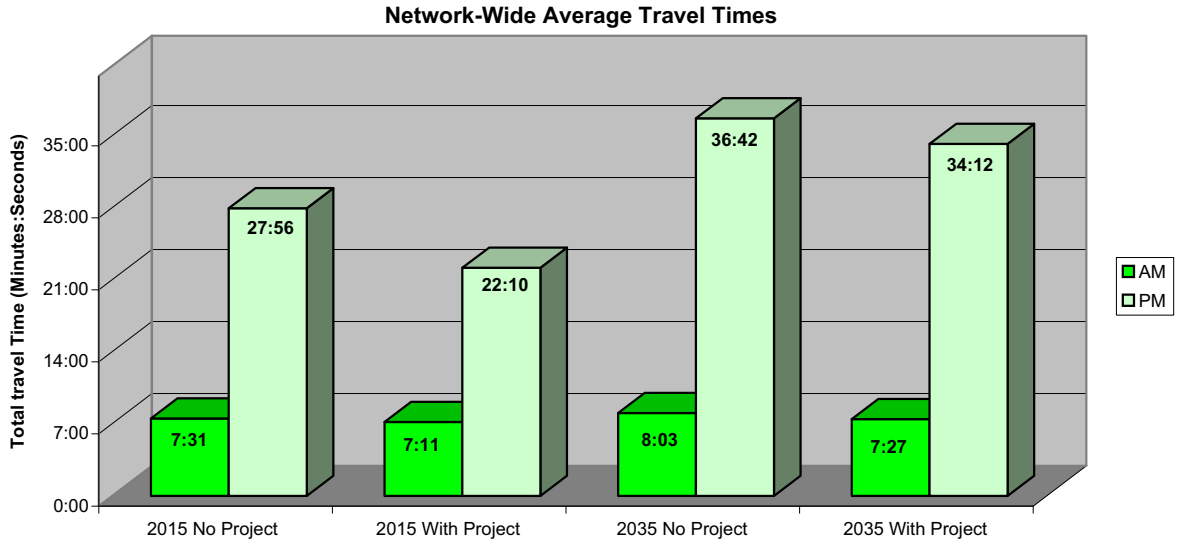
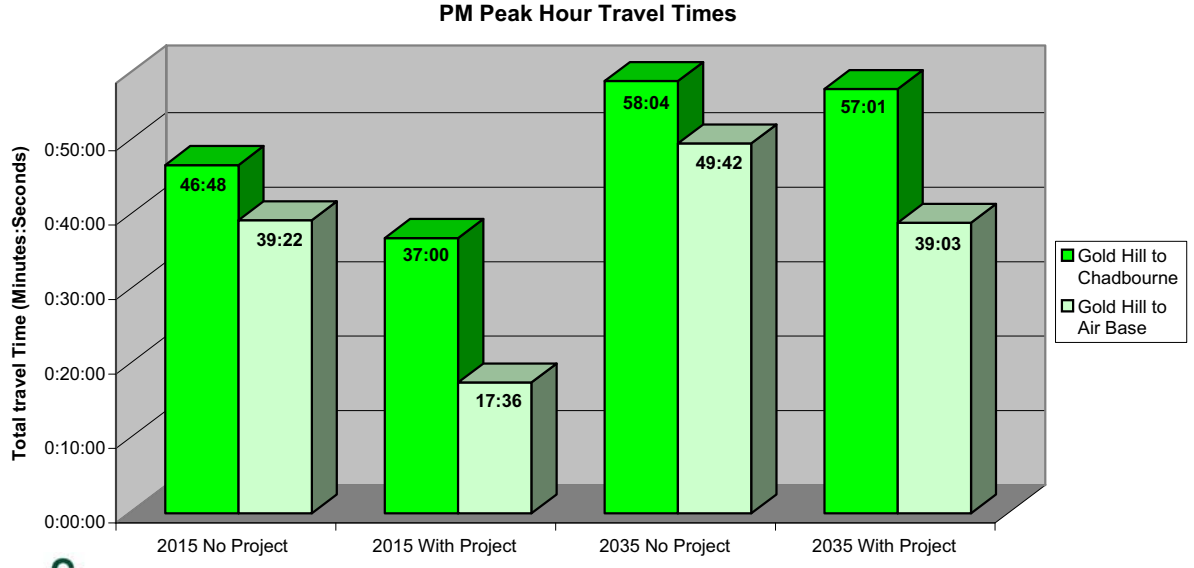
SYSTEM-WIDE MEASURES OF EFFECTIVENESS



NOTE: Total of 40 Study Locations under No Project conditions and 39 Study Locations under With Project Conditions.





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SYSTEM-WIDE MEASURES OF EFFECTIVENESS

- All of the study locations operate at LOS D conditions or better.

TABLE 3:
EXISTING AM AND PM PEAK HOURS
EASTBOUND MEASURES OF EFFECTIVENESS[1]

MOE	Existing AM Peak Hour	Existing PM Peak Hour
Vehicle Miles of Travel (Vehicle Miles / Hour)	50,690	75,120
Vehicle Hours of Travel (Hours of Travel / Hour)	860	1,835
Vehicle Hours of Delay (Hours of Delay / Hour)	60	665

Note:
1. The study area extends on I-80 **eastbound** from west of Red Top Road to east of Air Base Parkway / Waterman and on northbound I-680 south of Gold Hill Road to I-80. The study area also includes eastbound SR 12 east of I-80 and all ramps.

Source: Fehr & Peers, September 2008.

TABLE 4:
EXISTING FREEWAY LEVEL OF SERVICE

Segment	AM Peak Hour		PM Peak Hour	
	Density[1]	LOS	Density[1]	LOS
I-80 Freeway				
EB I-80, west of Red Top Road	13	B	19	C
EB I-80, between Red Top Road and SR 12 West Connector	14	B	30	D
EB I-80, between SR 12 West Connector and Lopes Road (Weave)[2]	17	B	**56**	**F**
EB I-80, between NB I-680 Connector and Pittman Road (Weave)[2]	21	C	**84**	**F**
EB I-80, between Pittman Road and Truck Scales (Weave)[2]	19	B	**57**	**F**
EB I-80, between Truck Scales and SR 12 East Connector	22	C	30	D
EB I-80, between SR 12 East and Abernathy Road	18	B	25	C
EB I-80, between Abernathy Road and Auto Mall Parkway (Weave)[2]	16	B	24	C
EB I-80, between Beck Avenue and Travis Boulevard (Weave) [2]	16	B	**40**	**F**
EB I-80, between Travis Blvd. and Air Base Pkwy. / Waterman Blvd.	18	C	43	E
EB I-80, east of Air Base Pkwy / Waterman Boulevard	17	B	27	D

Notes: Bold font with shading indicates unacceptable operations.
1. Density is expressed in vehicles per hour per lane and is based on the average of 13 runs.
2. Level of service thresholds for weaving sections are different than mainline sections. Refer to Table 1 for thresholds.

Source: Fehr & Peers, September 2008.

- Vehicle hours of delay is projected to decrease 40 hours, a 35 percent improvement when compared to No Project Conditions.

TABLE 9:
2015 AM PEAK HOUR
EASTBOUND MEASURES OF EFFECTIVENESS[1]

MOE	2015 No Project	2015 With Project[2]
Vehicle Miles of Travel (Vehicle Miles / Hour)	116,055	116,095 (0%)
Vehicle Hours of Travel (Hours of Travel / Hour)	2,020	1,925 (- 5%)
Vehicle Hours of Delay (Hours of Delay / Hour)	115	75 (- 35%)

1. The study area extends on I-80 **eastbound** from west of Red Top Road to east of Air Base Parkway / Waterman and on northbound I-680 south of Gold Hill Road to I-80. The study area also includes eastbound SR 12 east of I-80 and all ramps.
2. (%) indicates change relative to the No Project condition

Source: Fehr & Peers, September 2008.

TABLE 10:
2015 PM PEAK HOUR
EASTBOUND MEASURES OF EFFECTIVENESS[1]

MOE	2015 No Project	2015 With Project[2]
Vehicle Miles of Travel (Vehicle Miles / Hour)	176,960	176,490 (0%)
Vehicle Hours of Travel (Hours of Travel / Hour)	4,945	4,810 (- 3%)
Vehicle Hours of Delay (Hours of Delay / Hour)	2,145	2,050 (- 4%)

1. The study area extends on I-80 **eastbound** from west of Red Top Road to east of Air Base Parkway / Waterman and on northbound I-680 south of Gold Hill Road to I-80. The study area also includes eastbound SR 12 east of I-80 and all ramps.
2. (%) indicates change relative to the No Project condition

Source: Fehr & Peers, September 2008.

The primary results of the PM peak hour analysis are:

- Vehicle Miles Traveled will decrease 470 miles, which represents a negligible increase in mobility. It should be noted that eastbound I-80 is the peak direction during evening peak hour conditions;

- Vehicle hours of travel is projected to decrease 135 hours, a three percent improvement

compared to No Project Condition.

TABLE 19:
2035 AM PEAK HOUR
EASTBOUND MEASURES OF EFFECTIVENESS[1]

MOE	2035 No Project	2035 With Project[2]
Vehicle Miles of Travel (Vehicle Miles / Hour)	153,660	152,570 (0%)
Vehicle Hours of Travel (Hours of Travel / Hour)	2,820	2,660 (- 6%)
Vehicle Hours of Delay (Hours of Delay / Hour)	280	225 (- 20%)

1. The study area extends on I-80 **eastbound** from west of Red Top Road to east of Air Base Parkway / Waterman and on northbound I-680 south of Gold Hill Road to I-80. The study area also includes eastbound SR 12 east of I-80 and all ramps.
2. (%) indicates change relative to the No Project condition

Source: Fehr & Peers, September 2008.

TABLE 20:
2035 PM PEAK HOUR
EASTBOUND MEASURES OF EFFECTIVENESS[1]

MOE	2035 No Project	2035 With Project[2]
Vehicle Miles of Travel (Vehicle Miles / Hour)	160,445	172,395 (+ 7%)
Vehicle Hours of Travel (Hours of Travel / Hour)	6,585	6,455 (- 2%)
Vehicle Hours of Delay (Hours of Delay / Hour)	4,045	3,745 (- 7%)

1. The study area extends on I-80 eastbound from west of Red Top Road to east of Air Base Parkway / Waterman and on northbound I-680 south of Gold Hill Road to I-80. The study area also includes eastbound SR 12 east of I-80 and all ramps.
2. (%) indicates change relative to the No Project condition

Source: Fehr & Peers, September 2008.

Appendix C

Level of Service

- All of the study locations operate at LOS D conditions or better.

TABLE 3:
EXISTING AM AND PM PEAK HOURS
EASTBOUND MEASURES OF EFFECTIVENESS[1]

MOE	Existing AM Peak Hour	Existing PM Peak Hour
Vehicle Miles of Travel (Vehicle Miles / Hour)	50,690	75,120
Vehicle Hours of Travel (Hours of Travel / Hour)	860	1,835
Vehicle Hours of Delay (Hours of Delay / Hour)	60	665

Note:
1. The study area extends on I-80 **eastbound** from west of Red Top Road to east of Air Base Parkway / Waterman and on northbound I-680 south of Gold Hill Road to I-80. The study area also includes eastbound SR 12 east of I-80 and all ramps.

Source: Fehr & Peers, September 2008.

TABLE 4:
EXISTING FREEWAY LEVEL OF SERVICE

Segment	AM Peak Hour		PM Peak Hour	
	Density[1]	LOS	Density[1]	LOS
I-80 Freeway				
EB I-80, west of Red Top Road	13	B	19	C
EB I-80, between Red Top Road and SR 12 West Connector	14	B	30	D
EB I-80, between SR 12 West Connector and Lopes Road (Weave)[2]	17	B	**56**	**F**
EB I-80, between NB I-680 Connector and Pittman Road (Weave)[2]	21	C	**84**	**F**
EB I-80, between Pittman Road and Truck Scales (Weave)[2]	19	B	**57**	**F**
EB I-80, between Truck Scales and SR 12 East Connector	22	C	30	D
EB I-80, between SR 12 East and Abernathy Road	18	B	25	C
EB I-80, between Abernathy Road and Auto Mall Parkway (Weave)[2]	16	B	24	C
EB I-80, between Beck Avenue and Travis Boulevard (Weave) [2]	16	B	**40**	**F**
EB I-80, between Travis Blvd. and Air Base Pkwy. / Waterman Blvd.	18	C	43	E
EB I-80, east of Air Base Pkwy / Waterman Boulevard	17	B	27	D

Notes: Bold font with shading indicates unacceptable operations.
1. Density is expressed in vehicles per hour per lane and is based on the average of 13 runs.
2. Level of service thresholds for weaving sections are different than mainline sections. Refer to Table 1 for thresholds.

Source: Fehr & Peers, September 2008.

TABLE 5:
EXISTING ON-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour		PM Peak Hour	
	Density[1]	LOS	Density[1]	LOS
On-Ramp Merge Section				
EB I-80, at Red Top Road	11	B	19	B
EB I-80, at Truck Scales	17	B	57	E*
EB I-80, at AutoMall Parkway	12	B	32	D
EB I-80, at Travis Boulevard	14	B	55	E*
EB I-80, at Air Base Parkway / Waterman Boulevard	13	B	26	C
EB SR 12 East, at Chadbourne Road	12	B	18	B

Notes: Bold font with shading indicates unacceptable operations.
* This ramp operates at capacity and is by definition LOS E.
1. Density is expressed in vehicles per hour per lane
Source: Fehr & Peers, September 2008.

TABLE 6:
EXISTING OFF-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour		PM Peak Hour	
	Density[1]	LOS	Density[1]	LOS
Off-Ramp Diverge Section				
EB I-80, at Red Top Road	12	B	18	B
EB I-80, at EB SR 12 East Connector	16	B	23	C
EB I-80, at Abernathy Road	13	B	21	C
EB I-80, at Air Base Parkway / Waterman Boulevard	13	B	23	C
EB SR 12 East, at Chadbourne Road	12	B	16	B

Notes: Bold font with shading indicates unacceptable operations
* Based on a discussion with Caltrans District 4 Highway Operations staff, this ramp operates at capacity and by definition LOS E.
1. Density is expressed in vehicles per hour per lane
Source: Fehr & Peers, September 2008.

PM Peak Hour Operations

During the PM peak hour, a bottleneck develops on eastbound I-80 at the truck scales on-ramp, where slow-moving trucks attempt to accelerate and merge to freeway travel speeds. In addition, trucks entering the freeway mainline must weave across two lanes of traffic to continue eastbound on I-80. This results in passenger cars and trucks weaving across multiple lanes between the existing Cordelia Truck Scales facility and SR 12E.

3.2 Ramp Terminal Intersection Operations Analysis

The operations of the ramp terminal intersections are summarized in **Table 7**. For all intersections, the average control delay and LOS for the entire intersection are reported. As shown in **Table 7**, 10 of the 11 (91 percent) study intersections operate at acceptable LOS C or better conditions during the AM peak hour. The all-way stop-controlled intersection of I-80 Eastbound Ramps/Red Top Road operates at LOS F in the AM peak hour due to a combination of heavy traffic volumes and all-way stop-controlled operations.

During the PM peak hour, 11 of the 11 (100 percent) of the study intersections operate at acceptable LOS D conditions or better.

TABLE 7:
INTERSECTION LEVELS OF SERVICE
EXISTING CONDITIONS

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	I-80 EB Ramps / Red Top Road	All-Way Stop	**>50**	**F**	5.3	A
2	I-80 EB Ramps / Pittman Road	Signal	10.0	A	9.2	A
3	SR 12 East EB Ramps / Chadbourne Road	Side-Street Stop	0.5	A	8.3	A
4	I-80 EB Ramps / Abernathy Road	All-Way Stop	3.6	A	25.2	D
5	I-80 EB Ramps / Magellan Road	All-Way Stop	11.0	B	20.2	C
6	I-80 EB Off-Ramp / West Texas Street	Signal	2.6	A	4.2	A
7	I-80 EB On-Ramp – Beck Avenue / West Texas Street	Signal	17.4	B	42.2	D
8	SR 12 East / Beck Avenue	Signal	26.2	C	35.2	D
9	SR 12 East / Pennsylvania Avenue	Signal	20.0	C	27.9	C
10	I-80 EB Ramps / Travis Boulevard	Signal	2.4	A	8.8	A
11	I-80 EB Ramps / Air Base Parkway	Signal	14.0	B	17.2	B

Notes: Bold font with shading indicates unacceptable operations
The intersections are numbered as presented in the I-80/I-680/SR 12 Interchange Existing Traffic Operating Conditions Report (February 2005). Only ramp terminal intersections on I-80 Eastbound between Red Top and Air Base, and on SR 12 East between I-80 and Pennsylvania Avenue, are included in this report.
Source: Fehr & Peers, September 2008.

3.3 Accident Analysis

Accident data for three years (2004 – 2006) from the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) was evaluated for the I-80 and SR 12E segments in the study area. **Table 8** summarizes the TASAS data and highlights locations where the actual accident rate exceeds the statewide average for the westbound and eastbound directions. It should be noted, that similar to Existing traffic conditions, the accident data will be updated for the most recent three-year time period

TABLE 11:
2015 NO PROJECT
FREEWAY LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
I-680 Freeway				
NB I-680, between Gold Hill Road and Central Way	21	C	**135**	**F**
I-80 Freeway				
EB I-80, west of Red Top Road	17	B	25	C
EB I-80, between Red Top Road and SR 12 West	17	B	23	C
EB I-80, between SR 12 West and Green Valley Road / I-680 SB (Weave) [2]	17	B	28	C
EB I-80, between Pittman Road and Truck Scales (Weave) [2]	20	B	**110**	**F**
EB I-80, between Abernathy Road and West Texas Street (Weave) [2]	18	B	23	C
EB I-80, between Beck Avenue and Travis Boulevard (Weave) [2]	17	B	23	C
EB I-80, between Travis Blvd and Air Base Parkway / Waterman Boulevard	16	B	26	C
EB I-80, east of Air Base Parkway / Waterman Boulevard	19	C	29	D
SR 12 Freeway				
EB SR 12 East, between Webster Street and Civic Center Boulevard (Weave) [2]	11	B	18	B

Notes:
1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed over all lanes (excluding HOV).
2. Level of service thresholds for weaving sections are different than mainline sections.

Source: Fehr & Peers, September 2008.

TABLE 12:
2015 WITH PROJECT
FREEWAY LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
I-680 Freeway				
NB I-680, between Gold Hill Road and Central Way	20	B	**115**	**F**
I-80 Freeway				
EB I-80, west of Red Top Road	17	B	25	C
EB I-80, between Red Top Road and SR 12 West	14	B	23	C
EB I-80, between SR 12 West and Green Valley Road / I-680 SB (Weave) [2]	17	B	28	C
EB I-80, between Pittman Road and Truck Scales (Weave) [2]	18	B	**96**	**F**
EB I-80, between Truck Scales and Abernathy Road (Weave) [2,3]	19	B	22	C
EB I-80, between Abernathy Road and West Texas Street (Weave) [2]	16	B	21	C
EB I-80, between Beck Avenue and Travis Boulevard (Weave) [2]	15	B	21	C
EB I-80, between Travis Blvd and Air Base Parkway / Waterman Boulevard	14	B	24	C
EB I-80, east of Air Base Parkway / Waterman Boulevard	18	C	28	D
SR 12 Freeway				
EB SR 12 East, between Truck Scales and Chadbourne Road (Weave) [2,3]	10	A	**159**	**F**
EB SR 12 East, between Webster Street and Civic Center Boulevard (Weave) [2]	11	B	18	B

Notes:
1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed over all lanes (excluding HOV).
2. Level of service thresholds for weaving sections are different than mainline sections.
3. These analysis segments only apply to the With Project case (i.e. they don't appear in Table 11).

Source: Fehr & Peers, September 2008.

TABLE 13:
2015 NO PROJECT
ON-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
On-Ramp Merge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	19	B	**127**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	9	A	18	B
EB I-80, at Green Valley Road	11	B	40	E
EB I-80, at Connector from NB I-680	18	B	**114**	**F**
EB I-80, at Truck Scales[2]	22	C	**92**	**F**
EB I-80, at Travis Boulevard	9	A	18	B
EB I-80, at Air Base Parkway / Waterman Boulevard	12	B	22	C
SR 12 Freeway				
EB SR 12 East, at Chadbourne Road	13	B	**143**	**F**
EB SR 12 East, at Civic Center Boulevard	14	B	24	C

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.
2. This analysis location is not a standard merge in the With Project case, so does not appear in Table 14 (2015 With Project). Operations in this area for the With Project case are described in the weave section in Table 12.

Source: Fehr & Peers, September 2008.

TABLE 14:
2015 WITH PROJECT
ON-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
On-Ramp Merge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	19	B	**105**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	9	A	18	B
EB I-80, at Green Valley Road	11	B	40	E
EB I-80, at Connector from NB I-680	18	B	**100**	**F**
EB I-80, at Travis Boulevard	10	A	18	B
EB I-80, at Air Base Parkway / Waterman Boulevard	13	B	22	C
SR 12 Freeway				
EB SR 12 East, at Chadbourne Road	12	B	**143**	**F**
EB SR 12 East, at Civic Center Boulevard	14	B	24	C

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.

Source: Fehr & Peers, September 2008.

TABLE 15:
2015 NO PROJECT
OFF-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
Off-Ramp Diverge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	20	B	**124**	**F**
NB I-680, at Central Way	21	C	**138**	**F**
NB I-680, at Suisun Valley Road	17	B	**144**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	14	B	20	B
EB I-80, at Connector to EB SR 12 East	23	C	**89**	**F**
EB I-80, at Abernathy Road [2]	12	B	25	C
EB I-80, at Air Base Parkway / Waterman Boulevard	13	B	19	B
SR 12 Freeway				
EB SR 12 East, at Chadbourne Road [2]	16	B	**131**	**F**
EB SR 12 East, at Webster Street	16	B	21	C

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.
2. These locations are not standard diverges with the project, and so they do not appear in Table 16 (2015 With Project). Instead, for the With Project case, they are included within the applicable weave sections in Table 12.

Source: Fehr & Peers, September 2008.

TABLE 16:
2015 WITH PROJECT
OFF-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
Off-Ramp Diverge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	20	B	**98**	**F**
NB I-680, at Central Way	21	C	**124**	**F**
NB I-680, at Suisun Valley Road	17	B	**126**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	14	B	20	B
EB I-80, at Connector to EB SR 12 East	11	B	**136**	**F**
EB I-80, at Air Base Parkway / Waterman Boulevard	12	B	19	B
SR 12 Freeway				
EB SR 12 East, at Webster Street	15	B	21	C

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.

Source: Fehr & Peers, September 2008.

5.3 Ramp Terminal Intersection Operations Analysis

It should be noted that with the projected increase in traffic volumes through the study area, all study intersections would meet Caltrans peak hour signal warrants and would require signalization under Construction Year 2015 Conditions. **Table 17** shows that during the AM peak hour condition, the peak westbound I-80 congestion would result in one of the 12 study intersections operating at unacceptable LOS F conditions. **Table 18** shows that construction of the I-80 Eastbound Cordeila Truck Scales Relocation Project would result in one of the 12 study intersections operating at unacceptable LOS F conditions.

Table 17 shows that during the PM peak hour condition, the severe congestion on eastbound I-80 congestion would result in four of the 12 study intersections operating at unacceptable LOS F conditions. **Table 18** shows that construction of the Project would result in four of the 12 study intersections operating at unacceptable LOS F conditions.

TABLE 17:
2015 NO PROJECT
INTERSECTION LEVELS OF SERVICE

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Red Top Road/I-80 EB Ramps	Signal	22	C	13	B
2	Jameson Canyon Road (SR 12)/Red Top Road	Signal	28	C	44	D
3	Green Valley/Lopes Road/EB I-80 Ramps	Signal	15	B	11	B
4	Pittman Road/I-80 EB Ramps	Signal	16	B	**> 80**	**F**
5	Chadbourne Road/SR 12 EB Ramps	Signal	5	A	35	C
6	Abernathy Road/I-80 EB Ramps	Signal	7	A	34	C
7	West Texas Street/I-80 EB Off-Ramp	Signal	5	A	10	A
8	I-80 EB On-Ramp/Beck Avenue/West Texas Street	Signal	18	B	**> 80**	**F**
9	Beck Avenue/SR 12	Signal	**>80**	**F**	**> 80**	**F**
10	Pennsylvania Avenue/SR 12	Signal	48	D	**> 80**	**F**
11	I-80 EB Ramps/Travis Boulevard	Signal	2	A	6	A
12	I-80 EB Ramps/Air Base Parkway	Signal	11	B	14	B

Notes: Bold font with shading indicates unacceptable operations.
The number corresponds to the intersection number as presented in the existing conditions reports. Only ramp terminal intersections are included in this report; the environmental document will contain results for all the intersections studied within the study area.
Source: Fehr & Peers, September 2008.

TABLE 18:
2015 WITH PROJECT
INTERSECTION LEVELS OF SERVICE

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Red Top Road/I-80 EB Ramps	Signal	20	B	12	B
2	Jameson Canyon Road (SR 12)/Red Top Road	Signal	28	C	49	D
3	Green Valley/Lopes Road/EB I-80 Ramps	Signal	16	B	12	B
4	Pittman Road/I-80 EB Ramps	Signal	16	B	**>80**	**F**
5	Chadbourne Road/SR 12 EB Ramps	Signal	4	A	39	D
6	Abernathy Road/I-80 EB Ramps	Signal	7	A	61	E
7	West Texas Street/I-80 EB Off-Ramp	Signal	5	A	11	B
8	I-80 EB On-Ramp/Beck Avenue/West Texas Street	Signal	18	B	**> 80**	**F**
9	Beck Avenue/SR 12	Signal	**> 80**	**F**	**> 80**	**F**
10	Pennsylvania Avenue/SR 12	Signal	49	D	**> 80**	**F**
11	I-80 EB Ramps/Travis Boulevard	Signal	2	A	6	A
12	I-80 EB Ramps/Air Base Parkway	Signal	11	B	14	B

Notes: Bold font with shading indicates unacceptable operations.
The number corresponds to the intersection number as presented in the existing conditions reports. Only ramp terminal intersections are included in this report; the environmental document will contain results for all the intersections studied within the study area.
Source: Fehr & Peers, September 2008.

6. DESIGN YEAR 2035 OPERATIONS ANALYSIS

This chapter presents the results of the Design Year 2035 Traffic Operations Analysis. As described in Chapter 4, the following programmed and funded projects were included in both No Project and With Project Conditions:

1) North Connector between Jameson Canyon (SR 12 West) and Chadbourne/Abernathy (four lanes, except for a two-lane section from the Business Center Drive terminus to SR 12 West)
2) I-80 eastbound and westbound auxiliary lanes from I-680 to SR 12 East (recently completed)
3) I-80 eastbound auxiliary lane between Abernathy Road and Auto Mall Parkway
4) I-80 eastbound auxiliary lane between Beck Avenue and Travis Boulevard
5) I-80 westbound auxiliary lane from Green Valley Road to SR 12 West
6) Jameson Canyon widening eastbound and westbound from I-80 to SR 29
7) I-80 eastbound removal of Auto Mall Parkway hook ramps
8) I-80 HOV Lanes, Red Top Road to Air Base Parkway
9) Braid ramp from I-680 to Suisun Valley Road
10) I-80 westbound auxiliary lane from Waterman Boulevard to Travis Boulevard
11) I-80 westbound auxiliary lane from West Texas Street to Abernathy Road

6.1 System-Wide Measures of Effectiveness

It is useful to supplement the individual segment and intersection analyses with system-wide performance measures such as vehicle miles traveled (VMT), vehicle hours of travel (VHT), and vehicle hours of delay (VHD). This is particularly useful for comparison of No Project and With Project Alternatives to determine the benefits of the proposed I-80 Eastbound Truck Scales Relocation Project.

Table 19 and **Table 20** summarize the System-Wide Measures Of Effectiveness (MOE's) under 2035 Conditions on the study network, for the AM and PM peak hours, respectively. The study network consists of:

- Eastbound I-80 from Red Top to Air Base
- Northbound I-680 from Gold Hill to I-80
- Eastbound SR 12 East from I-80 to Civic Center

Figure 7 shows the Construction Year 2035 System-Wide MOEs in graphical bar chart format.

The primary results of the AM Peak hour analysis are:

- Vehicle Miles Traveled will decrease by 1,090 miles, which represents a minor increase in mobility. It should be noted that eastbound I-80 is the off-peak direction during morning peak hour conditions;

- Vehicle hours of travel is projected to decrease 160 hours, a six percent improvement when compared to the No Project Condition; and

- Vehicle hours of delay is projected to decrease 55 hours, a 20 percent improvement when

compared to No Project Condition.

TABLE 19:
2035 AM PEAK HOUR
EASTBOUND MEASURES OF EFFECTIVENESS[1]

MOE	2035 No Project	2035 With Project[2]
Vehicle Miles of Travel (Vehicle Miles / Hour)	153,660	152,570 (0%)
Vehicle Hours of Travel (Hours of Travel / Hour)	2,820	2,660 (- 6%)
Vehicle Hours of Delay (Hours of Delay / Hour)	280	225 (- 20%)

1. The study area extends on I-80 **eastbound** from west of Red Top Road to east of Air Base Parkway / Waterman and on northbound I-680 south of Gold Hill Road to I-80. The study area also includes eastbound SR 12 east of I-80 and all ramps.
2. (%) indicates change relative to the No Project condition

Source: Fehr & Peers, September 2008.

TABLE 20:
2035 PM PEAK HOUR
EASTBOUND MEASURES OF EFFECTIVENESS[1]

MOE	2035 No Project	2035 With Project[2]
Vehicle Miles of Travel (Vehicle Miles / Hour)	160,445	172,395 (+ 7%)
Vehicle Hours of Travel (Hours of Travel / Hour)	6,585	6,455 (- 2%)
Vehicle Hours of Delay (Hours of Delay / Hour)	4,045	3,745 (- 7%)

1. The study area extends on I-80 eastbound from west of Red Top Road to east of Air Base Parkway / Waterman and on northbound I-680 south of Gold Hill Road to I-80. The study area also includes eastbound SR 12 east of I-80 and all ramps.
2. (%) indicates change relative to the No Project condition

Source: Fehr & Peers, September 2008.

The primary results of the PM peak hour analysis are:

- Vehicle Miles Traveled will decrease 11,950 miles, which represents a major increase in mobility, and a seven percent improvement when compared to No Project Conditions. It should be noted that eastbound I-80 is the peak direction during evening peak hour conditions;

- Vehicle hours of travel is projected to decrease 130 hours, a two percent improvement when compared to No Project Conditions; and

- Vehicle hours of delay is projected to decrease 300 hours, a seven percent improvement when compared to No Project Conditions.

TABLE 21:
2035 NO PROJECT
FREEWAY LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
I-680 Freeway				
NB I-680, between Gold Hill Road and Central Way	36	E	**163**	**F**
I-80 Freeway				
EB I-80, west of Red Top Road	31	D	**79**	**F**
EB I-80, between Red Top Road and SR 12 West	18	C	**74**	**F**
EB I-80, between SR 12 West and Green Valley Road / I-680 SB (Weave) [2]	22	C	**70**	**F**
EB I-80, between Pittman Road and Truck Scales (Weave) [2]	29	D	**106**	**F**
EB I-80, between Abernathy Road and West Texas Street (Weave) [2]	25	C	19	B
EB I-80, between Beck Avenue and Travis Boulevard (Weave) [2]	25	C	18	B
EB I-80, between Travis Blvd and Air Base Parkway / Waterman Boulevard	23	C	22	C
EB I-80, east of Air Base Parkway / Waterman Boulevard	25	C	25	C
SR 12 Freeway				
EB SR 12 East, between Webster Street and Civic Center Boulevard (Weave) [2]	15	B	15	B

Notes:
1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed over all lanes (excluding HOV).
2. Level of service thresholds for weaving sections are different than mainline sections.

Source: Fehr & Peers, September 2008.

TABLE 22:
2035 WITH PROJECT
FREEWAY LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
I-680 Freeway				
NB I-680, between Gold Hill Road and Central Way	36	E	**148**	**F**
I-80 Freeway				
EB I-80, west of Red Top Road	34	D	**79**	**F**
EB I-80, between Red Top Road and SR 12 West	18	C	**79**	**F**
EB I-80, between SR 12 West and Green Valley Road / I-680 SB (Weave) [2]	22	C	**67**	**F**
EB I-80, between Pittman Road and Truck Scales (Weave) [2]	26	C	**103**	**F**
EB I-80, between Truck Scales and Abernathy Road (Weave) [2, 3]	25	C	24	C
EB I-80, between Abernathy Road and West Texas Street (Weave) [2]	21	C	19	B
EB I-80, between Beck Avenue and Travis Boulevard (Weave) [2]	21	C	18	B
EB I-80, between Travis Blvd and Air Base Parkway / Waterman Boulevard	20	C	22	C
EB I-80, east of Air Base Parkway / Waterman Boulevard	23	C	25	C
SR 12 Freeway				
EB SR 12 East, between Truck Scales and Chadbourne Road (Weave) [2, 3]	13	B	**157**	**F**
EB SR 12 East, between Webster Street and Civic Center Boulevard (Weave) [2]	15	B	17	B

Notes:
1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed over all lanes (excluding HOV).
2. Level of service thresholds for weaving sections are different than mainline sections.
3. These analysis segments only apply to the With Project case (i.e. they don't appear in Table 21).

Source: Fehr & Peers, September 2008.

TABLE 23:
2035 NO PROJECT
ON-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
On-Ramp Merge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	37	E	**158**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	12	B	**83**	**F**
EB I-80, at Green Valley Road	14	B	**82**	**F**
EB I-80, at Connector from NB I-680	26	C	**126**	**F**
EB I-80, at Truck Scales[2]	36	E	**135**	**F**
EB I-80, at Travis Boulevard	14	B	18	B
EB I-80, at Air Base Parkway / Waterman Boulevard	18	B	20	B
SR 12 Freeway				
EB SR 12 East, at Chadbourne Road	20	B	**157**	**F**
EB SR 12 East, at Civic Center Boulevard	17	B	24	C

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.
2. This analysis location is not a standard merge in the With Project case, so does not appear in Table 24 (2015 With Project). Operations in this area for the With Project case are described in the weave section in Table 22.

Source: Fehr & Peers, September 2008

TABLE 24:
2035 WITH PROJECT
ON-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
On-Ramp Merge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	36	E	**148**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	12	B	**104**	**F**
EB I-80, at Green Valley Road	14	B	**64**	**F**
EB I-80, at Connector from NB I-680	26	C	**96**	**F**
EB I-80, at Travis Boulevard	13	B	18	B
EB I-80, at Air Base Parkway / Waterman Boulevard	17	B	18	C
SR 12 Freeway				
EB SR 12 East, at Chadbourne Road	15	B	**147**	**F**
EB SR 12 East, at Civic Center Boulevard	17	B	24	C

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.

Source: Fehr & Peers, September 2008.

TABLE 25:
2035 NO PROJECT
OFF-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
Off-Ramp Diverge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	38	E	**152**	**F**
NB I-680, at Central Way	36	E	**165**	**F**
NB I-680, at Suisun Valley Road	27	C	**166**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	36	E	**88**	**F**
EB I-80, at Connector to EB SR 12 East	33	D	**119**	**F**
EB I-80, at Abernathy Road	18	B	13	B
EB I-80, at Air Base Parkway / Waterman Boulevard	19	B	18	B
SR 12 Freeway				
EB SR 12 East, at Chadbourne Road	22	C	**145**	**F**
EB SR 12 East, at Webster Street	20	B	15	B

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.
2. These locations are not standard diverges with the project, and so they do not appear in Table 26 (2035 With Project). Instead, for the With Project case, they are included within the applicable weave sections in Table 22.

Source: Fehr & Peers, September 2008.

TABLE 26:
2035 WITH PROJECT
OFF-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
Off-Ramp Diverge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	36	E	**143**	**F**
NB I-680, at Central Way	36	E	**131**	**F**
NB I-680, at Suisun Valley Road	27	C	**104**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	**44**	**F**	**88**	**F**
EB I-80, at Connector to EB SR 12 East	13	B	**119**	**F**
EB I-80, at Air Base Parkway / Waterman Boulevard	16	B	18	B
SR 12 Freeway				
EB SR 12 East, at Webster Street	20	B	15	B

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.

Source: Fehr & Peers, September 2008.

6.3 Ramp Terminal Intersection Operations Analysis

It should be noted that with the projected increase in traffic volumes through the study area, all study intersections would meet Caltrans peak hour signal warrants and would require signalization under Design Year 2035 Conditions. **Table 27** shows that during the AM peak hour condition, the peak westbound I-80 congestion would result in four of the 12 study intersections operating at unacceptable LOS F conditions. **Table 28** shows that construction of the Eastbound Truck Scales Relocation Project would continue to result in four of the 12 study intersections operating at unacceptable LOS F conditions.

Table 27 shows that during the PM peak hour condition, the severe congestion on eastbound I-80 congestion would result in eight of the 12 study intersections operating at unacceptable LOS F conditions. **Table 28** shows that construction of the Eastbound Truck Scales Relocation Project would result in seven of the 12 study intersections operating at unacceptable LOS F conditions. This represents a 13 percent decrease in the number of intersections operating at unacceptable conditions during PM peak hour conditions.

TABLE 27:
2035 NO PROJECT
INTERSECTION LEVELS OF SERVICE

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Red Top Road/I-80 EB Ramps	Signal	**> 80**	**F**	**> 80**	**F**
2	Jameson Canyon Road (SR 12)/Red Top Road	Signal	**>80**	**F**	**> 80**	**F**
3	Green Valley/Lopes Road / EB I-80 Ramps	Signal	52	D	27	C
4	Pittman Road/I-80 EB Ramps	Signal	21	C	**> 80**	**F**
5	Chadbourne Road/SR 12 EB Ramps	Signal	5	A	**> 80**	**F**
6	Abernathy Road/I-80 EB Ramps	Signal	9	A	**> 80**	**F**
7	West Texas Street/I-80 EB Off-Ramp	Signal	7	A	75	E
8	I-80 EB On-Ramp/Beck Avenue/West Texas Street	Signal	23	C	**> 80**	**F**
9	Beck Avenue/SR 12	Signal	**> 80**	**F**	**> 80**	**F**
10	Pennsylvania Avenue/SR 12	Signal	**> 80**	**F**	**> 80**	**F**
11	I-80 EB Ramps/Travis Boulevard	Signal	3	A	15	B
12	I-80 EB Ramps/Air Base Parkway	Signal	15	B	41	D

Notes: Bold font with shading indicates unacceptable operations.

The number corresponds to the intersection number as presented in the existing conditions reports. Only ramp terminal intersections are included in this report; the environmental document will contain results for all the intersections studied within the study area.

Source: Fehr & Peers, September 2008.

TABLE 28:
2035 WITH PROJECT
INTERSECTION LEVELS OF SERVICE

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Red Top Road/I-80 EB Ramps	Signal	**> 80**	**F**	**> 80**	**F**
2	Jameson Canyon Road (SR 12)/Red Top Road	Signal	**>80**	**F**	**> 80**	**F**
3	Green Valley/Lopes Road / EB I-80 Ramps	Signal	51	D	42	D
4	Pittman Road/I-80 EB Ramps	Signal	22	C	**> 80**	**F**
5	Chadbourne Road/SR 12 EB Ramps	Signal	4	A	**> 80**	**F**
6	Abernathy Road/I-80 EB Ramps	Signal	9	A	77	E
7	West Texas Street/I-80 EB Off-Ramp	Signal	7	A	26	C
8	I-80 EB On-Ramp/Beck Avenue/West Texas Street	Signal	22	C	**> 80**	**F**
9	Beck Avenue/SR 12	Signal	**> 80**	**F**	**> 80**	**F**
10	Pennsylvania Avenue/SR 12	Signal	**> 80**	**F**	**> 80**	**F**
11	I-80 EB Ramps/Travis Boulevard	Signal	3	A	17	B
12	I-80 EB Ramps/Air Base Parkway	Signal	15	B	38	D

Notes: Bold font with shading indicates unacceptable operations.

The number corresponds to the intersection number as presented in the existing conditions reports. Only ramp terminal intersections are included in this report; the environmental document will contain results for all the intersections studied within the study area.

Source: Fehr & Peers, September 2008.

TABLE 5:
EXISTING ON-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour		PM Peak Hour	
	Density[1]	LOS	Density[1]	LOS
On-Ramp Merge Section				
EB I-80, at Red Top Road	11	B	19	B
EB I-80, at Truck Scales	17	B	57	E*
EB I-80, at AutoMall Parkway	12	B	32	D
EB I-80, at Travis Boulevard	14	B	55	E*
EB I-80, at Air Base Parkway / Waterman Boulevard	13	B	26	C
EB SR 12 East, at Chadbourne Road	12	B	18	B

Notes: Bold font with shading indicates unacceptable operations.
* This ramp operates at capacity and is by definition LOS E.
1. Density is expressed in vehicles per hour per lane
Source: Fehr & Peers, September 2008.

TABLE 6:
EXISTING OFF-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour		PM Peak Hour	
	Density[1]	LOS	Density[1]	LOS
Off-Ramp Diverge Section				
EB I-80, at Red Top Road	12	B	18	B
EB I-80, at EB SR 12 East Connector	16	B	23	C
EB I-80, at Abernathy Road	13	B	21	C
EB I-80, at Air Base Parkway / Waterman Boulevard	13	B	23	C
EB SR 12 East, at Chadbourne Road	12	B	16	B

Notes: Bold font with shading indicates unacceptable operations
* Based on a discussion with Caltrans District 4 Highway Operations staff, this ramp operates at capacity and by definition LOS E.
1. Density is expressed in vehicles per hour per lane
Source: Fehr & Peers, September 2008.

PM Peak Hour Operations

During the PM peak hour, a bottleneck develops on eastbound I-80 at the truck scales on-ramp, where slow-moving trucks attempt to accelerate and merge to freeway travel speeds. In addition, trucks entering the freeway mainline must weave across two lanes of traffic to continue eastbound on I-80. This results in passenger cars and trucks weaving across multiple lanes between the existing Cordelia Truck Scales facility and SR 12E.

TABLE 13:
2015 NO PROJECT
ON-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
On-Ramp Merge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	19	B	**127**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	9	A	18	B
EB I-80, at Green Valley Road	11	B	40	E
EB I-80, at Connector from NB I-680	18	B	**114**	**F**
EB I-80, at Truck Scales[2]	22	C	**92**	**F**
EB I-80, at Travis Boulevard	9	A	18	B
EB I-80, at Air Base Parkway / Waterman Boulevard	12	B	22	C
SR 12 Freeway				
EB SR 12 East, at Chadbourne Road	13	B	**143**	**F**
EB SR 12 East, at Civic Center Boulevard	14	B	24	C

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.
2. This analysis location is not a standard merge in the With Project case, so does not appear in Table 14 (2015 With Project). Operations in this area for the With Project case are described in the weave section in Table 12.

Source: Fehr & Peers, September 2008.

TABLE 14:
2015 WITH PROJECT
ON-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
On-Ramp Merge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	19	B	**105**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	9	A	18	B
EB I-80, at Green Valley Road	11	B	40	E
EB I-80, at Connector from NB I-680	18	B	**100**	**F**
EB I-80, at Travis Boulevard	10	A	18	B
EB I-80, at Air Base Parkway / Waterman Boulevard	13	B	22	C
SR 12 Freeway				
EB SR 12 East, at Chadbourne Road	12	B	**143**	**F**
EB SR 12 East, at Civic Center Boulevard	14	B	24	C

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.

Source: Fehr & Peers, September 2008.

TABLE 15:
2015 NO PROJECT
OFF-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
Off-Ramp Diverge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	20	B	**124**	**F**
NB I-680, at Central Way	21	C	**138**	**F**
NB I-680, at Suisun Valley Road	17	B	**144**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	14	B	20	B
EB I-80, at Connector to EB SR 12 East	23	C	**89**	**F**
EB I-80, at Abernathy Road [2]	12	B	25	C
EB I-80, at Air Base Parkway / Waterman Boulevard	13	B	19	B
SR 12 Freeway				
EB SR 12 East, at Chadbourne Road [2]	16	B	**131**	**F**
EB SR 12 East, at Webster Street	16	B	21	C

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.
2. These locations are not standard diverges with the project, and so they do not appear in Table 16 (2015 With Project). Instead, for the With Project case, they are included within the applicable weave sections in Table 12.

Source: Fehr & Peers, September 2008.

TABLE 16:
2015 WITH PROJECT
OFF-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
Off-Ramp Diverge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	20	B	**98**	**F**
NB I-680, at Central Way	21	C	**124**	**F**
NB I-680, at Suisun Valley Road	17	B	**126**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	14	B	20	B
EB I-80, at Connector to EB SR 12 East	11	B	**136**	**F**
EB I-80, at Air Base Parkway / Waterman Boulevard	12	B	19	B
SR 12 Freeway				
EB SR 12 East, at Webster Street	15	B	21	C

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.

Source: Fehr & Peers, September 2008.

TABLE 23:
2035 NO PROJECT
ON-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
On-Ramp Merge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	37	E	**158**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	12	B	**83**	**F**
EB I-80, at Green Valley Road	14	B	**82**	**F**
EB I-80, at Connector from NB I-680	26	C	**126**	**F**
EB I-80, at Truck Scales[2]	36	E	**135**	**F**
EB I-80, at Travis Boulevard	14	B	18	B
EB I-80, at Air Base Parkway / Waterman Boulevard	18	B	20	B
SR 12 Freeway				
EB SR 12 East, at Chadbourne Road	20	B	**157**	**F**
EB SR 12 East, at Civic Center Boulevard	17	B	24	C

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.
2. This analysis location is not a standard merge in the With Project case, so does not appear in Table 24 (2015 With Project). Operations in this area for the With Project case are described in the weave section in Table 22.

Source: Fehr & Peers, September 2008

TABLE 24:
2035 WITH PROJECT
ON-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
On-Ramp Merge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	36	E	**148**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	12	B	**104**	**F**
EB I-80, at Green Valley Road	14	B	**64**	**F**
EB I-80, at Connector from NB I-680	26	C	**96**	**F**
EB I-80, at Travis Boulevard	13	B	18	B
EB I-80, at Air Base Parkway / Waterman Boulevard	17	B	18	C
SR 12 Freeway				
EB SR 12 East, at Chadbourne Road	15	B	**147**	**F**
EB SR 12 East, at Civic Center Boulevard	17	B	24	C

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.

Source: Fehr & Peers, September 2008.

TABLE 25:
2035 NO PROJECT
OFF-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
Off-Ramp Diverge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	38	E	**152**	**F**
NB I-680, at Central Way	36	E	**165**	**F**
NB I-680, at Suisun Valley Road	27	C	**166**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	36	E	**88**	**F**
EB I-80, at Connector to EB SR 12 East	33	D	**119**	**F**
EB I-80, at Abernathy Road	18	B	13	B
EB I-80, at Air Base Parkway / Waterman Boulevard	19	B	18	B
SR 12 Freeway				
EB SR 12 East, at Chadbourne Road	22	C	**145**	**F**
EB SR 12 East, at Webster Street	20	B	15	B

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.
2. These locations are not standard diverges with the project, and so they do not appear in Table 26 (2035 With Project). Instead, for the With Project case, they are included within the applicable weave sections in Table 22.

Source: Fehr & Peers, September 2008.

TABLE 26:
2035 WITH PROJECT
OFF-RAMP JUNCTION LEVEL OF SERVICE

Segment	AM Peak Hour [1]		PM Peak Hour [1]	
	Density	LOS	Density	LOS
Off-Ramp Diverge Section				
I-680 Freeway				
NB I-680, at Gold Hill Road	36	E	**143**	**F**
NB I-680, at Central Way	36	E	**131**	**F**
NB I-680, at Suisun Valley Road	27	C	**104**	**F**
I-80 Freeway				
EB I-80, at Red Top Road	**44**	**F**	**88**	**F**
EB I-80, at Connector to EB SR 12 East	13	B	**119**	**F**
EB I-80, at Air Base Parkway / Waterman Boulevard	16	B	18	B
SR 12 Freeway				
EB SR 12 East, at Webster Street	20	B	15	B

Notes:

1. Density is expressed in vehicles per hour per lane. Speed is expressed in miles per hour and is the speed within the influence area.

Source: Fehr & Peers, September 2008.

3.2 Ramp Terminal Intersection Operations Analysis

The operations of the ramp terminal intersections are summarized in **Table 7**. For all intersections, the average control delay and LOS for the entire intersection are reported. As shown in **Table 7**, 10 of the 11 (91 percent) study intersections operate at acceptable LOS C or better conditions during the AM peak hour. The all-way stop-controlled intersection of I-80 Eastbound Ramps/Red Top Road operates at LOS F in the AM peak hour due to a combination of heavy traffic volumes and all-way stop-controlled operations.

During the PM peak hour, 11 of the 11 (100 percent) of the study intersections operate at acceptable LOS D conditions or better.

TABLE 7:
INTERSECTION LEVELS OF SERVICE
EXISTING CONDITIONS

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	I-80 EB Ramps / Red Top Road	All-Way Stop	**>50**	**F**	5.3	A
2	I-80 EB Ramps / Pittman Road	Signal	10.0	A	9.2	A
3	SR 12 East EB Ramps / Chadbourne Road	Side-Street Stop	0.5	A	8.3	A
4	I-80 EB Ramps / Abernathy Road	All-Way Stop	3.6	A	25.2	D
5	I-80 EB Ramps / Magellan Road	All-Way Stop	11.0	B	20.2	C
6	I-80 EB Off-Ramp / West Texas Street	Signal	2.6	A	4.2	A
7	I-80 EB On-Ramp – Beck Avenue / West Texas Street	Signal	17.4	B	42.2	D
8	SR 12 East / Beck Avenue	Signal	26.2	C	35.2	D
9	SR 12 East / Pennsylvania Avenue	Signal	20.0	C	27.9	C
10	I-80 EB Ramps / Travis Boulevard	Signal	2.4	A	8.8	A
11	I-80 EB Ramps / Air Base Parkway	Signal	14.0	B	17.2	B

Notes: Bold font with shading indicates unacceptable operations
The intersections are numbered as presented in the I-80/I-680/SR 12 Interchange Existing Traffic Operating Conditions Report (February 2005). Only ramp terminal intersections on I-80 Eastbound between Red Top and Air Base, and on SR 12 East between I-80 and Pennsylvania Avenue, are included in this report.
Source: Fehr & Peers, September 2008.

3.3 Accident Analysis

Accident data for three years (2004 – 2006) from the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) was evaluated for the I-80 and SR 12E segments in the study area. **Table 8** summarizes the TASAS data and highlights locations where the actual accident rate exceeds the statewide average for the westbound and eastbound directions. It should be noted, that similar to Existing traffic conditions, the accident data will be updated for the most recent three-year time period

5.3 Ramp Terminal Intersection Operations Analysis

It should be noted that with the projected increase in traffic volumes through the study area, all study intersections would meet Caltrans peak hour signal warrants and would require signalization under Construction Year 2015 Conditions. **Table 17** shows that during the AM peak hour condition, the peak westbound I-80 congestion would result in one of the 12 study intersections operating at unacceptable LOS F conditions. **Table 18** shows that construction of the I-80 Eastbound Cordeila Truck Scales Relocation Project would result in one of the 12 study intersections operating at unacceptable LOS F conditions.

Table 17 shows that during the PM peak hour condition, the severe congestion on eastbound I-80 congestion would result in four of the 12 study intersections operating at unacceptable LOS F conditions. **Table 18** shows that construction of the Project would result in four of the 12 study intersections operating at unacceptable LOS F conditions.

TABLE 17:
2015 NO PROJECT
INTERSECTION LEVELS OF SERVICE

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Red Top Road/I-80 EB Ramps	Signal	22	C	13	B
2	Jameson Canyon Road (SR 12)/Red Top Road	Signal	28	C	44	D
3	Green Valley/Lopes Road/EB I-80 Ramps	Signal	15	B	11	B
4	Pittman Road/I-80 EB Ramps	Signal	16	B	**> 80**	**F**
5	Chadbourne Road/SR 12 EB Ramps	Signal	5	A	35	C
6	Abernathy Road/I-80 EB Ramps	Signal	7	A	34	C
7	West Texas Street/I-80 EB Off-Ramp	Signal	5	A	10	A
8	I-80 EB On-Ramp/Beck Avenue/West Texas Street	Signal	18	B	**> 80**	**F**
9	Beck Avenue/SR 12	Signal	**>80**	**F**	**> 80**	**F**
10	Pennsylvania Avenue/SR 12	Signal	48	D	**> 80**	**F**
11	I-80 EB Ramps/Travis Boulevard	Signal	2	A	6	A
12	I-80 EB Ramps/Air Base Parkway	Signal	11	B	14	B

Notes: Bold font with shading indicates unacceptable operations.
The number corresponds to the intersection number as presented in the existing conditions reports. Only ramp terminal intersections are included in this report; the environmental document will contain results for all the intersections studied within the study area.
Source: Fehr & Peers, September 2008.

TABLE 18:
2015 WITH PROJECT
INTERSECTION LEVELS OF SERVICE

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Red Top Road/I-80 EB Ramps	Signal	20	B	12	B
2	Jameson Canyon Road (SR 12)/Red Top Road	Signal	28	C	49	D
3	Green Valley/Lopes Road/EB I-80 Ramps	Signal	16	B	12	B
4	Pittman Road/I-80 EB Ramps	Signal	16	B	**>80**	**F**
5	Chadbourne Road/SR 12 EB Ramps	Signal	4	A	39	D
6	Abernathy Road/I-80 EB Ramps	Signal	7	A	61	E
7	West Texas Street/I-80 EB Off-Ramp	Signal	5	A	11	B
8	I-80 EB On-Ramp/Beck Avenue/West Texas Street	Signal	18	B	**> 80**	**F**
9	Beck Avenue/SR 12	Signal	**> 80**	**F**	**> 80**	**F**
10	Pennsylvania Avenue/SR 12	Signal	49	D	**> 80**	**F**
11	I-80 EB Ramps/Travis Boulevard	Signal	2	A	6	A
12	I-80 EB Ramps/Air Base Parkway	Signal	11	B	14	B

Notes: Bold font with shading indicates unacceptable operations.
The number corresponds to the intersection number as presented in the existing conditions reports. Only ramp terminal intersections are included in this report; the environmental document will contain results for all the intersections studied within the study area.
Source: Fehr & Peers, September 2008.

6.3 Ramp Terminal Intersection Operations Analysis

It should be noted that with the projected increase in traffic volumes through the study area, all study intersections would meet Caltrans peak hour signal warrants and would require signalization under Design Year 2035 Conditions. **Table 27** shows that during the AM peak hour condition, the peak westbound I-80 congestion would result in four of the 12 study intersections operating at unacceptable LOS F conditions. **Table 28** shows that construction of the Eastbound Truck Scales Relocation Project would continue to result in four of the 12 study intersections operating at unacceptable LOS F conditions.

Table 27 shows that during the PM peak hour condition, the severe congestion on eastbound I-80 congestion would result in eight of the 12 study intersections operating at unacceptable LOS F conditions. **Table 28** shows that construction of the Eastbound Truck Scales Relocation Project would result in seven of the 12 study intersections operating at unacceptable LOS F conditions. This represents a 13 percent decrease in the number of intersections operating at unacceptable conditions during PM peak hour conditions.

TABLE 27:
2035 NO PROJECT
INTERSECTION LEVELS OF SERVICE

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Red Top Road/I-80 EB Ramps	Signal	**> 80**	**F**	**> 80**	**F**
2	Jameson Canyon Road (SR 12)/Red Top Road	Signal	**>80**	**F**	**> 80**	**F**
3	Green Valley/Lopes Road / EB I-80 Ramps	Signal	52	D	27	C
4	Pittman Road/I-80 EB Ramps	Signal	21	C	**> 80**	**F**
5	Chadbourne Road/SR 12 EB Ramps	Signal	5	A	**> 80**	**F**
6	Abernathy Road/I-80 EB Ramps	Signal	9	A	**> 80**	**F**
7	West Texas Street/I-80 EB Off-Ramp	Signal	7	A	75	E
8	I-80 EB On-Ramp/Beck Avenue/West Texas Street	Signal	23	C	**> 80**	**F**
9	Beck Avenue/SR 12	Signal	**> 80**	**F**	**> 80**	**F**
10	Pennsylvania Avenue/SR 12	Signal	**> 80**	**F**	**> 80**	**F**
11	I-80 EB Ramps/Travis Boulevard	Signal	3	A	15	B
12	I-80 EB Ramps/Air Base Parkway	Signal	15	B	41	D

Notes: Bold font with shading indicates unacceptable operations.

The number corresponds to the intersection number as presented in the existing conditions reports. Only ramp terminal intersections are included in this report; the environmental document will contain results for all the intersections studied within the study area.

Source: Fehr & Peers, September 2008.

TABLE 28:
2035 WITH PROJECT
INTERSECTION LEVELS OF SERVICE

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Red Top Road/I-80 EB Ramps	Signal	**> 80**	**F**	**> 80**	**F**
2	Jameson Canyon Road (SR 12)/Red Top Road	Signal	**>80**	**F**	**> 80**	**F**
3	Green Valley/Lopes Road / EB I-80 Ramps	Signal	51	D	42	D
4	Pittman Road/I-80 EB Ramps	Signal	22	C	**> 80**	**F**
5	Chadbourne Road/SR 12 EB Ramps	Signal	4	A	**> 80**	**F**
6	Abernathy Road/I-80 EB Ramps	Signal	9	A	77	E
7	West Texas Street/I-80 EB Off-Ramp	Signal	7	A	26	C
8	I-80 EB On-Ramp/Beck Avenue/West Texas Street	Signal	22	C	**> 80**	**F**
9	Beck Avenue/SR 12	Signal	**> 80**	**F**	**> 80**	**F**
10	Pennsylvania Avenue/SR 12	Signal	**> 80**	**F**	**> 80**	**F**
11	I-80 EB Ramps/Travis Boulevard	Signal	3	A	17	B
12	I-80 EB Ramps/Air Base Parkway	Signal	15	B	38	D

Notes: Bold font with shading indicates unacceptable operations.

The number corresponds to the intersection number as presented in the existing conditions reports. Only ramp terminal intersections are included in this report; the environmental document will contain results for all the intersections studied within the study area.

Source: Fehr & Peers, September 2008.