Value Analysis Report

I-5/SR56 North Connectors

11-SD-5/56
KP 52.9/53.7 (I-5) and 0.0/0.8 (SR56)
17790K Special Designation: 6VA56N5

Contract No. 53A0063
Task Order No. 202.173

May 2002

Prepared by

Value Management Strategies, Inc.

To: **All Recipients of Value Analysis Report for the I-5/SR 46 North Connector Project**

We are pleased to transmit this Value Analysis Study Report for the referenced project. It is important to note that the scope of this project was the I-5/SR56 North Connectors. It is recognized that there are many traffic issues in this area, some which surface as a result of the VA Study, however, it was important for the VA Team to remain focused on the function of the North Connectors. This report does suggest that further studies are necessary to address the long term transportation issues in the area.

This concludes the VA study activities for this project.

If you have any questions or comments concerning the report, please contact either Chili Cilch or Carmen Mullenix from the Caltrans District 11 VA Program. Their contact information is on the last page of this report.

I would also like to thank the many participants of this VA Study. It was truly a unique and challenging project.

Sincerely,

R. Terry Hays
VA Team Leader
Value Management Strategies, Inc.

VA Study Report
I-5/SR56 North Connectors

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SYNOPSIS

The Value Analysis (VA) team examined the proposed project to improve traffic flow between State Route 56 (SR-56) and Interstate 5 (I-5). The VA team assessed the alternatives identified in the December 2000 Caltrans *Project Study Report* (PSR). The project's need and purpose, as understood by the VA Team, is to minimize the regional traffic connecting from westbound SR56 to northbound I-5 and southbound I-5 to eastbound SR56 from congesting local streets while making these moves. The PSR recommends two primary alternatives for further study:

- Direct Connectors - construction of two connector ramps, one from southbound I-5 to eastbound SR-56 and the other from westbound SR-56 to northbound I-5. This option would separate the regional from local traffic in the area. The PSR estimated the project to cost ~$137,000,000 (escalated to assume construction in the year 2005). However, during the course of the VA study the team identified additional needs that could increase project cost.

- Local Street Connection - improve the local street connection to northbound I-5 by improving the ramps at El Camino Real and Carmel Valley Road. This option would use Carmel Valley Road for regional traffic making the north connections between SR56 and I-5 and make improvements to this area so that local traffic would operate at an acceptable level. The PSR estimated the project to cost ~$30,000,000 (escalated to assume construction in the year 2005).

The project is currently listed in the Regional Transportation Improvement Plan's *2020 Highway Plan*, but not included in the *Revenue Constrain Plan*.

The VA Team's *mission* was to identify all viable alternatives (e.g., highway, local streets, and/or traffic management solutions) that meet the project's need, purpose and functional requirements. The study's objective was to accelerate the implementation of solutions by determining lower cost alternatives that meet or exceed the performance criteria of the PSR alternatives. In addition, the VA team considered the requirements set forth in 1998 in the approved City of San Diego ballot measure "M". Measure "M" restricts the build-out Pacific Highlands Ranch until a complete connection between SR-56 and I-5 has been constructed.

> *Development within the phase-shifted area of the Pacific Highlands Ranch Subarea Plan shall not exceed 1,900 dwelling units until such time that the ramps for westbound SR-56 connecting with I-5 North and I-5 South connecting with eastbound SR-56 are constructed and operational.*

The VA Team was comprised of representatives from the community's local planning groups, the City of San Diego, SANDAG, Caltrans and highway design consultant engineers.

After identifying and evaluating 42 alternative ideas, the VA team endorsed the PSR proposed design for the *direct connector* as the only viable configuration for the direct connectors. The VA team also developed an understanding for the need to add lanes to I-5 to accommodate safe merging of traffic and why all elements of the project described in the PSR are necessary. The over-riding fatal flaw of the other alternatives developed by the VA team was safety. The alternatives developed by the team were determined not viable due to operational conditions such as insufficient merging and sight distance that cannot meet current safety standards for the other configurations.

The VA team's primary recommendation is to initiate the environmental process to study the direct connectors and to include in that process an alternative that would:

1. Initiate a project to improve city street (such as, adding turning lanes and signal timing/coordination) and freeway operational improvements on I-5 and SR-56 (widen El Camino Real off-ramp, add auxiliary lanes on I-5 from Carmel Valley Road to Del Mar Heights Road)
2. Construct the PSR-proposed westbound SR-56 to northbound I-5 connector and improve operations on eastbound Carmel Valley Road to permit southbound I-5 to eastbound SR56 traffic to more readily use this movement.
3. Construct the PSR-proposed southbound I-5 to eastbound SR-56 connector.

Implementation of the multi-phase approach will be easier to finance thereby expediting the short and long-term improvements to accommodate increasing regional demand along the I-5 and SR-56 corridors. However, the direct connectors do not serve, as a stand-alone solution to meet future needs. SANDAG's updated traffic forecast model data and the team's traffic simulations indicate continued congestion degradation on local streets. In addition, the increased traffic volumes resulted in the VA Team identifying operational deficiencies with the PSR defined *direct connector* proposal that may necessitate added improvements to SR-56 to prevent merging conflicts. Therefore, the VA team also recommends the following actions to extend the range of benefits and design life to further decrease travel time and improve the travel experience for future freeway and local street commuters:

- Conduct traffic studies to better understand the relative impacts of converging freeway connections on local street operations considering the planned improvements and expected growth.
- Initiate studies to identify integrated multi-modal solutions that address the areas long-term needs to more effectively facilitate the movement of people and goods.

The VA team's efforts resulted in a greater understanding of community needs and the project's complexity. In summary, the VA Study:

- Validated the freeway-to-freeway connector alternative as described in Caltrans' PSR.
- Identified the potential for additional operational improvements to SR-56 to meet project performance objectives.
- Identified the need to pursue a multi-phase staged approach to balance funding with the need for operational improvements.
- Identified the need for added studies to better understand traffic operations in the area surrounding the area studied by the VA Team and identify solutions to address future traffic congestion, including multimodal solutions to reduce demand in the area.

Project Development Funding

Currently, $300,000 of federal demonstration grant funds is dedicated to this project, but the required non-federal 20% match, $60,000, needs to be provided. An approved Project Report and environmental document is needed to proceed with the project's design. A Federal Corridors and Borders grant of $2 million dollars has been earmarked for this effort. A total of $460,000 of non-federal matching funds is required to take advantage of federal dollars available to fund the project's environmental study and review phase.

INTRODUCTION

This Value Analysis (VA) Report summarizes the events of the VA study requested by the City of San Diego, conducted by Caltrans District 11 and facilitated by Value Management Strategies, Inc. The subject of the study was the I-5/SR56 North Connectors in San Diego, California:

- 11-SD-5/56 KP 52.9/53.7 (I-5) and 0.0/0.8 (SR56)
- EA 17790K Special Designation: 6VA56N5

The VA study was intended to focus on alternatives that would minimize the impact of regional traffic on State Route 56 from congesting the local streets in the Carmel Valley area and develop project stakeholder consensus in determining feasible alternatives.

PROJECT DESCRIPTION

SR-56 will serve as an east-west connector between I-5 and I-15 and will connect the communities of Carmel Valley and Rancho Penasquitos. Two sections of SR-56 between I-5 and I-15 have been completed and are currently operational. The middle section, approximately 8.0 KM, is scheduled to be advertised for construction in April 2002. The project's need and purpose, as understood by the VA Team, is to minimize the regional traffic connecting from westbound SR56 to northbound I-5 and southbound I-5 to eastbound SR56 from congesting local streets while making these moves. Based on the SR-56 traffic study, the SR-56/I-5 north direct connectors need to be built between 2015 and 2020, in order to maintain level of service "D" operating conditions in the SR-56/I-5 Interchange area. Caltrans recently completed a PSR in order to identify project impacts.

The direct connector concept proposed in the PSR is to construct connectors from westbound SR-56 to northbound I-5 and southbound I-5 to eastbound SR-56. Improvements would include constructing two-lane direct connector structures, approach pavement sections, and auxiliary lanes on westbound SR-56 and northbound and southbound I-5. The truck bypass facilities on north and southbound I-5 would be realigned to the outside of the 5/56 connector structures and the bypasses and barrier separation would be extended to Del Mar Heights Road. To facilitate the alignment of the direct connectors, Carmel Valley Road, the entrance ramp from El Camino Real to eastbound SR-56, the northbound entrance ramp and southbound exit ramp at Carmel Valley Road, and all ramps at the Del Mar Heights Road Interchange will be realigned to facilitate the alignment of the direct connectors.

Project cost is estimated at $137,000,000 in 2005 dollars. However, this estimate does not include the design modification that may be needed based on the most recent traffic numbers. This project is not currently funded in the Regional STIP/RTP.

PROJECT ISSUES

The following are some of the issues and concerns associated with the direct connector project:

- South to east flyover
  - Visual impact
  - Community Character Impact
  - Noise
- West to north connector is more important to local community. The main concern is that traffic on WB56 will seek alternative routes through their community if the west to north connector is not provided.
- Both movements may be needed to satisfy Measure M.
- South to East connector is more important for I-5 traffic operations as it optimizes the flow of traffic off I-5
- Impact of not providing connectors – it may constrain the planned development along SR 56 (middle portion), delay planned smart growth communities and the delivery of associated infrastructure improvements (schools, libraries, etc.) to already completed communities in the area.
- Funding – The project is currently listed in the Regional Transportation Improvement Plan as an unfunded project.
- A solution is needed to avoid regional traffic from SR56 from further impacting the existing surface street traffic congestion.
- Local stakeholders did not understand why the total cost of the project is as high as it is.

PROJECT ANALYSIS

The VA team used the Value Analysis techniques and process to analyze the project and develop alternative concepts. Key conclusions and results of this analysis are summarized below.

Using function analysis and Function Analysis System Technique (FAST) diagramming, the team defined the basic functions of this project as *Provide Freeway to Freeway Connection* in order to *Satisfy Measure M* and *Reduce Local Impact* of regional traffic on local streets. This process also helped to gain understanding by the local stakeholders participating on the VA Team why the widening on I-5 is a necessary part of the direct connectors.

Specific performance criteria were developed in cooperation with the designers and stakeholders. These criteria were weighted, using a paired comparison approach, and resulted in the following criteria being used to evaluate ideas and alternative concepts. These criteria are listed in the order of priority.

- Safety
- Environmental Impacts
- Community Character
- Freeway Operations
- Local Traffic Operations
- Facilitate Smart Growth
- Support Multi-modal Use
- Constructibility
- Compatibility with other Highway Improvement Projects
- Right of Way Impact

Based on the cost estimate in the PSR, approximately 13% of the estimated project costs are for right of way and utility relocation, 12% for retaining walls to accommodate widening of I-5, 12% for the SB5 to EB 56 Connector and 7% for the EB to NB Connector. As a result of the traffic simulation developed to

evaluate the relative effectiveness of the various concepts, the team identified possible congestion on WB56 between Carmel Creek Road and El Camino Real. This congestion is caused by weaving between vehicles at the Carmel Creek westbound on-ramp and the El Camino Real westbound off-ramp on SR 56. Correcting this weaving problem could add ~10% to the project cost.

The development and analysis of the traffic simulations also resulted in the following revelations regarding traffic in the area.

- The latest traffic model data from SANDAG, released during the VA Study, shows an increase in the traffic demand for the North Connectors. Increases are due to changes in the SANDAG model, since the data was collected for the PSR in 1998. The latest traffic model data shows ~2100 vph in the year 2025, where the Caltrans PSR shows ~1500 vph.

- Based on latest traffic projections from the City of San Diego, local traffic on El Camino Real and Carmel Valley Road has also increased over the traffic numbers available at the time the PSR was developed. This increase is partially due to the removal of the segment of Carmel Creek Road to the south of SR 56. This forces more traffic onto El Camino Real, which impacts operations on Carmel Valley Road.

- The development of the local area has created significant trip generators that affect southbound I-5 and local arterials in both AM and PM rush hours. This local demand creates significant local congestion and is independent of regional traffic using SR56.

- The westbound to northbound Connector will be capable of handling the year 2025 regional traffic demands caused by the completion of SR56. Without the connector, the added traffic that will use Carmel Valley Road or other local streets will further exacerbate the existing congestion problem.

- The southbound to eastbound Connector will be capable of handling the regional traffic demands in the year 2025. Eastbound Carmel Valley Road also appears capable of handling this volume of traffic, although local operational improvements may be necessary to ensure the viability of using Carmel Valley Road until the completion of the southbound I-5 to eastbound SR56 Connector.

- Freeway congestion is only apparent during peak travel times. Non-peak traffic in the area is not expected to be a problem.

VA ALTERNATIVES

The VA Study resulted in validating the Direct Connector concept described in the PSR and led to local stakeholders understanding of the required project scope and the resulting cost. One VA Alternative presented is to stage the project elements and balance funds with needs. The VA Team developed two additional alternatives to determine their feasibility. They are included in this report to document why they are not feasible and should not be pursued.

Summary lists of the VA alternatives are in a following report section; descriptions of VA alternatives are given below:

Alt. No.	Description	Potential Savings *(Added Cost)*	Performance
1.1	Use Direct Connector for WB56 to NB5 Movement and Carmel Valley Road for SB5 to EB56 Movement.	TBD	+4%

Use the direct connector from WB56 to NB5 as planned in the PSR. For the SB5 to EB56 move, use the existing EB Carmel Valley Road and optimize traffic signals and provide other operational improvements to minimize the potential for traffic congestion on local streets. While the Environmental Document should include both connectors, stage the project to break-up project costs into values that are easier for the region to fund and provide interim improvements to balance with the increased traffic projections in future years. Concurrently, the region needs to examine multi-modal solutions that can address long-term congestion in the area. This approach might preclude the need for the SB5 to EB56 Direct Connector until sometime after 2020.

1.2	Loop Ramp I.L.O. Direct Connector Flyover for SB to EB Traffic **(Not feasible)**	0	-29%

Use a loop ramp from SB5 to EB56 and provide for continuous flow from freeway to freeway using a dedicated and segregated lane on the surface street. Once the SB off ramp lane crosses under the NB5 to EB56 connector, it would need to become grade separated with the EB Carmel Valley Road to permit continuous flow into EB56 and allow EB Carmel Valley Road to connect with the El Camino Real Intersection.

Considering there is no cost savings potential, environmental issues and the fact that it cannot be built to operate safely, it should be dropped from further consideration.

1.3	Use City Streets by Grade Separating SR56 On/Off Ramps at El Camino Real **(Not feasible)**	0	-26%

This concept was based on grade separating SR56 with El Camino Real and using Carmel Valley Road between El Camino Real and I-5 to carry both local and regional traffic. This would require all business access along Carmel Valley Road between El Camino Real and I-5 to be closed. This would require acquiring the Shell gas station.

The EB Carmel Valley Road left turn to NB 5 would be no longer allowed to improve traffic signal operations and traffic flow in the area. This traffic would need to travel to El Camino Real and loop back to the NB on ramp.

At the end of the EB 56 off ramp there would need to be a traffic metering signal across both the off ramp lanes and the lanes on WB Carmel Valley Road to provide traffic the opportunity to weave and get in the desired lane to access either the NB or SB I-5 on ramps or go westbound on Carmel Valley Road. Both SR56 on and off ramps at El Camino Real would need to be closed.

The team concluded that this is not viable and there are too many operational and safety related issues to warrant further consideration.

Detailed documentation of all the VA alternatives is in the Value Analysis Alternatives Section of this report.

PERFORMANCE AND VALUE IMPROVEMENTS

The VA team evaluated the performance of each alternative to determine its effect on the project based on the performance criteria identified by the project stakeholders. The Performance Rating Matrix and rationale for the ratings are included on the following pages. Performance for Alternatives 1.2 and 1.3 have been included as part of the documentation to help clarify why these alternatives are not viable.

PERFORMANCE RATING MATRIX
I-5 / SR56 North Connectors

Caltrans

Criteria	Criteria Weight	Concept	Performance Rating 1	2	3	4	5	6	7	8	9	10	Total Performance
Constructibility	6	Baseline		2									12
		Alternative 1.1						6					36
		Alternative 1.2		2									12
		Alternative 1.3						6					36
Local Traffic Operations	11	Baseline										10	110
		Alternative 1.1								8			88
		Alternative 1.2						6					66
		Alternative 1.3	1										11
Environmental Impact	16	Baseline								8			128
		Alternative 1.1								8			128
		Alternative 1.2				4							64
		Alternative 1.3									9		144
Community Character	14	Baseline			3								42
		Alternative 1.1								8			112
		Alternative 1.2					5						70
		Alternative 1.3					5						70
I-5 Freeway Operations	13	Baseline								8			104
		Alternative 1.1								8			104
		Alternative 1.2					5						65
		Alternative 1.3										10	130
Facilitate Smart Growth	9	Baseline										10	90
		Alternative 1.1							7				63
		Alternative 1.2										10	90
		Alternative 1.3					5						45
Compatible with Other Highway Projects	4	Baseline									9		36
		Alternative 1.1									9		36
		Alternative 1.2									9		36
		Alternative 1.3										10	40
R/W Impacts	2	Baseline								8			16
		Alternative 1.1								8			16
		Alternative 1.2							7				14
		Alternative 1.3		2									4
Safety	18	Baseline								8			144
		Alternative 1.1							7				126
		Alternative 1.2			3								54
		Alternative 1.3	1										18
Support Mult-Modal Use	7	Baseline					5						35
		Alternative 1.1					5						35
		Alternative 1.2					5						35
		Alternative 1.3					5						35

Overall Performance	Total Performance	% Performance Improvement	Total Cost	Value Index (P/C)	% Value Improvement
Baseline Design	717		$137.0	5.23	
Alternative 1.1	744	4%	$90.0	8.27	58%
Alternative 1.2	506	-29%	NA	NA	NA
Alternative 1.3	533	-26%	NA	NA	NA

BASIS FOR CHANGE IN PERFORMANCE AND VALUE

Baseline – Direct Connector	Alternative 1.1 – Staged Approach
Constructibility Environmental process time due to SB to EB Connector issues and funding for complete project could result in a project that would take ~12 years to complete.	**Constructibility** Will be able to be delivered sooner and allow needs to better match traffic demand.
Local Traffic Operations Direct connectors can handle all projected traffic and there would be no reason for regional traffic to impact local streets.	**Local Traffic Operations** WB to NB traffic will not impact local streets. SB to EB traffic will have some impact.
Environmental Impact No significant impact to local wildlife or habitat.	**Environmental Impact** No significant impact to local wildlife or habitat.
Community Character Concern for visual and noise impacts from the SB5 to EB52 connector. Local opposition due to these factors could further delay approval for the project.	**Community Character** Possible minor noise impact from WB to NB connectors.
I-5 Freeway Operations Concept includes added lane on I-5 to permit safe merging of traffic on I-5 with minimal disruption to traffic flow.	**I-5 Freeway Operations** Concept includes added lane on I-5 to permit safe merging of traffic on I-5 with minimal disruption to traffic flow.
Facilitate Smart Growth Permits the development of planned smart growth communities along the SR56 corridor.	**Facilitate Smart Growth** Need to determine if SB to WB connection using local streets satisfy Measure M and permits development of smart growth communities.
Compatibility with Other Highway Projects No significant impacts to other projects in the area.	**Compatibility with Other Highway Projects** No significant impacts to other projects in the area.
R/W Impacts No business takes or business disruptions.	**R/W Impacts** No business takes or business disruptions.
Safety Minor design exceptions required.	**Safety** Minor design exceptions required. Added congestion on EB Carmel Valley Road could increase accident rate.
Support Multi-modal Use Does not add to or restrict multi-modal operations.	**Support Multi-modal Use** Does not add to or restrict multi-modal operations

BASIS FOR CHANGE IN PERFORMANCE AND VALUE

Alternative 1.2 – Loop Connector	Alternative 1.3 – Use Surface Street
Constructibility Environmental process time due to SB to EB Connector issues and funding for complete project could result in a project that would take ~12 years to complete.	**Constructibility** Reduced cost and environmental issues could improve delivery time.
Local Traffic Operations Would require closing of the NB5 off ramp at Carmel Valley Road. This would force this traffic off at other locations and result in added traffic on local streets.	**Local Traffic Operations** Added significant amount of traffic to local roads that are already congested by local traffic. Significant impact during rush hours.
Environmental Impact Impacts wetlands SW of interchange.	**Environmental Impact** No significant environmental impact.
Community Character Loop ramp impacts access to recreational area near wetlands.	**Community Character** May impact both noise and air quality due to congestion on Carmel Valley Road.
I-5 Freeway Operations Concept includes added lane on I-5 to permit safe merging of traffic on I-5 with minimal disruption to traffic flow. Exit spacing from SB5 do not meet required standards for driver decisions.	**I-5 Freeway Operations** No impact to I-5 operations as traffic entering I-5 is controlled by a ramp mater.
Facilitate Smart Growth Permits the development of planned smart growth communities along the SR56 corridor.	**Facilitate Smart Growth** Need to determine if this option using local streets satisfy Measure M and permits development of smart growth communities.
Compatibility with Other Highway Projects No significant impacts to other projects in the area.	**Compatibility with Other Highway Projects** Does not impact other planned projects in the area.
R/W Impacts No business takes or business disruptions.	**R/W Impacts** Requires take of Shell station and possible environmental clean-up and closing of access to businesses along Carmel Valley Road.
Safety Significant design exceptions required. Insufficient separation between exits on SB5. Cannot maintain geometry required for freeway to freeway connector.	**Safety** Significant safety problems due to poor stopping sight distances, weave conflicts and potentially confusing conditions for drivers.
Support Multi-modal Use Does not add to or restrict multi-modal operations.	**Support Multi-modal Use** Does not add to or restrict multi-modal operations.

VA TEAM AND PROCESS

The VA study was performed between June 2001 and March 2002. The first phase of the VA Study, June through September 2001, focused on alternatives to the freeway-to-freeway direct connector alternatives. The second phase of the VA Study, October 2001 through February 2002 focused on alternatives that would use the city streets as par of the solution. Consultants were added to the team at this point to provide expertise in city street design and operations. In March 2002, a presentation of the findings was made to the community planning groups in the area. The VA study was led by Terry Hays, CVS, from Value Management Strategies, Inc. The VA team members are listed below:

Scott Mann	Caltrans D-11, Design
Mike Powers	Caltrans D-11, Traffic Ops
Julie Carlin	Caltrans D-11 Traffic Ops – Route Mgr.
Michelle McCart	Caltrans D-11, Environmental (part-time)
Bob Dauffenbach	Caltrans D-11, Right of Way
Bob Gibbs	Caltrans D-11, Planning – (part-time)
Curtis Johnson	Caltrans D-11, Landscape
Gary Levitt	Carmel Valley Community Planning
Lisa Ross	Chair, SR56 Task Force
John Dean	SR56 Task Force Member
Rick Smith	Sabre Springs Planning Group
Bob Lewis	Torrey Pines Planning Board
John Eardensohn	Latitude 33 Planning & Engineering
Dean Hiatt	SANDAG
Labib Qasem	City of San Diego
Arnold Torma	Katz, Okitsu and Associates
Graham Fraser	Fraser Engineering

Throughout the VA session, several members of Caltrans and the stakeholders supported the VA team. These participants included:

Chili Cilch	Caltrans D-11	VA Program Manager
Carmen Mullinex	Caltrans D-11	Value Analysis Coordinator
Eric Pahlke	SANDAG	Director of Transportation
Pedro Orso-Delgado	Caltrans D-11	District Director
Joel Haven	Caltrans D-11	Deputy District Director, Traffic Operations
Allan Kossup	Caltrans D-11	Deputy District Director, PPM
Rick Hopkins	Caltrans D-11	Deputy District Director, Design
Arturo Jacobo	Caltrans D-11	Project Manager
Majid Kharrati	Caltrans D-11	Design Manager

The VA Job Plan was followed to analyze the functions of the project, create and evaluate ideas for change, and develop and present alternatives to the project team.

Value Analysis Alternatives

VA ALTERNATIVES

INTRODUCTION

The results of this study are presented as individual alternatives to the original concept.

VA ALTERNATIVES

Each alternative consists of a summary of the original concept, a description of the suggested change, a listing of its advantages and disadvantages, a cost comparison, change in performance, and a brief narrative that compares the original design with the alternative. Sketches, calculations, and performance measures ratings are also presented. The cost comparisons reflect the comparable level of detail as in the original estimate. A life cycle benefit-cost analysis for major alternatives is included where appropriate. There are three alternatives documented in this report. Only Alternative 1.1 is feasible. The other alternatives (1.2 and 1.3) are not feasible, as there is not sufficient physical space to construct and satisfy minimal standards to ensure safe operations.

SUMMARY OF VA ALTERNATIVES *I-5 / SR56 North Connectors*			Caltrans
Number	**Description**	**Potential Savings**	**Performance**
1.1	Use Direct Connector for WB56 to NB5 Movement and Carmel Valley Road for SB5 to EB56 Movement	TBD	+4%
1.2	Loop Ramp Connector from SB5 to EB56	Not Viable	-29%
1.3	Use City Streets by Grade Separating SR56 On/Off Ramps at El Camino Real	Not Viable	-26%

VALUE ANALYSIS ALTERNATIVE *I-5 / SR56 North Connectors*	**Caltrans**
FUNCTION: Separate Regional from Local Traffic	**ALTERNATIVE NO.** 1.1
TITLE: Use Direct Connector for WB56 to NB5 Movement and Carmel Valley Road for SB5 to EB56 Movement	**PAGE NO.** 1 of 4

ORIGINAL CONCEPT:

A direct freeway-to-freeway connector is planned for SB5 to EB56. This direct connect will need to "flyover" the existing WB56 to SB5 connector. The height of this connector poses concerns for project approval due to the visual impact and some community opposition.

ALTERNATIVE CONCEPT:

Use the direct connector from WB56 to NB5 as planned in the PSR. For the SB5 to EB56 move, use the existing EB Carmel Valley Road and optimize traffic signals and provide other operational improvements to minimize the potential for traffic congestion on local streets. Stage the project to break-up project costs into values that are easier for the region to fund and provide interim improvements to balance with the increase traffic projections in future years. Concurrent with this, the region needs to examine multi-modal solutions that can address long-term congestion in the area. This approach might preclude the need for the SB5 to EB56 Direct Connector until sometime after 2020.

ADVANTAGES:

- Reduced cost and phasing of project improves funding potential
- Reduced visual impact
- Improved community acceptance
- Addresses major community traffic concern, WB56 to NB5

DISADVANTAGES:

- Long term viability depends on reducing congestion at El Camino Real and Carmel Valley Road
- Funding sources are not currently available
- May not satisfy Measure M as currently written

COST SUMMARY	Initial Cost	Present Value Subsequent Cost	Present Value Highway User Cost	Net Present Value
Original Concept	$	$	$	$
Alternative Concept	$	$	$	$
Savings	$	$	$	$

Team Member: All	**Discipline:** All	**PERFORMANCE:** +4%

VALUE ANALYSIS ALTERNATIVE *I-5 / SR56 North Connectors*		Caltrans	
TITLE:	Use Direct Connector for WB56 to NB5 Movement and Carmel Valley Road for SB5 to EB56 Movement	**ALTERNATIVE NO.** 1.1	**PAGE NO** 2 of 4

DISCUSSION / JUSTIFICATION:

This alternative addresses the main community concern that traffic heading west on SR56 will be forced through their community trying to reach NB I-5. The WB56 to NB5 Connector can safely accommodate this traffic and there would be no reason for regional traffic to divert through the community with this in place.

Traffic congestion in this area is caused by significant locally generated demand in both the AM and PM peak traffic hours trying to access SB I-5 from Carmel Valley Road. As this demand is greater than SB I-5 can accept at this location, traffic eventually backs up and affects the El Camino Real intersection. Congestion at this intersection eventually affects the SB5 to EB56 traffic that would exit at Carmel Valley Road to access EB SR56. Improving local traffic in this area is key to using EB Carmel Valley Road, which otherwise could accept this added traffic, as part of a long term solution as an effective way to move traffic from SB I-5 to EB SR56.

FHWA needs to agree that providing just one of the two direct connectors is acceptable. This may be possible as there is a viable connection for this move.

This alternative could be phased to improve funding opportunities and keep regional traffic demand from significantly impacting local street operations. Phasing approach could be to:

1. Provide improvements to freeway on/off ramps, add an auxiliary lane on NB5 between Carmel Valley Road, and Del Mar Heights Road and add a right turn lane from SB El Camino Real to WB Carmel Valley Road. These improvements are described in the PSR and would provide local operational improvements until the WB56 to NB5 Connector can be constructed.
2. Construct the WB56 to NB5 Connector. This addresses the major traffic concern for the local stakeholders.
3. Identify and implement operational improvements to permit SB5 to EB56 to use Carmel Valley Road. Preliminary analysis indicates that continued use of this movement might be a long term viable solution
4. Initiate studies to implement multi-modal solutions in this area to address long-term movement of people and goods.

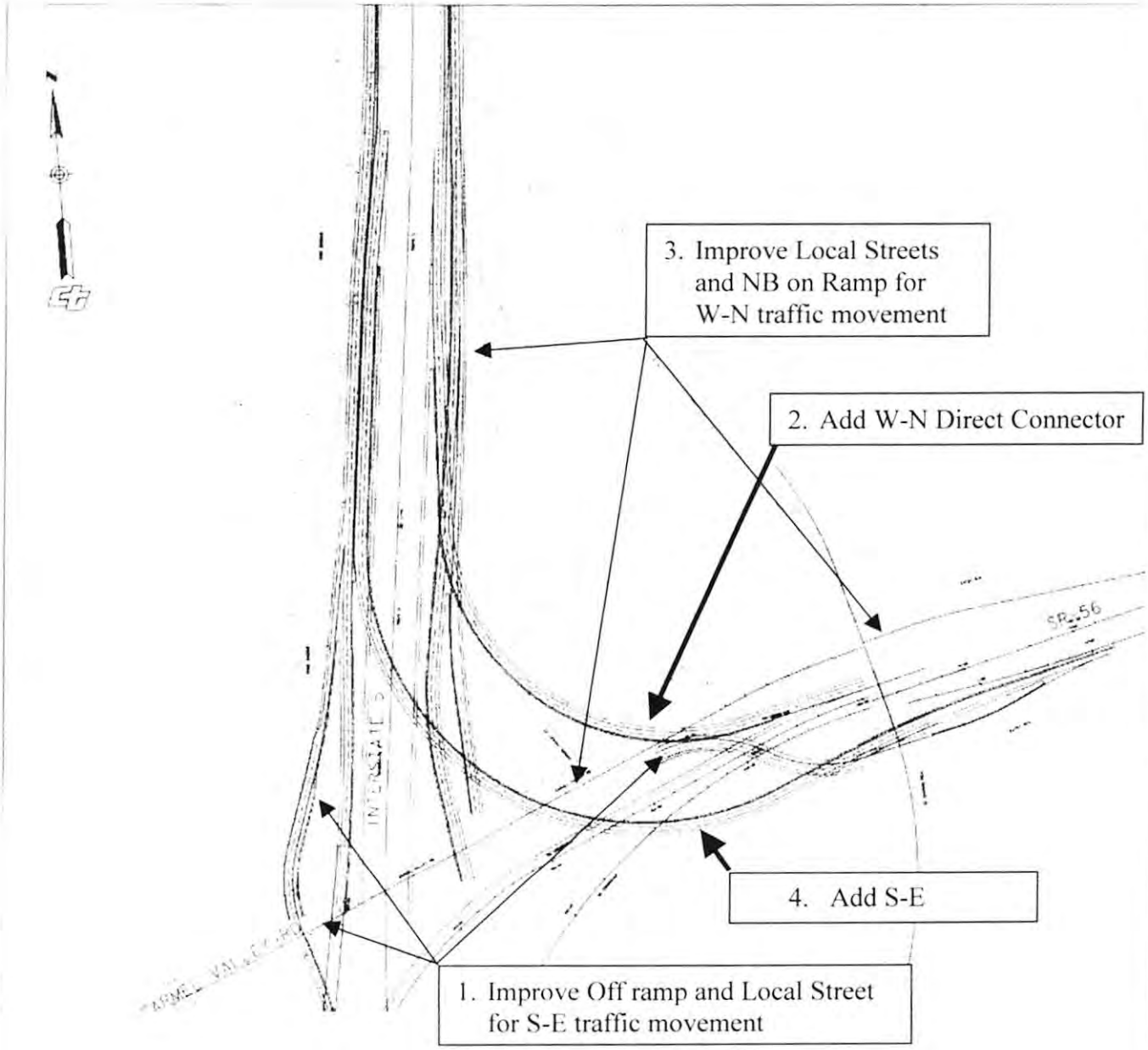
TECHNICAL REVIEWER COMMENTS:

None provided.

PROJECT MANAGEMENT CONSIDERATIONS:

Need to refine costs and schedule to implement before a decision is made. Added traffic studies with the City of San Diego needed to identify possible improvements to City roads and traffic signals to improve local operations and permit long-term use of Carmel Valley Road to carry SB5 to EB56 traffic.

SKETCHES *I-5 / SR56 North Connectors*		Caltrans	
TITLE:	Use Direct Connector for WB56 to NB5 Movement and Carmel Valley Road for SB5 to EB56 Movement	**NUMBER** 1.1	**PAGE NO.** 3 of 4



PERFORMANCE MEASURES *I-5 / SR56North Connector*		Caltrans		
TITLE:	Use Direct Connector for WB56 to NB5 Movement and Carmel Valley Road for SB5 to EB56 Movement	**NUMBER** 1.1		**PAGE NO.** 4 of 4
CRITERIA		**Performance**	**Original**	**Alternative**
Constructibility Will be able to be delivered sooner and allow needs to better match traffic demand		Rating	2	6
		Weight	6	6
		Contribution	12	36
Local Traffic Operations WB to NB traffic will not impact local streets. SB to EB traffic will have some impact.		Rating	10	8
		Weight	11	11
		Contribution	110	88
Environmental Impact No significant impact to local wildlife or habitat		Rating	8	8
		Weight	16	16
		Contribution	128	128
Community Character Possible minor noise impact from WB to NB connectors.		Rating	3	8
		Weight	14	14
		Contribution	42	112
I-5 Freeway Operations Concept include added lanes on I-5 to permit safe merging of traffic on I-5 with minimal disruption to traffic flow.		Rating	8	8
		Weight	13	13
		Contribution	104	104
Facilitate Smart Growth Need to determine if SB to WB connection using local streets satisfies Measure M and permits development of smart growth communities.		Rating	10	7
		Weight	9	9
		Contribution	90	63
Compatibility with Other Highway Projects No significant impacts to other projects in the area.		Rating	9	9
		Weight	4	4
		Contribution	36	36
R/W Impacts No business takes or business disruptions.		Rating	8	8
		Weight	2	2
		Contribution	16	16
Safety Minor design exceptions required. Added congestion on EB Carmel Valley Road could increase accident rate.		Rating	8	7
		Weight	18	18
		Contribution	144	126
Support Multi-modal Use Does not add to or restrict multi-modal operations.		Rating	5	5
		Weight	7	7
		Contribution	35	35
Total Performance:			**717**	**744**
Net Change in Performance:				**+4**

VALUE ANALYSIS ALTERNATIVE *I-5 / SR56 North Connectors*	**Caltrans**
FUNCTION: Separate Regional from Local Traffic	**ALTERNATIVE NO.** 1.2
TITLE: Loop Ramp Connector from SB5 to EB56	**PAGE NO.** 1 of 4

ORIGINAL CONCEPT:

A direct freeway-to-freeway connector is planned for SB5 to EB56. This direct connect will need to "flyover" the existing WB56 to SB5 connector. The height of this connector poses concerns for project approval due to noise and visual impacts and community opposition.

ALTERNATIVE CONCEPT:

Use a loop ramp from SB5 to EB56 and provide for continuous flow from freeway to freeway using a dedicated and segregated lane on the surface street. Once the SB off ramp lane crosses under the NB5 to EB56 connector, it would need to become grade separated with the EB Carmel Valley Road to permit continuous flow into EB56 and allow EB Carmel Valley Road to connect with the El Camino Real Intersection.

NB5 off-ramp to Carmel Valley Road would need to be closed and I-5 structure over Carmel Valley Road lengthened to provide more lanes on Carmel Valley Road.

ADVANTAGES:

- Meets community desires to keep freeway to freeway traffic off local roads
- Reduced visual impact
- Improved community acceptance

DISADVANTAGES:

- Safety –geometric design of the connector is not realistic
- Numerous design exceptions
- Wetland impact
- Requires lengthening of I-5 structure over Carmel Valley Road to be widened
- Closing of NB off ramp
- Ability to construct at grade separation with Carmel Valley Road in space provided
- Out of direction travel for NB5 to WB Carmel Valley Road movements.

COST SUMMARY	Initial Cost	Present Value Subsequent Cost	Present Value Highway User Cost	Net Present Value
Original Concept	$	$	$	$
Alternative Concept	$	$	$	$
Savings	$	$	$	$ Not Viable

Team Member: All	**Discipline:** All	**PERFORMANCE:** -29%

VALUE ANALYSIS ALTERNATIVE *I-5 / SR56 North Connectors*	Caltrans	
TITLE: Loop Ramp Connector from SB5 to EB 56	ALTERNATIVE NO. 1.2	PAGE NO 2 of 4

DISCUSSION / JUSTIFICATION:

As part of this VA Study, Caltrans team members developed the roadway layout for this concept to demonstrate the safety problems with this concept. It simply cannot be designed to any standards that would ensure safe operation. Due to the need to rebuild the structure on I-5 over the Carmel Valley Road, other structures required and the added length of the connector, there is no cost savings potential for this concept.

Considering that there is no cost savings potential, environmental issues and the fact that it cannot be built to operate safely, it should be dropped from further consideration.

The local community desire to keep the freeway-to-freeway traffic off local streets, freeway-to-freeway traffic needs to be accommodated in accordance with accepted standards to ensure safe, predictable operations. The direct connectors concept as shown in the PSR accomplish this.

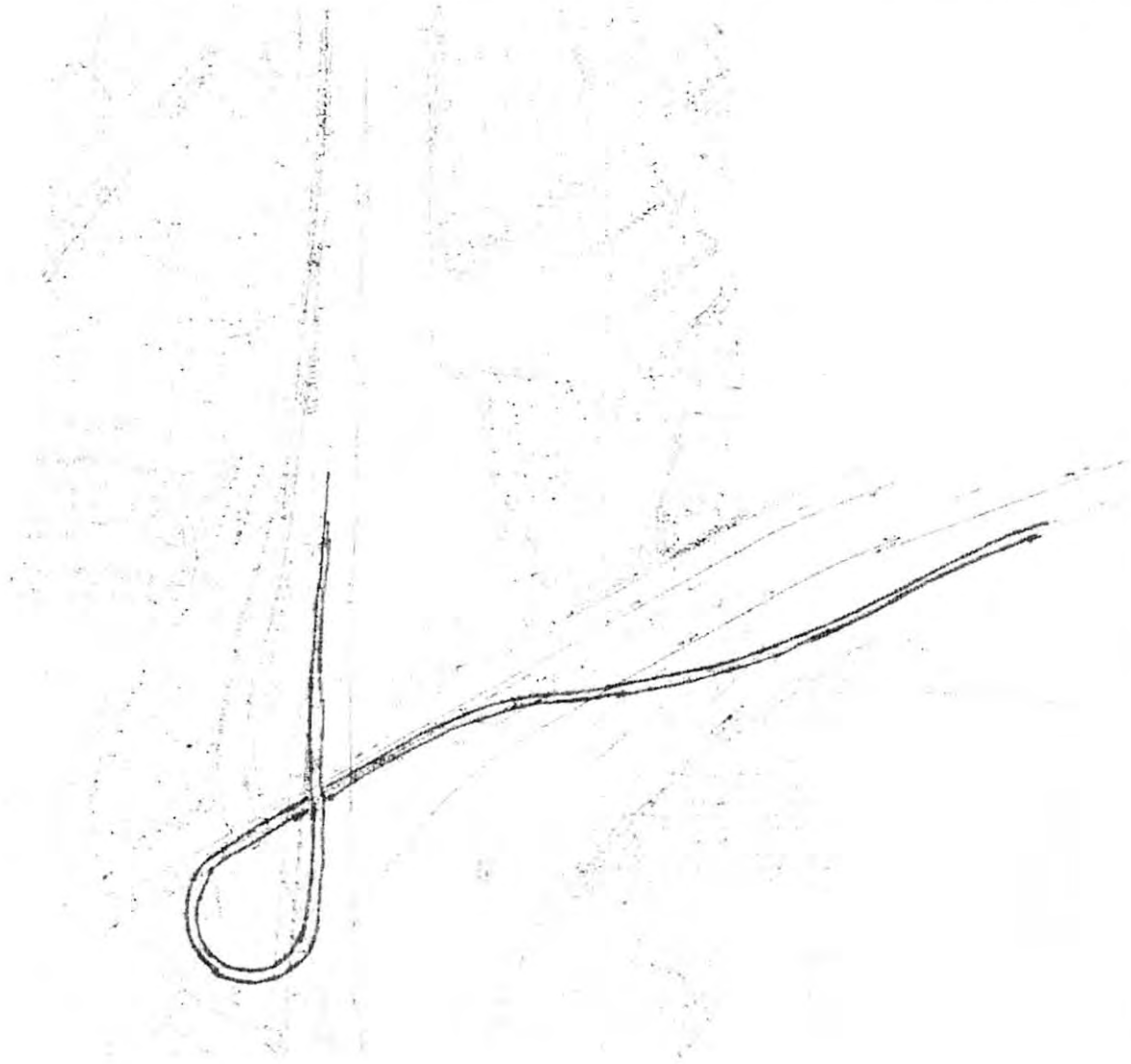
TECHNICAL REVIEWER COMMENTS:

This concept has too many design and safety issues to consider.

PROJECT MANAGEMENT CONSIDERATIONS:

Not a valid concept. No further action required

SKETCHES *I-5 / SR56 North Connectors*	**Caltrans**	
TITLE: Loop Ramp Connector from SB5 to EB 56	**NUMBER** 1.2	**PAGE NO.** 3 of 4



PERFORMANCE MEASURES *I-5 / SR56North Connector*	Caltrans		
TITLE: Loop Ramp I.L.O. Direct Connector Flyover	NUMBER 1.2		PAGE NO. 4 of 4
CRITERIA	**Performance**	**Original**	**Alternative**
Constructibility Environmental process time due to SB to EB Connector issues and funding for complete project could result in a project that would take ~12 years to complete.	Rating	2	2
	Weight	6	6
	Contribution	12	12
Local Traffic Operations Would require closing of the NB5 off ramp at Carmel Valley Road. This would force this traffic off at other locations and result in added traffic on local streets.	Rating	10	6
	Weight	11	11
	Contribution	110	66
Environmental Impact Impacts wetlands SW of interchange.	Rating	8	4
	Weight	16	16
	Contribution	128	64
Community Character Loop ramp impacts access to recreational area near wetlands.	Rating	3	5
	Weight	14	14
	Contribution	42	70
I-5 Freeway Operations Concept includes added lane on I-5 to permit safe merging of traffic on I-5 with minimal disruption to traffic flow. Exit spacing from SB5 do not meet required standards for driver decisions.	Rating	8	5
	Weight	13	13
	Contribution	104	65
Facilitate Smart Growth Permits the development of planned smart growth communities along the SR56 corridor.	Rating	10	10
	Weight	9	9
	Contribution	90	90
Compatibility with Other Highway Projects No significant impacts to other projects in the area.	Rating	9	9
	Weight	4	4
	Contribution	36	36
R/W Impacts No business takes or business disruptions.	Rating	8	7
	Weight	2	2
	Contribution	16	14
Safety Significant design exceptions required. Insufficient separation between exits on SB5. Cannot maintain geometry required for freeway to freeway connector.	Rating	8	3
	Weight	18	18
	Contribution	144	54
Support Multi-modal Use Does not add to or restrict multi-modal operations.	Rating	5	5
	Weight	7	7
	Contribution	35	35
Total Performance:		**717**	**506**
Net Change in Performance:			**-29%**

VALUE ANALYSIS ALTERNATIVE *I-5 / SR56 North Connectors*	**Caltrans**
FUNCTION: Separate Regional from Local Traffic	**ALTERNATIVE NO.** 1.3
TITLE: Use City Streets by Grade Separating SR56 On/Off Ramps at El Camino Real	**PAGE NO.** 1 of 4

ORIGINAL CONCEPT:

A direct freeway-to-freeway connector is planned for SB5 to EB56. This direct connect will need to "flyover" the existing WB56 to SB5 connector. The height of this connector poses concerns for project approval due to the visual impact and some community opposition.

ALTERNATIVE CONCEPT:

This concept was based on grade separating SR56 with El Camino Real and using Carmel Valley Road between El Camino Real and I-5 to carry both local and regional traffic. This would require all business access along Carmel Valley Road between El Camino Real and I-5 to be closed, requiring the take of the Shell gas station. The EB Carmel Valley Road left turn to NB 5 would be no longer allowed to improve traffic signal operations and traffic flow in the area. This traffic would need to travel to El Camino Real and loop back to the NB on ramp. At the end of the EB 56 off ramp there would need to be a traffic metering signal across both the off ramp lanes and the lanes on WB Carmel Valley Road to provide traffic the opportunity to weave and get in the desired lane to access either the NB or SB I-5 on ramps or go westbound on Carmel Valley Road. Both SR56 on and off ramps at El Camino Real would need to be closed.

ADVANTAGES:

- Cost reduction
- Reduced visual impact
- May be fundable sooner
- Reduced environmental resource issues
- Closing SR56 on and off ramps at El Camino Real improved signal timing opportunities and traffic congestion on El Camino Real

DISADVANTAGES:

- Cannot achieve roadway geometry that will result in safe operations
- Too many possible conflicts and driver confusion
- Significantly increases congestion in area already heavily congested
- Closing of businesses and access along Carmel Valley Road
- May need to widen structure under I-5
- Would impact right of way and businesses along Carmel Valley Road west of El Camino Real
- Cost are virtually all "throw-away" if direct connectors are eventually built
- Not a feasible solution
- Require possible environmental clean-up at site of Shell gas station

COST SUMMARY	Initial Cost	Present Value Subsequent Cost	Present Value Highway User Cost	Net Present Value
Original Concept	$	$	$	$
Alternative Concept	$	$	$	$
Savings	$	$	$	$ Not Viable

Team Member: All	**Discipline:** All	**PERFORMANCE:** -29%

VALUE ANALYSIS ALTERNATIVE *I-5 / SR56 North Connectors*		Caltrans	
TITLE:	Use City Streets by Grade Separating SR56 On/Off Ramps at El Camino Real	**ALTERNATIVE NO.** 1.3	**PAGE NO** 2 of 4

DISCUSSION / JUSTIFICATION:

The team spent considerable time trying to make this concept work. As each flaw was identified the concept was refined to try to get a workable solution. From this effort the team concluded that this is not viable and there are too many safety related issues to warrant further consideration. There is not sufficient physical space in this area to accommodate proper design and permit safe traffic operations. In addition the traffic simulation showed that the local streets are already heavily congested along Carmel Valley Road, and adding the R56 traffic to this road during peak travel times would virtually gridlock this area.

Even if this concept were valid, it would cost $60,000,000 to $70,000,000. This cost is basically "throw-away" and little from this concept would be usable if the direct connectors were implemented at a later date.

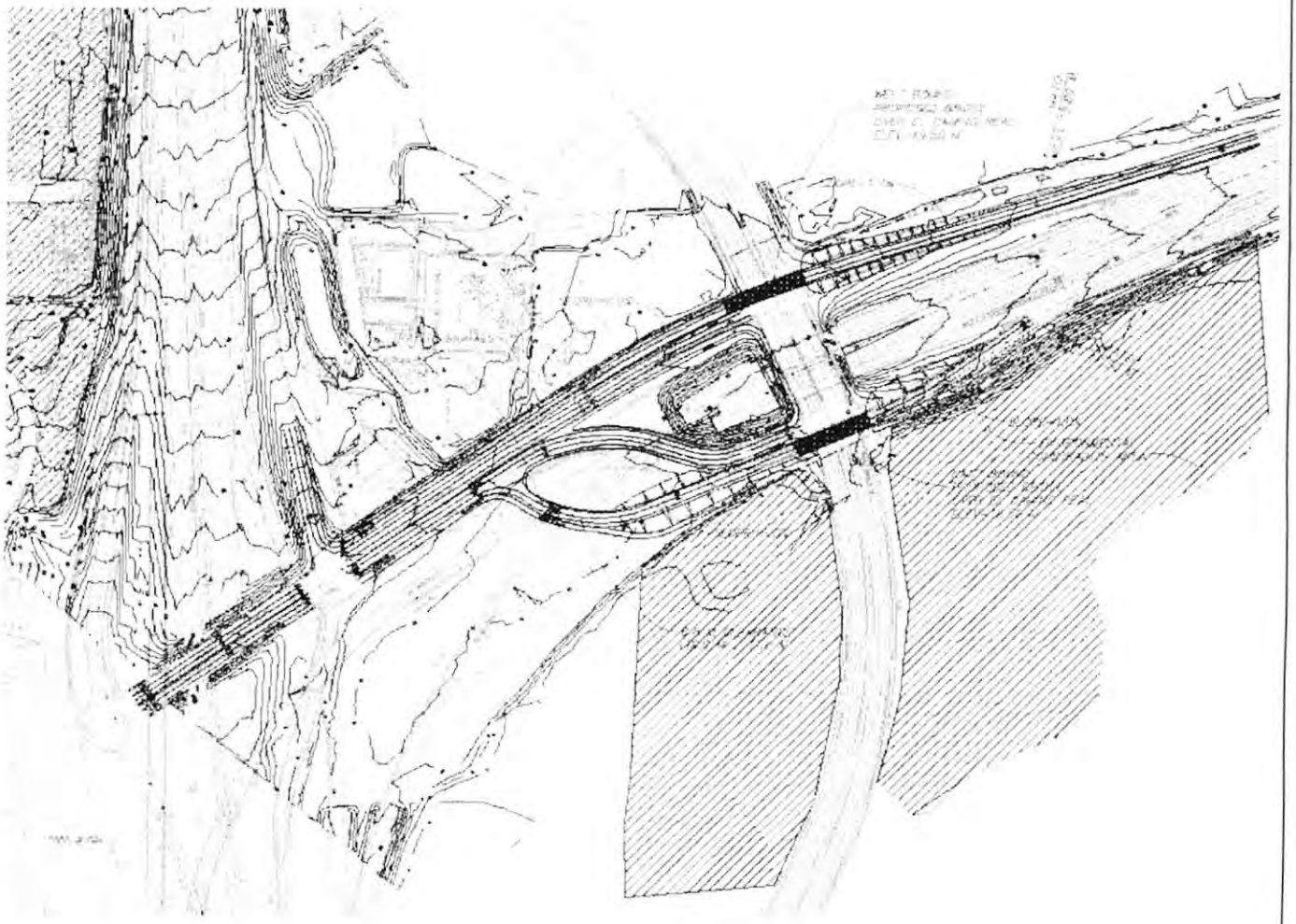
TECHNICAL REVIEWER COMMENTS:

This alternative should not be supported because it creates additional safety concerns without improving the traffic flow on the freeways, ramps and city streets. Furthermore it creates further added redirections through the community

PROJECT MANAGEMENT CONSIDERATIONS:

Not a valid concept. No further action required

SKETCHES *I-5 / SR56 North Connectors*		Caltrans	
TITLE:	Use City Streets by Grade Separating SR56 On/Off Ramps at El Camino Real	**NUMBER** 1.3	**PAGE NO.** 3 of 4



PERFORMANCE MEASURES *I-5 / SR56North Connector*		Caltrans	
TITLE: Use City Streets by Grade Separating SR56 On/Off Ramps at El Camino Real		**NUMBER** 1.3	**PAGE NO.** 4 of 4
CRITERIA	**Performance**	**Original**	**Alternative**
Constructibility Reduced cost and environmental issues could improve delivery time.	Rating	2	6
	Weight	6	6
	Contribution	12	36
Local Traffic Operations Added significant amount of traffic to local roads that are already congested by local traffic. Significant impact during rush hours.	Rating	10	1
	Weight	11	11
	Contribution	110	11
Environmental Impact No significant environmental impact.	Rating	8	9
	Weight	16	16
	Contribution	128	144
Community Character May impact both noise and air quality due to congestion on Carmel Valley Road.	Rating	3	5
	Weight	14	14
	Contribution	42	70
I-5 Freeway Operations No impact to I-5 operations. Traffic entering I-5 is controlled by ramp mater.	Rating	8	10
	Weight	13	13
	Contribution	104	130
Facilitate Smart Growth Need to determine if this option using local streets satisfies Measure M and permits development of smart growth communities.	Rating	10	5
	Weight	9	9
	Contribution	90	45
Compatibility with Other Highway Projects Does not impact other planned projects in the area.	Rating	9	10
	Weight	4	4
	Contribution	36	40
R/W Impacts Requires take of Shell station and possible environmental clean-up and closing of access to businesses along Carmel Valley Road.	Rating	8	2
	Weight	2	2
	Contribution	16	4
Safety Significant safety problems due to poor stopping sight distances, weave conflicts and potentially confusing conditions for drivers.	Rating	8	1
	Weight	18	18
	Contribution	144	18
Support Multi-modal Use Does not add to or restrict multi-modal operations.	Rating	5	5
	Weight	7	7
	Contribution	35	35
Total Performance:		**717**	**533**
Net Change in Performance:			**-26%**

Project Analysis

PROJECT ANALYSIS

SUMMARY OF ANALYSIS

The following value analysis tools were used to study the project:

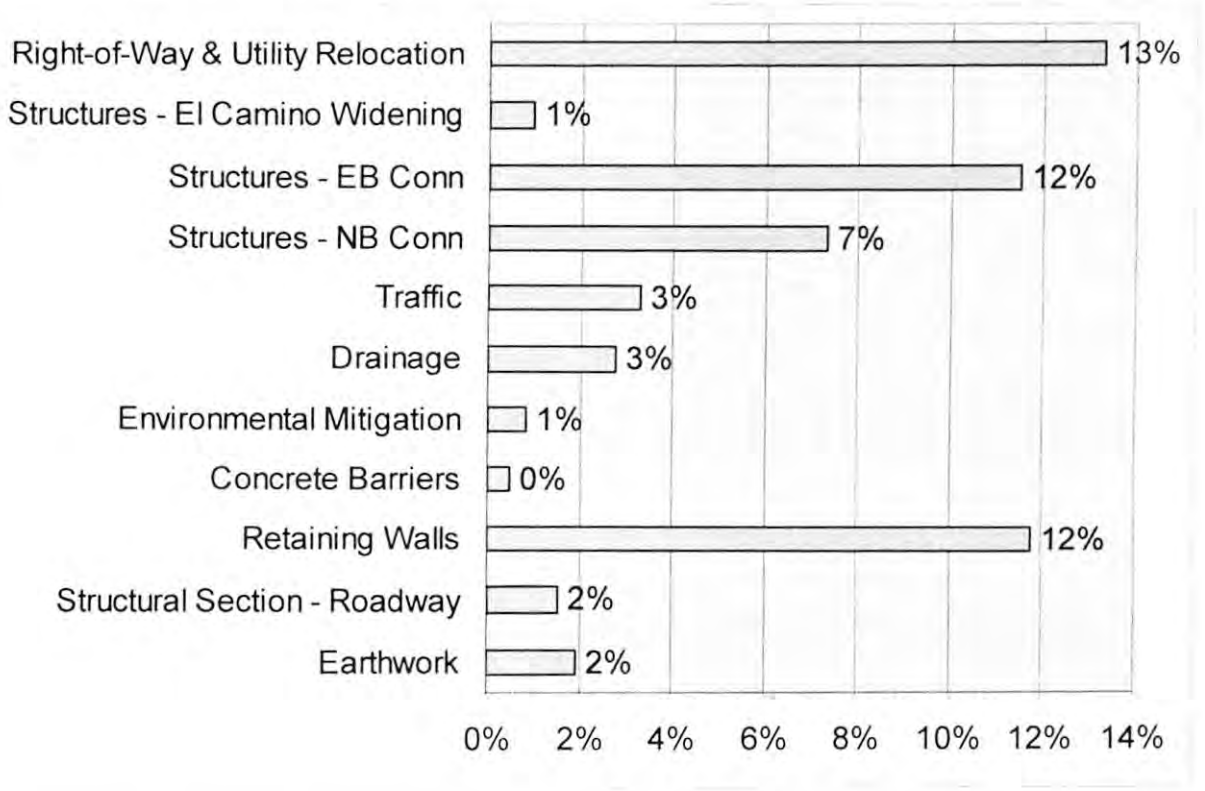
- Cost Model
- Function Analysis / FAST Diagram
- Performance Criteria Matrix
- Performance Rating Matrix
- Traffic Volume Estimates

Supporting information relating to the analysis performed using these tools is included on the following pages.

COST MODEL

The VA team leader prepared a cost model from the designer's cost estimates. The model is organized to identify major construction elements or trade categories, the designer's estimated costs, and the percent of total project cost for the significant cost items.

This cost model clearly showed the cost drivers for the project and was used to guide the VA team during the VA Study. Based on the cost estimate in the PSR, approximately 13% of the estimated project costs are for right of way and utility relocation, 12% for retaining walls to accommodate widening of I-5, 12% for the SB5 to EB 56 Connector and 7% for the EB to NB Connector. As a result of the traffic simulation developed to evaluate the relative effectiveness of the various concepts, the team identified possible congestion on WB56 between Carmel Creek Road and El Camino Real. This congestion is caused by weaving between vehicles at the Carmel Creek westbound on-ramp and the El Camino Real westbound off-ramp on SR 56. Correcting this weaving problem could add ~10% to the project cost.



Cost Model - I 5 / SR 56 North Connectors

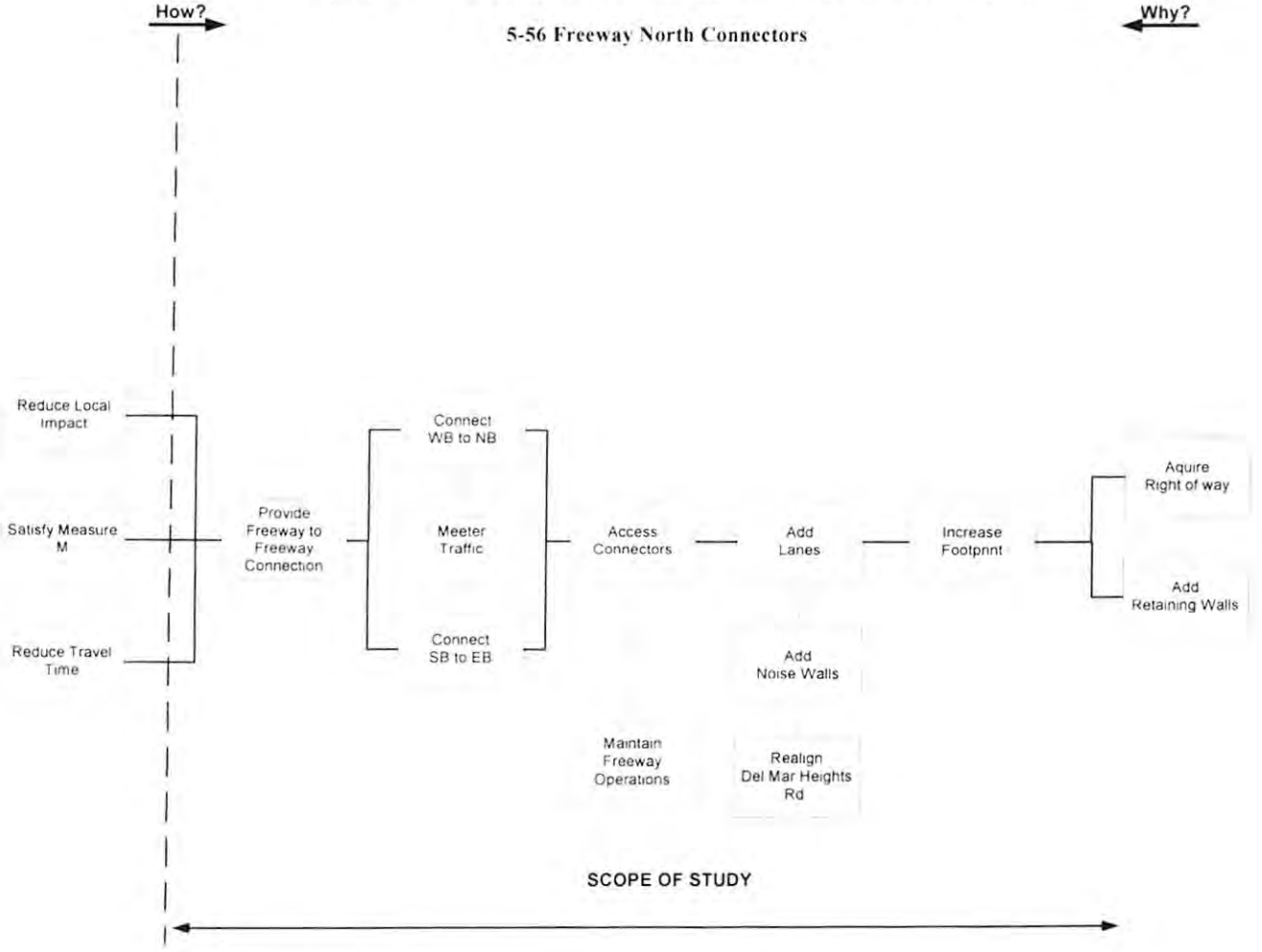
Estimated Items		PSR Alternative 1	% of Total	% of Subtotal
Earthwork	$	2,647,350	2%	3%
Structural Section - Roadway	$	2,094,660	2%	3%
Retaining Walls	$	16,170,000	12%	21%
Concrete Barriers	$	668,400	0%	1%
Environmental Mitigation	$	1,126,787	1%	1%
Drainage	$	3,788,175	3%	5%
Traffic	$	4,499,699	3%	6%
Structures - NB Connector	$	10,084,528	7%	13%
Structures - EB Connector	$	15,805,345	12%	21%
Structures - El Camino Widening	$	1,340,196	1%	2%
Right-of-Way & Utility Relocation	$	18,223,100	13%	24%
			0%	
Sub Total - Estimated Items	**$**	**76,448,240**	56%	100%
Items Determined as a % of Highway Work				
Minor Items	$	1,628,402		
Mobilization	$	3,419,644		
Supplemental Work	$	1,720,522		
Contingencies	$	8,549,110		
Sub Total - % Items	**$**	**15,317,678**		
	TOTAL $	**91,765,918**		
Support	$	21,940,000		
Escalation to 2005	$	23,536,082		
	TOTAL ESCALATED COST $	**137,242,000**		

FUNCTION ANALYSIS / FAST DIAGRAM

Function analysis was performed and a FAST Diagram was produced, which revealed the key functional relationships for the project. This analysis provided a greater understanding of the total project and how the issues, project cost, and function requirements are related.

Using function analysis and Function Analysis System Technique (FAST) diagramming, the team defined the basic functions of this project as *Provide Freeway to Freeway Connection* in order to *Satisfy Measure M* and *Reduce Local Impact* of regional traffic on local streets. This process also helped to gain understanding by the local stakeholders participating on the VA Team why the widening on I-5 is a necessary part of the direct connectors.

FUNCTION ANALYSIS SYSTEM TECHNIQUE DIAGRAM



PERFORMANCE CRITERIA MATRIX

The evaluative criteria matrix was used to determine the key evaluative criteria for the project. The VA team listed, with the assistance of the stakeholders, the possible evaluative criteria that could be used to evaluate the creative ideas. These criteria were entered onto a matrix and compared in pairs, asking the question: "Which one is more important to the project?" The letter code (e.g., "a") was entered into the matrix for each pair. When the VA team considered the pair of criteria to be essentially equal in importance, both letters (e.g., "a/b") were entered into the appropriate box. When all pairs were discussed they were tallied and percentages calculated. The highest scoring criteria were selected for use in the Evaluation Phase of the study.

For this project, the following performance criteria were selected using the Performance Criteria Matrix on the following page:

- **Constructibility:** How will the concept affect construction related issues such as staging, ability to phase construction to meet available funds, and delivery schedule?
- **Local Traffic Operations:** How will the concept affect local trips by motorists, bicyclists and pedestrians and the level of service on local roads?
- **Satisfy Ballot Measure M:** Will the alternative satisfy the wording of Measure M? Y or N?
- **Environmental Impacts:** How does the concept affect the local environment in terms of noise, wetlands, environmental justice, visual, etc. as it relates to the animals and habitat?
- **Community Character:** How does the concept affect the local environment in terms of noise, environmental justice, visual, etc. as it relates to people?
- **Freeway Operations:** How will the concept affect operating speeds and level of service on I 5 and SR 56 as it relates to LOS and trip time?
- **Facilitate Smart Growth:** How will the concept support smart growth plans and initiatives?
- **Compatible with other Highway Improvement Projects:** How compatible are the concepts with the other projects being constructed at this interchange.
- **Right of Way Impact:** The amount of right a way needed for the project, the cost of the right of way, any unique problems or remediation that may be needed for the right of way and the utility relocation requirements for the project are considered.
- **Safety:** How the concept complies with Design Standards that effect highway accident rates.
- **Increases Demand:** Does the concept result in increasing travel through the area?
- **Support Multi-modal Use:** Does the concept support or improve opportunities for multi-modal use, including bicycle, and walking?

PERFORMANCE CRITERIA MATRIX

I-5 / SR56 Interchange

Caltrans

											TOTAL	%	Adjusted Rating %
Constructibility	A	b	c	d	e	f	a	a	i	a	k	3.0	5.5%	6%
Local Traffic Operations	B	c	d	e	b	b	b	i	b	b		6.0	10.9%	11%
Environmental Impact	C	c	c	c	c	c	c	i	c	c		9.0	16.4%	16%
Community Character	D	d	d	d	d	d	i	d	d			8.0	14.5%	14%
I-5 Freeway Operations	E	e	e	e	e	i	e	e				7.0	12.7%	13%
Facilitate Smart Growth	F	f	f	f	i	f	f					5.0	9.1%	9%
Compatibility with Other Projects	G	g	g	i	g	k						2.0	3.6%	4%
R/W Impact	H	i	h	k								1.0	1.8%	2%
Safety	I	I	I									10.0	18.2%	18%
Increases Demand	J	k										0.0	0.0%	0%
Support Multi-modal Use	K											4.0	7.3%	7%
												55.0	100%	100%

PERFORMANCE RATING MATRIX

A performance matrix was used to compare the original design concepts with VA alternative sets. Using the performance criteria developed by the VA team, the design concepts were ranked on a scale of 1 to 10 and scored by multiplying the weightings. The resulting matrix (see following pages) gives total criteria and value ratio (criteria/cost) numbers.

The VA team evaluated the performance of the current project, as well as the existing ("no-build") conditions presented in the PSR. The performance ratings for these are indicated on the matrix using a different pattern scheme. Where possible, the VA team tried to use recognized units of measure to rate performance; however, this was not possible in all cases.

The total performance ratio for each of the sets, as well as the original design, has been totaled and divided by their total costs. The resulting number has been identified as the value index (cost/performance ratio). The net change in the value index between the original design and the three VA Alternatives has been identified as a percent value improvement.

PERFORMANCE RATING MATRIX

I-5 / SR56 North Connectors

Caltrans

Criteria	Criteria Weight	Concept	Performance Rating 1	2	3	4	5	6	7	8	9	10	Total Performance
Constructibility	6	Baseline		2									12
		Alternative 1.1						6					36
		Alternative 1.2		2									12
		Alternative 1.3						6					36
Local Traffic Operations	11	Baseline										10	110
		Alternative 1.1								8			88
		Alternative 1.2						6					66
		Alternative 1.3	1										11
Environmental Impact	16	Baseline								8			128
		Alternative 1.1								8			128
		Alternative 1.2				4							64
		Alternative 1.3									9		144
Community Character	14	Baseline			3								42
		Alternative 1.1								8			112
		Alternative 1.2					5						70
		Alternative 1.3					5						70
I-5 Freeway Operations	13	Baseline								8			104
		Alternative 1.1								8			104
		Alternative 1.2					5						65
		Alternative 1.3										10	130
Facilitate Smart Growth	9	Baseline										10	90
		Alternative 1.1							7				63
		Alternative 1.2										10	90
		Alternative 1.3					5						45
Compatible with Other Highway Projects	4	Baseline									9		36
		Alternative 1.1									9		36
		Alternative 1.2									9		36
		Alternative 1.3										10	40
R/W Impacts	2	Baseline								8			16
		Alternative 1.1								8			16
		Alternative 1.2							7				14
		Alternative 1.3		2									4
Safety	18	Baseline								8			144
		Alternative 1.1							7				126
		Alternative 1.2			3								54
		Alternative 1.3	1										18
Support Mult-Modal Use	7	Baseline					5						35
		Alternative 1.1					5						35
		Alternative 1.2					5						35
		Alternative 1.3					5						35

Overall Performance	Total Performance	% Performance Improvement	Total Cost	Value Index (P/C)	% Value Improvement
Baseline Design	717		$137.0	5.23	
Alternative 1.1	744	4%	$90.0	8.27	58%
Alternative 1.2	506	-29%	NA	NA	NA
Alternative 1.3	533	-26%	NA	NA	NA

TRAFFIC SIMULATION

To better understand the potential operational effect of the VA Alternatives, traffic simulations were created for the various VA and PSR Alternatives. Traffic data for this analysis was updated from the information in the PSR. This was done to reflect the latest estimates from SANDAG and the City of San Diego. These new traffic estimates were significantly greater than the values provided to Caltrans at the time the PSR was developed.

With this new information the development and analysis of the traffic simulations resulted in the following revelations regarding traffic in the area.

- The latest traffic model data from SANDAG, released during the VA Study, shows an increase in the traffic demand for the North Connectors. Increases are due to changes in the SANDAG model, since the data was collected for the PSR in 1998. The latest traffic model data shows ~2100 vph in the year 2025, where the Caltrans PSR shows ~1500 vph.

- Based on latest traffic projections from the City of San Diego, local traffic on El Camino Real and Carmel Valley Road has also increased over the traffic numbers available at the time the PSR was developed. This increase is partially due to the removal of the segment of Carmel Creek Road to the south of SR 56. This forces more traffic onto El Camino Real, which impacts operations on Carmel Valley Road.

- The development of the local area has created significant trip generators that affect southbound I-5 and local arterials in both AM and PM rush hours. This local demand creates significant local congestion and is independent of regional traffic using SR56.

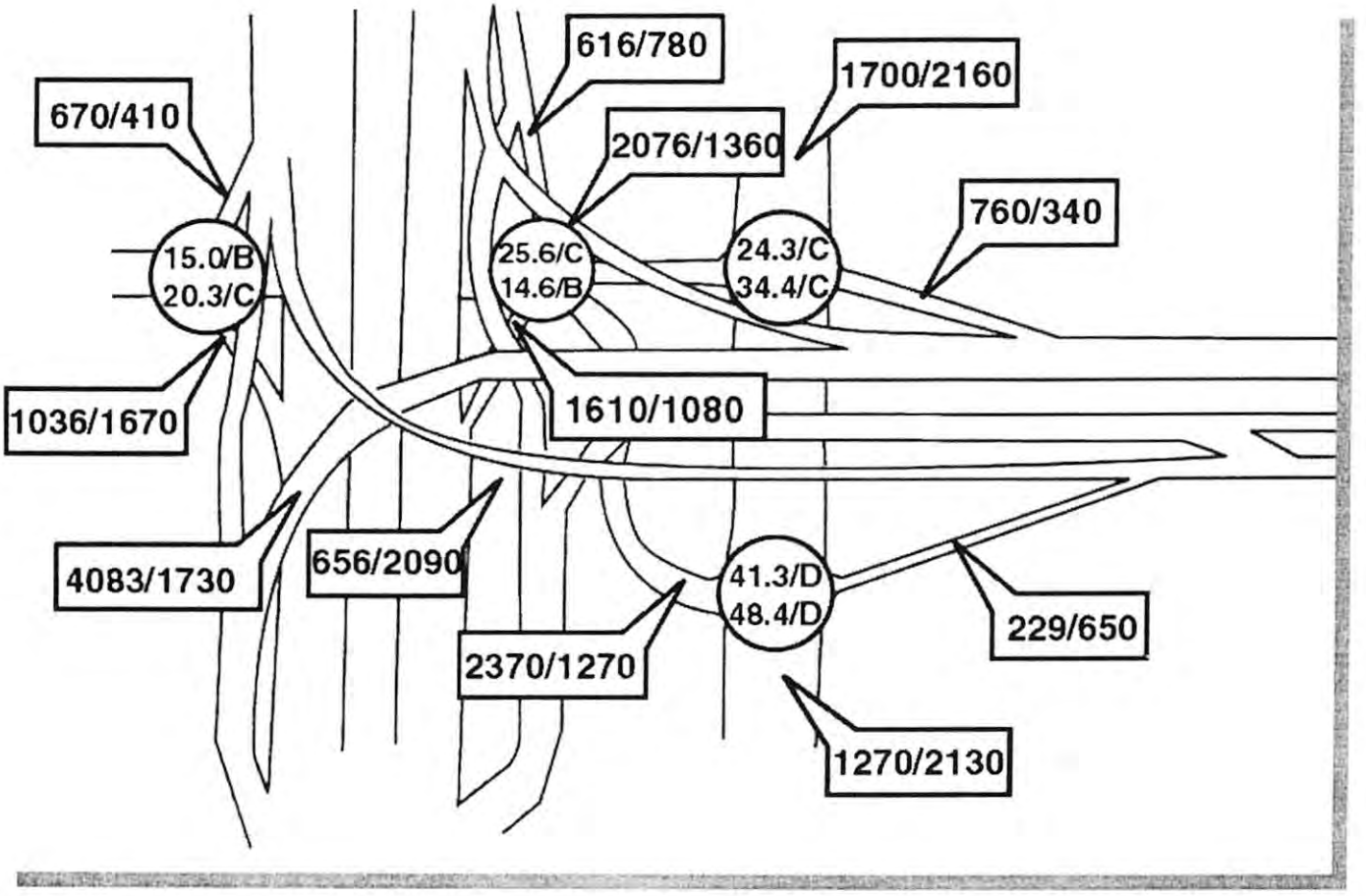
- The westbound to northbound Connector will be capable of handling the year 2025 regional traffic demands caused by the completion of SR56. Without the connector, the added traffic that will use Carmel Valley Road or other local streets will further exacerbate the existing congestion problem.

- The southbound to eastbound Connector will be capable of handling the regional traffic demands in the year 2025. Eastbound Carmel Valley Road also appears capable of handling this volume of traffic, although local operational improvements may be necessary to ensure the viability of using Carmel Valley Road until the completion of the southbound I-5 to eastbound SR56 Connector.

- Freeway congestion is only apparent during peak travel times. Non-peak traffic in the area is not expected to be a problem.

The traffic volumes used in this analysis are included on the following pages.

Projected Traffic Demand Volumes for 5/56 Interchange



Project Description

PROJECT DESCRIPTION

INTRODUCTION

SR-56 will serve as an east-west connector between I-5 and I-15 and will connect the communities of Carmel Valley and Rancho Penasquitos. Two sections of SR-56 between I-5 and I-15 have been completed and are currently operational. The middle section, approximately 8.0 KM, is scheduled to be advertised for construction in April 2002. The project's need and purpose, as understood by the VA Team, is to minimize the regional traffic connecting from westbound SR56 to northbound I-5 and southbound I-5 to eastbound SR56 from congesting local streets while making these moves. Based on the SR-56 traffic study, the SR-56/I-5 north direct connectors need to be built between 2015 and 2020, in order to maintain level of service "D" operating conditions in the SR-56/I-5 Interchange area. Caltrans recently completed a PSR in order to identify project impacts.

Project cost is estimated at $137,000,000 in 2005 dollars. However, this estimate does not include the design modification that may be needed based on the most recent traffic numbers. This project is not currently funded in the Regional STIP/RTP.

BACKGROUND

I-5 is a principal north-south arterial for the western United States in the National Highway System, extending from the Mexican border at the south to the Canadian border at the north. Regionally, I-5 serves as the commuter link for the coastal communities of San Diego County. As such, this portion of I-5 carries a large percentage of commuter traffic as well as intraregional, interregional, and international traffic. The portion of I-5 covered in this report was originally constructed in 1953 and added to the California Freeway and Expressway System in 1959. It was widened to eight lanes in 1972. SR-56 will serve as an east-west connector for I-5 and I-15. It is located in the northerly part of San Diego County and will connect the communities of Carmel Valley and Rancho Penasquitos. Completion of SR-56 will reduce traffic congestion on local streets and provide an east-west connection from I-5 to I-15, between SR-52 and SR-78.

Two sections of SR-56 between I-5 and I-15 have been completed and are currently operational. These sections include approximately 3.4 kilometers (km) at the western end (SR-56 West) and approximately 3.1 km at eastern end (SR-56 East). The middle section, approximately 8.0 km will be completed in the near future. Most of the middle section will be within an area of the City of San Diego formerly known as the North City Future Urbanizing Area (NCFUA). Proposition A, the Managed Growth Initiative, requires a majority vote of the general public to change the zoning from "future" to "planned" urbanizing. This is known as the "phase shift". Recent ballot initiatives received the required majority vote for a "phase shift". Now the entire area is a planned urbanizing area. Based on the SR-56 traffic study, implementation of the "phase shift" in the NCFUA requires that the SR-56/I-5 north direct connectors are built between 2015 and 2020, in order to maintain level of service D operating conditions in the SR-56/I-5 interchange area. The portion of I-5 and SR-56 in the vicinity of this project is characterized by a mix of developed and undeveloped property adjacent to the freeway right of way. On I-5, business parks, residential, and commercial development define the surrounding area. On SR 56, residential, hotel, and open space areas lie to the north of the highway. To the south is the undeveloped Carmel Creek basin.

The Carmel Valley Restoration and Enhancement Program (CVREP) was developed to reduce the urban runoff and associated sediments and prevent such from reaching Los Penasquitos Lagoon. It also provided biological mitigation for transportation projects in the Carmel Valley area (I-5/ SR-56 interchange, Sr-56 West, El Camino Real).

SR-56 west was constructed as a four-lane freeway (with a 16.5 meter median to accommodate future widening for two additional lanes) from El Camino Real to 0.8 km east of Carmel Country Road. This section was opened to traffic in March 1995. A collector/distributor road was constructed between El Camino Real and Carmel Creek Road to reduce the weaving conflicts in this area. A barrier separates the through traffic on SR-56 from the entrance and exit ramp traffic. On I-5, a project is being completed to widen I-5 and I-805 to reduce congestion, increase capacity, and improve motorist safety. The project extends from Genesee Avenue to Del Mar Heights Road. The project was separated into 3 stages. The first stage (Stage 1) included the construction of direct connectors from northbound I-5 to eastbound SR-56 ("NE" connector) and from westbound SR-56 to southbound I-5 ("WS" connector). This project was completed in October, 1998. The second stage (Stage 1b) to add high occupancy vehicle (HOV) lanes to the center median between the I-5/805 merge and Del Mar Heights Road was completed in 2000.

The third stage (Stage 2) consists of adding four lanes in each direction to I-5 south of the SR-56 junction and 2 lanes north of the junction, between Carmel Valley Road and Del Mar Heights Road. A barrier will separate the new lanes from the existing freeway. The new lanes are for truck traffic and for motorists using SR-56 and the proposed interchange at Carmel Mountain Road. The proposed diamond interchange at Carmel Mountain Road will be added as part of this project. Construction advertisement is scheduled for late 2001. As a result of this project, the configuration of I-5 between SR-56 and Del Mar Heights Road will consist of 12-lanes plus 2-HOV lanes. When the I-5/805 widening project is complete, the southern section of I-5 will be connected to SR-56 with direct freeway-to-freeway connectors. The section of I-5 north of SR-56 will use the Carmel Valley Road interchange to access SR-56. The barrier-separated truck bypass facility will end just north of the Carmel Valley Road Interchange resulting in a six-lane contiguous freeway. On northbound I-5, the two-truck lanes will continue to the Del Mar Heights Interchange. The 6th lane will exit at the Del Mar Heights exit ramp and the 5th lane will continue past Del Mar Heights Road. On southbound I-5, the 5th lane begins north of Del Mar Heights Road and diverges at the truck bypass exit ramp. The 6th lane begins between Carmel Valley Road and Del Mar Heights Road. The interchange spacing between Carmel Valley Road and Del Mar Heights Road is approximately 1.9 kilometers.

Due to freeway congestion and excess traffic demand, a PSR is currently being completed to add two general purpose lanes and one HOV lane to northbound and southbound I-5 from Del Mar Heights Road to Encinitas Blvd. It will add one general purpose lane and one HOV lane from Encinitas Blvd. to Vandegrift Blvd. The PSR also shows the addition of auxiliary lanes, where necessary, to address weaving and merge problems on the corridor. The PSR has been completed and the project is awaiting the initiation of the PR/ED phase. Based on funding availability, the construction is scheduled to be completed by year 2020.

An additional lane is being studied for northbound I-5 between Del Mar Heights Road and Via De La Valle. The project study report was completed in October 1997. The project is programmed in the 1998 STIP with the Regional Improvement Program (STIP-RIP) with funds totaling $6,100,000. The next stage will complete the PR/ED and the completion date has not yet been determined. In addition to the freeway improvements, Caltrans, the Metropolitan Transit Development Board (MTDB), and the North County Transit Development Board (NCTD) are studying Traffic System Management (TSM), Intelligent Transportation Systems (ITS) improvement alternatives, Light Rail Transit (LRT) alignments, and/or other transit-related improvements. These were part of the Major Investment Study (MIS) for the I-5

corridor. These improvements are intended to maximize the person-carrying capacity within the I-5 corridor.

PROJECT DESCRIPTION

The PSR recommends two primary alternatives for further study:

- Direct Connectors - The direct connector concept proposed in the PSR is to construct connectors from westbound SR-56 to northbound I-5 and southbound I-5 to eastbound SR-56. Improvements would include constructing two-lane direct connector structures, approach pavement sections, and auxiliary lanes on westbound SR-56 and northbound and southbound I-5. The truck bypass facilities on north and southbound I-5 would be realigned to the outside of the 5/56 connector structures and the bypasses and barrier separation would be extended to Del Mar Heights Road. To facilitate the alignment of the direct connectors, Carmel Valley Road, the entrance ramp from El Camino Real to eastbound SR-56, the northbound entrance ramp and southbound exit ramp at Carmel Valley Road, and all ramps at the Del Mar Heights Road Interchange will be realigned to facilitate the alignment of the direct connectors.

- Local Street Connection - improve the local street connection to northbound I-5 by improving the ramps at El Camino Real and Carmel Valley Road. This option would use Carmel Valley Road for regional traffic making the north connections between SR56 and I-5 and make improvements to this area so that local traffic would operate at an acceptable level. The PSR estimated the project to cost ~$30,000,000 (escalated to assume construction in the year 2005).

INFORMATION PROVIDED TO THE VA TEAM

The following project documents were provided to the VA team for their use during the study:

- Project Study Report, this report was detailed and included, narratives, traffic projections, drawings, and cost estimates. This was provided to the VA Team both in printed and electronic formats. CAD files of the PSR concepts were also provided.

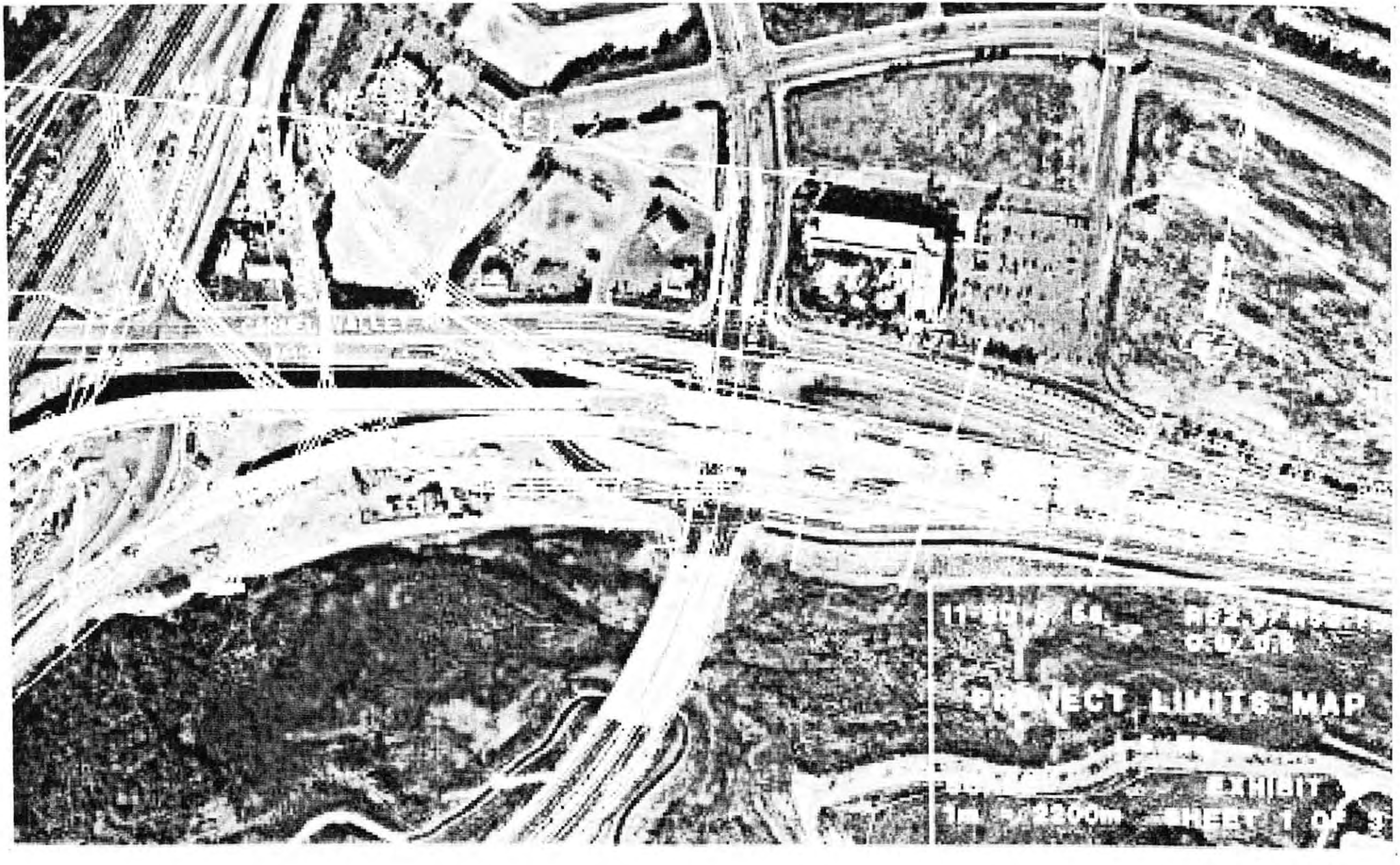
- Aerial Photographs

PROJECT DRAWINGS

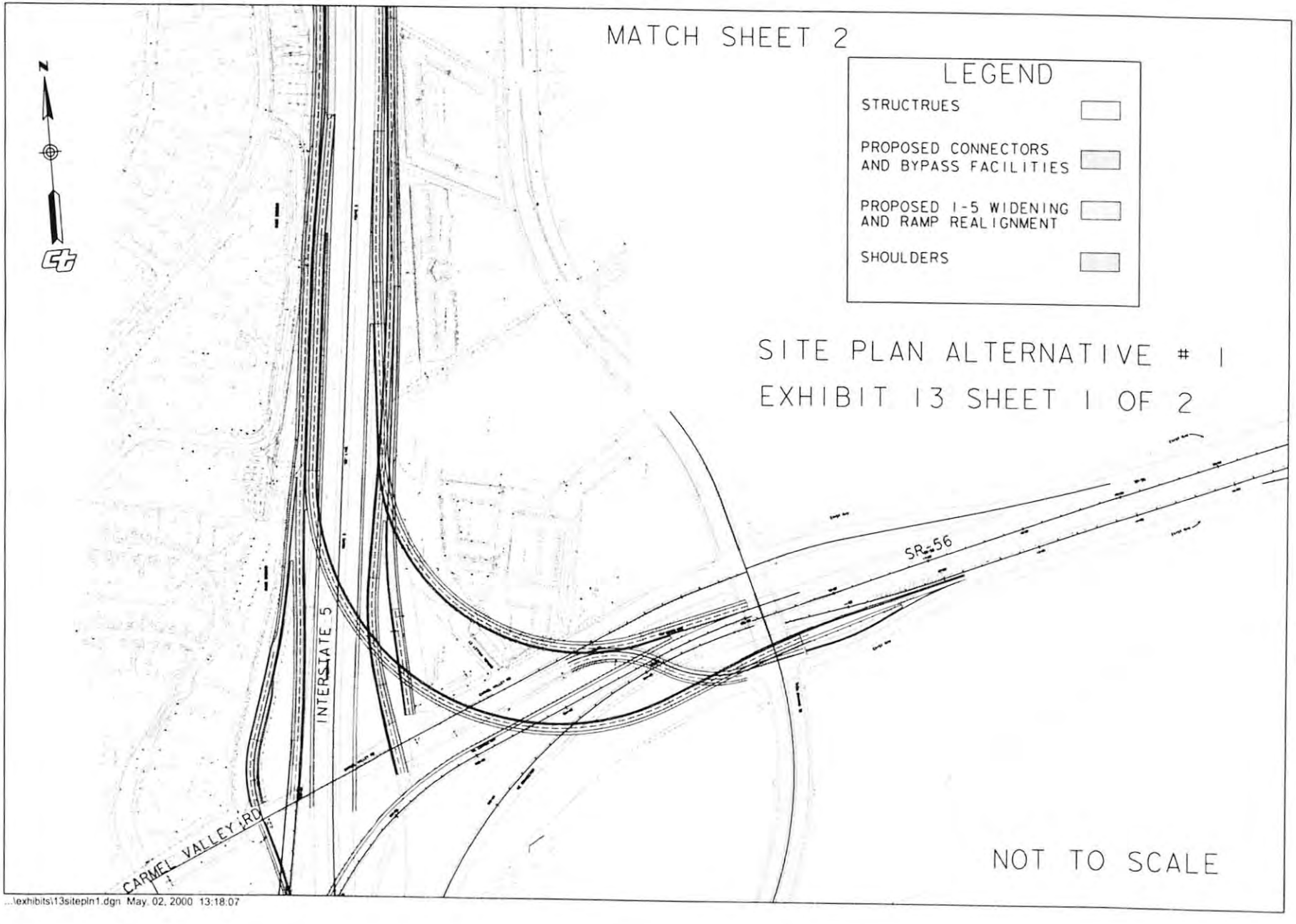
A drawing depicting the overall project is included at the end of this section.

PROJECT COST ESTIMATE

The PSR project estimate is included following the drawings


PROJECT LIMITS MAP
EXHIBIT

MATCH LINE SEE SHEET 3



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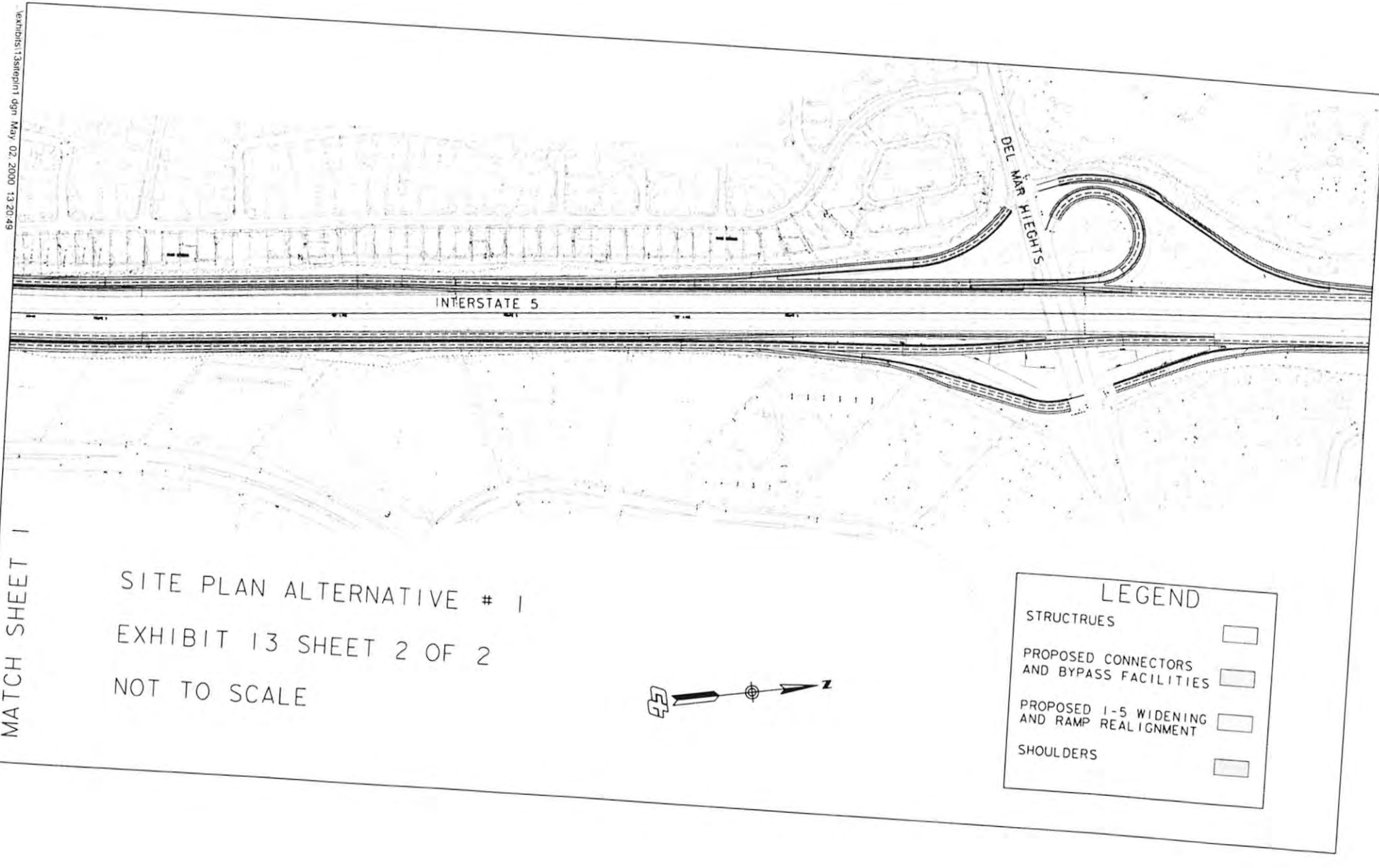

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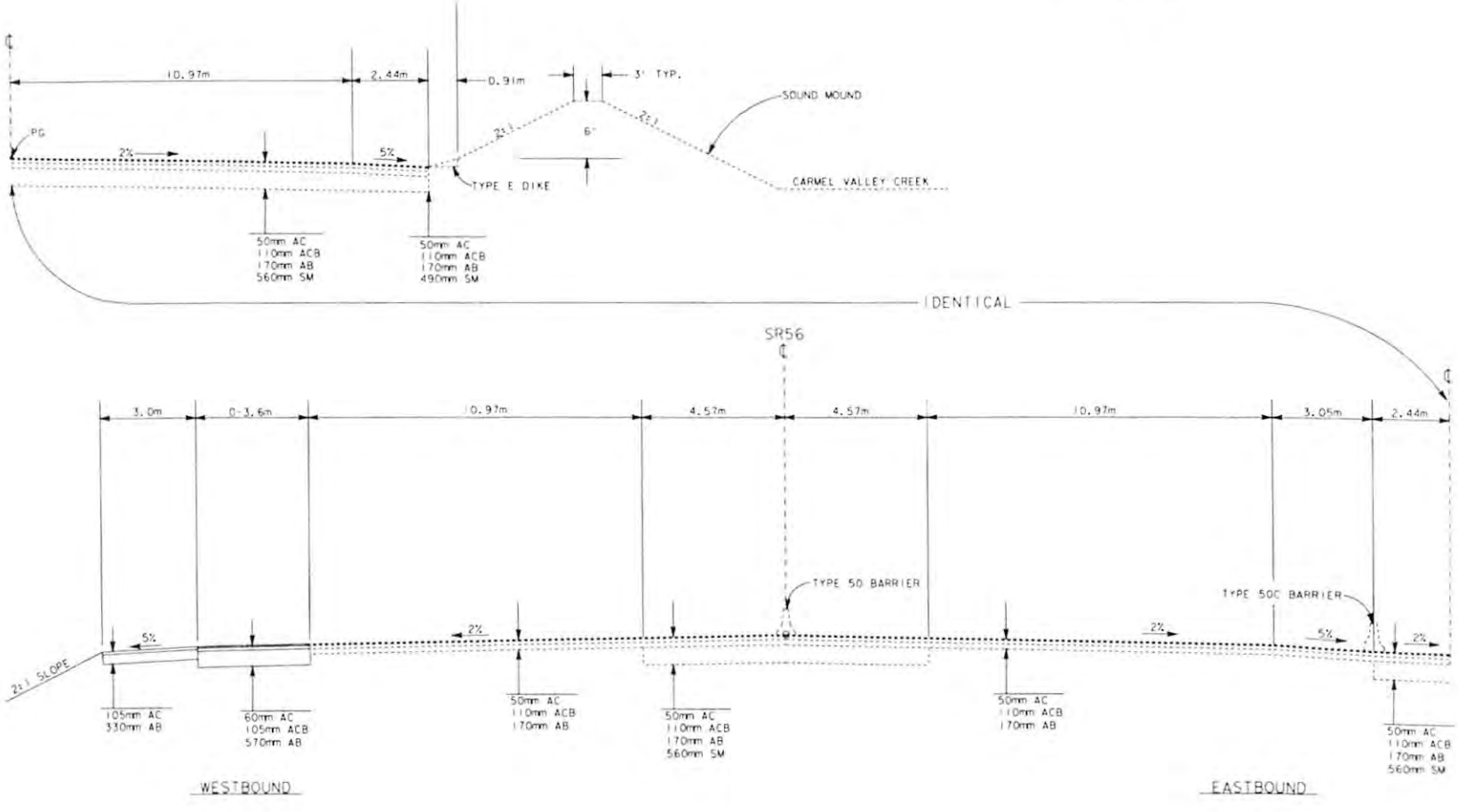
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
11	SD	S.56	R52.9/R53.7, 0.0/0.8	1	7

Caltrans Metric



SR 56

EXHIBIT 11
TYPICAL SECTION
ALTERNATIVE 1

NTS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER | CALCULATED/DESIGNED BY | CHECKED BY | DATE REVISED BY | DATE REVISED

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

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DGN FILE => $REQUEST

CU 00000

EA 000000

DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

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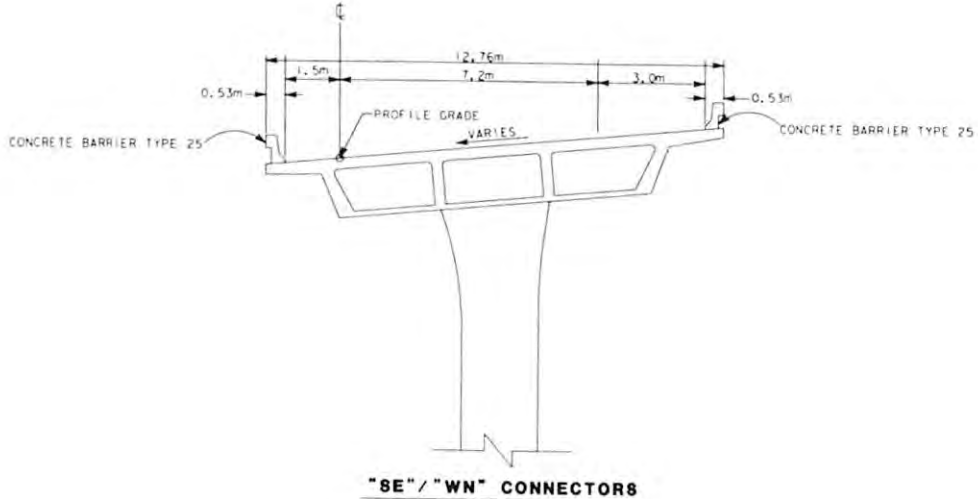
Caltrans Metric



"SE"/"WN" CONNECTORS

EXHIBIT 11
BRIDGE ELEVATION

NTS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER
CALCULATED/DESIGNED BY
CHECKED BY
DATE
REVISED BY
DATE REVISED

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80
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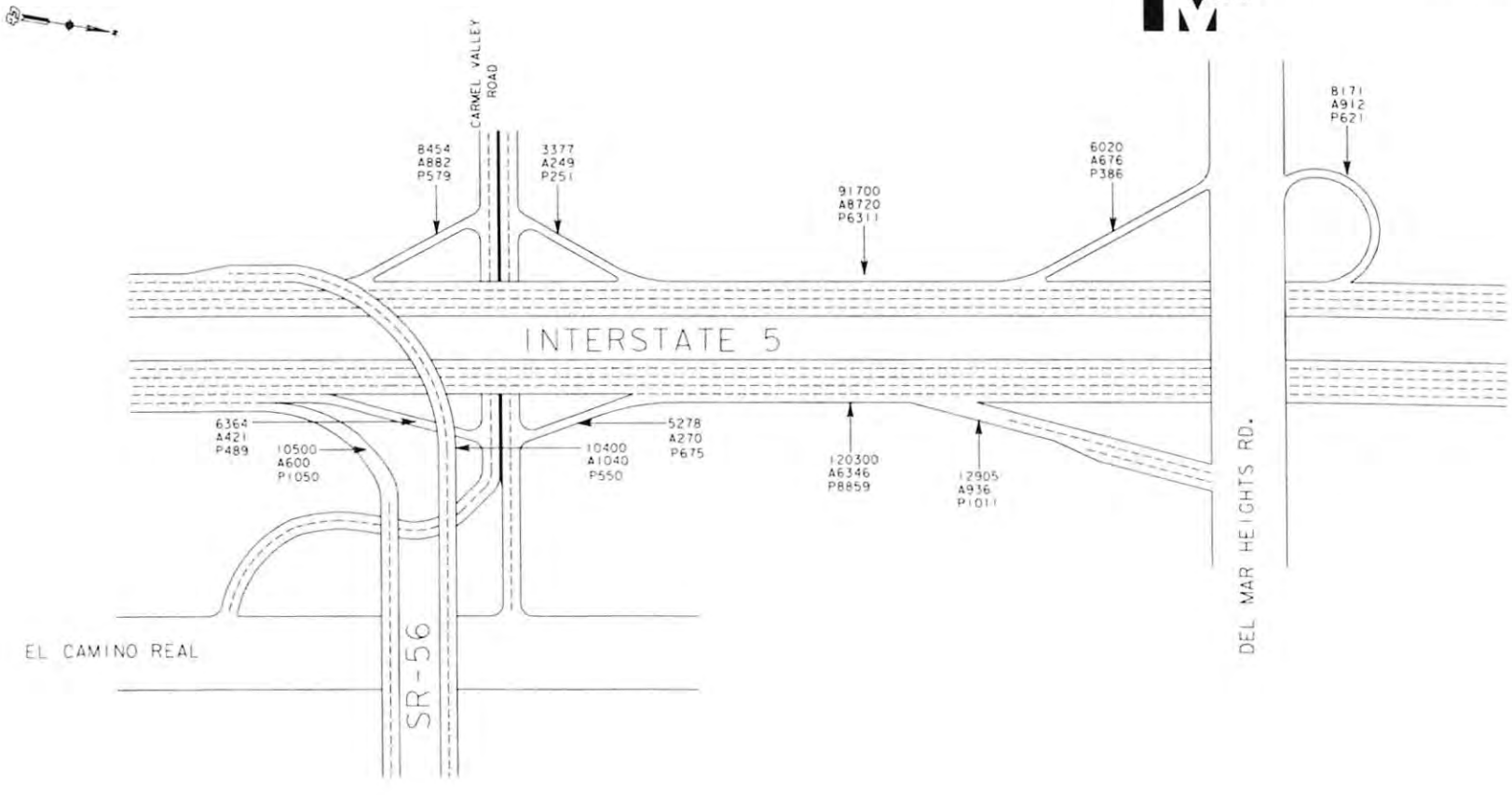
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
11	SD	S/56	R52.9/R53.7. 0.0/0.8	2	2

Caltrans Metric



LEGEND:

10000 : AVERAGE DAILY TRAFFIC

A 1000 : AM PEAK PERIOD (vph)

P 1000 : PM PEAK PERIOD (vph)

TRAFFIC VOLUMES

EXISTING - YEAR 1998

AM AND PM

EXHIBIT 4

NTS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER | CALCULATED/DESIGNED BY | CHECKED BY | DATE | REVISED BY | DATE REVISED

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

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DGN FILE => $REQUEST

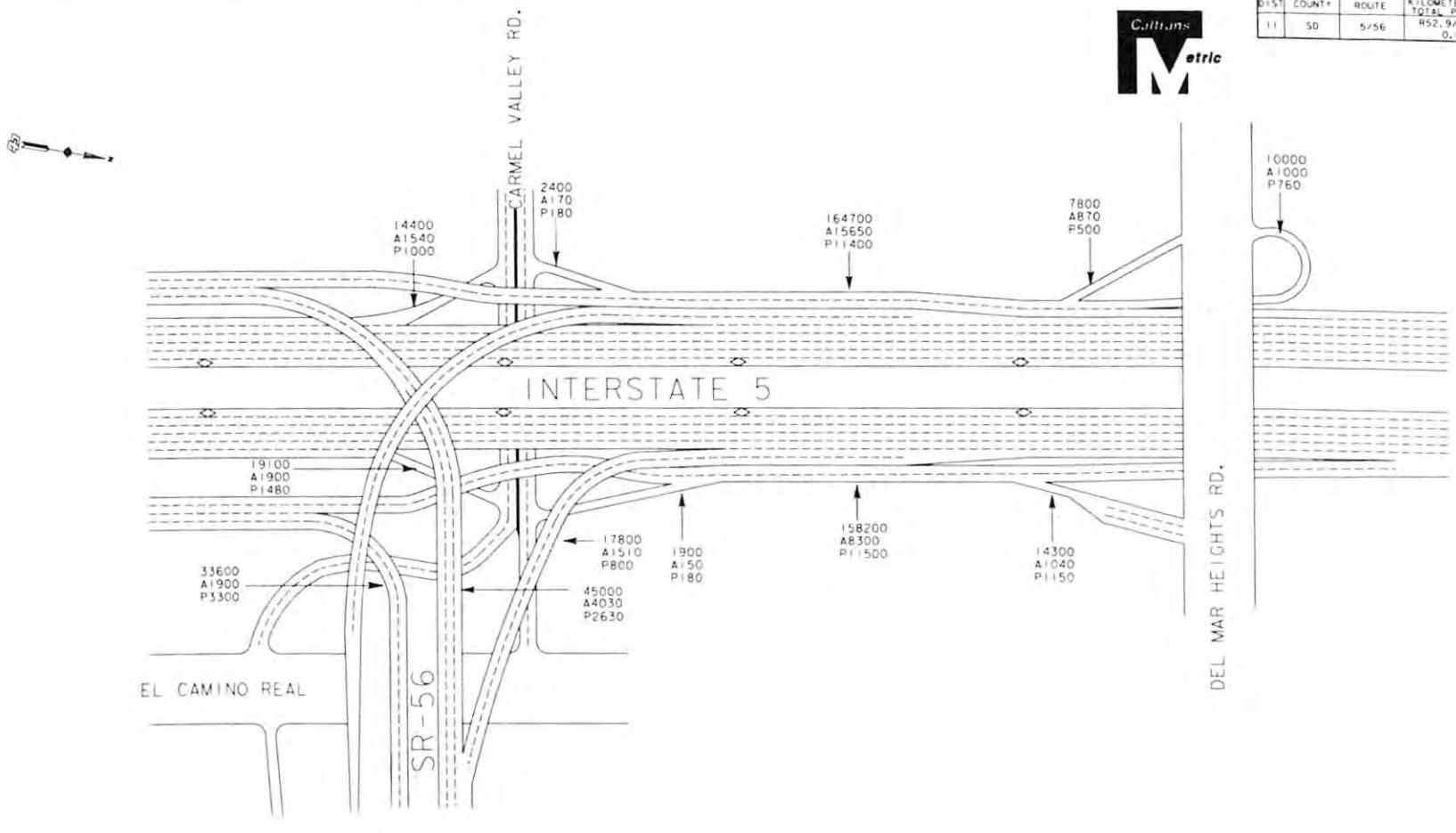
CU 00000

EA 000000

DATE PLOTTED => $DATE
TIME PLOTTED => $$TIME

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
11	SD	S/56	R52.9/R53.7, 0.0/0.8	1	2

Caltrans Metric



LEGEND:

10000 : AVERAGE DAILY TRAFFIC

A 1000 : AM PEAK PERIOD (vph)

P 1000 : PM PEAK PERIOD (vph)

TRAFFIC VOLUMES
ALTERNATIVE 1
YEAR 2020
AM AND PM

EXHIBIT 5
NTS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER | CALCULATED/DESIGNED BY | CHECKED BY | DATE | REVISED BY | DATE REVISED

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

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DGN FILE = $MESQUEST

CU 00000 | EA 000000

LAST REVISION | DATE PLOTTED = 00-00-00 | TIME PLOTTED = 00:00

DISTRICT 11
PROJECT COST ESTIMATE SUMMARY

Type of Estimate : PSR

11-SD-5/56
K.P. R53.9/R53.7(I-5
0.0/0.8(RTE 56)
EA 17790K

Program Code : HE11

Project Description IN SAN DIEGO COUNTY ON INTERSTATE 5 FROM CARMEL VALLEY ROAD TO 0.80 KM NORTH OF CARMEL VALLEY ROAD AND ON ROUTE 56 FROM CARMEL VALLEY ROAD OVERCROSSING TO 0.30 KM EAST OF EL CAMINO REAL.

Limits : K.P.R52.9/R53.7(I-5), 0.0/0.8(RTE 56)

Proposed Improvement BUILD DIRECT FREEWAY TO FREEWAY CONNECTORS

Alternative : 1

		Current[1]		Escalated[2]
ROADWAY ITEMS	$	47,942,514	$	55,578,514
STRUCTURE ITEMS	$	27,230,069	$	31,567,114
SUBTOTAL CONSTRUCTION COST	$	75,172,583	$	87,145,628
RIGHT OF WAY	$	17,133,100	$	24,660,692
TOTAL CAPITAL COST	$	92,306,000	$	111,807,000
PR/ED SUPPORT	$	1,750,000	$	2,028,800
PS&E SUPPORT	$	8,300,000	$	9,622,000
RIGHT OF WAY SUPPORT	$	1,090,000	$	1,263,700
CONSTRUCTION SUPPORT	$	10,800,000	$	12,520,200
TOTAL SUPPORT COST	$	21,940,000	$	25,434,700
TOTAL PROJECT COST	$	114,246,000	$	137,242,000

*ESCALATED PROJECT COST FY 00/2005

[1]Year of PSR= 2000
[2]Year of Construction= 2005
5

Reviewed by District 0.E. _____ x6735
Leon G. Edmonds Date Phone

Approved by Project Manager _____ x3633
Joseph R. Hull Date Phone

* Escalated Cost is calculated at 3.0% for inflation compounded annually to construction year
(Only escalate projects that **have not** been programmed)

Revise 9/12/00 MDR

Section		Cost
Earthwork	$	2,647,350
Structural Section	$	2,094,660
Drainage	$	3,788,175
Specialty Items	$	15,154,560
Environmental	$	1,126,787
Traffic Items	$	4,499,699
Detours	$	0
Minor Items	$	1,465,562
Overhead	$	3,294,445
Supplemental Work	$	1,720,522
Roadway Mobilization	$	3,419,644
State Furnished	$	182,000
Contingencies	$	8,549,110
TOTAL ROADWAY ITEMS*	$	47,942,514

Estimate Prepared By	M. Powers	Date	x7848 Phone
Estimate Reviewed By	M. Ravanipour	Date	x6963 Phone

*Verify that total equals total on Page 8

Section 1 EARTHWORK

	Unit	Quantity		Unit Price ($)		Cost
190101 Roadway Excavation	m3	288,650	x	10.00	=	$2,886,500
198050 Embankment	m3	8,650	x		=	$0
198001 Imported Borrow	m3	0	x		=	$0
160101 Clearing & Grubbing	LS	1	x	30,000.00	=	$30,000
170101 Develop Water Supply	LS	1	x	25,000.00	=	$25,000
Removal or Relocation of Existing Facilities	LS		x		=	$0

SUBTOTAL EARTHWORK	$	2,941,500
OVERHEAD	$	294,150
TOTAL EARTHWORK	$	2,647,350

Section 2 STRUCTURAL SECTION

	Unit	Quantity		Unit Price ($)		Cost
401000 PCC Pavement (___ Depth)	m3	7,900	x	150.00	=	$1,185,000
390102 Asphalt Concrete (Type A)	tonne	2,400	x	60.00	=	$144,000
390155 with Asphalt Price Index	tonne		x		=	$0
390108 Asphalt Concrete Base (Type A)	tonne	5,100	x	50.00	=	$255,000
390171 with asphalt Price Index	tonne		x		=	$0
390128 RAC- Type G	tonne		x		=	$0
390163 with Asphalt Price Index	tonne		x		=	$0
260201 Class 2 Aggregate Base	m3	21,000	x	35.00	=	$735,000
250401 Class 4 Aggregate Subbase	m3		x		=	$0
XXXXXX Minor Concrete _____	m3		x		=	$0
731502 Minor Concrete (Misc Const)	m3		x		=	$0
3940XX Place AC Dike Type E	m	1,400	x	6.00	=	$8,400
150771 Remove AC Dike	m		x		=	$0
420201 Grind Existing Pavement	m2		x		=	$0
XXXXXX Remove Concrete	m3		x		=	$0
390095 Replace AC Surfacing	m2		x		=	$0
XXXXXX Place AC (Misc Area)	m2		x		=	$0
1531XX Cold Plane ___mm	m2		x		=	$0
1531XX Cold Plane ___mm	m2		x		=	$0
68XXXX Permeable Material Blanket	m		x		=	$0
68XXXX Edgedrains	m		x		=	$0

SUBTOTAL STRUCTURAL SECTION	$	2,327,400
OVERHEAD	$	232,740
TOTAL STRUCTURAL SECTION	$	2,094,660

Section 3 DRAINAGE

	Unit	Quantity		Unit Price ($)		Cost
Project Drainage	LS	1	x	4,209,083.00	=	$4,209,083
6XXXXX ___ mm Type of Pipe	m		x		=	$0

6XXXXX ___ mm Type of Pipe	m	x	=	$0
6XXXXX ___ mm Type of Pipe	m	x	=	$0
6XXXXX ___ mm Type of Pipe	m	x	=	$0
510502 Minor Concrete (minor structure)	m3	x	=	$0
152604 Modify Inlet	EA	x	=	$0
72XXXX Rock Slope Protection Type__	m3	x	=	$0
729010 Rock Slope Protection Fabric	m2	x	=	$0
721XXX Concrete _____ Lining	m3	x	=	$0

SUBTOTAL DRAINAGE	$	4,209,083
OVERHEAD	$	420,908
TOTAL DRAINAGE	$	3,788,175

Section 4 SPECIALTY ITEMS

	Unit	Quantity		Unit Price ($)		Cost
Retaining Wall	m2	23,100		700.00		$16,170,000
518201 Masonry Block Wall	m2		x		=	$0
51800X Sound Wall	m2		x		=	$0
72XXXX Slope Protection (Type _)	HA		x		=	$0
839704 Concrete Barriers (Type 60 D)	m	2,500		150.00		$375,000
833125 Concrete Barriers (Type 25)	m	1,600	x	150.00	=	$240,000
839XXX Cable Railing	m		x		=	$0
800391Chain Link Fence 1.80m CL	m	1,780	x	30.00	=	$53,400
839XXX Crash Cushions (Type _____)	EA		x		=	$0
Hazardous Waste Work	LS		x		=	$0
192037 Structure Excavation (Ret.Wall)	m3		x		=	$0
193013 Structure Backfill (Ret. Wall)	m3		x		=	$0
193031 Pervious Backfill Material (Ret. Wall)	m3		x		=	$0
520103 Bar Reinf. Steel (Ret. Wall)	KG		x		=	$0
510133 Class 2 Concrete (Ret. Wall)	m3		x		=	$0

SUBTOTAL SPECIALTY	$	16,838,400
OVERHEAD	$	1,683,840
TOTAL SPECIALTY	$	15,154,560

Section 5 ENVIRONMENTAL

5A - Environmental & Landscape

	Unit	Quantity		Unit Price ($)		Cost
208000 Irrigation System	LS	1	x	83,600.00	=	$83,600
Biological Resources	LS	1	x	10,000.00	=	$10,000
Noise Abatement	LS	1	x	200,000.00	=	$200,000
Cultural Resources Assessment	LS	1	x	2,000.00	=	$2,000
204037Planting	HA	1	x	86,485.00	=	$86,485
204099 Plant Establishment	LS	1	x	100,000.00	=	$100,000
Eucalyptus Replacement	EA	324	x	25.00	=	$8,100
Pinus Torreyana Replacement	EA	100	x	225.00	=	$22,500
20XXXX Erosion Control (Type __)	HA		x		=	$0
Vine Planting	m	1,610	x	32.81	=	$52,824
Biological Mitigation	LS		x		=	$0
Extend Plant Establishment (_ Years)	LS		x		=	$0
Texture Wall Treatment	m2	4,700	x	86.08	=	$404,576

5B - NPDES

074019 Prepare SWPPP	LS	1	x	10,000.00	=	$10,000
074020 Water Pollution Control	LS	1	x	120,000.00	=	$120,000
074023 Temporary Erosion Control	HA	4.80	x	8,000.00	=	$38,400
074027 Temp. Erosion Control Blanket	m2		x		=	$0
203561 Jute Mesh	m2		x		=	$0
074033A Temp. Construction Entrance	EA	4	x	800.00	=	$3,200
074032A Temporary Concrete Washout	EA	4	x	1,200.00	=	$4,800
074031A Temporary Gravel Bags	EA	1,500	x	5.00	=	$7,500
074028 Temporary Fiber Rolls	m	2,800	x	30.00	=	$84,000
074029 Temporary Silt Fence	m	1,400	x	10.00	=	$14,000

SUBTOTAL ENVIRONMENTAL	$	1,251,985
OVERHEAD	$	125,199
TOTAL ENVIRONMENTAL	$	1,126,787

Estimate Reviewed By	S. Glasgow	Date	Environmental Branch Chief	x6715 Phone
Estimate Reviewed By	S. Alvarez	Date	District Landscape Architect	x2542 Phone
Estimate Reviewed By	C. Tesoro	Date	NPDES	x3626 Phone

Section 6 TRAFFIC ITEMS

6A - Traffic Electrical

	Unit	Quantity		Unit Price ($)		Cost
86055X Lighting & Sign Illumination	LS	1	x	360,000.00	=	$360,000
Traffic Monitoring System	EA	2	x	50,000.00	=	$100,000
8602XX Traffic Signals & Lighting	LS		x		=	$0
560213 Furnish Overhead Sign Structures	LS		x		=	$0
560219 Install Overhead Sign Structures	LS	1	x	620,000.00	=	$620,000
CMS System	EA	1	x	150,000.00	=	$150,000
Modify Traffic Signals	LS	1	x	100,000.00	=	$100,000
53C Conduit-(F/O)	m	1,600	x	60.00	=	$96,000
2-103C Conduit(F/O)	m	4,000	x	160.00	=	$640,000
Splice Enclosure	EA	8	x	2,000.00	=	$16,000
Fiber Optic Vault	EA	10	x	3,500.00	=	$35,000
FOA	m	9,600	x	22.00	=	$211,200
FOC	m	3,840	x	16.00	=	$61,440
Enclousure for HUB	EA	1	x	80,000.00	=	$80,000
FDU	EA	20	x	1,500.00	=	$30,000
CCTV Pole, Cabinet,Foundation	EA	5	x	9,000.00	=	$45,000
Traffic Signal Cabinet Foundation	EA	4	x	8,000.00	=	$32,000
CCTV Assembly	EA	5	x	40,000.00	=	$200,000
Field Elements	EA	18	x	2,500.00	=	$45,000
HUB Assembly	EA	1	x	220,000.00	=	$220,000
Installation Cost(F/O Equip.)	LS	1	x	220,000.00	=	$220,000
XXXXXX Fiber Optic Conduit System	LS		x		=	$0
8611XX Ramp Metering System	EA	4	x	70,000.00	=	$280,000
8611XX Ramp Metering System & TMS	EA	1	x	80,000.00	=	$80,000
XXXXXX Interconnection Facilities	LS		x		=	$0
860810 Inductive Loop Detectors	LS		x		=	$0
86093X Traffic Monitoring Stations	LS		x		=	$0

6B - Traffic Signing and Striping

566011 Ground Mounted Signs	EA	40	x	400.00	=	$16,000
568016 Overhead Sign Panels	EA	13	x	5,000.00	=	$65,000
840656 Permanent Pavement Delineation	m	12,892	x	5.50	=	$70,906
832001 Metal Beam Guard Railing	m		x		=	$0
120159 Temporary Pavement Delineation	m	21,820	x	6.00	=	$130,920
120090 Construction Area Signs	LS	1	x	19,000.00	=	$19,000
129000 Temporary Railing "Type K"	m	6,660	x	60.00	=	$399,600
129100 Temporary Crash Cushions Modules	EA	216	x	300.00	=	$64,800
Guardrail	m	718	x	100.00	=	$71,800
120152 Temporary Pavement Markings	m2		x		=	$0
840515 Thermoplastic Pavement Marking	m2		x		=	$0
120199A Traffic Plastic Drums	EA		x		=	$0
120120 Type III Barricades	EA		x		=	$0

6C - Traffic Management Plan

066063 Public Information	LS	1	x	80,000.00	=	$80,000
066061 COZEEP	LS	1	x	120,000.00	=	$120,000
120100 Traffic Control System	LS	1	x	260,000.00	=	$260,000
066090 Maintain Traffic	LS	1	x	50,000.00	=	$50,000
128650 Portable Changeable Message Signs	LS	1	x	30,000.00	=	$30,000

SUBTOTAL TRAFFIC ITEMS	$	4,999,666
OVERHEAD	$	499,967
TOTAL TRAFFIC ITEMS	$	4,499,699

Estimate Reviewed By

Dale Wilson — Date — Traffic Design — x3248 Phone

Estimate Reviewed By

Camille Abou-Fadel — Date — Traffic Operations — (858)467-4328 Phone

Section 7 DETOURS*

	Unit	Quantity		Unit Price ($)		Cost
190101 Roadway Excavation	m3		x		=	$0
198050 Embankment	m3		x		=	$0
198001 Import Borrow	m3		x		=	$0
390102 Asphalt Concrete (Type A)	tonne		x		=	$0
390155 with Asphalt Price Index	tonne		x		=	$0
260201 Class 2Aggregate Base	m3		x		=	$0
250101 Class 4 Aggregate Subbase	m3		x		=	$0
Temporary Drainage	LS		x		=	$0
129000 Temporary Railing Type "K"	m		x		=	$0
12XXXX Temporary Signals	EA		x		=	$0
120159 Temporary Pavement Delineation	m		x		=	$0

* Includes constructing, maintaining, and removal

SUBTOTAL DETOURS	$	0
OVERHEAD	$	0
TOTAL DETOURS	$	0
SUBTOTAL SECTIONS 1-7 (With Overhead)	$	32,568,035

Section 8 MINOR ITEMS (5%-10%)

Subtotal Section 1-7 =	$	32,568,035	x	5%	=	$1,628,402

SUBTOTAL MINOR ITEMS	$	1,628,402
OVERHEAD	$	162,840
TOTAL MINOR ITEMS	$	1,465,562

Section 9 OVERHEAD

Overhead Section 1-8 = $ 3,294,445

	Unit	Quantity		Unit Price ($)		Cost
070015 Overhead	DAY	400	x	8,236.11	=	$3,294,445

TOTAL OVERHEAD	$	3,294,445

Section 10 SUPPLEMENTAL WORK (5%-10%)

Subtotal Section 1-8 =	$	34,196,437				
	$	34,196,437	x	5%	=	$1,709,822
WPCP Implementation**	$	34,196,437	x	0%	=	$0

	Unit	Quantity		Unit Price ($)		Cost
066666 Price Index For AC	LS	1	x	10,700.00	=	$10,700

TOTAL SUPPLEMENTAL WORK	$	1,720,522

**Use in all project with less than 2 hectares of disturbed soil. --- Contact NPDES unit to obtain appropriate percentage to use.

Section 11 ROADWAY MOBILIZATION*

Subtotal Section 1-8	$	34,196,437				
	$	34,196,437	x	10%	=	$3,419,644

* If <50 Working Days (N/A)

TOTAL ROADWAY MOBILIZATION $ 3,419,644

Section 12 STATE FURNISHED

	Unit	Quantity		Unit Price ($)		Cost
066105 RE OFFICE	LS	1	x	160,000.00	=	$160,000
066610 Partnering	LS	1	x	2,000.00	=	$2,000
066XXX Controller Assemblies	LS	1	x	20,000.00	=	$20,000

TOTAL STATE FURNISHED $ 182,000

Section 13 CONTINGENCIES**

Subtotal Section 1-8						
Contigencies						
	$	34,196,437	x	25%	=	$8,549,110

TOTAL CONTIGENCIES $ 8,549,110

TOTAL ROADWAY ITEMS $ 47,942,514

Approx # of Working Days = 400

** As a general rule use appropriate percentage per Project Development Procedures Manual (PDPM).
(Pre-PSR 30%-50%, PSR 25%, PR 20%, PAR 15%, After PAR 10%)

Contingencies could be increased or decreased depending on the accuracy of the Enginnering Estimate and in the possibility of any potential problems that could arise later on. If a contingency other than the recommened on the PDPM is used, then a justification is required.

Justification: (Briefly explain as to why a different percentage was used)

II. STRUCTURES ITEMS

Bridge Name	SE CON	WN CON	EL CAM (WIDEN)
Bridge Number	57-SECONN	57-WNCONN	57-1004L
Structure Type	CIP/PC	CIP/PC	CIP/PC
Width (M) [out to out]	12.95	12.95	8.80
Total Bridge Length (M)	710.00	426.00	55.00
Total Area (SQM)	9194.50	5516.70	484.00
Structure Depth (M)	2.80	2.80	2.59
Footing Type (pile/spread)	PILE	PILE	
Cost Per SQM (incl. 10% mobilization, 20% contingency & special aesthetic treatment)	$ 1,719.00	$ 1,828.00	$ 2,769.00
Total Cost for Structure	$ 15,805,345.50	$ 10,084,527.60	$ 1,340,196.00

SUBTOTAL STRUCTURES ITEMS $ 27,230,069

Railroad Related Costs $ 0

TOTAL STRUCTURES ITEMS $ 27,230,069

COMMENTS:

Date

Phone

III. RIGHT OF WAY

Acquisition, including Excess Land Purchases, Damages to Remainder(s) & Goodwill Loss	$	4,503,000
Condemnation Settlements 30%	$	1,350,900
Acquisition of Offsite Mitigation (out to Out)	$	
Utility Relocation (State Share)	$	9,900,000
Clearance and Demolition	$	20,000
RAP and/or Last Resort Housing Costs	$	
Title and Escrow Fees	$	8,300
Base Right of Way Cost	$	
Design Appreciation Factor 30%	$	1,350,900

TOTAL RIGHT OF WAY $ 17,133,10

RIGHT OF WAY SUPPORT	$	1,090,000
ESCALATED RIGHT OF WAY	$	24,660,692

COMMENTS: (TOTAL ACREAGE, PARCEL COUNT, ESCALATION RATE THROUGH PROGRAMMED YEAR)

R/W Estimate Prepared By

Murray Wilson Date x6120 Phone

Idea Evaluation

IDEA EVALUATION

INTRODUCTION

The creative ideas generated by the VA team are carefully evaluated, and project-specific criteria are applied to each idea to assure an objective evaluation.

KEY EVALUATIVE CRITERIA

The VA team used the paired comparison method to prioritize the evaluative criteria for this project. The criterion used in the preliminary evaluation of the ideas relating to improving the I-5/SR67 North Connectors concept include:

- **S = Safety**
- **EI = Environmental Impact**
- **CC = Community Character**
- **FO = Freeway Traffic Operations**
- **LO = Local Traffic Operations**
- **SG = Support Smart Growth**

The team enlisted the assistance of the stakeholders and designers to develop these criteria so that the evaluation would reflect their specific requirements.

EVALUATION PROCESS

The VA team, as a group, generated and evaluated ideas on how to reduce the impact of regional traffic using SR56 from effecting local traffic operations on the surface streets near the I-5/SR56 interchange..

The team compared each of the ideas with the original concept for each of the key evaluative criteria to determine whether it would represent an improvement or degradation for the criteria. The team reached a consensus on the ranking of the idea. High-ranked ideas would be developed further; low-ranked ones would be dropped from further consideration.

CREATIVE IDEA AND EVALUATION WORKSHEETS

All of the ideas that were generated during the creative phase using brainstorming techniques were recorded on the following Creative Ideas Evaluation forms. These ideas were discussed and the advantages and disadvantages of each were listed.

IDEA EVALUATION
Project Name

Caltrans

Ideas		Performance Criteria						Advantages	Disadvantages	$	Rank
No.	Idea	S	EI	CC	FO	LO	SG				
	Connect SB to EB										
1a	Loop Ramp I.L.O. Connector over freeway	-1							• Cost • Visual		2
1b	Loop Ramp I.L.O. Connector under freeway	-1	-1	+2	0	0	0	• Avoids high flyover	• Conflict with existing truck bi-pass • Connector conflict with Del Mar Heights Traffic • SB on ramp may be eliminated	+ 1	4
2	Tunnel								• Cost of Tunnel • Cost prohibitive • Water table issues • Connection points • Added width to freeway		2
3	Depressed Connector								• Cost of Tunnel Portion • Cost prohibitive • Water table issues • Connection points • Added width to freeway • Added R/W		2
4	Lower I-5								• Ground water issues • Constriction • Highway user cost during construction • Does not solve problem		2

Ranking Scale: **5 = Cost and Performance Improvement** **4 = Cost or Performance Improvement** **3 = Minor Improvements** **2 = Cost and Performance Reduction** **1 = Does not meet Project Purpose and Need**

Evaluation Criteria: Significant Improvement +2, +1, 0, -1, -2 Significant Degradation

S = Safety EI = Environmental Impact CC = Community Character
FO = Freeway Operations LO = Local Operations SG = Smart Growth

IDEA EVALUATION *Project Name*									Caltrans		
Ideas		**Performance Criteria**						**Advantages**	**Disadvantages**	**S**	**Rank**
No.	**Idea**	**S**	**EI**	**CC**	**FO**	**LO**	**SG**				
5	Eliminate Traffic Lights on Surface Streets							• Avoids flyover • W-N connector could be phased	• Eliminate access at some businesses (Gas Station and Taco Bell) • Bicycle circulation needed • Southbound on ramp concern • Widening of CV Undercrossing needed • Maintaining operations during construction		4
6	Grade Separate Local Streets								• Idea without merit		1
7	Optimize Traffic Operations on Local Connector								• Does not satisfy Measure M		1
8	Start Connector Earlier								• Does not relieve vertical issue • Impacts new commercial developments • Right of way costs		1
9	Exit from #1 Lane								• Does not solve any issues • Impacts HOV Lanes		1
10	Widen Existing Carmel Valley Road Undercrossing								• Cost • Impacts I-5 traffic operations		1
11	Reduce/Eliminate Conflicting Moves								• Access/Egress removals are not feasible		1
12	Eliminate Exit at Carmel Valley Road								• See 11		1
13	Reduce Design Speed of Connector								• Design speed is already below minimum standard		1
14	Eliminate Entrance at Carmel Valley Road								• See 11		1

Ranking Scale: **5 = Cost and Performance Improvement** **4 = Cost or Performance Improvement** **3 = Minor Improvements** **2 = Cost and Performance Reduction** **1 = Does not meet Project Purpose and Need**

Evaluation Criteria: Significant Improvement +2, +1, 0, -1, -2 Significant Degradation

S = Safety EI = Environmental Impact CC = Community Character
FO = Freeway Operations LO = Local Operations SG = Smart Growth

IDEA EVALUATION *Project Name*									Caltrans		
Ideas		**Performance Criteria**						**Advantages**	**Disadvantages**	**S**	**Rank**
No.	**Idea**	**S**	**EI**	**CC**	**FO**	**LO**	**SG**				
15	Start Ramp Later and Keep Lower								• Conflicts with W-S connector, still need to go over		1
16	Eliminate Del Mar Heights Road On Ramps								• See 11		1
17	Single Lane Connector	-1	0	0	-1	0	-1	• Compatible with 3 lane concept for I-5 SM additions	• Loss of performance		2
18	Widen Local Access Roads								• Does not meet Measure M		1
19	Improve SB off Ramp at Del Mar Heights Road								• Does not meet Measure M		1
20	Use Carmel Mountain Road								• Does not meet Measure M		1
21	Use a Roundabout								• Does not meet Measure M		1
22	Relocate Carmel Valley Road	-1	+1	+1	0	-1	0	• See 5			1
	SB Auxiliary and Truck Lanes										
1	Single I.L.O. Dual Auxiliary Lanes	-2	+1	+1				• Potential for use for non connector alternatives • Reduces runoff • Combine with Loop Alt	• Greater weaving conflicts		2
2	Reduce 4-lanes to 3 lanes							• See above			
3	Braid Del Mar Heights Ramps								• Geometric constraints • Visual Impact		1
4	Use Viaduct I.L.O. Retaining Walls								• Increases cost – no benefit		1
5	Stack Lanes								• Requires added footprint • Added structure cost • Increased area of impact		2
6	Reduce 1 Through Lane (mix flow)								• Through traffic demand required all mixed flow lanes		1

Ranking Scale: **5 = Cost and Performance Improvement** **4 = Cost or Performance Improvement** **3 = Minor Improvements** **2 = Cost and Performance Reduction** **1 = Does not meet Project Purpose and Need**

Evaluation Criteria: Significant Improvement +2, +1, 0, -1, -2 Significant Degradation

S = Safety EI = Environmental Impact CC = Community Character
FO = Freeway Operations LO = Local Operations SG = Smart Growth

IDEA EVALUATION *Project Name*									Caltrans		
Ideas		Performance Criteria						Advantages	Disadvantages	S	Rank
No.	Idea	S	EI	CC	FO	LO	SG				
7	Modern Roundabout at Off-Ramp								• On ramps would also need to use this facility and backup from on ramp would create gridlock in roundabout		1
8	Grade Separate and Loop at Off Ramp								• Need to widen Carmel Valley Road under I-5 • No cost savings • Numerous safety driven design standards violated		1
9	Use Existing off Ramp and Eliminate Widening to the North								• Cost similar to other alt • Possible traffic operations impact to I 5 • Does not reduce width requirements		4
	Connect WB to NB										
1	Reduce Width of Connectors							• Minimum cost savings	• Minimal ramp meter cues • Safety in the event of accidents on the connectors • Possible back up of traffic onto 56		2
2	Reduce Design Speed							• Consider in other alternatives	• DS is already less than standard • Changing radii impacts business takes		1
3	Eliminate Traffic Lights on Surface Streets								• Not feasible – local operations dictate their use.		1
4	Increase Carmel Valley Road Capacity and Operations								• Measure M		1

Ranking Scale: **5 = Cost and Performance Improvement** **4 = Cost or Performance Improvement** **3 = Minor Improvements** **2 = Cost and Performance Reduction** **1 = Does not meet Project Purpose and Need**

Evaluation Criteria: Significant Improvement +2, +1, 0, -1, -2 Significant Degradation

S = Safety EI = Environmental Impact CC = Community Character
FO = Freeway Operations LO = Local Operations SG = Smart Growth

IDEA EVALUATION *Project Name*									Caltrans		
Ideas		Performance Criteria						Advantages	Disadvantages	$	Rank
No.	Idea	S	EI	CC	FO	LO	SG				
5	Realign Carmel Valley Road and Use Existing Road for Connectors								• Increases area congestions • Creates excessive weave conflicts on surface street • Conflicts with safety driven design standards		1
6	Add Ramp from W-S Connector to 5N								• Widening to existing high structure • Reduces design speed • Does not provide any benefits • Creates revered superelevation		1
7	Connect the Connector into the On-Ramp/Auxiliary Lane							• Lowers structure • Reduces Relocation Of Truck Lanes	• Increase weaving concerns • CT original concept – traffic ops dictated move • Does not work with direct connector traffic volumes • Would need 24 hour ramp meter		1
8	Connect with the #1 Lane and HOV Lane								• Creates a non standard condition and excess weaving on SB I-5 • Does not significantly reduce the height of the direct connector	1	1

Ranking Scale: **5 = Cost and Performance Improvement** **4 = Cost or Performance Improvement** **3 = Minor Improvements** **2 = Cost and Performance Reduction** **1 = Does not meet Project Purpose and Need**

Evaluation Criteria: Significant Improvement +2, +1, 0, -1, -2 Significant Degradation

S = Safety EI = Environmental Impact CC = Community Character
FO = Freeway Operations LO = Local Operations SG = Smart Growth

IDEA EVALUATION *Project Name*									Caltrans		
Ideas		**Performance Criteria**						**Advantages**	**Disadvantages**	**$**	**Rank**
No.	**Idea**	**S**	**EI**	**CC**	**FO**	**LO**	**SG**				
9	Bridge Carmel Valley Road over Freeway	0	-1	-1	-1	1	0		• No significant advantages • Significant environmental and coastal commission concerns • Added Cost • Local traffic flow		1
10	Move Locations of SB Left							• Part of loop alternative 5			1

Ranking Scale: **5 = Cost and Performance Improvement** **4 = Cost or Performance Improvement** **3 = Minor Improvements** **2 = Cost and Performance Reduction** **1 = Does not meet Project Purpose and Need**

Evaluation Criteria: Significant Improvement +2, +1, 0, -1, -2 Significant Degradation

S = Safety EI = Environmental Impact CC = Community Character
FO = Freeway Operations LO = Local Operations SG = Smart Growth

Value Analysis Process

VALUE ANALYSIS PROCESS

INTRODUCTION

The Value Analysis process involves fourteen activities needed to accomplish a VA study, organized in three parts: Preparation, VA Study, and Report. The following VA Activity Chart describes each activity; the individual tasks are summarized below.

This VA Study was conducted in two phases. The first focused on "direct connector" concepts. Once the team determined that there were no viable direct connector alternatives, the stakeholders requested that we look at surface street alternatives to address the project's need and purpose.

PREPARATION

Prior to the start of a VA study, the District VA Coordinator (DVAC) and Team Leader carry out the following three activities:

- **Initiate Study** – Identify study project; define study goals; prepare draft study charter and Task Order Initiation Document.
- **Organize Study** – Conduct preparation meeting; select team members; finalize study charter and Task Order Initiation Document
- **Prepare Data** – Collect and distribute data; prepare cost models; develop LCC model.

All of the information gathered prior to the VA Study is given to the team members for their use.

VA STUDY

There are ten activities carried out by the VA team during the performance of the study, organized in three segments:

Segment 1

- **Inform Team** – Receive designer presentation; visit project site; develop performance criteria, evaluate baseline design.
- **Analyze Functions** – Identify basic functions and cost drivers; prepare FAST diagram.
- **Create Ideas** – List a large quantity of alternative ideas; use group/individual brainstorming.
- **Evaluate Ideas** – Evaluate all ideas against performance criteria; rank all ideas.

Segment 2

- **Develop Alternatives** – Develop high-ranked ideas into VA alternatives; measure performance.
- **Critique Alternatives** – Review grouped alternatives for team consensus, technical viability.
- **Present Alternatives** – Give informal presentation of alternatives; prepare preliminary report.

Segment 3

- **Assess Alternatives** – Review alternatives; prepare draft implementation decisions.
- **Resolve Alternatives** – Resolve dispositions; edit and revise alternatives; summarize results.
- **Present Results** – Give formal presentation of accepted alternatives.

REPORT

Following the VA study, the Team Leader assembles all study documentation into the final report:

- **Publish Results** – Prepare Final VA Study Report; distribute printed and electronic copies.

The VA study is complete when the report is issued as a record of the VA team's analysis and development work, as well as the project development team's implementation dispositions for the alternatives.

The following VA Activity Chart outlines the above fourteen VA activities in more detail, followed by Study Agenda and VA Meeting Attendees sheet, which document the schedule and participants in the VA Study.

Caltrans Value Analysis Activity Chart

PREPARATION

INITIATE STUDY
- Identify study project
- Identify study roles and responsibilities
- Define study goals
- Select team leader
- Prepare draft study charter

1

ORGANIZE STUDY
- Conduct preparation meeting
- Select team members
- Identify stakeholders, decision-makers and technical reviewers
- Identify data collection
- Select study dates
- Determine study logistics

2

PREPARE DATA
- Collect and distribute data
- Develop construction cost models
- Develop highway user benefit LCC model

3

VA STUDY

Segment 1

INFORM TEAM
- Review study activities and confirm reviewers
- Present design concept
- Present stakeholders' interests
- Review project issues and objectives
- Develop key functions and performance criteria
- Visit project site

4

ANALYZE FUNCTIONS
- Analyze project data
- Expand project functions
- Prepare FAST diagram
- Determine functional cost and performance drivers

5

CREATE IDEAS
- Focus on functions
- List all ideas
- Apply creativity and innovation techniques

6

EVALUATE IDEAS
- Apply key performance criteria
- Rate each idea
- List advantages and disadvantages
- Rank all ideas
- Assign alternatives for development

7

Segment 2

DEVELOP ALTERNATIVES
- Develop alternative concepts
- Prepare sketches and calculations
- Measure performance
- Estimate costs, LCC benefits/costs

8

CRITIQUE ALTERNATIVES
- VA Alternatives Team Consensus Review
- VA Alternatives Technical Review
- Group alternatives into sets
- Rate performance of sets

9

PRESENT ALTERNATIVES*
- Present findings
- Document feedback
- Confirm pending technical reviews, if needed
- Prepare preliminary report

**Informal presentation of study findings*

10

Segment 3

ASSESS ALTERNATIVES*
- Review preliminary report
- Assess alternatives for project acceptance
- Prepare draft implementation dispositions

**Activities performed by PDT, Technical Reviewers, and Stakeholders*

11

RESOLVE ALTERNATIVES
- Review implementation dispositions
- Resolve implementation actions with decision - makers and stakeholders
- Edit alternatives
- Revisit rejected alternatives, if needed

12

PRESENT RESULTS *
- Present results
- Obtain management approval on implemented alternatives
- Summarize performance, cost, and value improvements

**Formal presentation of study results*

13

REPORT

PUBLISH RESULTS
- Document process and study results
- Incorporate all comments and implementation actions
- Distribute printed report
- Distribute electronic report to HQ VA Branch
- Finalize VA Study Summary Report (VASSR)

14

SR-56 / I-5 NORTH CONNECTORS VALUE ANALYSIS STUDY PARTICIPANTS

FIRST NAME	LAST NAME	ORGANIZATION	TITLE	TELEPHONE	FAX	E-MAIL
John	Dean	Carmel Mountain Community Planning Board	R56 Sub-Committee	858-755-4422		Dean2dean@aol.com
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Labib	Qasem	City of San Diego	Principal Engr.	619 446-5358	619 446-5499	Lmq@sdcity.sannet.gov
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Frank	Belock	City of San Diego	Director, Engineering and Capital Projects	619-236-6274		fbelock@sandiego.gov
K.C.	Strang	Councilman Peters	Council Rep.	619 533-6559		Kstrang@sandiego.gov
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Majid	Kharrati	CT Project Manager	Project Mgr.	619 688-6729		Majid.kharrati@dot.ca.gov
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Ruel	Payaban	Fraser Engineering	Civil Engineer	760 722-3495		
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FIRST NAME	LAST NAME	ORGANIZATION	TITLE	TELEPHONE	FAX	E-MAIL
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