



04-NAP-12-KP 0.4-5.3 (PM 0.2-3.3)
 04-SOL-12-KP 0.0-R4.2 (PM 0.0-R2.6)
 04264-264100
 04-NAP-29-KP 6.7-8.7 (PM 4.2-5.4)
 04-NAP-12-KP 0.0-0.4 (PM 0.0-0.2)
 04264-287900
 HB4C Program

DRAFT PROJECT REPORT



On Route 29 in Napa County
 From 0.9km North of Kelly Road South AND
 To 1.3km South of Route 221

On Route 12 in Napa County
 From Route 29
 To Red Top Road in Solano County

I have reviewed the right of way information contained in this Draft Project Report and the R/W Data Sheet attached hereto, and find the data to be complete, current, and accurate:

R. A. MACPHERSON
 DEPUTY DISTRICT DIRECTOR-RIGHT OF WAY

APPROVAL RECOMMENDED:

KELLY K. HIRSCHBERG
 PROJECT MANAGER

APPROVAL RECOMMENDED:

ZIAD ABUBEKR
 DISTRICT OFFICE CHIEF, DESIGN NORTH

APPROVED:

HELENA "LENKA" CULIK-CARO
 DEPUTY DISTRICT DIRECTOR-DESIGN

DATE

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

REGISTERED CIVIL ENGINEER

DATE

DRAFT PROJECT REPORT

1. INTRODUCTION

This Draft Project Report covers two projects with two Expenditure Authorizations (EA) in one report, EA 04-264100 and EA 04-287900, respectively. EA 04-264100 proposes to widen Route 12 (Jameson Canyon Highway) from a two lane conventional highway to a four-lane highway from the intersection at Kelly Road in Napa County to Red Top Road in Solano County. The two directions will be separated by a 3.6m median with concrete barrier and a median opening in Napa and Solano Counties. Outside shoulder widths will be 2.4m. EA 04-287900 proposes to upgrade the intersection of Route 29 and Route 12 to an interchange. Two viable alternatives are proposed for this interchange: “tight diamond” and “single point.” Both the “tight diamond” and “single point” will have Route 12 elevated over Route 29 with ramps/connectors on fill, retaining walls, or bridge structures. For EA 04-264100, the cost estimate is \$152,026,000 (escalated to year 2011), which includes \$11,032,000 for right of way. For EA 04-287900, the cost estimate is \$82,813,000 for the “single point” alternative (2007 cost), which includes \$12,588,000 for right of way, and \$69,485,000 for the “tight diamond” alternative (2007 cost), which includes \$11,781,000 for right of way. Currently, EA 04-264100 planning and design phases are being funded through the Transportation Congestion Relief Program, Interregional Transportation Improvement Program, Regional Transportation Improvement Program (RTIP), and Surface Transportation Program (STP), while EA 04-287900 environmental phase is funded through RTIP. This project has been assigned the Project Development Processing Category 4A because it requires substantial new right of way and it increases traffic capacity.

2. RECOMMENDATION

It is recommended that this Draft Project Report be approved and that authorization be granted to proceed with the project development process, including circulating the Draft Environmental Document and holding a public meeting. It is also recommended that a Cooperative Agreement be executed between the State and the Counties of Napa and Solano.

3. BACKGROUND

- **Project History**

A Project Study Report / Project Development Support (PSR/PDS) of EA 26410K was approved on March 9, 2001, in which the estimated project development support component cost for the project was detailed. The PSR proposed a 4-lane expressway for Route 12 with a median width of 18.6m.

Since then, other alternatives of a four-lane expressway with median widths of 4.3m, 6.6m, and 13.8m median widths were studied with two-way left-turn lanes, collector-distributor roads and frontage roads. These frontage roads were included in the study because access to the expressway would be limited. During September 2004, a Value Analysis Study was conducted between Caltrans, the Napa County Transportation Planning Agency (NCTPA), and the Solano Transportation Authority (STA), was completed for this EA. As a result of this study, the present four-lane alternative with a 3.6m median width was developed as the viable alternative.

The PSR/PDS of EA 28790K, approved on October 26, 2000, established the cost to prepare the environmental document and project report. The Value Analysis Study was completed for this project in April 2005. It recommended that “tight diamond” and “single point” interchanges be studied, and that a third left turn lane be constructed for the ramp connecting southbound (SB) Route 29 to EB Route 12. It also recommended three eastbound lanes on Route 12 up to Kelly Road. An auxiliary lane in both alternatives will be constructed in the southbound direction of Route 29 connecting Route 221 and Airport Boulevard.

- **Community Interaction**

This project has the support of the Metropolitan Transportation Commission (MTC), NCTPA, and STA. Local agencies, community groups, local businesses, and residences have also expressed strong support for the project.

Scoping Meetings were held in Solano and Napa Counties on November 8 and 15, 2001, respectively, to afford the public an opportunity to view the project while allowing Caltrans to directly hear their concerns. A meeting with owners of properties along Route 12 was held on March 21, 2002 in Napa County. The purpose of this meeting was to explain the Permit to Enter process in detail.

- **Existing Facility**

- **Route 12**

Within the study area, Route 12 in Napa and Solano Counties serves as an important interregional east-west link between Napa Valley and the Fairfield/Suisun area. It serves as an interregional, recreational, commercial, agricultural, and commuter route. In addition, Route 12 corridor provides important truck linkages to Routes 29, 80, and 101. Within the project limits, Route 12 is mostly a two-lane undivided highway set in a rural landscape with flat to rolling terrain. A passing lane begins at Route 29 and extends eastbound (EB) for approximately 1.5km, making the segment three lanes wide before the highway reduces down to two lanes. Existing lane widths are 3.6m with shoulder widths ranging from 0.7m to 3.0m. There are

two at-grade signalized intersections (Kelly Road and Kirkland Ranch Road) and one at-grade unsignalized Y-intersection (Lynch Road) in Napa County. There is an unsignalized T-intersection (Red Top Road) in Solano County. Route 12 is not access controlled, except between Route 29 and Kelly Road.

Rumble strips with inverted thermoplastic stripes are placed along the center of Route 12.

- **Route 29**

Within the study area, Route 29 is a four-lane expressway. It is a north-south route connecting the City of Napa to the north and the City of Vallejo to the south. Both Routes 29 and 12 serve as important interregional, recreational, commercial, agricultural, and commuter routes. They link to several other routes including Interstate 80, Interstate 5, Route 101 and Route 221. Airport Boulevard, a local facility, links the Napa County Regional Airport to the State's highway system, thus serving as an intermodal route. Routes 29, 12, and Airport Boulevard intersect at an at-grade signalized intersection.

Route 29 at the existing intersection with Route 12 consists of three through lanes in the northbound direction, together with a left turning lane to Airport Boulevard and a right turning lane to Jameson Canyon Road. In the southbound direction, Route 29 consists of two through lanes and two left turning lanes to Jameson Canyon road, together with a right turning lane to Airport Boulevard. Route 12 consists of one through lane to Airport Boulevard and one left turning lane to southbound Route 29. The lane configuration on Airport Boulevard includes one left turning lane to northbound (NB) Route 29, one shared through and left lane, and a through lane. Route 12 and Airport Boulevard also have right turning lanes. Route 29 is access controlled.

4. Purpose and Need

A. Problem, Deficiencies, Justification

Traffic congestion and delay to the motoring public along Route 12, an interregional route, has increased in recent years as demographics and industrial centers have developed and shifted. Commercial growth in Napa and Sonoma Counties, coupled with population growth in Solano County, has resulted in a significant increase in commuting on the highway. Growth in residential development in the Fairfield/Suisun Valley area and industrial and commercial development in the Napa area are expected to continue. The existing highway provides insufficient capacity and routine rehabilitation improvements do not

address the changes in traffic volume. MTC notes in the North Bay Corridor Study, dated March 1998, that “population and job growth are expected to continue to intensify along Route 29, Route 101, and Interstate 80, leading to increased east-west travel demand across the northern (Routes 12, 116, 121)... Travel demand is diverse and includes not only weekday commuting, but weekend tourism, truck traffic from agricultural operations, and traffic generated by major events.” The existing Route 12 is operating at a Level of Service (LOS) E during both AM and PM peak periods.

The existing Route 29/Route 12 intersection is operating at LOS E during PM peak period and at LOS F during AM peak period due to the high demand for the left turn movements from SB Route 29 to EB Route 12 and the high volume of through traffic on Route 29.

According to the MTC’s Regional Transportation Plan 2030, daily trips between Napa and Solano Counties from year 2000 to year 2030 on Routes 29 and 12 will experience a 68% increase, third highest among nine Bay Area counties.

The proposed alternatives will provide operational improvement and relieve congestion for Route 12 and for the Route 29/Route 12 intersection by upgrading it to an interchange.

B. Regional and System Planning

- **Identify Systems**

The segment of Route 29 within the project limits is on the National Highway System (NHS) as designated by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. Route 12 within the limits of the project is not on the NHS. Also, both Routes 12 and 29 are identified as eligible interregional and inter-county routes in the State Statutes (2004). Additionally, Routes 12 and 29 are Terminal Access Routes to the National Truck Network.

- **State Planning**

The 1985 Route Concept Report indicates that the ultimate build-out of Route 29 is a four to six lane freeway. It also indicates that Route 12 will become a four lane divided highway. With the construction of an interchange at Route 29/Route 12 and the widening of Route 12 from two to four lanes, this project keeps both routes consistent with their respective route concepts.

- **Regional Planning**

Several studies prepared by the MTC, including the 1998 North Bay Corridor Study, the 1998 Regional Transportation Plan, and the Bay Area Transportation Blueprint for the 21st Century suggested improvements to the Route 12/ Route 29 intersection that included a partial grade separation, intersection improvements, and a full interchange, respectively. MTC noted in the North Bay Corridor Study, dated March 1998, that Jameson Canyon Road should be widened from two to four lanes. MTC's 1998 Regional Transportation Plan for the San Francisco Bay Area noted that widening the Route 12 portion between Route 29 and Interstate 80 would support the region's overall traffic management strategy as referenced under the Regional Transportation Planning 2030 document as #94074 and #94075 in Napa County and #94152 in Solano County. In addition, the two projects are consistent with Napa County's proposed Interchange at Route 29/Route 221, and with Solano County's proposed Interchange at Route 80/Route 12/Route 680.

- **Local Planning**

The Strategic Transportation Plan by the Napa County Transportation Planning Agency (NCTPA) states that the Route 12/Route 29 intersection needs "major intersection improvements," and that Route 12 (Jameson Canyon Road) needs to be widened to four lanes. The 1994 Freeway Agreement with Napa County for Route 29 indicates that Route 29 is to become a freeway in the future with an interchange at Route 12/Route 29. Without giving a specific recommendation, the 1997 Napa County Airport Industrial Area Specific Plan and Environmental Impact Report recommended upgrading the Route 12/Route 29 intersection. This project is consistent with all of these plans.

- **Transit Operator Planning**

Currently, no transit service is provided along Jameson Canyon Road. In July of 2004, STA completed the final report for the "I-80/I-680/I-780 TRANSIT CORRIDOR STUDY." In this report, STA identified building the first phase of the Red Top Road Park and Ride lot as a "near term" project. However, STA also noted that the full construction of the lot "is not immediately needed and can occur as demand grows in the future. This approach provides the maximum flexibility to adapt the site to serve future Napa-Solano commuter rail services...". The feasibility of these services will depend on the results of a transit corridor study for Route 12 that the report recommended to be funded and initiated by STA, in coordination with Caltrans and Napa County.

C. Traffic

- **Route 12 (EA 04-264100)**

Present (2005) ADT: 34,500 Year 2035 ADT: 62,200

% Trucks: 7.7%

T.I. (10 Year): 11.5 T.I. (20 Year): 12.5

Latest 3-Year Accident Data:

The accident rate for Route 12 for the three-year period from January 1, 2003 to December 31, 2005 is as follows:

<u>Mainline</u>	<u>Actual</u>			<u>Average</u>		
	<u>PM</u>	<u>FAT</u>	<u>F+I</u>	<u>TOTAL</u>	<u>FAT</u>	<u>F+I</u>
Napa County 0.0-3.3	0.017	0.44	1.30	0.030	0.55	1.15
Solano County 0.0-R2.6	0.011	0.44	1.26	0.029	0.63	1.31

In Napa County, the total accident rate of 1.30 for this section of Route 12 is higher than the statewide average of 1.15 for this type of facility. There were a total of 152 accidents in the three-year period with two fatalities and 50 injury accidents. The types of collision include 48.7% rear-ends, 17.8% sideswipes, and 14.5% broadsides. Speeding was the primary cause for collisions (41.4% of all accidents). Other types of violations caused 19.1% of collisions. Only 20 accidents (13.2%) happened on the wet surface of the roadway (9 were in the rain).

In Solano County, the total accident rate of 1.26 for this section of Route 12 is lower than the statewide average of 1.31 for this type of facility. There were a total of 118 accidents in the three-year period, with one fatality and 40 injury accidents. The types of collision include 46.6% rear-ends, 20.3% hit objects, and 12.7% broadside. Speeding was the primary cause of collision (44.1% of all accidents). Improper turns caused 19.5% of collisions. Only 25 accidents (21.2%) happened on the wet surface of the roadway (8 were in the rain).

In general, for both counties, most of the accidents were related to unsafe speed in congested traffic and all the fatal injuries were cross-centerline accidents.

- **Route 12 (EA 04-287900)**

The accident rate for Route 12 within the project limits for the three-year period from January 1, 2003 to December 31, 2005 is as follows:

<u>Mainline</u>	<u>Actual</u>			<u>Average</u>		
<u>PM</u>	<u>FAT</u>	<u>F+I</u>	<u>TOTAL</u>	<u>FAT</u>	<u>F+I</u>	<u>TOTAL</u>
Napa County 0.0-0.24	0.00	1.67	4.72	0.033	0.50	1.03

There were 31 accidents with a total accident rate of 4.72, which is higher than the average rate of 1.03 for similar facilities statewide. The actual fatal and injury rate of 1.67 is also higher than the average statewide rate of 0.50. Of these accidents, 16 were rear end type collisions (51.6%) and 12 were broadside (38.7%). Other violations were the primary cause of collision (14 accidents, 45.2% of all accidents). Speeding caused 12 accidents (38.7%). Failure to yield and improper turning accounted for 2 accidents each. In general, most of the accidents could be related to traffic congestion conditions on the highway, at the intersection of Kelly Road and the Route 29 Junction.

- **Route 29**

Present (2005) ADT: 66,000 Year 2035 ADT: 109,400

% Trucks: 6.3%

T.I. (10 year): 12.5

T.I. (20 Year): 13.5

Latest 3-Year Accident Data:

The accident rate for Route 29 within the project limits for the three-year period from January 1, 2003 to December 31, 2005 is as follows:

<u>Mainline</u>	<u>Actual</u>			<u>Average</u>		
<u>PM</u>	<u>FAT</u>	<u>F+I</u>	<u>TOTAL</u>	<u>FAT</u>	<u>F+I</u>	<u>TOTAL</u>
Napa County 4.2-5.5	0.025	0.61	1.83	0.023	0.41	0.90

In all three categories of accidents (Fatal, Fatal and Injury, and total), the actual accident rates are higher than the statewide average rates. There were a total of 149 accidents in the three-year period, with two fatalities. The

types of collision include 72.5% rear-ends, 10.1% sideswipes, and 8.7% hit objects. Speeding was the primary cause of collision (57.7% of all accidents). Other types of violations caused 16.8% of collisions. Only 21 accidents (14.1%) happened on the wet surface of the roadway (10 were in the rain). In general, most accidents appear to be congestion related.

The widening of Jameson Canyon Road to 4 lanes will reduce the potential for head on accidents by the addition of the extra lane in each direction, which provides for passing. The installation of concrete barrier in the median will also help reduce the potential for head on accidents. The grade separation at Route 12 and Route 29 will reduce the accident rate in that area due to the free flow of traffic on Route 29.

5. ALTERNATIVES

A. Viable Alternatives

This draft report considers two “build” alternatives and a “no-build” alternative.

Alternatives:

1. Widen Route 12 to 4-lanes with “tight diamond” interchange at Route 29/Route 12
2. Widen Route 12 to 4-lanes with “single point” interchange at Route 29/Route 12
3. No-Build. This alternative does not meet the project purpose and need, nor does it address the increasing congestion problem. It does not reduce peak traffic delays, nor does it improve operations or safety. This alternative also would not improve air quality and the efficiency of the transportation system.

• Proposed Engineering Features

For EA 04-264100, the project begins at the intersection of Kelly Road and Route 12 (KP 0.39) in Napa County and ends at Red Top Road (KP 3.9) in Solano County for a total length of approximately 9.1km. The “build” alternative incorporates the following design features for the roadway:

- Provide two 3.6m lanes in each direction with 1.5m inside shoulders, and 2.4m outside shoulders.
- Provide a 3.6m median. At some locations, the median is greater than 3.6m to provide adequate horizontal sight distances for motorists.

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- Construct a concrete median barrier separating the two directions of traffic.
 - Upgrade the existing features of the current two-lane highway, such as grades, shoulder widths and horizontal and vertical curves to meet the current minimum highway standards for a design speed of 90km/h (55mph); most of the existing highway will become the westbound direction for the four-lane facility.
 - Construct two new lanes for the EB direction to meet the minimum standards for a highway with a design speed of 90 km/h (55mph).

This “build” alternative will improve the LOS of Route 12 from LOS E to LOS D.

For EA 04-287900, two “build” alternatives are being considered for the upgrade of the Route 12/Route 29 intersection to an interchange; a “tight diamond” interchange and a “single point” interchange.

The “tight diamond” configuration provides four diagonal on/off ramps in all four quadrants with two signalized intersections on Route 12/Airport Boulevard. All ramps will be constructed on fill (at least 1:2 side slopes, with 1:4 provided where possible) with retaining walls as needed. The intersections will operate at LOS C or better, with the exception of the southbound ramps intersection, which operates at LOS D in the PM peak period.

The “single point” configuration is similar to the “tight diamond” except that the diagonal ramps in all quadrants meet at a “single point,” thus having a single, three-phase signalized intersection on Route 12. All new ramps to/from the interchange would be constructed on a combination of bridge structures and fill (at least 1:2 side slopes, with 1:4 provided where possible) with retaining walls as needed. The interchange intersections will operate at LOS C in the AM peak hour and LOS D in the PM peak hour.

Both alternatives will offer the following features:

- Accommodate all direct traffic movements for Route 12/Airport Boulevard to and from Route 29.
- Maintain the existing 3.6m wide through lanes in each direction on Route 29.
- Provide five 3.6m through lanes, two westbound (WB) and three eastbound, with 3.0m shoulders, up to Kelly Road on Route 12. The three eastbound lanes merge to two lanes east of Kelly Road.

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- Provide one 3.6m left turn lane in each direction from Route 12/ Airport Boulevard to the Route 29 on-ramps.
 - Construct 3.6m auxiliary lane with 3.0m shoulder on Route 29 in the southbound direction north of the interchange.
 - Access control will be maintained at all areas within the limits of EA 04-287900 that are currently access controlled.
 - A detour for east-west traffic on Route 12/Airport Boulevard will be needed during construction of the interchange. It will be built south of the existing Route 12/Route 29 intersection.

Also in either alternative, the ramps will be constructed with minimum 2.4m right and 1.2m left shoulders, and will have configurations as follows:

- The on-ramp in the southwest quadrant will have two 3.6m lanes merging into one before the entrance to Route 29.
 - The off-ramp in the southeast quadrant will have a single 3.6m lane at the exit expanding into two 3.6m lanes at the intersection with Route 12. One lane will be for right turning movements (east) to Route 12, and the other will be for left turns (west) to Airport Boulevard.
 - At the northwest location, two 3.6m lanes will exit from SB Route 29 and expand into four lanes at the intersection with Airport Boulevard. One lane will turn right (west) onto Airport Boulevard, while the other three lanes will turn left (east) onto Route 12.
 - At the northeast location, a two-lane connector from westbound Route 12 will merge with the one lane from the left turn pocket from eastbound Route 12/Airport Boulevard. These three 3.6m lanes will drop to two before entering northbound Route 29. A 3.0m shoulder will be provided on northbound Route 29.
- **Nonstandard Mandatory and Advisory Design Features**

This project includes improvements that would eliminate a number of existing non-standard features such as shoulder widths, vertical grades, and sight distance. However, a number of design exceptions to Mandatory and Advisory Design Standards would still be required by either of the “build” alternatives.

Mandatory:

Gordon Brown, Headquarters Design Reviewer, conceptually agrees with the Fact Sheet for Exceptions to Mandatory Design Standards. This Fact Sheet includes the following features:

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- For both “single point” and “tight diamond” alternatives, Airport Boulevard intersects Devlin Road almost in the middle of a 350m curve radius with 2% superelevation for “single point” and 547.5m curve radius with 3% superelevation for “tight diamond”, which is less than the required superelevation of 4%. In order to provide this, Devlin Road profile will have to be raised significantly to meet the minimum sight distance at the intersection, creating major impacts to the local road, businesses, and utilities.

For the ramps of both alternatives, lower superelevation rates were provided because of the restrictive conditions that dictate the use of short curve lengths. The ramps are also controlled by the superelevation rate of the connecting Route 12 bridge structure. However the provided rates would still provide for the maximum comfortable speed to drivers, according to Figure 202.2 of the Highway Design Manual. In order to provide standard superelevation rate for the ramps, the interchange would have to be designed with a much wider footprint in order to accommodate the required curve lengths and radii. This would result in additional right of way for the project, which would impact the existing commercial developments adjacent to the proposed interchange. It would also result in significant environmental impact.

- For “tight diamond” alternative, the project proposes nonstandard sag vertical curve length of 100m at the conform location at Kelly Road. As a result of that, the stopping sight distance at this location is 85m where it should be 220m (110km/h design speed). However, the intersection at Kelly Road and Route 12 is a signalized intersection.
- For Jameson Canyon Road alternative, the project proposes nonstandard stopping sight distance of 137m, which provides for 82 km/hr design speed at the conform with Red Top Road (east end of project). In order to achieve the standard stopping sight distance of 160m corresponding to the design speed of 90 km/hr, the 135m long sag vertical curve that is proposed by the project at that location will need a length extension of 27m. This would result in significant earthwork and disturbance in an environmentally sensitive area on the side slopes, where red-legged frog habitat would be destroyed.

Advisory:

The Fact Sheet for Exceptions to Advisory Design Standards was approved on June 7, 2007. The Fact Sheet included the following features:

- The “single point” and “tight diamond” alternatives have nonstandard freeway entrance for the ramp to northbound Route 29 (“NE” Line for “single point” and “TN” Line for “tight diamond”).

In order to reduce the impact on the commercial area located at the north east side of the interchange, the ramp entrance was designed without the 1000m curve and with an entrance angle of 1° 30' 00” for “single point” and 1° 08' 44.6” for “tight diamond” instead of the standard 1° 02' 05”. In addition, the proposed merge lane length is 95m for “tight diamond” and 120m for “single point” instead of the standard 300m. This is to conform before the Route 29/ North Kelly Road intersection.

- Several vertical curves for the ramps of the “single point”, “tight diamond” alternatives and Jameson Canyon widening don't have the minimum required length of two times the design speed.

The geometric constrains of the interchange, in addition to the environmental and Right of Way impacts, dictated that the curve lengths of the ramps be lower than standard. Also, the proposed profile of Route 12/Airport Boulevard needs to conform near Devlin Road on the west end and at Kelly Road on the east end in order that the existing commercial developments abutting the highway and the local roads intersecting it would not experience major impacts. As a result of that, shorter than standard vertical curve lengths for Route 12/ Airport Boulevard were proposed at these locations.

For Jameson Canyon widening, in order to match the existing profile as much as possible, thereby minimizing cost, environmental impacts, and staging impacts during construction, the WB and EB profiles were designed to maximize the use of existing pavement. Consequently, several vertical curves have lengths that are less than the minimum required, which is twice the design speed.

- In the “tight diamond” alternative, the “TE” Line has a proposed design speed of 50 km/h, which is less than the standard 80 km/h

for a branch connection. Providing for the standard design speed would require significant additional Right of Way from the commercial properties adjacent to Route 29.

- **Ramp Metering**

It is anticipated that Ramp Metering will be applied to the proposed Route 12/Route 29 interchange, and hence the cost estimate for this metering is included in the cost estimate of the project.

- **Highway Planting**

- **EA 04-264100**

Based on Caltrans' policy, (Chapter 29-Landscape Architecture, Section 2- Highway Planting, Article 1 of the Project Development Procedures Manual), replacement highway planting with an estimated cost of \$200,000 or more, in conjunction with or resulting from a roadway construction project, must be accomplished by a separate contract and must include three years of plant establishment.

Therefore, a separate contract to provide highway planting revegetation in the Jameson Canyon corridor will follow the roadway improvement contract. This landscape project will provide tree and shrub planting with oaks and other native species, a temporary irrigation system, and a 3-year plant establishment period. The estimated cost for a separate highway planting revegetation project with planting, temporary irrigation and 3-year plant establishment period included is \$3.65 million escalated to 2011 fiscal year dollars. Construction will begin within two years of the completion of the roadway project. The cost estimate for the separate highway replacement planting project will be escalated to the fiscal year of construction when the schedule is determined.

- **EA 04-287900**

Based on Caltrans' policy, (Chapter 29-Landscape Architecture, Section 2- Highway Planting, Article 1 of the Project Development Procedures Manual), highway planting with an estimated cost of \$200,000 or more, in conjunction with or resulting from a roadway construction project, must be accomplished by a separate contract and must include three years of plant establishment.

Therefore, a separate contract to provide highway planting in the Route 12/ Route 29 interchange will follow the interchange construction contract. This landscape project will provide tree and shrub planting with oaks and other native species, a temporary irrigation system, and a 3-year plant establishment period.

- **Tight Diamond Alternative**

The estimated cost for a separate highway planting project with planting, temporary irrigation and 3-year plant establishment period included is \$1.64 million in 2006/2007 fiscal year dollars. Construction will begin within two years of the completion of the interchange project. The cost estimate for the separate highway replacement planting project will be escalated to the fiscal year of construction when the schedule is determined.

- **Single Point Alternative**

The estimated cost for a separate highway planting project with planting, temporary irrigation and 3-year plant establishment period included is \$1.67 million in 2006/2007 fiscal year dollars. Construction will begin within two years of the completion of the interchange project. The cost estimate for the separate highway replacement planting project will be escalated to the fiscal year of construction when the schedule is determined.

- **Erosion Control**

Erosion Control will be addressed at the PS&E stage for this project. Typical erosion control measures that may be included in this project are permanent vegetation in the form of erosion control seeding, erosion control netting and fiber rolls.

- **Noise Barriers**

Based on the results of acoustic studies, soundwalls are not required for either EA.

- **Non-Motorized and Pedestrian features, etc**

Route 12 will provide a Class III Bikeway in which the bicyclists will share the use of the highway shoulders. Between Kelly Road and Airport Boulevard, both “tight diamond” and “single point” alternatives will construct a 2.4m wide two way bike path on the eastbound side of highway

12 to accommodate the bikers and pedestrians as they travel through the Route 29/Route 12 interchange.

- **Needed Roadway Rehabilitation and Upgrading**

Maintenance branch field review has identified segments of Route 12 within Solano County that require rehabilitation. No rehabilitation was deemed necessary for the section of Route 12 that falls within Napa County (e-mails from Chad Klein and Vince Pearson of Maintenance branch on 5/31/07 and 6/1/07 respectively). According to Material's branch recommendation in 3/5/01 memo, rehabilitation of the failed sections will consist of the removal of the existing Asphalt Concrete Layer, or up to a maximum of 150 mm (whichever is less) in depth of all failed or severely distressed areas.

- **Cost Estimate**

For EA 04-264100, the cost estimate includes the cost of retaining walls that will be constructed at various locations along Route 12. For fill areas, Mechanically Stabilized Embankment (MSE) Walls will be used. For cut areas, Soil Nail Walls will be used. For EA 04-287900, MSE Walls will also be used for fill areas, and the cost estimate includes the cost of the interchange bridges, as well as the surcharge that is required to address the anticipated soil settlement. Contingencies of 25% and 20% were applied to EA 04-264100 and EA 04-287900 respectively.

The following table shows a summary of the preliminary estimated cost of the project (current year dollars):

2007 Estimate	EA 04-264100	EA 04-287900	
		Tight Diamond Alternative	Single Point Alternative
Roadway Items:	\$115,996,000	\$47,478,000	\$52,861,000
Structures Items:	\$0	\$10,226,000	\$17,364,000
Construction Subtotal:	\$115,996,000	\$57,704,000	\$70,225,000
Right of Way:	\$ 10,607,000	\$ 11,781,000	\$ 12,588,000
Total:	\$126,603,000	\$69,485,000	\$82,813,000

The following table shows a summary of the preliminary estimated cost of the project (escalated at 5% to mid-construction year of 2011):

2011 Estimate	EA 04-264100
Roadway Items:	\$140,994,000
Structures Items:	\$0
Construction Subtotal:	\$140,994,000
Right of Way:	\$ 11,032,000
Total:	\$152,026,000

A detailed construction cost estimate is shown in Attachment E. A copy of the Right of Way Data Sheet showing an estimate of Right of Way costs is shown in Attachment F.

B. Rejected Alternatives

- **EA 04-264100**

1. **13.8m median four-lane expressway with frontage roads**

This alternative proposed to convert the existing Route 12 highway to a four-lane expressway with design speed of 110km/h. Two-way frontage roads would be built on both sides of the expressway so that access to it would be limited at selected intersections. However, the footprint of this alternative would create significant right of way and environmental impacts, with the median width of 13.8m and nearly an 8m separation between expressway and each frontage road. With the steep terrain, especially in Solano County, this alternative would require large cuts, fills and retaining walls (one location approximately 46m.). This alternative was rejected due to significantly greater right of way requirements, environmental impacts, and high construction costs.

2. **PSR Alternative-18.6m median four-lane expressway with frontage roads**

This alternative was the primary alternative proposed in the approved PSR. It proposed to convert the existing Route 12 highway to a four-lane expressway with design speed of 100 km/h. Two-way frontage roads would have been built on both sides of the expressway so that access would be limited to selected intersections. As with the 13.8m median alternative, the footprint of this alternative would have created right of way and environmental impacts with the wide median, frontage roads and a required

8m separation between the frontage roads and the expressway. Thus, it was dropped from further consideration.

3. 6.6m median four-lane expressway with collector-distributor roads

This alternative proposed to convert the existing Route 12 highway to a four-lane expressway with design speed of 110km/h. On both sides of the expressway, collector-distributor roads (strips of two-way roads) would collect multiple driveways together and distribute them to the expressway with one opening, thereby limiting access to it. Acceleration and deceleration lanes would allow ease of ingress and egress to and from the expressway. The footprint of this alternative was less than the above alternative, but it still created significant right of way and environmental impacts, with the median width of 6.6m and nearly 8m separation between expressway and the collector-distributor roads. This alternative was rejected due to significantly greater right of way requirements, environmental impacts, and high construction costs.

- **EA 04-287900**

1. At-Grade Intersection Improvement

Several at-grade improvements were investigated to alleviate traffic congestion at the existing Route 29/Route 12 intersection. The three proposals studied in the PSR included various widening proposals to the existing at-grade intersection that added thru-lanes on Route 29 and turning lanes between Route 29 and Route 12.

The first proposal added a northbound lane to Route 29 and southbound left turn lane to Route 29 for a total of three left turn lanes to Route 12. This was rejected because it did not address future traffic levels.

The second proposal included three left turn lanes, two through lanes, and one through/right turn lane on Route 29 southbound. In addition, one left turn lane, three through lanes and one through /right turn lane on Route 29 northbound were included. Eastbound Route 12 had to be widened to three lanes to accommodate the southbound left turn movement. This proposal was rejected because it did not address future traffic levels and it could not accommodate an interchange configuration in the future.

The third proposal included four southbound left turn lanes, six northbound lanes (with one northbound left turn lane), four eastbound lanes, with two eastbound left turn lanes; and three westbound lanes, including one westbound left turn lane. Although it did meet the 2025 traffic projections

(according to the traffic study performed at that time), this proposal was rejected because it was not technically feasible.

2. Spread Diamond Interchange

This alternative was considered as a low-cost variant of the Partial Cloverleaf Alternative (below). The idea was that if the partial cloverleaf configuration was to be the ultimate concept, a “spread” diamond interchange could initially be constructed as an incremental improvement, then later incorporating the loop ramps in a future project. This alternative was rejected due to significantly greater right of way requirements and environmental impacts.

3. Partial Cloverleaf Interchange

This alternative would include loop ramps in the northwest and southeast quadrants and diagonal ramps in all four quadrants. Auxiliary lanes on Route 29 would be required for the proposed two lane diagonal ramps in the northwest and northeast quadrants. This alternative was rejected due to significantly greater right of way requirements and environmental impacts.

4. Flyover

The flyover alternative would have called for a direct connector from Route 29 southbound to Route 12 eastbound. The opposite movement would have been provided by a northeast quadrant diagonal ramp. Because only the two direct connections were considered with no other improvement to the Route /Route 12 intersection, this alternative was rejected because it could not relieve all the congestion at the Route 29/Route 12 intersection and it was not acceptable to the local stakeholders.

6. CONSIDERATIONS REQUIRING DISCUSSION

A. Hazardous Waste

For EA 04-264100, a Site Investigation Report was prepared in September 2002. It concluded that the soil can be classified as non-hazardous and can be reused onsite without any restrictions.

For EA 04-287900, the initial assessment indicated the presence of aerielly deposited lead (ADL) material within the project limits. A Site Investigation Report will be prepared to determine whether to reuse the ADL material on site or off-haul it to a landfill.

B. Value Analysis

- **EA 04-264100**

The VA Study for EA 04-264100, conducted in September 2004, had considered several alternatives to the project concept that was the leading candidate at that time. This concept consisted of constructing a four-lane expressway with a 6.6m median and two-way collector/distributor (C-D) roads on both sides of the expressway (see Rejected Alternative No. 2, above). Included were 3m inside and outside shoulders and concrete barrier with one median opening.

1. Four Lane Highway With Continuous Two-way Left-turn Lane and Continuous Acceleration/Deceleration Lanes

This alternative proposed constructing a four-lane highway (not expressway). Instead of a paved median with barrier, a continuous two-way left-turn lane was considered. To serve the driveways, continuous acceleration/deceleration lanes were proposed. Although this alternative would have generated a cost savings of \$ 25.6 million from the baseline alternative, this was not as much savings as Alternative 5 (below). Also, this alternative still carried a similarly large roadway footprint as the baseline with significant right of way and environmental impacts. Thus, this alternative was rejected.

2. Four Lane Highway With Continuous Two-way Left-turn Lane and Collector/Distributor Roads

This alternative also proposed constructing a four-lane highway (not expressway) and a continuous two-way left-turn lane (instead of paved median with barrier). It proposed C-D roads as in the original concept, but added acceleration/deceleration lanes at the access openings to the C-D roads. As with Alternative 1, this alternative was also rejected because it did not have as much savings (only \$ 7.7 million) as Alternative 5 (below) and it carried a significantly large roadway footprint with similar right of way and environmental impact issues.

3. Four Lane Highway With Continuous Two-way Left-turn Lane (Standard Driveway Access)

This alternative again proposed constructing a four-lane highway (not expressway) and a continuous two-way left-turn lane (instead of paved median with barrier), but eliminated the C-D road. Instead, it only provided the standard driveway approach. Given that this alternative intended to correct profile grades and that the cross-section of the full width of the

roadway would have to be constructed in the same plane due to the two-way left-turn lane, this alternative required that construction of the roadway be performed in a single phase, thus requiring a full detour to maintain traffic. This alternative was rejected due to the additional cost and environmental impacts created by having to construct a detour.

4. Four Lane Highway With Continuous Two-way Left-turn Lane (Standard Driveway Access) in Napa County, Variable Width Median in Solano County

As with the other alternatives, this alternative proposed constructing a four-lane highway (not expressway), however, it proposed a continuous two-way left-turn lane in the Napa County segment and a variable width median in the Solano County segment. The median width variation was to be between 0.0 and 4.3 m, depending on the need for left-turning movements. Also, this alternative eliminated the C-D roads and provided only standard approaches for driveway access. This alternative was rejected because it does not meet current design standards.

5. Maintain Most of Existing 2-lane Highway as Westbound Direction; Construct New 2-Lane Expressway as Eastbound Direction (Standard Driveway Access)

This alternative proposed maintaining most of the existing two-lane highway as the westbound direction and constructing two new lanes to highway standards, or better, as the eastbound direction. This alternative eliminated the C-D roads and provided only standard approaches for driveway access. Also, it would provide a 3.6m paved median (minimum standard) with concrete barrier. Other than utilizing the existing signalized intersections and proposed median openings for U-turns, there would be no accommodation for left-turn movements to and from driveways throughout the project limits. This alternative had the advantage of being easily phased for construction, because the new lanes could be constructed first, after which traffic could be switched to the new lanes, followed by the existing lanes being upgraded. Also, this concept added flexibility by allowing phasing of project delivery depending on available funding. Because it showed improvements covering environmental impacts, phasing and right of way impacts, plus a cost savings of \$ 58.3 million, this alternative was accepted and is now the current “build” alternative.

• **EA 04-287900**

The VA Study for EA 04-287900 was conducted in February 2005. The “build” alternative studied was the original PSR variation of the “tight

diamond” interchange, in which the southbound off-ramp provided only two left-turn lanes to eastbound Route 12.

1.1 Tight Diamond Interchange -- Widen EB 12 to 3 Lanes Between SB Route 29 Off-ramp and Kelly Road

This alternative was essentially the same as the PSR “tight diamond” alternative, except with one additional left-turn lane on the SB Route 29 Off-Ramp and the widening of EB Route 12 to three lanes between Route 29 and Kelly Road. It adds \$ 397,000 to original cost. The alternative was accepted and is currently one of the two “build” alternatives.

1.2 Construct Partial Cloverleaf Interchange With Loop Ramp for SB Route 29 to EB Route 12 and Tight Diamond Interchange Configuration in All Other Quadrants

This alternative modified original PSR “tight diamond” alternative by adding a 2-lane loop ramp to the southwest quadrant. EB Route 12 would be widened to 3 lanes between Route 29 and Kelly Road. This alternative was rejected because it was \$ 6.2 million higher in cost to construct, required more right of way, and had a much larger “footprint” on the environment with significantly greater impacts to wetlands.

1.3 Construct Single Point Interchange (Wider than PSR Single Point Alt.)

This concept was essentially the same as PSR “single point” alternative, except with one additional lane for the turning movement on the SB Route 29 Off-Ramp to EB Route 12 and widening EB Route 12 to three lanes between Route 29 and Kelly Road. Although it added \$ 10 million to original cost, this alternative was accepted and is currently one of the two “build” alternatives.

2.1 Reconfigure Lanes at Sheehy Creek to Avoid Environmental Impacts

This alternative eliminated widening of Sheehy Creek Bridge by eliminating the outside shoulder. It was rejected for introducing a non-standard feature and for creating the future need for widening of the bridge.

2.2 Widen Route 29 Within Existing Median

This alternative would construct the auxiliary lanes on Route 29 by widening in the median instead of outside widening as originally proposed.

Although it showed a cost savings of \$ 1.97 million, it was rejected because it would not meet current design standards.

3.0 Construct Undercrossing on Route 12 at Kelly Road

This concept added a grade separation on Route 12 over Kelly Road. Also, it added off ramps from Route 12 to Kelly Road. This alternative had disadvantages of requiring additional right of way, having a larger environmental footprint and adding \$ 5.6 million to the cost of the project. It was rejected because the loss of access from Kelly Road to both directions of Route 12 was not acceptable to the local stakeholders.

4.0 Purchase Temporary Easement South of Route 12 to Construct Interchange

This modifies all alternatives by defining a way to stage the construction of the interchange. It proposes acquiring a Temporary Construction Easement (TCE) so that a detour alignment can be constructed to the south of the existing Route 12/Route 29 intersection and traffic can be maintained during construction. Acquisition of the TCE would cost \$ 30,000. This alternative was accepted and has been incorporated into the “build” alternatives.

C. Resource Conservation

The proposed project will attempt to rehabilitate existing pavement as much as possible, thereby reducing the need for new construction materials for structural sections. The fill section will reuse excavated materials from the project, if possible.

Also, the proposed project will improve traffic operations and facilitate traffic movements through the project area. The lessening of congestion and related traffic delays will result in faster average travel speeds, thus allowing more energy efficient vehicle operation.

This project will attempt to salvage as much existing material (such as sign panels, metal beam guard railing, etc.) as possible. Determination of what items to salvage and the respective quantity of salvaged material will be made during the design phase of the project.

D. Right of Way

- **General** - A Right of Way Data Sheet has been prepared based on the scope of work described and on the preliminary design.

Estimated cost information is contained in the Right of Way Data Sheet in Attachments F of this report.

- **Railroad** - A service contract and license agreement will be needed from the California Northern Railroad.
- **Utilities** - The project anticipates significant utility impacts. Verification and potholing will be required. Relocations will be necessary. Relocation of telephone poles, underground telephone lines, water lines, sewer lines, gas mains, underground power lines, an aqueduct and a pump station is anticipated. Utility impacts may be reduced as adjustments of the roadway alignment are made in the design phase of the project. All longitudinal encroachments will be relocated outside the access controlled areas. Final determination will be made during the design phase as to whether to relocate all longitudinal utilities outside the State right of way where the State highway is not currently access controlled. Utility owners within the project limits are PG&E (gas and electric), AT&T, Napa Public Works, City of Benicia, City of Vallejo, City of American Canyon, CA Department of Water Resources, and Comcast.

E. Environmental Issues

The Draft Initial Study/Environmental Assessment is being prepared in accordance with California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA) and Caltrans environmental policy and procedures as well as State and Federal regulations. The Draft Initial Study/Environmental Assessment (Attachment A) is the appropriate level of document for this project. This environmental document shows there are no significant impacts to the environment due to the proposed project. The project includes avoidance, minimizations, and mitigation measures to address all potential impacts. This environmental document will be circulated to the public and will go through the public hearing process. Public input and comments from the general public and from local, state and federal agencies will be addressed prior to finalizing this environmental document. This project will comply with Caltrans' statewide NPDES permit. A Storm Water Data Report is being prepared summarizing the actions taken in compliance with the permit.

F. Air Quality Conformity

This project alternative is fully compatible with the design concept and scope described in the current Regional Transportation Plan as well as the current Federal Regional Transportation Improvement Program, which the Regional Agency has determined to conform to the State Implementation Plan for air quality.

G. Title VI Considerations

This project currently proposes new pedestrian facilities at the new Route 29/Route 12 interchange. These facilities, including sidewalks, will be installed in compliance with the requirements of the Federal Americans with Disabilities Act (ADA) of 1990. The project will result in no disproportionate impacts upon minority and low-income populations.

7. OTHER CONSIDERATIONS AS APPROPRIATE

- **Public Hearing Process**

It is recommended that a public meeting be scheduled to present the developed viable alternatives for public comment.

- **Route Matters**

This project constructs a new interchange and will require a revised freeway agreement.

- **Permits**

Permits expected for this project include:

1. Section 7 Biological Opinion with incidental take permit from the US Fish and Wildlife Service.
2. Clean Water Act Section 404 Permit from the US Army Corp of Engineers. (Individual)
3. Clean Water Act 401 Water Quality Certification from the Regional Water Quality Control Board.
4. California Department of Fish and Game Section 1602 Lake and Streambed Alteration Agreement.

Other regulations that apply include the Federal Migratory Bird Treaty Act, the California Endangered Species Act, and the Bald and Golden Eagle Protection Act and sections of the California Fish and Game Code.

- **Cooperative Agreements**

Cooperative Agreements with the Counties of Napa and Solano will be required to identify funding sources and the implementing agency for design, right of way, construction activities, and environmental mitigation.

- **Other Agreements**

The existing maintenance agreements will be modified for this project. These agreements were executed on April 1, 1983 and January 1, 1974 with Solano and Napa Counties respectively.

- **Transportation Management Plan for Use during Construction**

A Transportation Management Plan (TMP) will be required for this project. The TMP is a special program that is implemented during construction to minimize and prevent delay and inconvenience to the traveling public. The proposed construction and improvements will include upgrading the intersection to our interchange and widening the roadway, which may require lane closures, ramp closures, shoulder closures, and detours.

The TMP for this project will be developed and refined during the PS&E and final design phases, supported by detailed traffic studies to evaluate traffic operations. The need for necessary lane closures during off-peak hours or at night, or short-term detour routes, will be identified as required. The TMP typically will include press releases to notify and inform motorists, businesses, community groups, local entities, emergency services, and elected officials of upcoming closures or detours. Various TMP elements, such as portable Changeable Message Signs and Construction Zone Enhanced Enforcement Program (COZEEP) may be utilized to alleviate and minimize delay to the traveling public. For safety purpose, temporary railing (K-rails) will be provided throughout the project limits during construction.

- **Stage Construction**

For EA 04-264100, it is anticipated that the project will be built in stages. The work on the first stage, which includes the construction of the new two lanes in the eastbound direction, will be done behind temporary railing (k-rail) both day and night. Work on the transition sections between the new lanes and the existing highway will be done at night. Shifting of traffic between existing and new lanes will be done as needed to complete construction. During all stages of construction, two lanes will be open for traffic (one lane for EB and one lane for WB). For EA 04-287900, all existing lanes on Route 29 will be maintained. A temporary detour for Route 12 will be built between Kelly Road and Airport Boulevard in order to elevate Route 12 over Route 29 and construct it at its proposed alignment.

- **Risk Management Plan**

A Risk Management Plan (RMP) has been prepared for this project (see Attachment H). The RMP will be continually updated in the PS&E phase and through construction. A few of the major risks are receiving Biological Opinion from USFWS in a timely manner in order to complete the Project Approval and Environmental Document, as well as completing the Right of Way activities, acquisition, and utility clearance.

- **Materials/Pavement Strategy Review Committee Recommendations**

The structural sections used in the proposed design of the project were based on recommendations by Materials branch in their 3/5/01 and 8/22/03 memos. The sections were later revised and updated based on comments received from Materials branch on this draft project report.

8. PROGRAMMING

- **Funding for EA 04-264100**

Funding Source	Amount
TCRP	\$7,000,000
ITIP	\$14,110,000
RTIP	\$35,500,000
DEMO (SAFETEA-LU)	\$6,400,000
STP	\$2,500,000
CMIA	\$73,990,000
Total Funding (including support cost)	\$139,500,000
Total Funding (capital)	\$112,300,000
Estimated Capital Cost	\$152,026,000
Additional Funding Needed (capital)	\$39,726,000

- **Funding for EA 04-287900**

Funding Source	Amount
ITIP	\$0
RTIP	\$1,500,000
Total Funding (support only)	\$1,500,000
Estimated Capital Cost	\$82,813,000
Additional Funding Needed (capital)	\$82,813,000

- The Draft Project Report and the Environmental Document are based on the ultimate improvements of a 4-lane highway facility along Route 12 and a new interchange to replace the existing Route 12/Route 29 Intersection. These improvements will be constructed in phases as the funds are available. Route 12 will be constructed in two phases. The first phase converts the existing two-lane facility to primarily the westbound direction and constructs two additional lanes for the eastbound direction. The second phase brings the existing highway to current standards by improving the horizontal alignment and vertical profile. The construction of the Route 12/Route 29 Interchange will be done as a separate contract.

The first phase of the Route 12 improvement is funded for FY 09/10 delivery for \$139.5 million. The remaining second phase of the Route 12 improvements and construction of the interchange at Route 12/Route 29 are funded through the environmental stage only.

- **Schedule**

	DED	PAED	PS&E*	RWC*	RTL*	CCA*
EA 264100	Aug 07	Jan 08	Dec 09	Apr 10	May 10	Aug 13

* These milestones only applicable for phase 1.

9. REVIEW

This project falls within the delegated authority for State authorization under the current FHWA-Caltrans Stewardship Agreement. It has been reviewed by Michael Thomas (Headquarters Design Reviewer), the Constructability Office, and by David Seriani (the Program Advisor), and their comments were all incorporated in the project report.

10. PROJECT PERSONNEL

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11. LIST OF ATTACHMENTS

- A. Draft Environmental Document
- B. Location map
- C. Layout Maps
- D. Typical sections
- E. Project Report Cost Estimate
- F. R/W Data Sheet
- G. Traffic Management Plan
- H. Risk Management Plan
- I. Storm Water Data Report