04-Sol-80-PM 0.8/5.6
04-Sol-37-PM 10.2/11.7
Program Code HB5
EA 4A440K
December 2008

PROJECT STUDY REPORT
(Project Development Support)

To

Request Programming for
Capital Support for
Project Approval and Environmental Document Phase
Plans, Specifications and Estimate
In the 2008 STIP

And

Authorize Preparation of a Cooperative Agreement

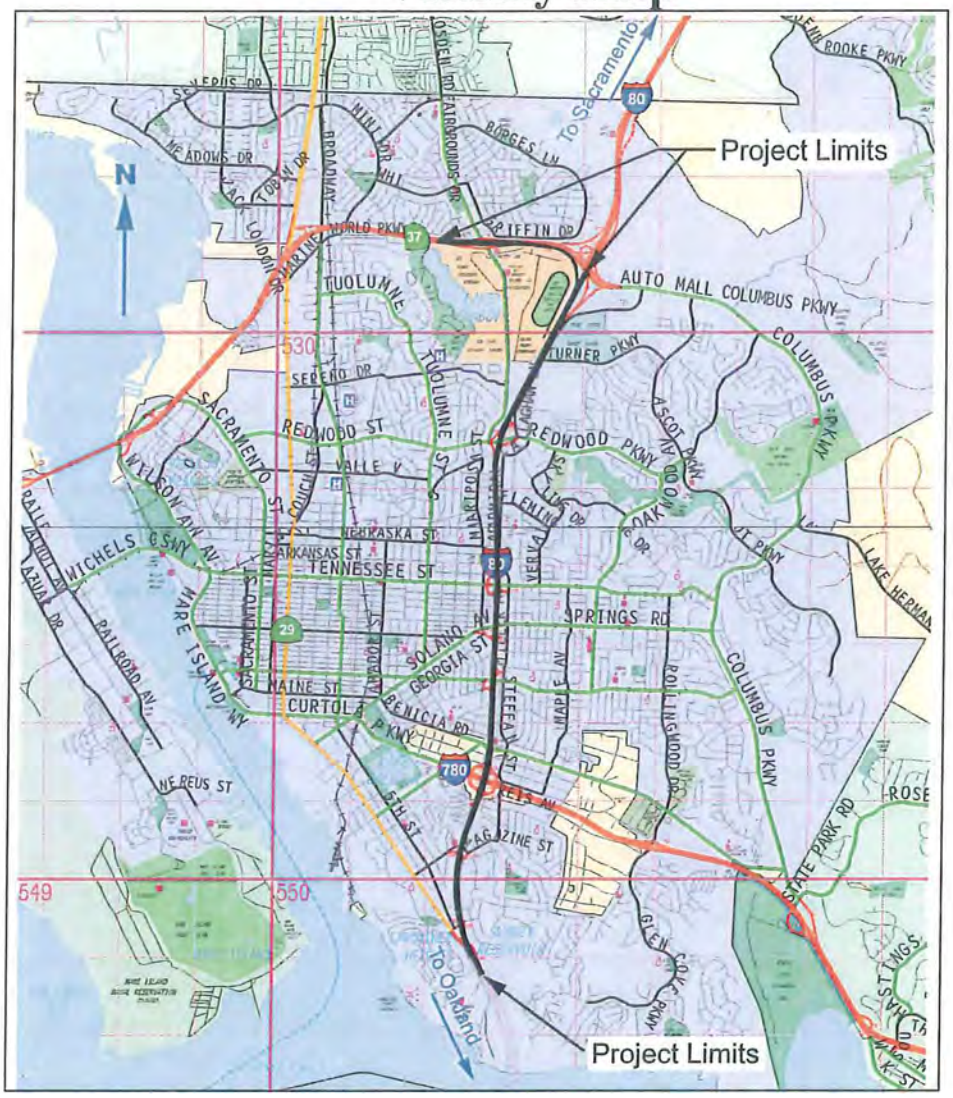
On Route 80 Between the Al Zampa Bridge and Route 37
And On Route 37 Between Fairgrounds Drive and Route 80
In the City of Vallejo

APPROVAL RECOMMENDED: _____
Sameer Khoury - PROJECT MANAGER

APPROVED: _____ 3-4-09
Bijan Sartipi - DISTRICT DIRECTOR *DATE*

04-Sol-80-PM 0.8/5.6
04-Sol-37-PM 10.2/11.7
Program Code HB5
EA 4A440K
December 2008

Vicinity Map



On Route 80 Between the Al Zampa Bridge and Route 37

And On Route 37 Between Fairgrounds Drive and Route 80

In the City of Vallejo

04-Sol-80-PM 0.8/5.6
04-Sol-37-PM 10.2/11.7

This Project Study Report (PDS) has been prepared under the direction of the following Registered Engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Heidi M. Ouren, P.E. — *DATE* 12/11/08

REGISTERED PROFESSIONAL ENGINEER
HEIDI M. OUREN
No. C46784
Exp. 06/30/09
CIVIL
STATE OF CALIFORNIA

Patrick K. Pang.- Office Chief
Office of Advance Planning — *DATE* 1/16/09

Table of Contents

List of Attachments

1. INTRODUCTION

The Solano Transportation Authority (STA), Solano County, and the City of Vallejo, in cooperation with the California Department of Transportation (Caltrans) and Federal Highways (FHWA), propose to construct high occupancy vehicle (HOV) lanes on westbound (WB) and eastbound (EB) I-80 between the Alfred Zampa (formerly Carquinez) Bridge and Route 37. The project would add approximately ten (10) lane miles of HOV lanes to the I-80 corridor and consolidate access points within the project limits via ramp closures.

In addition, improvements required to mitigate traffic impacts caused by the planned development of the Solano County Fairgrounds area were studied. Potential mitigations included a new I-80 overcrossing structure extending Turner Parkway from Admiral Callaghan Lane to Fairgrounds Drive. The Turner Parkway extension over I-80 may include HOV connections to I-80, Park and Ride facilities, and improvements to the local frontage roads between Redwood Parkway and Route 37. Improvements to the I-80/Redwood Parkway and the Route 37/Fairgrounds Drive interchanges will also be required.

STA is the Implementing Agency, with Solano County and the City of Vallejo as Project Sponsors. The estimated cost for Capital Outlay Support for the PA/ED phase of project development is $3.6 million and $9.6 million for PS&E. See the Preliminary Cost Estimates in Attachments B through F for specific work items included in this project.

Route 80 is designated as an interstate highway. This will be a Category 3 project due to the anticipated need for a revised freeway agreement. The preliminary construction cost estimates for the range of alternatives is from $55M to $200M.

The remaining support, right of way and construction components of the project are preliminary estimates and are not suitable for programming purposes. A Project Report will serve as the programming document for the remaining support and capital components of the project. The Project Report will also approve a preferred alternative that will be identified by the project development team. The purpose of this PSR (PDS) is to program project development support dollars through the PS&E phase.

See Attachment A for a project location map.

2. BACKGROUND

A. EXISTING FACILITY

Within the study limits, Interstate 80 (I-80) is currently a six lane, east-west freeway passing through the City of Vallejo connecting the Port of Oakland to the Central Valley as well as the western United States. It serves not only as a regional commuter

route, but also as a major regional goods movement gateway corridor north of Route 4 in Contra Costa County through Solano County. HOV lanes currently exist on westbound I-80 from just east of the Al Zampa Bridge in Solano County through Contra Costa and Alameda Counties to the Bay Bridge. In the eastbound direction, the HOV lane currently extends from the Bay Bridge through Alameda and Contra Costa Counties to Route 4 with final design underway east to Cummings Skyway. The new Al Zampa Bridge, completed in November of 2003, also has a dedicated HOV lane eastbound through the Toll Plaza.

The addition of another ten lane miles of HOV lanes in Solano County will relieve the existing and forecasted congestion that is discussed in Section 4. DEFICIENCIES.

I-80 was originally adopted as a state highway (Route 7) on April 2, 1937 and subsequently declared a freeway by resolution of the California Highway Commission on January 24, 1941. The I-80/Route 29 (Old Route 74) Separation was the first controlled access point, constructed in 1947, followed by the Magazine Street interchange constructed in the mid-1950s. The six additional access points that exist today (Sequoia, I-780, Georgia Street, Solano Avenue, Tennessee Street and Redwood Street) were all added in the late 1950's and I-80 was widened to its current six lane configuration. The original I-80 six lane facility consisted of asphalt concrete paving over a cement treated base. A metal beam guard rail and resurfacing project was constructed in the late 1960's, followed by a concrete median barrier replacement and resurfacing project in the early 2000's. In general, I-80 consists of 12' lanes with 8'-10' left and right shoulders, separated by a concrete median barrier. Right of way is constrained by parallel frontage roads serving commercial and residential areas adjacent to I-80. Attachment A shows the existing (and No Build) conditions within the project corridor.

Because the existing facility is over 50 years old, several nonstandard features are present within this study segment. Currently, interchange spacing varies from ¼ to ½ mile (see Table 1), creating short weaving sections and inadequate distance between entrance and exit ramps, resulting in nonstandard merge and diverge distances. With the exception of Route 29, I-780 and Tennessee St., the interchange configurations consist of short, tight radius hook ramps connecting to parallel arterial roadways rather than the cross road that they serve.

TABLE 1		
Location	**Post Mile (I-80)**	**Distance to Next Interchange (mi)**
I-80 Interchange Location		
Route 80/29 Separation	1.14	0.64
Magazine Street OC (Hook Ramps)	1.78	0.44
Route 80/780 Separation	2.22	0.66
Georgia St OC (Hook Ramps)	2.88	0.35
Springs Rd OC (Hook Ramps)	3.23	0.26
Tennessee St OC (Hook Ramps EB)	3.49	0.94
Redwood St OC (Hook Ramps EB)	4.43	1.20
Route 80/37 Separation	5.63	-
SR 37 Interchange Location		
Fairgrounds Drive UC	10.96	0.72
Route 80/37 Separation	11.68	-

Vertical clearance for all overcrossing and undercrossing structures is also nonstandard. Bridge inspection reports show that only one of the structures, the Springs Rd./Solano Ave. Overcrossing, has experienced high load hits over the westbound I-80 lanes. The vertical clearance at this location is as low as 14'-9". Table 2 shows the existing nonstandard vertical clearances within the project limits.

Table 2		
Structure	**Minimum Vertical Clearance**	
	Eastbound	**Westbound**
Route 80/29 Sep	16'- 2"	15' - 2"
Magazine OC	15' - 4"	15' - 1"
Benicia OC	15' - 2"	15' - 2"
Georgia OC	15' - 3"	15' - 8"
Springs OC	14' - 11"	14' - 9"
Tennessee OC	15' - 5"	15' - 5"
Redwood OC	14' - 11"	16' - 0"

Route 37 is a four lane, east-west freeway connecting Route 29 and I-80 within the City of Vallejo. The westerly project limit includes the Route 37/Fairgrounds Drive interchange, a tight diamond configuration, and the I-80/Route 37 freeway to freeway interchange, constructed in the late1970's, is at the easterly project limit. The majority of this segment was constructed in the mid- to late 1970's, while the Fairgrounds Drive/Route 37 interchange was built in the early 1990's. This segment of Route 37 consists of 12' lanes, 5' left shoulders, and 10' right shoulders. The existing pavement section is constructed of asphaltic concrete on top of cement treated base.

As shown in Table 1, there is only ¾ mile spacing between the Fairgrounds Drive and I-

80 interchanges leaving less than ¼ mile for major merge, diverge and weaving activities as motorists enter and exit the I-80/Route 37 freeway to freeway interchange.

B. PROJECT DEVELOPMENT

The Solano County Transportation Authority (STA) prepared the I-80/I-680/I-780 Major Investment and Corridor Study in July 2004 to develop a long range transportation plan for those corridors. The study was broken into seven geographical segments, with this portion of the I-80 corridor identified as Segment 2 - Carquinez Bridge to Route 37. The corridor study prioritized projects within the categories of near-term, mid-term and long-term improvements. The I-80 Westbound HOV Lane was identified as Mid-Term priority number 23 and the I-80 Eastbound HOV Lane with improvements to the Redwood Parkway eastbound ramps as priority number 24. STA, Solano County, Caltrans, and local jurisdictions were involved throughout the development of the study.

In July 2003, a Memorandum of Understanding (MOU) was entered into between the City of Vallejo and the Solano County Fairgrounds Association outlining the general understanding between the two parties regarding development of the Solano County Fairgrounds. Subsequently, a Memorandum of Intent (MOI) was executed in January 2004 between Solano County, the Solano County Fairgrounds Association, and the Mills Corporation. The MOI provided the framework for the development to be an integrated public/private regional development totaling approximately 1.2 million square feet, of which 750,000 square feet would be retail oriented. A Preliminary Master Plan was prepared, but the Solano County Board of Supervisors did not approve the plan and the MOI expired in 2006. The Solano County Fairgrounds Association is continuing to lead the planning effort by pursuing other means of developing a master plan that is acceptable to all parties.

Solano County received a Federal earmark in 2005 (SAFETEA-LU) to perform preliminary studies for the I-80 HOV Lanes/Turner Overcrossing and the Metropolitan Transportation Commission (MTC) programmed the project in Amendment No. 07-05 to Transportation 2030 (**Tip ID: SOL050061**). The earmark requires a 20% Local Match which is being funded jointly between STA, Solano County and the City of Vallejo.

3. PURPOSE AND NEED

A. PURPOSE

The purpose of the project is twofold. Implementation of an HOV lane will reduce traffic congestion and delays for motorists and transit riders using the HOV lanes; facilitate alternative modes of transportation; and increase the carrying capacity of I-80 in Solano County. Operations on I-80 will also be improved by consolidation of access points via potential ramp closures at Sequoia, Lincoln Rd West, Benecia, and Solano/Springs. As a result of replacing the Solano Ave./Springs Rd. OC structure, the minimum vertical clearance through this segment of I-80 will be increased. Secondly,

the Turner Parkway/Redwood/Fairgrounds Drive improvements will reduce congestion on the local roadway network adjacent to I-80 between Redwood Parkway and Route 37 to mitigate traffic impacts caused by redevelopment of the Solano County Fairgrounds

B. NEED

The aforementioned project purposes address the need to encourage carpooling and the use of alternative transportation modes to improve future mainline operations; and the need to accommodate the future development of the Solano County Fairgrounds by improving local roadway operations to mitigate traffic congestion generated by the development.

Congestion in the I-80 corridor, as described in Section 4. DEFICIENCIES, is expected to continue to deteriorate as demand increases. I-80 through the project area has several local access points that do not meet the standard interchange spacing of 1 mile. The overcrossing at Solano Ave./Springs Rd. currently has a vertical clearance of 14'9" and has a history of being hit by vehicles with tall loads.

4. DEFICIENCIES

A. EXISTING CONDITIONS

1) I-80

Existing conditions in the I-80 corridor were studied to determine the vehicle occupancy rates, truck percentages, congestion, and queuing characteristics for the study area. The eastbound direction of I-80 is the PM peak direction and the westbound direction is the AM peak direction. Approximately 8.5% truck traffic was observed during the AM peak period in the westbound direction and 9% during the PM peak period in the eastbound direction. Vehicle occupancy counts indicate that 12% of the traffic has two or more persons per vehicle in the eastbound PM peak and 13% in the westbound AM peak. See Attachment G for existing mainline traffic volumes and data.

In the AM peak period (6:00-10:00 am), westbound I-80 experiences speed reductions throughout the section between Tennessee St. and the Al Zampa Bridge as a result of heavy merging at Route 29, weaving activities at Solano Ave. and Tennessee St., and short acceleration and deceleration lanes. The slowest observed travel speed was approximately 35 mph.

In the PM peak period (3:00-7:00 pm), eastbound I-80 experiences speed reductions between Georgia St. and Tennessee St. as a result of heaving merging at I-780, weaving activities at Springs Ave. and Tennessee St., and short auxiliary lanes. The slowest observed travel speed was approximately 40 mph.

2) Route 37

The segment of Route 37 between Fairground Drive and I-80 experiences turbulence in

both the AM and PM peak periods due to the heavy demands to/from I-80 and to/from Fairgrounds drive combined with short weaving distances.

3) Local Street Intersections

Ramp and local street intersections within the study area currently operate at Level of Service (LOS) D or better during both the AM and PM peak periods with the following exceptions:

- Fairgrounds Drive/Route 37 WB Ramps – PM Peak LOS F
- Admiral Callaghan Lane/I-80 eastbound Ramps – AM/PM Peaks LOS E

B. ACCIDENT DATA

Accident data for the three-year period from January 1, 2004 to December 31, 2006 was obtained from Caltrans Traffic Accident Surveillance and Analysis System (TASAS) data and is summarized in the tables below. The summaries are shown for the following project segments:

- I-80 Mainline – Eastbound and Westbound
- SR 37 Mainline – Eastbound and Westbound
- I-80 Eastbound Ramps
- I-80 Westbound Ramps
- SR 37 Ramps – Eastbound and Westbound

The accident information includes the number of fatal (F), fatal plus injury (F+I) and total (Total) accidents on the study area ramps. The actual rates for the project area are compared with the statewide averages for similar facilities in urban areas.

For all project segments, three fatalities were reported on I-80 – one in the eastbound direction near Magazine Street; one in the westbound direction near the I-780 entrance ramp; and one in the westbound direction near the Route 37 entrance ramp to I-80. The actual fatality accident rates at all three locations exceed the statewide average for similar facilities.

Several locations within the project limits show an actual F+I and/or Total accident rate above the statewide average for similar facilities, as discussed below. Implementation of the HOV project has the potential to reduce these rates by relieving congestion. The Redwood Parkway Interchange Modifications will also contribute to the potential for reduction in accident rates through proposed modifications that will improve operations at the I-80 Redwood Parkway and Route 37/Fairgrounds Drive interchanges. See Section 6. Alternatives Analysis for discussion of the anticipated congestion relief and operational improvements.

The proposed access consolidation may also improve the accident rates by decreasing the number of conflict points through the corridor and increasing the weave distance between ramps.

Accident Data – I-80 Mainline
January 1, 2004 to December 31, 2006 (36 months)

Location	No. of Accidents			Actual Accident Rates (per million vehicle miles)			Average Accident Rates (per million vehicle miles)		
	F	F+I	Total	F	F+I	Total	F	F+I	Total
EASTBOUND I-80									
Toll Plaza to SR 29 Separation (PM 0.4 to 1.14)	0	32	178	0.000	***0.62***	***3.44***	0.005	0.27	0.88
SR 29 Sep to Magazine St (PM 1.14 to 1.78)	1	15	44	***0.024***	***0.36***	***1.06***	0.006	0.31	1.01
Magazine St to I-780 (PM 1.78 to 2.22)	0	11	25	0.000	***0.37***	0.83	0.011	0.33	0.99
I-780 to Benicia Rd (PM 2.22 to 2.44)	0	5	14	0.000	0.29	0.83	0.016	0.37	1.04
Benicia Rd to Georgia St (PM 2.44 to 2.88)	0	17	59	0.000	***0.50***	***1.74***	0.007	0.36	1.16
Georgia St to Springs Rd (PM 2.88 to 3.23)	0	14	26	0.000	***0.50***	0.93	0.005	0.30	0.96
Springs Rd to Tennessee St (PM 3.23 to 3.49)	0	6	23	0.000	0.29	***1.10***	0.006	0.33	1.05
Tennessee St to Redwood St (PM 3.49 to 4.43)	0	17	46	0.000	0.22	0.60	0.007	0.38	1.21
Redwood St to SR 37 (PM 4.43 to 5.82)	0	20	98	0.000	0.19	0.94	0.006	0.33	1.07
WESTBOUND I-80									
SR 37 to Redwood St (PM 4.43 to 5.82)	1	21	100	***0.010***	0.20	0.96	0.006	0.33	1.07
Redwood St to Tennessee St (PM 3.49 to 4.43)	0	25	85	0.000	0.33	1.12	0.007	0.38	1.21
Tennessee St to Springs Rd (PM 3.23 to 3.49)	0	6	28	0.000	0.29	***1.34***	0.006	0.33	1.05
Springs Rd to Georgia St (PM 2.88 to 3.23)	0	12	39	0.000	***0.43***	***1.39***	0.005	0.30	0.96
Georgia St to Benicia Rd (PM 2.44 to 2.88)	0	13	44	0.000	***0.38***	***1.30***	0.007	0.36	1.16
Benicia Rd to I-780 (PM 2.22 to 2.44)	0	2	19	0.000	0.12	***1.12***	0.016	0.37	1.04
I-780 to Magazine St (PM 1.78 to 2.22)	1	7	24	***0.033***	0.23	0.80	0.011	0.33	0.99

x.xx **= Actual rate is higher than average rate; F=Fatal; I=Injury**

1) I-80 EASTBOUND

Eastbound Toll Plaza to SR 29 Separation

The F+I and Total accidents far exceed the statewide average in this segment. Over half were rear end collisions caused by excessive speed in congested conditions during the afternoon peak period. Over 65% occurred during day light hours on dry pavement. This segment requires merging from ten lanes at the toll plaza to three through eastbound lanes and one exit only to northbound SR 29.

SR 29 Separation to Magazine St.

The F+I and Total accidents are only slightly higher than the statewide average in this segment. Over 60% were rear end collisions caused by excessive speed during the afternoon peak period. Nearly 20% hit the median barrier and one accident involved a pedestrian on the shoulder.

Magazine St to I-780

The F+I accident rates are only slightly higher than the statewide average. As was the case with the two previous segments, over half of the accidents were rear end collisions caused by excessive speed during the afternoon peak period. Over 70% occurred in the left lane under dry pavement conditions during day light hours. One accident involved a pedestrian on the right shoulder.

Benicia Rd to Georgia St

The F+I and Total accidents are significantly higher than the statewide average in this segment. Approximately 40% were rear end collisions, 30% sideswipes, and 25% hit the median barrier, guardrail or wall. The accidents were evenly divided between the left, center and right lanes. Over 65% occurred during the day light under clear, dry conditions and during the afternoon.

Georgia St to Springs Rd

The F+I accidents are higher than the statewide average for similar facilities. Approximately 60% were rear end collisions and 15% sideswipes, while over 25% hit the median barrier, guardrail, or bottom of the structure. Most accidents occurred in either the left lane/shoulder area (45%) or right lane/shoulder area (40%).

Springs Rd to Tennessee St

The Total accident rate is only slightly higher than the statewide average for this segment. Over half the accidents were rear end collisions caused by speeding and occurred in the left lane. Over 20% were sideswipe collisions and a little over 10% hit the median barrier.

2) I-80 WESTBOUND

Tennessee St to Springs Rd

The Total accident rate is higher than the statewide average for this segment. Half of the accidents were rear end collisions caused by speeding during day light hours under clear, dry conditions and occurred in the middle lane. Over 50% were during slow moving traffic conditions and just over 10% hit the median barrier or wall.

Springs Rd to Georgia St

The F+I and Total accidents are much higher than the statewide average for this half mile stretch of roadway. Half of the accidents were rear end collisions caused by speeding during day light hours under clear, dry conditions and occurred in the middle lane. Over 80% were slowing or stopped and over 50% occurred during the afternoon peak period.

Georgia St to Benicia Rd

The F+I and Total accidents are higher than the statewide average. Over 60% were rear end collisions caused by speeding and following too close during slow moving traffic conditions. Just fewer than 15% occurred on wet pavement while it was dark. About 50% took place in the right lane/shoulder area and over 40% in the left lane/shoulder area. Just over 50% occurred during the morning peak period.

Benicia Rd to I-780

The Total accident rate is slightly higher than the statewide average. A majority of the accidents occurred during the day light hours under dry, clear conditions. Over 60% were rear end collisions caused by speeding and following too close during slow moving traffic conditions. Over 75% occurred in the left lane/shoulder area and over 50% were during the morning peak period.

Accident Data – SR 37 Mainline
January 1, 2004 to December 31, 2006 (36 months)

Location	No. of Accidents			Actual Accident Rates (per million vehicle miles)			Average Accident Rates (per million vehicle miles)		
	F	F+I	Total	F	F+I	Total	F	F+I	Total
EASTBOUND SR 37									
West of Fairgrounds Dr (PM 10.7 to 10.96)	0	2	5	0.000	0.25	0.62	0.011	0.36	0.97
Fairgrounds Dr to Sage St (PM 10.96 to 11.22)	0	3	14	0.000	0.25	***1.16***	0.010	0.37	1.06
Sage St to I-80 (PM 11.22 to 11.41)	0	1	1	0.000	0.11	0.11	0.005	0.27	0.86
WESTBOUND SR 37									
I-80 to Sage St (PM 11.22 to 11.41)	0	8	19	0.000	***0.91***	***2.16***	0.005	0.27	0.86
Sage St to Fairgrounds Dr (PM 10.96 to 11.22)	0	9	30	0.000	***0.75***	***2.49***	0.010	0.37	1.06
West of Fairgrounds Dr (PM 10.7 to 10.96)	0	2	6	0.000	0.25	0.74	0.011	0.36	0.97

***x.xx* = Actual rate is higher than average rate; F=Fatal; I=Injury**

3) SR 37 EASTBOUND

Fairgrounds Dr to Sage St

The Total accident rate for this segment is slightly higher than the average rate. Over 70% were speeding or following too close, resulting in rear end collisions in the right lane/shoulder area. 80% of the accidents occurred during day light hours under dry pavement conditions, and over 40% were slowing or stopped. More than 50% of the accidents occurred during the afternoon peak period.

4) SR 37 WESTBOUND

I-80 to Sage St

The F+I and Total accident rates were significantly higher for this segment of roadway. Over 70% occurred in the right lane/shoulder area during the day light on dry pavement, and almost 30% were sideswipe collisions. Over 45% were rear end collisions due to speeding and following too close during slow moving traffic conditions.

Sage St to Fairgrounds Dr

The F+I and Total accident rates were significantly higher for this segment of roadway. Over 80% occurred in the right lane/shoulder area on dry pavement, and 20% were sideswipe collisions. Over 45% occurred in the dark and were rear end collisions due to speeding and following too close during slow moving traffic conditions.

Accident Data – I-80 Eastbound Ramps
January 1, 2004 to December 31, 2006 (36 months)

Location	No. of Accidents			Actual Accident Rates (per million vehicle miles)			Average Accident Rates (per million vehicle miles)		
	F	F+I	Total	F	F+I	Total	F	F+I	Total
Exit to NB SR 29 (PM 0.954)	0	2	3	0.000	***0.40***	0.60	0.006	0.21	0.60
Exit to Sequoia St (PM 1.219)	0	0	0	0.000	0.00	0.00	0.003	0.31	0.90
Exit to Magazine St (PM 1.671)	0	0	3	0.000	0	***3.27***	0.005	0.39	1.15
Entrance from Magazine (PM 1.723)	0	1	1	0.000	0.15	0.15	0.002	0.20	0.60
Exit to Rte 780 (PM 2.017)	0	0	0	0.000	0.00	0.00	0.002	0.08	0.25
Exit to Benicia Rd (PM 2.322)	0	0	1	0.000	0.00	0.39	0.004	0.28	0.80
Entrance from Rte 780 (PM 2.451)	0	1	3	0.000	0.05	0.16	0.002	0.08	0.25
Exit to Georgia St (PM 2.891)	0	0	5	0.000	0.00	***1.88***	0.005	0.39	1.15
Entrance from Georgia St (PM 2968)	0	2	3	0.000	***0.27***	0.41	0.002	0.20	0.60
Exit to Springs Rd (PM 3.124)	0	0	0	0.000	0.00	0.00	0.005	0.39	1.15
Entrance from Springs Rd (PM 3.171)	0	0	0	0.000	0.00	0.00	0.002	0.20	0.60
Exit to Humboldt (Tennessee St) (PM 3.443)	0	0	0	0.000	0.00	0.00	0.005	0.39	1.15
Entrance from Humboldt (Tennessee St) (PM 3.597)	0	0	1	0.000	0.00	0.22	0.002	0.20	0.60
Exit to Admiral Callaghan Lane (Tennessee St) (PM 3.444)	0	0	4	0.000	0.00	0.96	0.005	0.39	1.15
Entrance from Admiral Callaghan Lane (Tennessee St) (PM 3.598)	0	1	3	0.000	***0.25***	***0.76***	0.002	0.20	0.60
Exit to EB Redwood St (PM 4.300)	0	0	1	0.000	0.00	0.31	0.006	0.33	0.90
Exit to Redwood St (PM 4.502)	0	2	3	0.000	0.19	0.28	0.005	0.39	1.15
Entrance from Redwood St (PM 4.579)	0	0	0	0.000	0.00	0.00	0.002	0.20	0.60
Exit to Rte 37- Columbus Pkwy (PM 5.263)	0	0	0	0.000	0.00	0.00	0.002	0.08	0.25
Entrance from Columbus Pkwy (PM 5.741)	0	0	1	0.000	0.00	0.24	0.003	0.22	.60

***x.xx* = Actual rate is higher than average rate; F=Fatal; I=Injury**

5) I-80 EASTBOUND RAMPS

Exit to NB SR 29

The F+I accidents were higher than the statewide average at this location. Two of the three accidents were on a wet road surface and occurred on the ramp. Both accidents involved speeding and hitting the guardrail at the right abutment.

Exit to Magazine St

The Total number of accidents was significantly higher than the statewide average for this exit ramp. The primary collision factors were unknown, with one sideswipe and one hitting a light or signal pole. One occurred at the ramp exit, one on the ramp, and one at the ramp intersection with Lincoln Road. One was reported during snowy or icy road conditions.

Exit to Georgia St

The Total accident rate is only slightly higher at this location. 80% occurred during a clear night with dry pavement conditions. 60% were reported to have hit the traffic island located between the exit and entrance ramps. Various collision factors were reported, including speeding, improper turns, and other violations.

Entrance from Georgia St

The F+I accidents are slightly higher than average at this entrance ramp. Over 65% were caused by speeding during the day light hours under clear, dry conditions while the motorist was proceeding straight on the ramp. The location of the accidents was split evenly along the ramp.

Entrance from Admiral Callaghan Lane

The F+I and Total accidents are slightly higher than average at this location. All of the accidents occurred at the ramp intersection with Admiral Callaghan Lane and over 60% were broadsides caused by a failure to yield. One was a head-on accident.

Accident Data – I-80 Westbound Ramps
January 1, 2004 to December 31, 2006 (36 months)

Location	No. of Accidents			Actual Accident Rates (per million vehicle miles)			Average Accident Rates (per million vehicle miles)		
	F	F+I	Total	F	F+I	Total	F	F+I	Total
Entrance from Magazine St (PM 1.733)	1	1	1	***0.375***	***0.38***	0.38	0.002	0.20	0.6
Exit to Magazine St (PM 1.763)	0	0	3	0.000	0.00	0.70	0.005	0.39	1.15
Entrance from Rte 780 (PM 2.043)	0	0	1	0.000	0.00	0.09	0.005	0.37	1.05
Exit to Rte 780 (PM 2.462)	0	2	2	0.000	***0.09***	0.09	0.002	0.08	0.25
Entrance from Georgia St (PM 2.796)	0	1	3	0.000	***0.28***	***0.84***	0.002	0.20	0.60
Exit to Georgia St (PM 2.878)	0	0	4	0.000	0.00	0.67	0.005	0.39	1.15
Entrance from Springs Rd (PM 3.130)	0	0	2	0.000	0.00	0.61	0.002	0.32	0.80
Exit to Springs Rd (PM 3.205)	0	1	1	0.000	0.21	0.21	0.004	0.50	1.35
Entrance from Tennessee St (PM 3.370)	0	0	0	0.000	0.00	0.00	0.002	0.08	0.25
Exit to Tennessee St (PM 3.679)	0	0	1	0.000	0.00	0.16	0.002	0.08	0.25
Entrance from Redwood St (PM 4.317)	0	1	3	0.000	0.06	0.19	0.002	0.19	0.55
Exit to Redwood St (PM 4.507)	0	6	9	0.000	***1.09***	***1.63***	0.005	0.61	1.50
Entrance from EB Rte 37 (PM 5.526)	0	1	2	0.000	0.04	0.08	0.004	0.13	0.04

x.xx **= Actual rate is higher than average rate; F=Fatal; I=Injury**

6) I-80 WESTBOUND RAMPS

Entrance from Magazine St

One fatality occurred at this ramp, so the F and F+I accident rates are higher than the statewide average. An auto hit a pedestrian near the ramp intersection with Lincoln Road late at night under cloudy, dry conditions.

Exit to Route 780

The F+I accident rate is only slightly higher than the statewide average. Both of the accidents were rear ends caused by speeding during congested conditions and occurred near the ramp exit.

Entrance from Georgia St

The F+I and Total accident rates are higher at this entrance ramp location. Two of the three were caused by a failure to yield, resulting in broadside accidents. One was caused by speeding and resulted in the vehicle overturning and one involved a pedestrian. Most occurred at the ramp intersection with 14th Street.

Exit to Redwood Street

The F+I and Total accident rates are higher than the statewide average at this exit ramp. Over half were broadside accidents occurring during the day under dry, clear conditions. Six of the nine accidents occurred at the ramp intersection with Redwood Street/Fairgrounds Drive in the right lane. One accident involved a bicyclist.

Accident Data – SR 37 Ramps
January 1, 2004 to December 31, 2006 (36 months)

Location	No. of Accidents			Actual Accident Rates (per million vehicle miles)			Average Accident Rates (per million vehicle miles)		
	F	F+I	Total	F	F+I	Total	F	F+I	Total
EASTBOUND SR 37									
Exit to Fairgrounds Dr (PM 10.756	0	3	5	0.000	***1.21***	***2.01***	0.005	0.61	1.50
Entrance from Fairgrounds Dr (PM 11.051)	0	3	12	0.000	0.15	0.62	0.002	0.32	0.80
WESTBOUND SR 37									
Exit to Fairgrounds Dr (PM 11.093)	0	517		0.000	0.25	0.84	0.005	0.61	1.50
Entrance from Fairgrounds Dr (PM 10.903)	0	2	6	0.000	***1.15***	***3.46***	0.002	0.32	0.80

***x.xx* = Actual rate is higher than average rate; F=Fatal; I=Injury**

7) SR 37 RAMPS

Eastbound Exit to Fairgrounds Dr

The F+I and Total accidents are much higher at this location when compared to the statewide average for similar facilities. Two of the accidents were broadsides and one was a rear end accident with the primary collision factor unknown. 60% occurred during the day under clear, dry conditions. Four of the five accidents occurred at the ramp intersection with Fairgrounds Drive.

Westbound Entrance from Fairground Dr

The F+I and Total accidents are significantly higher at this location. Over 80% were sideswipes and rear end accidents caused by following too close and speeding. No unusual roadway conditions were present. Four of the six accidents occurred near the ramp intersection with Fairgrounds Drive.

C. FORECASTED CONDITIONS (2035)

Traffic operations analysis of the No Build alternative represents the baseline condition against which the effectiveness and impacts of alternatives are measured. The Traffic Operations Analysis Report prepared by DKS Associates shows that significant congestion is projected on I-80 under 2035 No Build conditions during both AM and PM peak periods, as well as on Route 37 in the eastbound direction during both peak periods. Attachment G shows the AM and PM projected peak period volumes for I-80 and Route 37, as well as the AM and PM peak period volumes at the study intersections.

1) I-80 AM Peak Period (6 am to 10 am)

The primary bottleneck for WB I-80 is located just west of the Route 29 entrance ramp where the acceleration lane ends and the mainline is reduced to three mixed flow lanes plus an HOV lane (3+). Queues from this bottleneck extend through the entire study area and beyond SR 37 for the first two hours (6 am to 8 am) and only dissipate slightly from 8 am to 10 am. Average travel speeds are projected to be as low as 9 mph.

On eastbound I-80, congestion is projected due to a bottleneck between the Tennessee Street on-ramp and Redwood Parkway off-ramp. In this case, queues begin to form in the second hour (7 am) and grow through the remainder of the peak period, extending beyond the toll plaza at the end of the peak period.

2) I-80 PM Peak Period (3 pm to 7 pm)

Congestion is forecasted in the westbound direction as a result of a bottleneck between the Redwood Street on-ramp and Tennessee Street off-ramp. Queues from this bottleneck persist throughout the peak period and extend back to the Route 37 junction. The volume of traffic reaching this bottleneck is constrained by the capacity of the Route 37 eastbound to I-80 WB entrance ramp and limits the flow of traffic entering at this ramp to well below the projected demand.

In the eastbound direction, during the first hour (3-4 pm), a bottleneck appears right after the lane drop located at the exit ramp to Route 29. During the remaining peak hours, the queue from the bottleneck at the Redwood Road entrance ramp extends beyond the toll plaza. Average travel speeds are projected to be as low as 25 mph.

3) Route 37 Eastbound AM and PM Peak

Operations analysis shows that the weaving section between the Fairground Drive entrance ramp and the I-80 exit ramp (direct connector) will operate at LOS F in 2035 during both the am and pm peak.

4) Local Street Intersections

Only 17 of the 34 intersections analyzed are projected to operate at LOS D or better during the AM and PM peaks. The PM peak period has the heaviest traffic and thus the worst level of service except at the westerly end of the corridor. The intersections of Magazine St/I-80 eastbound Ramps and Magazine St/Pine St operate at LOS F during

the morning commute. This is consistent with the high volumes using the Magazine entrance and exit ramps.

5. CORRIDOR AND SYSTEM COORDINATION

A. CORRIDOR OVERVIEW

I-80 is a transcontinental Interstate facility that is critical to regional and interregional traffic in the San Francisco region. It is vital to commuting, freight, and recreational traffic and is one of the most congested freeway facilities in the region. I-80 serves as the single freeway connection between the San Francisco Bay Area and the Sacramento metropolitan region. It links the Bay Area with recreational destinations in the Sierra and points north via I-505 to I-5.

B. STATE PLANNING

The Governor's Strategic Growth Plan (2006) calls for an infrastructure improvement program that includes a major transportation component (Go California). The SGP is based on the premise that investments in mobility throughout the system will yield significant improvements in congestion relief. It calls for transportation infrastructure improvements that are designed to decrease congestion, improve travel times and safety, while accommodating growth in the economy and population.

The Strategic Growth Plan was supported by the passage of the transportation bond (Prop 1B) in the November 2006 election. The Corridor Mobility Improvement Account (CMIA) was developed as part of Prop 1B and includes funding for a project(s) in this corridor. The I-80 HOV Lane Project (Red Top Road to Air Base Parkway) is being funded through CMIA.

On March 15, 2007, the CTC adopted Resolution CMIA-P-0607-02. In Sections 2.12 and 2.13 of this resolution, the CTC resolved that "...the Commission expects Caltrans and regional agencies to preserve the mobility gains of urban corridor capacity improvements over time that will be described in Corridor System Management Plans (CSMP's),.." A CSMP is a transportation planning document that will study the facility based on comprehensive performance assessments and evaluations. The strategies take into account transit usage and projections and interactions with arterial network and connection to State Highways. Each CSMP presents an analysis of existing and future traffic conditions and proposes traffic management strategies and capital improvements to maintain and enhance mobility within each corridor.

C. SYSTEM PLANNING

The project is consistent with and supports statewide, regional and local transportation planning documents. Caltrans' Interregional Transportation Strategic Plan (ITSP), June 1998, designates I-80 as a High Emphasis route and the California Transportation Plan 2025 (CTP 2025) and CTP 2030 Amendment identifies I-80 as a priority corridor and major gateway, stating that "The State should actively pursue improving the operating efficiency of the State's major gateways."

The Metropolitan Transportation Commission (MTC), acting as the Bay Area's Metropolitan Planning Organization (MPO), supports the development of High Occupancy Vehicle (HOV) lanes on this segment of I-80 and has included the project in the Transportation 2030 Plan (TIP ID SOL050061). MTC's 2002 HOV Master Plan Update includes the HOV improvements as a Priority II project.

Consistent with the goals of Transportation 2030, MTC sponsored development of the San Francisco Bay Area Regional Intelligent Transportation System (ITS) Plan as a roadmap for transportation systems integration in the Bay Area over the next 10 years. It identifies ITS strategies such as vehicle detection, ramp metering, closed caption television (CCTV) cameras, and changeable message signs (CMS) for the I-80 corridor. This project is consistent with the ITS plan in that it proposes to maintain the existing traffic operations system (TOS) elements of in-road detectors and CMS. In addition, ramp metering of all local roadway interchanges within the study limits is included in all proposed alternatives. One of the objectives of the Solano Comprehensive Transportation Plan (CTP 2030) is to support the goals of MTC's ITS Plan.

STA's CTP 2030 - Arterials, Highways and Freeways Element, also identifies I-80 as a Regional Route of Significance and supports the implementation of HOV Lanes on I-80. The proposed improvements to Fairground Drive are also consistent with the Solano Countywide Bicycle Plan and Pedestrian Plan.

The development of the Solano County Fairgrounds is consistent with the City of Vallejo Redevelopment Agency's Five Year Implementation Plan (FY 04/05 to FY 08/09). The Fairgrounds property is included in the Flosden Acres Redevelopment Area of that plan. In addition, the project alternatives are consistent with the City of Vallejo's Regulations and Standard Specifications for Public Improvements.

On December 19, 2008, MTC released Draft Transportation 2035 Plan: Change in Motion for public review and comment. The plan includes project Reference No. 230658 "I-80 in Solano County from Route 37 to Carquinez Bridge – widen to add an HOT lane in each direction." This project is one of the five projects listed under the I-80 corridor with a total cost of $768.1 million for all five projects. As such, High Occupancy Toll (HOT) lanes will need to be considered during the next phase of project development.

D. RELATED PROJECTS

Caltrans recently completed extension of the I-80 westbound HOV lanes in Contra Costa County, over the Al Zampa Bridge and approximately a half a mile into Solano County. That segment of HOV lane was opened in November 2007. In the eastbound direction, a project is underway to extend the HOV lane from Route 4 to Cummings Skyway in Contra Costa County (EA 0T0504). There is also an I-80 pavement rehabilitation project under construction within the project study limits from just east of Tennessee St. to American Canyon Rd (EA 0T2404).

Caltrans is also currently preparing a study to construct a concrete barrier at the Right edge of EB I-80 from the Redwood Street on ramp to the Route 37 connector (EA 4A4600). Construction of this project is scheduled to be completed in 2010.

In December 2005, Caltrans approved a Supplemental Project Study Report (SPSR) to extend the I-80 westbound HOV lane from Route 29 to Magazine St. The SPSR identified construction for the year 2010/2011.

The City of Vallejo has a feasibility study underway to examine the viability of either expanding the existing Park and Ride lot at Curtola Parkway (I-780) and Lemon Street or providing additional lots along the I-80 corridor between Route 37 and I-780. In addition, the City has construction underway at the Redwood Parkway/I-80 Interchange to improve traffic operations at the intersections of Admiral Callaghan Lane/I-80 eastbound ramps and Admiral Callaghan Lane/Redwood Parkway/I-80 eastbound exit ramp.

E. FREEWAY AGREEMENTS

An original Freeway Agreement was executed between the State and Solano County in April of 1945 and amended in November of 1968 to include improvements at the I-780 interchange and Route 37 interchange. This agreement also covers the entire I-80 study corridor limits as they exist today.

An amended Freeway Agreement for the existing infrastructure in this segment of the I-80 corridor was executed in April 1956 between the State and City of Vallejo. It extends from the Al Zampa Bridge to the Napa County line, east of the I-80/Route 37 interchange. The Freeway Agreement will need to be amended again for all build alternatives due to new or removed freeway access points.

F. NEW PUBLIC ROAD CONNECTIONS

The only new potential public road connection would be in Alternative 2A, construction of HOV drop ramps from the new Turner Parkway OC to I-80 in the median. See Attachment D for the preliminary Typical Cross Sections and Layout. There is little likelihood that this alternative will move forward due to the fact that other solutions utilizing existing frontage roads provide the same or better benefit. See Section 6 for a more detailed discussion.

6. ALTERNATIVES ANALYSIS

A. DESCRIPTION OF ALTERNATIVES

The following alternatives were studied to determine their viability and effectiveness in meeting the purpose and need for the project. The design year used for analysis is 2035 and the HOV occupancy rate used was 2+ persons per vehicle. The HOV Alternatives, 1A and 1B, have independent utility and can be constructed without implementation of

Alternatives 2A, 2B and 2C. Only Alternative 2A, construction of the Turner Overcrossing with HOV drop ramps, depends on the prior or concurrent construction of an HOV alternative.

The estimated ranges of capital cost for each alternative are shown in Section 9A.

1) No Build Alternative

This is the base case alternative and assumes none of the project improvements are constructed. Attachment A shows the No Build condition.

2) Alternative 1A – Standard HOV Lanes

The Standard HOV Lane alternative meets a majority of the current Mandatory and Advisory design standards, and includes the following features:

- Consolidation of access by closing entrance and exit ramps at Sequoia Avenue, Magazine Street, Lincoln Road West, Benicia Road, Georgia Street, Solano Avenue/Springs Road, and Tennessee Street (eastbound southern-most ramps)
- Demolition and removal of overcrossing (OC) structures at Magazine Street, Benicia Road, Georgia Street and Solano Avenue/Spring Road
- Reconstruction of the I-80/Redwood Parkway Interchange
- Closure of existing frontage roads
- Construction of retaining walls
- Construction of sound walls
- Substantial Right of Way acquisition
- Freeway widening

This alternative, shown in Attachment B, would not meet the Mandatory standard of providing two mile spacing between freeway to freeway and local interchanges; would require a brief reduction in shoulder standards at the Route 29 Separation, I-780 Separation, and Tennessee Street OC; and would maintain a nonstandard vertical clearance of 15'-5" at the Tennessee Street OC.

Alternatives 1A and 1B provide the same travel time savings. However, Alternative 1A would create greater impacts to the local streets and require additional right of way. Additionally, the City of Vallejo staff has stated that the impacts due to Alternative 1A would not be acceptable to the City. Therefore, Alternative 1A should be dropped from further consideration and Alternative 1B should be carried forward to the PA/ED Phase.

3) Alternative 1B – Minimum HOV Lanes

This alternative proposes nonstandard lane and shoulder widths in order to minimize environmental, right of way and cost impacts. As shown in Attachment C, 11 ft lane widths are proposed for all but the number four lane, with 4 ft left and 10 ft right shoulders. The shoulder widths will experience additional brief reductions at existing bridge rails, piers and abutments. The Minimum HOV Lane alternative also includes the following features:

- Consolidation of access by closing entrance and exit ramps at Sequoia Avenue, Lincoln Road West, Benicia Road, and Springs Road
- Auxiliary lanes WB from Georgia Street to I-780 and from I-780 to Magazine Street
- Construction of retaining walls
- Construction of sound walls
- Signalized intersections at Magazine Street/Lincoln Rd East, Pine Street/Magazine Street, and I-80 eastbound Ramps/Admiral Callaghan Lane (Tennessee interchange)
- Minor Right of Way acquisition
- Freeway Widening
- Reconstruction of the Solano Avenue/Springs Road overcrossing structure

4) Alternative 2A –Turner Parkway OC + HOV Drop Ramps

In this alternative, an overcrossing would be constructed connecting Turner Parkway on the east side of I-80 with Fairgrounds Drive on the west side. HOV drop ramps would be provided from the Turner Overcrossing into the median of I-80. As shown in Attachment D, the HOV drop ramps would have nonstandard lane and shoulder widths matching that of the minimum HOV lane alternative. It should be noted that this alternative cannot be constructed without one of the HOV lane alternatives being constructed first or at the same time. It therefore does not have independent utility. The following major features are proposed in addition to those listed above for Alternative 1B:

- Turner Parkway OC structure (See Attachment H for Preliminary Bridge Planning Study)
- Rindler Creek Bridge
- HOV drop ramps connecting Turner Parkway to the median of I-80
- Park and Ride Lots
- Widening of Fairground Drive from two to four lanes from Redwood Street to Coach Lane, and from four to six lanes from Coach Lane to Route 37.
- Signalized intersections at Turner Parkway/New Turner Parkway, Fairgrounds Drive/New Turner Parkway, Fairgrounds Drive/Solano County Fairgrounds Development Entrance (south), and Fairgrounds Drive/Valle Vista Avenue
- Signal modifications at Fairgrounds Drive/Route 37 WB ramps, Fairgrounds Drive/Route 37 eastbound ramps, Fairgrounds Drive/Solano County Fairgrounds Development Entrance (north), and Sereno Drive/Fairground Drive
- Relocation of Admiral Callaghan Lane
- Construction of retaining walls
- Utility relocations
- Right of Way acquisition
- Freeway Widening

The HOV drop ramps proposed in Alternative 2A would require approval of a geometric alignment that contains non-standard decision sight distance. Upon review

and discussions with the Division of Design, Design Coordinator, the request for exception to this standard would most likely not be granted. In addition the projected usage of the HOV drop ramps is not projected to be significant. Therefore, Alternative 2A should be dropped from further consideration and not be carried forward to the next phases of project development.

5) Alternative 2B –Turner Parkway OC

This alternative is the same as Alternative 2A, except the HOV drop ramps would not be constructed. Admiral Callaghan Lane would still require relocation, but to a much lesser extent. Attachment E shows the improvements for Alternative 2B.

In order for an overcrossing at Turner Parkway to be effective additional improvements to Fairgrounds Drive, Admiral Callaghan Lane, the I-80/Redwood Parkway interchange and the Route 37/Fairgrounds Drive interchange would still be required. The improvements to the interchanges and local streets are similar to those in Alternative 2C and the added overcrossing at Turner Parkway is projected to provide little additional operational improvements. Alternative 2B should therefore be dropped from further consideration and not be carried forward to the next phase of the project development.

6) Alternative 2C –Redwood Parkway Interchange Modifications

In addition to the minimum HOV lane alternative improvements, a tight diamond interchange configuration is proposed utilizing the existing Redwood Parkway OC structure as shown in Attachment F. The following major features are proposed in addition to those listed above for Alternative 1B:

- Construction of a tight diamond at I-80/Redwood Parkway Interchange
- Widening of Fairground Drive from two to four lanes from Redwood Street to Coach Lane, and from four to six lanes from Coach Lane to Route 37.
- Signalized intersections at the Redwood Parkway/I-80 eastbound ramps, Redwood Road/I-80 WB ramps, and Redwood Road/Fairgrounds Drive
- Signalized intersections at Fairgrounds Drive/Solano County Fairgrounds Development Entrance (south), and Fairgrounds Drive/Valle Vista Avenue
- Signal modifications at Fairgrounds Drive/Route 37 WB ramps, Fairgrounds Drive/Route 37 eastbound ramps, Fairgrounds Drive/Solano County Fairgrounds Development Entrance (north), Sereno Drive/Fairground Drive, and Redwood Road/Admiral Callaghan Way
- Relocation of the Fairgrounds Drive/Redwood Road intersection
- Cul-de-sac at Moorland Street west of Fairgrounds Drive
- Construction of retaining walls
- Construction of sound walls
- Right of Way acquisition
- Freeway Widening

The proposed entrance and exit ramp closures for the various alternatives are projected to have minimal impact to local traffic because of existing ramps within a short distance. Existing local streets will provide connections to the areas serviced by the

ramps which are proposed to be closed.

Several additional interchange configurations were investigated during the development of the alternatives. These included a partial-cloverleaf (parclo) interchange, a trumpet interchange and an urban (single point) interchange. All interchange configurations other than the diamond type would require reconstruction of the Redwood Parkway OC structure and have severe right of way impacts combined with extremely high construction costs. The parclo interchange configuration is shown in Attachment F.

Constructing a roundabout on the WB side of the Redwood Parkway interchange was also investigated. This was found to be infeasible due to the grades. Moving the termini of the WB off ramp to Valley Vista was also examined. This would create additional right of way impacts and did not provide additional operational improvements.

B. TRAFFIC OPERATIONS

Attachment G shows the AM and PM projected peak period volumes for I-80 and Route 37, as well as the AM and PM peak period volumes at the study intersections.

1) I-80 Mainline Operations

Traffic operations analysis was performed to measure the performance of the alternatives using the design year (2035) forecasted peak period volumes. As can be seen in Table 3, the measures of effectiveness (MOEs) for implementation of the HOV lanes show that during the morning peak period motorists using the HOV lanes save over 11 minutes of travel time in the westbound direction and almost 9 minutes in the eastbound direction during the evening peak period.

Congestion will still be heavy in the WB direction during the AM peak period, as evidenced by the average travel speeds expected to remain in the 10-15 mph range. Conversely, users in the HOV lanes will be traveling at 60-65 mph in the PM peak eastbound direction.

Table 3. Freeway Measures of Effectiveness (MOE's) - 2035

MOE		Westbound (6-10 AM)			Eastbound (3-7 PM)		
		No Build	ALT 1B*	ALT 2A	No Build	HOV Lanes*	ALT 2A
Study Segment Travel Time (min)	SOV	37.5	30.6	31.6	14.7	11.6	10.7
	HOV	37.5	24.7	26.6	14.7	5.8	5.8
	Travel Time Savings	n/a	5.9	5.0	n/a	5.8	4.9
Study Segment Average Speed (mph)	SOV	9	11	11	25	32	35
	HOV	9	11	11	25	64	64
Freeway Hours of Travel	Vehicle (veh-hr)	8771	7908	7937	4973	4668	4352
	Person (per-hr)	10526	9764	9807	5968	5477	5096
Ramp/Entry Delay	Vehicle (veh-hr)	19486	14764	13336	16384	7416	6596
	Person (per-hr)	23385	18229	16478	19661	9270	8242
Total Hours of Travel	Vehicle (veh-hr)	28257	22672	21273	21357	12103	10948
	Person (per-hr)	33911	27993	26284	25629	14747	13339
Source: DKS Associates, 2008							

***All alternatives except Alternative 2A.**

The HOV lane alternatives also provide travel time savings for single occupancy vehicles (SOV) using the mixed flow lanes, reducing travel time up to 10% in the AM peak and 25% in the PM peak when compared to the No Build Alternative.

The results for Alternative 2A show that there is no significant difference in HOV or SOV operations with the addition of drop ramps at the New Turner OC. Traffic forecasting results showed that a very small number of vehicles used the HOV drop ramps during the peak hours in either the morning or evening commute (less than 200 vph). The addition of two small Park and Ride lots near the proposed OC improved usage only slightly due to their limited size. The assumed Park and Ride lot locations and configurations are shown in Attachment D.

The use of the drop ramps during non-peak hours was discussed with HQ Design Coordinators and with FHWA. Similar types of facilities exist on I-80, notably at the Richmond Parkway Interchange. However, due to the unique nature of the proposed project not having the provisions for a standard right entry-exit interchange in addition to the median drop ramps, the likelihood of obtaining approval for this alternative is very low. Additional factors that make the geometry unfavorable are potential safety issues due to the lack of adequate decision sight distance for drivers using the left hand eastbound exit (HOV drop ramp). The proposed drop ramp location begins between the two eastbound exit ramps to Redwood Parkway and would be only ½ mile from the exit to Route 37, which is a major direct connector. Because motorists are not accustomed to left exits, this could cause safety issues due to last minutes maneuvers to the left lane in order to make the exit.

2) Redwood Parkway/Fairgrounds Drive/Route 37

Traffic analysis was performed for Alternatives 2A, 2B and 2C to study the effect of the future Solano County Fairgrounds development on the surrounding transportation system. Conservative estimates of development build-out were used based on the Master Plan developed by the Mills Corporation as discussed in Section 2.B. The analysis included the base case assumption that Fairgrounds Drive would need to be widening to four lanes between the Coach Lane/Fairground Drive intersection and Redwood Street.

Traffic analysis performed along the Route 37/Fairgrounds Drive/Redwood Parkway area shows that the PM peak hour is the controlling peak for this portion of the study area. Saturday peak volumes, assuming both full development of the Fairgrounds area and Discovery Kingdom open, were also analyzed to ensure that they did not control over the PM peak. As shown in Table 4 below, the Saturday peak operations are the same or better than the PM peak operations at all study intersections.

Table 4 - 2035 PM vs. Saturday Peak Intersection Operations

ID	Intersection	Weekday PM		Saturday Peak	
		Delay	LOS	Delay	LOS
2	Fairgrounds Dr and SR 37 WB ramps	70	E	72	E
1	Fairgrounds Dr and SR 37 EB ramps	56	E	37	C
5	Fairgrounds Dr and Marine World Entrance (north entrance)	29	C	33	C
4	Fairgrounds Dr and Solano Fairgrounds Entrance (south entrance)	29	C	24	C
7	Fairgrounds Dr/Redwood St/I-80 WB ramps	203	F	51	D
14	Redwood Parkway, Admiral Callaghan Lane and I80 EB ramps	123	F	48	D

As stated above, the New Turner OC with HOV Drop Ramps did not prove to be an attractive route for motorists destined to or coming from the Solano County Fairgrounds development/Discovery Kingdom area. Of the roughly 2000 vph leaving the development in the PM peak hour, 50% head north on Fairgrounds Drive and 50% head south. The morning peak shows the same pattern entering the development. In the evening peak, about 60% of the vehicles are entering from the south and 40% from the north. The forecasts also showed that about 25% of the AM peak traffic generated by the development comes from the south through the Redwood eastbound ramps. Because the development adds up to 1000 vph to Fairgrounds Drive south of the New Turner OC connection, Fairgrounds Drive will have to be widened to four lanes even with construction of the New Turner Parkway OC.

Alternative 2B, which does not include the HOV drop ramps to I-80 but only an OC, showed moderate usage by local traffic coming from the residential areas to the east of I-80. The PM peak hour forecasts indicate that about 600 vph use the structure in the eastbound direction and 600 vph in the westbound direction. Similar to Alternative 2B, the additional traffic on Fairgrounds Drive generated by the development will require widening from two to four lanes south of the New Turner Parkway intersection.

Alternative 2C included investigating alternate improvements to the Redwood Parkway/I-80 Interchange and local road system to achieve the same purpose as constructing a new interstate connection at Turner Parkway. FHWA requires that any proposal for a new connection justify that the existing interchanges and local roads systems cannot be improved to handle the deficiencies. Several types of interchange configurations were considered, including a Type L-1 tight diamond, Type L-8 reverse two quadrant cloverleaf (reverse parclo), a Type L-9 parclo, a Type L-6 hook ramp, and a Type L-13 single point interchange. All of the interchange types except the tight diamond will require reconstruction of the Redwood Parkway OC.

3) Local Street Intersections

The analysis results for the AM peak period show that the HOV Lane alternatives would worsen the operating conditions at the following study intersections:

- Fairground Dr at SR 37 eastbound Ramps – the intersection would operate at LOS E under the 2035 HOV Lanes plus Turner Overcrossing with HOV Ramps Alternative 2A, deteriorating from LOS D under the 2035 No Project and the 2035 Project scenario without the HOV direct ramps, Alternative 2B. This reflects the subtle changes in traffic patterns that would result from the presence of the HOV ramps.
- Miller Street at I-80 Northbound Ramps – the intersection would operate at LOS F under the HOV Alternatives 1A and 1B, deteriorating from LOS C under the 2035 No Project scenario. This reflects the redirection of traffic to the Georgia Street interchange that results from the closure of the Springs Road ramps in the eastbound I-80 direction. This intersection will require signalization, which would result in LOS C in the AM peak and LOS C in the PM peak.

The analysis results for the PM peak period show that the alternatives would cause an adverse impact to the following intersections. Most of these intersections would already operate at LOS F under the 2035 No Build scenario, but delay would increase significantly with implementation of the project.

- Admiral Callaghan Lane at I-80 eastbound Ramps (Alternatives 2A and 2B)
- Fairground Drive at Route 37 Eastbound Ramps (Alternatives 2A, 2B and 2C)
- Fairground Drive at Route 37 Westbound Ramps (Alternatives 2A, 2B and 2C)
- Lincoln Road East and I-80 Eastbound Ramps (Alternatives 1A and 1B)
- Magazine and Pine Street (Alternatives 1A and 1B)

The Admiral Callaghan Lane/I-80 eastbound ramps will operate at LOS D in the PM peak with implementation of Alternative 2C – Redwood Parkway Interchange Modifications.

The Fairground Drive/Route 37 intersections will operate a LOS E in the PM peak with widening to six lanes as shown in Attachment D.

The Lincoln Road East/I-80 eastbound ramps will require signalization and operate at LOS C.

The intersection of Magazine and Pine would deteriorate from LOS C to LOS E in the PM peak with HOV Lane alternatives, and operate at LOS F in the AM peak. It is currently controlled by stop signs and will require signalization in, which will result in LOS B in the AM peak and LOS A in the PM peak.

C. POTENTIAL ENVIRONMENTAL IMPACTS

A Preliminary Environmental Assessment Report (PEAR) was prepared utilizing a study boundary encompassing an area that included all reasonable alternative impacts. The PEAR is included in Attachment I and shows the study boundaries and associated potentially sensitive environmental resources. An Initial Site Assessment (ISA) was also prepared to identify the potential hazardous material sites in the study boundary. Aerially Deposited Lead (ADL) is likely to be encountered in all study Alternatives due to the age of the existing freeway.

1) Alternative 1A – Standard HOV Lanes

This alternative will require either construction of continuous frontage roads along the corridor or widening of existing residential streets to mitigate local traffic impacts due to extensive access consolidation. Continuous frontage roads would impact several commercial and residential properties, including those identified in the ISA as potentially containing hazardous materials (gas stations, auto body shops, dry cleaner, etc).

If continuous frontage roads were not provided, widening of existing residential streets (such as Magazine, Laurel, Miller, Humboldt, Mariposa, 14th Street, and Benicia Rd.) would be required due to diversion of over 3300 vehicles from I-80 between Route 29 and Tennessee Street in the am peak hour and 4200 vehicles in the pm peak hour. The impact of this amount of traffic diversion in mostly residential areas would not only be extremely costly but would likely have severe community and economic impacts.

Removal of the existing bridge structures at Magazine, Benicia, Georgia, and Springs/Solano have the potential to expose asbestos-containing materials in joint fillers, tie-down pads, and/or insulative materials found associated with conduits, ducting, etc. In addition, the Magazine St. OC may contain lead in the painted steel girders.

2) Alternative 1B – Minimum HOV Lanes

This alternative has the least potential to significantly affect the environment due to the fact that this alternative minimizes the amount of freeway widening and requires only sliver right of way acquisitions. Most of the environmental impacts would be temporary in nature, occurring only during construction of the HOV lanes. Indirect impacts, such as air, noise, socio-economic, and community effects are likely to have a low level of significance. There will also be potential minor impacts to Blue Rock Springs Creek on the east side of I-80 where it crosses under Admiral Callaghan Lane.

Due to the proposed access consolidation, there will be some traffic diversion requiring traffic signals to be installed at the intersections of Magazine St./Pine St., Magazine St./Lincoln Rd. East, and I-80 eastbound Ramps/Admiral Callaghan Lane (Tennessee Interchange).

3) Alternatives 2A and 2B - Turner Parkway Overcrossing, with or without HOV Drop Ramps

Both of these alternatives have unavoidable direct impacts that will require close coordination with the appropriate resource agencies to identify acceptable forms of mitigation. Potential special-status species along Turner Creek, Rindler Creek, and Blue Rock Springs Creek that have the highest likelihood of existing in the project area include the California red-legged frog, and the burrowing owl has the potential to nest and/or forage in the Solano County Fairgrounds area. The central portion of the vacant property on the east side of I-80 between Admiral Callaghan Lane and Turner Parkway contains potential jurisdictional wetland habitat.

These alternatives also impact several commercial and residential properties located along Fairgrounds Drive causing potential socio-economic and community effects that can likely be mitigated via suitable relocations. There are also three potentially historic structures located at the corner of Fairgrounds Drive and Coach Lane and a moderate potential for historic-period archaeological resources in the eastern portion of the project area.

4) Alternative 2C – Redwood Parkway Interchange Modification

Impacts to several residential and commercial properties will occur with this alternative. An estimated eleven single family residences and a gas station on Fairgrounds Drive will require acquisition and relocation assistance. It also impacts three commercial properties on Admiral Callaghan Lane – Redwood Veterinary Hospital, Super Quality Furniture and Tell Rentals located in the northeast quadrant of the interchange. The veterinary hospital is in the process of relocating to the west side of I-80 near Coach Lane. Because Fairgrounds Drive will require widening with this alternative, there will be impacts to Rindler Creek where it parallels Fairgrounds Drive prior to crossing under the roadway unless widening of Fairgrounds Drive takes place on the west side. In that case, the Six Flags/Discovery Kingdom right of way would be impacted.

D. DESIGN EXCEPTIONS

Mike Thomas, Division of Design, Design Coordinator, has agreed to defer design exception approval to the Draft Project Report when a preferred alternative has been selected. The following non-standard design features have been discussed with him and are anticipated to be approved when the fact sheets are submitted.

1) Alternative 1A – Standard HOV Lanes

This alternative would not meet the mandatory standard of providing two mile spacing between freeway to freeway and local interchanges; would require a brief reduction in shoulder standards at the Route 29 Separation, I-780 Separation, and Tennessee Street OC; and would maintain a nonstandard vertical clearance of 15'-5" at the Tennessee Street OC.

2) Alternative 1B – Minimum HOV Lanes

Draft Mandatory Fact Sheets have been submitted to Division of Design - Design Reviewers to obtain approval for the following features:

- 11 ft lane widths
- 4 ft left shoulder widths
- 8 ft right shoulder widths
- Brief reductions in shoulder widths at piers/abutments: 2 ft left and 4 ft right
- Reduction in width of Lincoln Road East between Benicia Road and Georgia Street to 28 ft
- Existing vertical clearances less than 16'-6"
- Existing nonstandard diverge distances at exit ramps
- Existing nonstandard horizontal and vertical sight distance restrictions
- Existing interchange spacing of less than one mile

3) Alternative 2C – Redwood Parkway Interchange Modifications

The Draft Mandatory Facts Sheets submitted for review and approval included a corner sight distance exception request for the eastbound exit ramp and intersection spacing of less than 400 ft between the proposed diamond ramp connections and the local road connections.

E. RIGHT OF WAY

1) General

Right of Way Estimate sheets have been prepared for each alternative and are shown in attachments B, C, D and F. The parcel requirements for the various alternatives will impact residential and commercial/industrial properties.

2) Railroad

There will be no work within operating railroad right of way for this project.

3) Utilities

Investigation of the existing utilities in the study area show that there are two potential longitudinal encroachments on I-80 – a 3" gas line along WB I-80 between I-780 and Magazine Street and a 20" water line between Solano Ave and Tennessee Street. High Risk Utilities include a 12" gas line crossing under I-80 near I-780, a 12" gas line crossing under I-80 near Turner Parkway and underground electrical lines along the length of Fairgrounds Drive. Major utilities include a 20" water line that crosses under I-80 near Magazine, a 12" water near Tennessee Street, and two overhead electrical/telephone lines crossing over I-80 near Redwood Parkway and Turner Parkway. Longitudinal encroachment exceptions will be pursued in the PA/ED phase of project development.

F. VALUE ANALYSIS

The PDT discussed timing of the VA study. It was decided that performing the study during the PA/ED phase would provide more value. The VA Study should be scheduled early in the PA/ED process.

G. TRANSPORTATION MANAGEMENT PLAN

The Transportation Management Plan (TMP) is a specialized program tailored to prevent and mitigate the impacts of the construction project by applying a variety of techniques including system management, demand management, construction strategies and public awareness measures. The basic objectives of the TMP are to:

1. Maintain efficient and safe movement of vehicles through the construction zone.
2. Foster a high level of awareness of potential impacts among residents, agricultural and commercial motorists, travelers and the media.
3. Achieve public acceptance of the project and traffic mitigation measures.
4. Minimize disruptions to traffic on I-80, adjacent intersections and local streets.

A TMP will be required as part of this project. The detailed TMP will be prepared in a later stage of the project.

7. COMMUNITY INVOLVEMENT

The PDT was formed in May 2007 and consisted of representatives from Caltrans, FHWA, the Solano Transportation Authority, Solano County and the City of Vallejo. The full PDT is in support of the alternatives discussed in this report.

Extensive community involvement will be required during the Project Approval/Environmental Document phase of project development. Public participation will be required to address access consolidation proposed within the corridor as well as other environmental concerns.

While this project does not anticipate any significant challenges in the area of Title VI

and ADA compliance, they will be fully addressed in the PA/ED phase as required.

8. ENVIRONMENTAL DETERMINATION/DOCUMENT

The expected type of environmental document for this project is a combined Environmental Assessment/Initial Study for compliance with NEPA and CEQA, leading to a Finding of No Significant Impacts/Mitigated Negative Declaration.

9. FUNDING

A. CAPITAL COST

The Preliminary Cost Estimates showing the assumptions and basis for the construction costs shown below are included in Attachments B through F for each alternative. Alternatives 2A through 2C assume that the freeway widening for the HOV Alternative, 1B, has been constructed. Attachment I shows the pavement structural sections used and recommends that the Life Cycle Cost Analysis be prepared during the PA/ED phase of project development.

Capital Outlay Estimate

	Interchange/ Overcrossing Cost (millions)	Cost of HOV Lane (millions)	Total Cost (millions)
Alternative 1A	-	$120 - $200	$120 - $200
Alternative 1B	-	$55 - $65	$55 - $65
Alternative 2A	$90 - $110	$55 - $65	$145 - $175
Alternative 2B	$70 - $80	$55 - $65	$125 - $145
Alternative 2C	$60 - $65	$55 - $65	$115 - $130

The level of detail available to develop these capital cost estimates is only accurate to within the above ranges and is useful for long-range planning purposes only. The capital costs should not be used to program or commit capital funds. The Project Report will serve as the appropriate document from which the remaining support and capital components of the project will be programmed.

The HOV Alternatives (Alternatives 1A & 1B) will most likely be revised as community involvement develops during the PA/ED phase. The estimates given above reflect the approximate ranges costs due to these anticipated revisions.

Additionally, some of the alternatives contain non-standard design features, with the assumption that the corresponding design exception will be approved in the PA/ED phase. This assumption could represent a significant risk to the project cost. Potential exceptions may be required for longitudinal encroachment of utilities, ramp metering/HOV bypass lanes, and geometric design features.

B. CAPITAL SUPPORT ESTIMATE FOR THE PROGRAMMABLE ALTERNATIVE IN THE 2008 STIP

The project support components listed below assume that Alternative 1B – Minimum HOV Lanes and Alternative 2C – Redwood Parkway Interchange Modifications are carried forward to the PA/ED and PS&E phases of project development. Estimates for the PS&E phase should be updated during the PA/ED phase.

	PROJECT SUPPORT COMPONENTS	
	PA & ED (0 PHASE)	**DESIGN (1 PHASE)**
Estimated PY's	16	42
Estimated PS $'s	$3,600,000	$9,600,000
Estimated PYE $'s ($1000's)	$225	$229

10. SCHEDULE

HQ Milestones	**Delivery Date (Month, Day, Year)**
Begin Environmental	Jan 2009
DPR/Circulate DED	July 2010
PA & ED	Jan 2011
Project PS&E	Jan 2013

11. FHWA COORDINATION

This Report has been reviewed by Karen Bobo, Field Operations Engineer, Team Leader (North) on **September 5, 2008**. Per SAFETEA-LU, this project is eligible for federal-aid funding. As I-80 is part of the National Highway System, this project is considered a Delegated Project under current FHWA-Caltrans Stewardship Agreements.

Submittal of an unsigned Project Report to FHWA is required to request federal "engineering and operational acceptability" determination of a new or modified access to the Interstate. Federal "engineering and operational acceptability" determination must be obtained prior to circulation of the environmental document.

This project may be eligible for CMAQ funding for the HOV Lane Alternative (1B).

Sufficient funding is expected to be reasonably available at the time of the approval of the environmental document to allow for the inclusion of a fully funded preferred

alternative in the financially constrained MPO, RTP and FTIP.

12. PROJECT CONTACTS

AGENCY	*CONTACT PERSON*	*PHONE / FAX*
Solano Transportation Authority One Harbor Center Suite 130 Suisun City, CA 94585	Janet Adams Director of Projects	(707) 424-6010 Fax (707) 424-6074
Solano County 675 Texas Street, Suite 5500 Fairfield, CA 94533	Paul Wiese Engineering Manager	(707) 784-6072 Fax (707) 784-2994
City of Vallejo 555 Santa Clara Street Vallejo, CA 94590	Gary Leach Director of Public Works	(707) 648-4316 Fax (707) 648-4691
Caltrans – District 4 111 Grand Avenue Oakland, CA 94623	Sameer Khoury, Project Manager Hin Kung, Advance Planning Evelyn Gestuvo, Highway Operations Phillip Cox, Traffic Forecasting Patricia Maurice, Environmental Branch Chief, Advance Planning	(510) 622-0114 (510) 622-0155 (510 286-4535 (510) 286-5584 (510) 286-5563
Caltrans – HQ Sacramento, CA	Mike Thomas, Division of Design, Design Coordinator Gordon Brown, Division of Design, Design Reviewer	(916) 275-2942 (510) 622-5932
FHWA CALIFORNIA DIVISION 650 Capitol Mall Ste. 4-100 Sacramento, CA 95814	Karen Bobo, Field Operations Engineer, Team Leader (North)	(916) 498-5036 Fax (916) 498-5008

AGENCY	*CONTACT PERSON*	*PHONE / FAX*
HQE Incorporated 1305 Franklin Street, Suite 410 Oakland, CA 94612	Heidi Ouren, Project Manager Garrett Low, Project Engineer	(510) 763-4895 x114 (510) 763-4895 x102 Fax (510) 763-6215
DKS Associates 1330 Broadway Oakland, CA 94612	Kevin Fehon, Traffic Manager Terry Klim, Traffic Engineer	(510) 267-6608 (510) 267-6621 Fax (510) 268-1739
HDR Engineering 2121 N. California Blvd, Suite 475 Walnut Creek, CA 94596	Laurie Warner Herson, Environmental Manager Kuang Yak Lim, Structures Manager	(916) 817-4894 Fax (916) 817-4747 (925) 9742503

13. PROJECT REVIEWS

The project was reviewed by Mike Thomas, Division of Design, Design Coordinator and Gordon Brown, Division of Design, Design Reviewer, on August 11, 2008 and Karen Bobo, FHWA Field Operations Engineer on September 5, 2008.