

CALIFORNIA HIGH-SPEED TRAIN

Program Environmental Impact Report/Environmental Impact Statement

Los Angeles – Orange County – San Diego

Section 4(f) and 6(f) TECHNICAL EVALUATION

January 2004

Prepared for:

California High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration



U.S. Department
of Transportation
**Federal
Railroad
Administration**

CALIFORNIA HIGH-SPEED TRAIN PROGRAM EIR/EIS

Los Angeles – Orange County – San Diego Section 4(f) and 6(f) Technical Evaluation

Prepared by:

**HDR
for
IBI GROUP**

January 2004

TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 ALTERNATIVES..... 3

 1.1.1 NO-PROJECT ALTERNATIVE..... 3

 1.1.2 MODAL ALTERNATIVE..... 3

 1.1.3 HIGH SPEED TRAIN ALTERNATIVE..... 4

2.0 SECTION 4(F) AND 6(F) EVALUATION METHODOLOGY..... 18

3.0 LOS ANGELES-ORANGE COUNTY-SAN DIEGO SECTION 4(F) AND 6(F) ANALYSIS 21

3.1 IDENTIFICATION OF SECTION 4(F) AND 6(F) RESOURCES 21

3.2 PUBLICLY OWNED PARKS, RECREATIONAL LANDS AND WILDLIFE AND WATERFOWL REFUGES..... 26

3.3 NATIONAL REGISTER OF HISTORIC PLACES (NHRP) LISTED AND ELIGIBLE AREAS 44

3.4 COMPARISON OF ALTERNATIVES..... 44

3.5 LIKELIHOOD OF ADDITIONAL RESOURCES BEING IDENTIFIED AT PROJECT LEVEL 45

3.6 AVOIDANCE ALTERNATIVES OR REASONS FOR NO PRUDENT OR FEASIBLE ALTERNATIVE FOR 4(F) OR 6(F) USE..... 46

3.7 OUTLINE OF FUTURE PROJECT-LEVEL SECTION 4(F) AND 6 (F) EVALUATION 46

4.0 REFERENCES 48

5.0 PREPARERS 49

APPENDIX A – CULTURAL RESOURCE ANALYSIS

APPENDIX B – CONVENTIONAL RAIL ROUTE COMBINATIONS FOR IMPACT COMPARISON

LIST OF FIGURES

FIGURE 1-1 NO-PROJECT ALTERNATIVE – CALIFORNIA TRANSPORTATION SYSTEM..... 5

FIGURE 1-2 MODAL ALTERNATIVE – HIGHWAY COMPONENT..... 7

FIGURE 1-3 MODAL ALTERNATIVE – AVIATION COMPONENT..... 8

FIGURE 1-4 HIGH-SPEED TRAIN ALTERNATIVE – CORRIDORS AND STATIONS FOR CONTINUED INVESTIGATION..... 10

FIGURE 1-5A HIGH-SPEED TRAIN ALTERNATIVE – ALIGNMENT AND CONSTRUCTION TYPE BY SEGMENT
 (LOS ANGELES TO IRVINE)..... 15

FIGURE 1-5B HIGH-SPEED TRAIN ALTERNATIVE – ALIGNMENT AND CONSTRUCTION TYPE BY SEGMENT
 (IRVINE TO OCEANSIDE)..... 16

FIGURE 1-5C HIGH-SPEED TRAIN ALTERNATIVE – ALIGNMENT AND CONSTRUCTION TYPE BY SEGMENT
 (OCEANSIDE TO SAN DIEGO)..... 17

LIST OF TABLES

TABLE 1-1 PROGRAMMED IMPROVEMENTS INCLUDED IN THE NO-PROJECT ALTERNATIVE..... 6

TABLE 1-2 MODAL ALTERNATIVE: HIGHWAY CAPACITY IMPROVEMENT OPTIONS FOR YEAR 2020..... 9

TABLE 1-3 ALIGNMENT AND STATION OPTIONS FOR HIGH-SPEED TRAIN ALTERNATIVE..... 11

TABLE 2-1 STUDY AREAS FOR SECTION 4(F) AND 6(F) ANALYSIS..... 19

TABLE 3-1 SUMMARY ANALYSIS/COMPARISON TABLE – IMPACTS TO SECTION 4(F) AND 6(F) RESOURCES..... 22

TABLE 3-2 PUBLICLY OWNED PARKS, GOVERNMENT CONSERVATION LANDS, AND WILDLIFE/WATERFOWL REFUGES ... 27

ACRONYMS

AUTHORITY	CALIFORNIA HIGH-SPEED RAIL
CEQA	CALIFORNIA ENVIRONMENTAL QUALITY ACT
COG	COUNCIL OF GOVERNMENTS
EIR	ENVIRONMENTAL IMPACT REPORT
EIS	ENVIRONMENTAL IMPACT STATEMENT
EPA	ENVIRONMENTAL PROTECTION AGENCY
FAA	FEDERAL AVIATION ADMINISTRATION
FHWA	FEDERAL HIGHWAY ADMINISTRATION
FRA	FEDERAL RAILROAD ADMINISTRATION
FTA	FEDERAL TRANSIT ADMINISTRATION
LOSSAN	LOS ANGELES TO SAN DIEGO CONVENTIONAL RAIL CORRIDOR
MTA	METROPOLITAN TRANSPORTATION AUTHORITY
NEPA	NATIONAL ENVIRONMENTAL POLICY ACT
NRHP	NATIONAL REGISTER OF HISTORIC PLACES
RTP	REGIONAL TRANSPORTATION PLAN
STIP	STATE TRANSPORTATION IMPROVEMENT PROGRAM

1.0 INTRODUCTION

The California High-Speed Rail Authority (Authority) was created by the Legislature in 1996 to develop a plan for the construction, operation, and financing of a statewide, intercity high-speed passenger train system.¹ After completing a number of initial studies over the past six years to assess the feasibility of a high-speed train system in California and to evaluate the potential ridership for a variety of alternative corridors and station areas, the Authority recommended the evaluation of a proposed high-speed train system as the logical next step in the development of California's transportation infrastructure. The Authority does not have responsibility for other intercity transportation systems or facilities, such as expanded highways, or improvements to airports or passenger rail or transit used for intercity trips.

The Authority adopted a *Final Business Plan* in June 2000, which reviewed the economic feasibility of a 1,127-kilometer-long (700-mile-long) high-speed train system. This system would be capable of speeds in excess of 321.8 kilometers per hour (200 miles per hour [mph]) on a dedicated, fully grade-separated track with state-of-the-art safety, signaling, and automated train control systems. The system described would connect and serve the major metropolitan areas of California, extending from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego. The high-speed train system is projected to carry a minimum of 42 million passengers annually (32 million intercity trips and 10 million commuter trips) by the year 2020.

Following the adoption of the Business Plan, the appropriate next step for the Authority to take in the pursuit of a high-speed train system is to satisfy the environmental review process required by federal and state laws which will in turn enable public agencies to select and approve a high speed rail system, define mitigation strategies, obtain necessary approvals, and obtain financial assistance necessary to implement a high speed rail system. For example, the Federal Railroad Administration (FRA) may be requested by the Authority to issue a *Rule of Particular Applicability*, which establishes safety standards for the high-speed train system for speeds over 200 mph, and for the potential shared use of rail corridors.

The Authority is both the project sponsor and the lead agency for purposes of the California Environmental Quality Act (CEQA) requirements. The Authority has determined that a Program Environmental Impact Report (EIR) is the appropriate CEQA document for the project at this conceptual stage of planning and decision-making, which would include selecting a preferred corridor and station locations for future right-of-way preservation and identifying potential phasing options. No permits are being sought for this phase of environmental review. Later stages of project development would include project-specific detailed environmental documents to assess the impacts of the alternative alignments and stations in those segments of the system that are ready for implementation.

The decisions of federal agencies, particularly the Federal Railroad Administration (FRA) related to high-speed train systems, would constitute major federal actions regarding environmental review under the National Environmental Policy Act (NEPA). NEPA requires federal agencies to prepare an Environmental Impact Statement (EIS) if the proposed action has the potential to cause significant environmental impacts. The proposed action in California warrants the preparation of a Tier 1 Program-level EIS under NEPA, due to the nature and scope of the comprehensive high-speed train system proposed by the Authority, the need to narrow the range of alternatives, and the need to protect/preserve right-of-way in the future. FRA is the federal lead agency for the preparation of the Program EIS, and the Federal Highway Administration (FHWA), the U.S. Environmental Protection Agency (EPA), the U.S. Corps of Engineers (USACE), the Federal Aviation Administration (FAA), the U.S. Fish and Wildlife Service (USFWS), and the Federal Transit Administration (FTA) are cooperating federal agencies for the EIS.

A combined Program EIR/EIS is to be prepared under the supervision and direction of the FRA and the Authority in conjunction with the federal cooperating agencies. It is intended that other federal, state,

¹ Chapter 796 of the Statutes of 1996; SB 1420, Kopp and Costa

regional, and local agencies will use the Program EIR/EIS in reviewing the proposed program and developing feasible and practicable programmatic mitigation strategies and analysis expectations for the Tier 2 detailed environmental review process which would be expected to follow any approval of a high speed train system.

The statewide high-speed train system has been divided into five regions for study: Bay Area-Merced, Sacramento-Bakersfield, Bakersfield-Los Angeles, Los Angeles-San Diego via the Inland Empire, and Los Angeles-Orange County-San Diego. This Section 4(f) and 6(f) Technical Evaluation for the Los Angeles – Orange County – San Diego Region is one of five such reports being prepared for each of the regions on the topic, and it is one of fifteen technical reports for this region. This report will be summarized in the Program EIR/EIS and it will be part of the administrative record supporting the environmental review of alternatives.

1.1 ALTERNATIVES

1.1.1 NO-PROJECT ALTERNATIVE

The No-Project Alternative serves as the baseline for the comparison of Modal and High-Speed Train alternatives (Figure 1-1). The No-Project Alternative represents the state's transportation system (highway, air, and conventional rail) as it existed in 1999-2000 and as it would be after implementation of programs or projects currently programmed for implementation and projects that are expected to be funded by 2020. The No-Project Alternative addresses the geographic area serving the same intercity travel market as the proposed high-speed train (generally from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego). The No-Project Alternative satisfies the statutory requirements under CEQA and NEPA for an alternative that does not include any new action or project beyond what is already committed.

The No-Project Alternative defines the existing and future statewide intercity transportation system based on programmed and funded (already in funded programs/financially constrained plans) improvements to the intercity transportation system through 2020, according to the following sources of information:

- State Transportation Improvement Program (STIP)
- Regional Transportation Plans (RTPs) for all modes of travel
- Airport plans
- Intercity passenger rail plans (California Rail Plan 2001-2010, Amtrak Five- and Twenty-year Plans)

The No-Project Alternative for the Los Angeles-Orange County-San Diego Region includes highway expansion as well as conventional rail improvements to the existing LOSSAN corridor that are programmed and funded for implementation through 2020. Table 1-1 summarizes the infrastructure components of the No-Project Alternative for this Region. As with all of the alternatives, the No-Project Alternative will be assessed against the purpose and need topics/objectives for congestion, safety, air pollution, reliability, and travel times.

1.1.2 MODAL ALTERNATIVE

There are currently only three main options for intercity travel between the major urban areas of San Diego, Los Angeles, the Central Valley, San Jose, Oakland/San Francisco, and Sacramento: vehicles on the interstate highway system and state highways, commercial airlines serving airports between San Diego and Sacramento and the Bay Area, and conventional passenger trains (Amtrak) on freight and/or commuter rail tracks. The Modal/System Alternative consists of expansion of highways, airports, and intercity and commuter rail systems serving the markets identified for the High-Speed Train Alternative. (Figures 1-2 and 1-3) The Modal Alternative uses the same inter-city travel demand (not capacity) assumed under the high-end sensitivity analysis completed for the high-speed train ridership in 2020. This same travel demand is assigned to the highways and airports and passenger rail described under the No-Project Alternative, and the additional improvements or expansion of facilities is assumed to meet the demand, regardless of funding potential and without high-speed train service as part of the system.

The Modal Alternative for the Los Angeles-Orange County-San Diego Region is defined as further expansion of Interstate 5 (beyond the expansion planned under the No-Project Alternative), as well as expansion at the Long Beach Airport. Table 1-2 summarizes the highway expansion components of the Modal Alternative for this Region.

1.1.3 HIGH-SPEED TRAIN ALTERNATIVE

The Authority has defined a statewide high-speed train system capable of speeds in excess of 200 miles per hour (mph) (320 kilometers per hour [km/h]) on dedicated, fully grade-separated tracks, with state-of-the-art safety, signaling, and automated train control systems. State of the art high-speed steel-wheel-on-steel-rail technology is being considered for the system that would serve the major metropolitan centers of California, extending from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego. (Figure 1-4)

The High-Speed Train Alternative includes several corridor and station options. A steel-wheel on steel-rail, electrified train, primarily on exclusive right-of-way with small portions of the route on shared track with other rail is planned. Conventional “non-electric” improvements are also being considered along the existing LOSSAN rail corridor from Los Angeles to San Diego. The train track would be either at-grade, in an open trench or tunnel, or on an elevated guideway, depending on terrain and physical constraints.

In the Los Angeles-Orange County-San Diego Region, the High-Speed Train Alternative consists of electrified rail options north of Irvine (described in this report as High-Speed Rail or HSR), and improvements and options for the existing LOSSAN rail corridor between Los Angeles and San Diego (described in this report as Conventional Rail).

For purposes of comparative analysis the HST corridors will be described from station-to-station within each region, except where a by-pass option is considered when the point of departure from the corridor will define the end of the corridor segment. Table 1-3 summarizes the segments, improvements, and alignment and station options evaluated for the Los Angeles-Orange County-San Diego Region. The alignment segments are shown (north to south) in Figures 1-5A, B and C. These figures also show the proposed construction type for each alignment option (open trench, covered trench, tunnel, at-grade, or elevated), and where the alignment options would be located outside of an existing rail corridor.

LOSSAN Corridor Screening Process

A strategic planning process was undertaken as part of the evaluation of Conventional Rail improvements in the LOSSAN Corridor. This process was used to gain additional public input on the various rail improvement options being considered, and to reduce the number of alternatives to those that most reasonably and feasibly can meet the objectives, purpose, and need for the project. There are four locations within the LOSSAN Corridor where the initial range of alternatives was sufficiently broad to allow for the screening, or narrowing, of the alternatives to be carried forward in the Program EIR/EIS: San Juan Capistrano, Dana Point/San Clemente, Encinitas, and Del Mar.

Based on public and agency input, and technical, environmental and economic evaluations, a number of alternatives described in this technical report were subsequently eliminated from further consideration. The alternatives eliminated are shown in Table 1-3 in italics and gray shading. The environmental evaluation of these alternatives is included in this technical report, and was considered in the screening process. More detail on the screening process for the LOSSAN Corridor can be found in the final *Los Angeles to San Diego via Orange County Conventional Improvements Screening Report* (Authority, 2003).

FIGURE 1-1
No-Project Alternative – California Transportation System



TABLE 1-1

**PROGRAMMED IMPROVEMENTS INCLUDED IN THE NO-PROJECT ALTERNATIVE
LOS ANGELES-ORANGE COUNTY-SAN DIEGO REGION
(from 1998 and 2000 Regional Transportation Plans)**

County	Type of Project	Description
INTERCITY HIGHWAY PROJECTS		
Los Angeles	HOV	HOV Project on SR-14 (Ave P-8 to Ave-L)
Los Angeles	HOV	HOV Project on I-710 (I-10 to I-210)
Los Angeles	HOV	HOV Project on I-5 (SR-19 to I-710)
Los Angeles	Highway Widening	I-710 (I-10 to I-210) Additional Mixed Flow Lane
Los Angeles	Highway Widening	I-5 (Rosecrans to Orange Co) Additional Mixed Flow Lane
Los Angeles	Highway Widening	I-405 (US-101 to I-105) Additional Mixed Flow Lane
Los Angeles	Highway Widening	SR-57 (SR-60 to Orange Co) Additional Mixed Flow Lane
Orange	HOV	HOV Project on I-5 (SR-1 to Avenida Pico)
Orange	Highway Widening	I-5 (SR-91 to Los Angeles Co) Additional Mixed Flow Lane
Orange	Highway Widening	SR-91 (westbound auxiliary lane SR-57 to I-5) Additional Mixed Flow Lane
Orange	Highway Widening	SR-91 (auxiliary lanes SR-241 to SR-71) Additional Mixed Flow Lane
Orange	Highway Widening	SR-57 (auxiliary lanes Los Angeles Co to SR-91) Additional Mixed Flow Lane
San Diego	Highway Interchange/Widening	I-5 at I-805 – New interchange with 10 freeway and 2 HOV lanes.
San Diego	Highway Widening	I-5 from Mission Bay Drive to SR-52 – Addition of a northbound auxiliary lane
San Diego	Highway Widening	I-5 at SR-78 Interchange: NB-EB Connector – Widen auxiliary lane and ramp.
San Diego	Highway Widening	I-15 from SR-163 to SR 78 – Addition of auxiliary lanes and meters. Bridge widening
San Diego	Highway Widening	I-15 from SR-56 to Centre City Parkway – Addition of 4 HOV/Managed lanes
San Diego	Highway Widening/HOV	I-5 from Del Mar Heights Road to Birmingham Drive – Upgrade from existing lane freeway to 12-lane freeway and 2 HOV lanes.
San Diego	Highway Interchange	I-15/SR-56 Interchange Ramp (EB-NB) – Loop ramp.
San Diego	Highway Widening/HOV	I-5 from Del Mar Heights Road to Encinitas Boulevard – Upgrade from 8-lane freeway to 12-lane freeway and 2 HOV lanes.
San Diego	Highway	I-5 from Encinitas Boulevard to La Costa Boulevard – Upgrade from 8-lane freeway to 10-lane freeway and 2 HOV lanes.
San Diego	Highway	I-15 from SR-163 to SR-56 – Addition of 4 HOV/Managed lanes.
San Diego	TSM	Intelligent Transportation Systems: Enhanced Incident/Emergency Response, Traveler/Commercial Vehicle Operations Information, and Management System Software.
CONVENTIONAL RAIL IMPROVEMENTS		
Los Angeles	Conventional Rail	Run through tracks at L.A. Union Station
Los Angeles	Conventional Rail	Continuous third main track from Union Station to Fullerton
Orange	Conventional Rail	Double tracking along Lincoln Avenue in Santa Ana
San Diego	Conventional Rail	Extension of Double-Track at San Onofre
San Diego	Conventional Rail	Extension of Double-Track in Oceanside
San Diego	Conventional Rail	Sorrento-Miramar Double-Tracking and Curve Realignment
San Diego	Conventional Rail	O'Neil to Flores Double-Tracking
San Diego	Conventional Rail	Santa Margarita River Bridge Replacement and Double-Tracking
San Diego	Conventional Rail	Fallbrook Junction Track Upgrades
San Diego	Conventional Rail	Del Mar Bluffs Stabilization
San Diego	Conventional Rail	False Bay Passing Track
San Diego	Conventional Rail	Tecolote Creek Track Improvements and Bridge Replacement

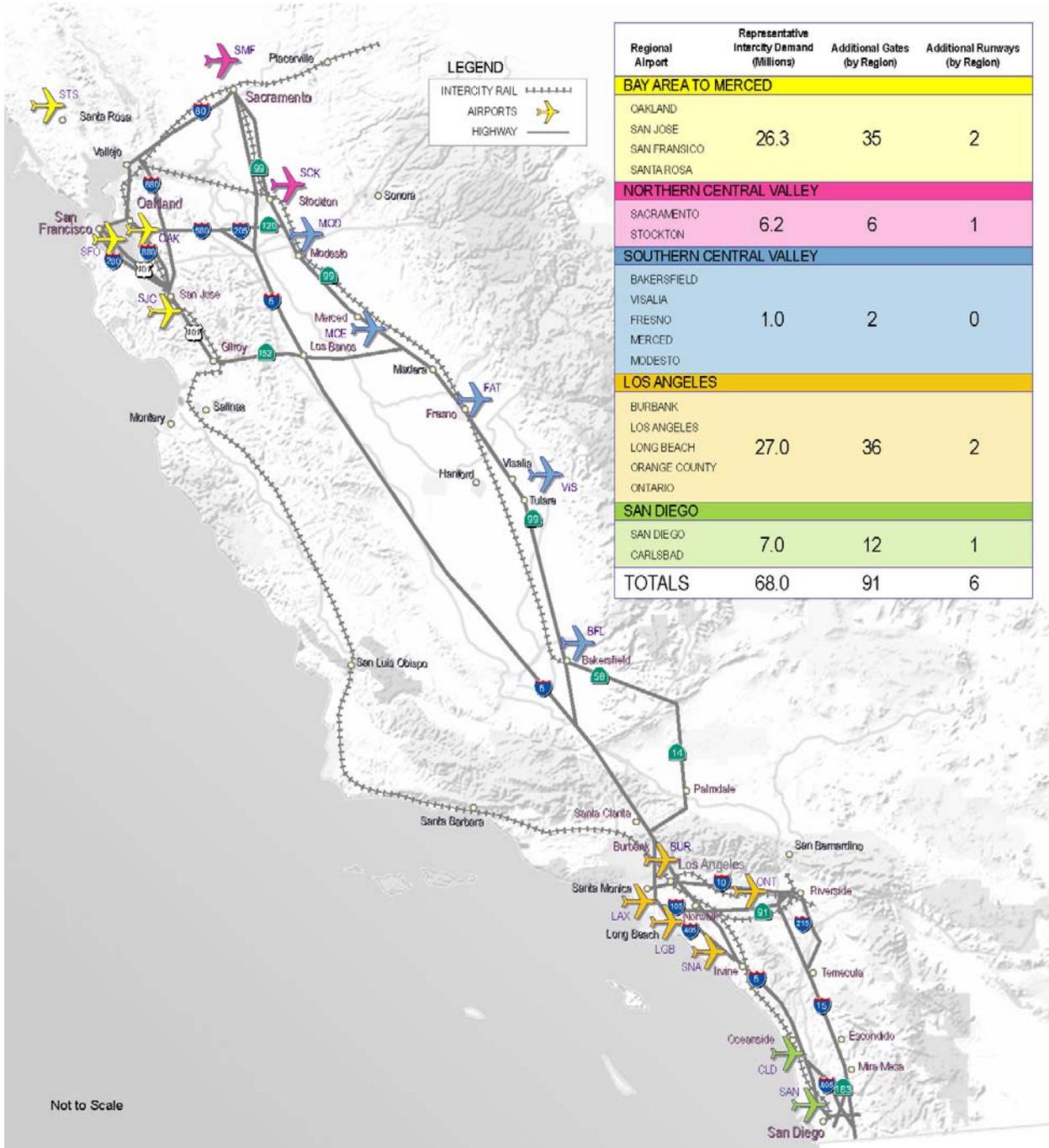
Source: Parsons Brinckerhoff, California High-Speed Train Program Environmental Impact Report/Environmental Impact Statement, *System Alternatives Definition*, November 18, 2002

FIGURE 1-2
Modal Alternative – Highway Component



FIGURE 1-3

Modal Alternative – Aviation Component



Not to Scale

TABLE 1-2

Modal Alternative: Highway Capacity Improvement Options for Year 2020
Los Angeles – Orange County – San Diego Region
 (2020 Intercity Travel Demand with Highway Expansion only)

Highway Corridor	Segment (To-From)	No. of Additional Lanes¹ (Total – Both Directions)
I-5	L.A. Union Station to I-10	4
I-5	I-10 to Norwalk	2
I-5	Norwalk to Anaheim	2
I-5	Anaheim to Irvine	2
I-5	Irvine to I-405	2
I-5	I-405 to SR-78	2
I-5	SR-78 to University Towne Centre	2
I-5	University Towne Centre to San Diego Airport	2

Source: Parsons Brinckerhoff, California High-Speed Train Program Environmental Impact Report/
Environmental Impact Statement, *System Alternatives Definition*, November 18, 2002

1. Represents the number of through lanes, in addition to the total number of lanes in the No-Project Highway Network, that approximate an equivalent level of capacity to serve the representative demand.

FIGURE 1-4

High-Speed Train Alternative – Corridors and Stations for Continued Investigation



TABLE 1-3

**Alignment and Station Options for High-Speed Train Alternative
Los Angeles – Orange County – San Diego Region**

Alignment Segments and Station Locations Evaluated¹	Description of Proposed Options & Improvements
HIGH-SPEED RAIL (HSR) & STATION OPTIONS	
LAX To Union Station	Construction of an electrified, grade-separated, dedicated track within an existing rail corridor. The train would be on an elevated structure from Union Station to Alameda Street, then transition into a trench that ends at LAX.
Stations	
LAX	New underground station.
Union Station To Anaheim Station via UPRR	Construction of an electrified, grade-separated, dedicated track within an existing rail corridor. Train would be on an elevated structure from Union Station, go into a trench at Slauson Avenue, move to at-grade across San Gabriel River, return to a trench up to La Canada Verde Creek, then become an aerial structure to Edison Field where it would go underground to a depressed station.
Stations	
Norwalk	New elevated station.
Anaheim	New underground station, built beneath existing station.
Union Station To Irvine Station via LOSSAN	Construction of fully grade-separated tracks within existing rail corridor, to be shared by electrified and conventional trains.
Stations	
Norwalk	Existing station. Proposed improvements include bypass tracks and additional parking.
Fullerton	Existing station. Proposed improvements include bypass tracks and additional parking.
Anaheim	Existing station. Proposed improvements include bypass tracks and additional parking.
Santa Ana	Existing station. Proposed improvements include bypass tracks and additional parking.
Irvine	Existing station. Expanded platform and parking, "terminal" tracks.
CONVENTIONAL RAIL (LOSSAN CORRIDOR) & STATION OPTIONS	
Union Station To Fullerton Station 4th Main Track	Construction of fourth main track in existing rail corridor between Commerce and Fullerton. Improvements can probably be accommodated within existing LOSSAN ROW except between Rio Hondo River and San Gabriel River.
Fullerton Station To Irvine Station	
Alignment Options:	
<i>AT-GRADE between Walnut Ave (Orange) and E. 17th St. (Santa Ana)</i>	Grade separations at street intersections between Walnut Ave. (in Orange) and E. 17 th Street in Santa Ana. At-grade curve straightening between Batavia Street and Walnut Ave. Improvements would be in existing rail corridor ROW, except for the curve realignment.
<i>TRENCH between Walnut Ave (Orange) and E. 17th St. (Santa Ana)</i>	Fully grade-separate existing rail corridor in a covered trench (same alignment as above), including curve straightening.
Stations	
Fullerton	Existing station. Proposed improvements include bypass tracks, platform reconfiguration, and additional parking.
Anaheim	Existing station. Proposed improvements include bypass tracks and additional parking.
Santa Ana	Existing station. Proposed improvements include bypass tracks and additional parking.
Irvine	Existing station. Proposed improvements include bypass tracks and additional parking.

¹ Conventional Rail (LOSSAN Corridor) alignment and/or construction options shown in italics and gray shading were eliminated from further evaluation during the LOSSAN Corridor Strategic Plan screening process. See text for more detail.

TABLE 1-3

**Alignment and Station Options for High-Speed Train Alternative
Los Angeles – Orange County – San Diego Region (continued)**

Alignment Segments and Station Locations Evaluated¹	Description of Proposed Options & Improvements
Irvine Station To San Juan Capistrano City Limits (no improvements)	No improvements are proposed for this conventional rail segment under the High-Speed Train Alternative.
San Juan Capistrano (City Limits to Avenida Aeropuerto)	
Alignments	
<i>Covered TRENCH/Cut-Fill between Trabuco Creek and Avenida Aeropuerto (trench goes under San Juan Creek); Double tracking</i>	<i>Double-tracking via an open trench along the approach to and departure from the San Juan Capistrano Station (relocated from the existing track location on the west side of the station to the east side of the station), and a covered trench under the parking area at the station. This option would include curve realignment at San Juan Creek</i>
TUNNEL along I-5 between Hwy 73 and Avenida Aeropuerto (tunnel under Trabuco Creek and San Juan Creek); Double tracking	Double-tracking in a tunnel running the length of the City of San Juan Capistrano under Interstate 5.
AT-GRADE and Open TRENCH along east side of Trabuco Creek	Double-tracking at grade and in an open trench along the east side of Trabuco Creek, west of the existing rail alignment.
Stations	
San Juan Capistrano	Existing station (for Covered Trench alignment only): Proposed improvements include double tracking (by-pass tracks) and parking expansion. New station would be constructed with the At-Grade/Open Trench option along Trabuco Creek. New station would be below-grade in open trench. No station would be included in San Juan Capistrano for the I-5 tunnel option.
Dana Point/San Clemente (Avenida Aeropuerto To San Onofre Power Plant)	
Alignments	
<i>Dana Point Curve Realignment; San Clemente - SHORT TRENCH; Double Tracking</i>	<i>Double-tracking and straightening existing curve at Dana Point between San Juan Creek and Avenida Aeropuerto along the existing rail corridor; double-tracking in existing rail alignment in San Clemente in a covered trench for about 1,000 feet either side of the pier.</i>
<i>Dana Point Curve Realignment; San Clemente - LONG TRENCH; Double Tracking</i>	<i>Double-tracking and straightening existing curve at Dana Point between San Juan Creek and Avenida Aeropuerto along the existing rail corridor; double-tracking generally along existing rail corridor through San Clemente in a covered trench from about one mile north of San Mateo Creek to about 4,000 feet north of the pier. This trench option includes one section that leaves the existing corridor and goes underneath residences located west of the corridor between the municipal pier and North El Camino Real.</i>
Dana Point Curve Realignment; San Clemente - SHORT TUNNEL; Double Tracking	Double-tracking and straightening existing curve at Dana Point in existing rail corridor; double-tracking via a short tunnel that follows Interstate 5 between Palm Drive and San Onofre State Beach, north of the power plant. The short tunnel alignment leaves the Interstate 5 corridor at Avenida Palizada, turns toward the coast and runs underneath residential, industrial and vacant areas, connecting with the existing rail corridor just south of Camino Capistrano.

¹ Conventional Rail (LOSSAN Corridor) alignment and/or construction options shown in italics and gray shading were eliminated from further evaluation during the LOSSAN Corridor Strategic Plan screening process. See text for more detail.

TABLE 1-3

**Alignment and Station Options for High-Speed Train Alternative
Los Angeles – Orange County – San Diego Region (continued)**

Alignment Segments and Station Locations Evaluated¹	Description of Proposed Options & Improvements
<i>San Clemente - LONG ONE-SEGMENT TUNNEL ; Double Tracking (crosses San Mateo and San Onofre Creeks)</i>	<i>Double-tracking via a long, one- segment tunnel following Interstate 5 from San Onofre State Beach to Avenida Aeropuerto in San Juan Capistrano. This option precludes the need for curve realignment at Dana Point. The existing rail corridor along the coast between southern San Clemente city limits to approximately Avenida Aeropuerto in San Juan Capistrano would be removed from service (or at least not be further improved from its existing condition).</i>
San Clemente - LONG TWO-SEGMENT TUNNEL; Double Tracking (crosses San Mateo and San Onofre Creeks)	Double-tracking via a long, two- segment tunnel following Interstate 5 from San Onofre State Beach to Avenida Aeropuerto in San Juan Capistrano. This option precludes the need for curve realignment at Dana Point. This tunnel would have the same alignment as the one-segment long tunnel above except in a one-mile stretch near Avenida Pico, it would veer to the east edge of I-5 and daylight into an open trench for about 1,000 feet. The existing rail corridor along the coast between southern San Clemente city limits to approximately Avenida Aeropuerto in San Juan Capistrano would be removed from service (or at least not be further improved from its existing condition).
Stations	
San Clemente	The trench options for this segment would include a proposed below-grade station south of the municipal pier to replace the existing San Clemente Station. The tunnel options would eliminate the need for a train station downtown; a new below-grade station would be constructed along the tunnel alignment where the tunnel transitions to a trench.
Camp Pendleton (San Onofre Power Plant to Oceanside City Limits - Double tracking; crosses San Mateo, San Onofre, and Santa Margarita Creeks)	Construction of an at-grade second main track, in portions of this segment covering about six miles, that are not already double-tracked or will be under the conventional rail improvements included in the No Project Alternative.
Oceanside/Carlsbad (Oceanside City Limits to Encinitas City Limits)	
Alignments	
Carlsbad - AT-GRADE; double tracking; crosses San Luis Rey, Buena Vista , Aqua Hedionda, and Batiquitos Lagoons	Double-tracking through Carlsbad in existing rail alignment at grade.
Carlsbad -TRENCH; double-tracking; crosses San Luis Rey, Buena Vista, Aqua Hedionda, and Batiquitos Lagoons	Double-tracking through Carlsbad in existing rail alignment in trench.
Stations	
Oceanside	Existing station. Proposed improvements include bypass tracks and parking expansion.

¹ Conventional Rail (LOSSAN Corridor) alignment and/or construction options shown in italics and gray shading were eliminated from further evaluation during the LOSSAN Corridor Strategic Plan screening process. See text for more detail.

TABLE 1-3

**Alignment and Station Options for High-Speed Train Alternative
Los Angeles – Orange County – San Diego Region (continued)**

Alignment Segments and Station Locations Evaluated¹	Description of Proposed Options & Improvements
Encinitas/Solana Beach (Encinitas City Limits to Solana Beach Station)	
Alignments	
Encinitas - AT-GRADE; Double Tracking; crosses San Elijo Lagoon	Double-tracking primarily at-grade, with a short trench segment for the rail corridor on either side of Birmingham Drive. This option would include reconfiguring the street intersection at Birmingham Drive and San Elijo Avenue, and close Chesterfield Drive at San Elijo Avenue. Another grade separation would occur at Leucadia Boulevard where the tracks would be depressed. Pedestrian undercrossings would be placed along the route.
Encinitas - SHORT TRENCH; Double Tracking; crosses San Elijo Lagoon	Double-tracking in same alignment as at-grade option above, but with an additional covered trench under Encinitas Boulevard and a transitional open trench about 1,500 feet either side of Encinitas Boulevard.
<i>Encinitas - LONG TRENCH; Double Tracking; crosses San Elijo Lagoon</i>	<i>Double-tracking in same alignment as options described above. Tracks would be in an open trench south of the Batiquitos Lagoon, then drop into a covered trench as they approach the downtown area, then return to an open trench up to the north end of the San Elijo Lagoon, where they transition to at-grade. Chesterfield Drive at San Elijo Avenue would be closed. Pedestrian crossings would be placed along the route.</i>
Stations	
Solana Beach	Existing station. Proposed improvements include platform modifications and parking expansion.
Del Mar (Solana Beach Station to I-5/805 Split)	
Alignments	
<i>COVERED TRENCH on bluffs; crosses San Dieguito and Los Penasquitos Lagoons</i>	<i>Double-tracking in a covered trench in the existing rail corridor alignment along the bluffs.</i>
TUNNEL under Camino Del Mar; crosses San Dieguito and Los Penasquitos Lagoons	Double-tracking via a tunnel underneath Camino Del Mar. Tunnel would begin at Jimmy Durante Boulevard, and daylight at Carmel Valley Road where tracks would then connect with the existing alignment across Los Penasquitos Lagoon. The existing rail track on the bluffs would be removed from service.
TUNNEL along I-5; crosses San Dieguito and Los Penasquitos Lagoons	Double-tracking via a tunnel that would run under Interstate 5 and daylight along the southern boundary of San Dieguito Lagoon. Tracks would reconnect with the existing rail at-grade near the Del Mar race track. The existing rail track on the bluffs would be removed from service.
I-5/805 Split To Hwy 52	
Alignments	
Miramar Hill Tunnel	Double-tracking via a tunnel through Miramar Hill.
I-5 Tunnel	Double-tracking via a tunnel under Interstate 5.
Stations	
UTC (Only applies to Miramar Hill Tunnel)	New station, proposed only with the Miramar Hill tunnel option. Station would be constructed underground.
Hwy 52 To Santa Fe Depot (Curve realignment; Double Tracking; San Diego River Bridge; Trench between Sassafras St and Cedar St)	Double-tracking in existing rail corridor for full length of segment. An existing curve just south of Highway 52 would be straightened, requiring two new bridges over wetlands in San Clemente Canyon. New bridges would also be constructed over Tecolote Creek and San Diego River. Tracks would be placed in a trench between Sassafras Street and Cedar Street.
Stations	
Santa Fe Depot	Existing station. Proposed improvements include bypass tracks and parking expansion.

¹ Conventional Rail (LOSSAN Corridor) alignment and/or construction options shown in italics and gray shading were eliminated from further evaluation during the LOSSAN Corridor Strategic Plan screening process. See text for more detail.

FIGURE 1-5A

**High-Speed Train Alternative: Alignment and Construction Type by Segment
 (Los Angeles to Irvine)**



FIGURE 1-5B

**High-Speed Train Alternative: Alignment and Construction Type by Segment
 (Irvine to Oceanside)**



FIGURE 1-5C

**High-Speed Train Alternative: Alignment and Construction Type by Segment
 (Oceanside to San Diego)**



2.0 SECTION 4(F) AND 6(F) EVALUATION METHODOLOGY

The 4(f) and 6(f) evaluation methodology for this program-level EIR/EIS is focused on a review of the potential impacts to historical, cultural and wildlife resources that are identified from existing information along corridors for each of the alternatives (high-speed train and modal alternatives) and around stations. The potential 4(f) and 6(f) impacts for each of these alternatives are compared with the No-Project Alternative.

Using the study area defined below to identify possible resources, (see Table 2-1) the 4 (f) and 6(f) analysis will:

- Where possible, identify 4(f) and 6(f) resources that have the potential to be considered a “use”. A use would occur if the physical features of a proposed alignment (i.e. track work) directly intersected with a portion or all of a 4(f) or 6(f) resource. For the purpose of this programmatic document, any resource that is within 150’ of the centerline will be considered a “use.” This 150’ buffer represents the most likely area that would constitute the Right of Way (ROW) boundary. This area would have the highest probability of disruption to 4(f) and 6(f) resources. While the actual ROW for the project will vary, this 150’ buffer is sufficient for this analysis.
- Where possible, identify 4(f) and 6(f) resources that have the potential to be a “constructive use.” A constructive use would occur if a resource were affected as a result of its proximity to the proposed alignment. Possible constructive uses could include but may not be limited to increased noise, dust, or vibration at the location of the 4(f) and 6(f) resource. For the purpose of this programmatic document, it is assumed that noise impacts will be the most likely determinant of constructive use. Consequently, any resource that is between 150’ and 900’ of the centerline will be considered a constructive use. Given that this buffer is based on the noise analysis, it is not applicable where the alignment is in a tunnel.
- Identify the most probable (obvious) measures to minimize harm or avoid a 4(f) and 6(f) resource altogether.

Both uses and constructive uses would constitute a 4(f) and 6(f) use and have the potential to be temporary (limited to the construction period) or permanent.

Data from the *Los Angeles-Orange County-San Diego Cultural Resources Technical Evaluation* (Authority 2003) was used to obtain information about areas listed as being known, eligible, or potentially eligible for the NHRP. For cultural resources, an overall ranking (Low, Medium, High) was assigned to each section of the study corridor that was based upon numbers of archaeological sites, percentage of the route developed in historic periods, and the presence of traditional cultural properties. No information was provided that would allow for the 4(f) determination of “use” or “constructive use” of these cultural resources.

TABLE 2-1
Study Areas for Section 4(f) and 6(f) Analysis

Discipline	4(f) and 6(f) Resources	HSR Study Area	No-Project/Modal Alternative
Cultural Resources. (National Register of Historic Places (NHRP) Listed and Eligible Areas)	Historic, historical archeological and prehistoric resources. (Given the level of detail required for this programmatic document, these resources will be identified at an "area" level and not at the individual resource level.)	>500' from each side of centerline in non-urban areas. >100' from centerline in urban areas.	100' from existing highways and existing airport property boundaries
Land Use	Parks, recreational lands	.25 miles from centerline.	.25 miles from centerline
Biological	Refuges and conservation lands	1,000' around stations and on both sides of the corridor in developed areas. .25 mi. around stations and on both sides of ROW in undeveloped areas*. .5 mi around stations and on both sides of the corridors in sensitive areas (lagoons and wildlife corridors).	>1,000' around stations and on both sides of the corridor in developed areas. >.25 mi. around stations and on both sides of ROW in undeveloped areas. >.5 mi around stations and on both sides of the corridors in sensitive areas (lagoons and wildlife corridors).

* The 0.25-mile study parameter was not used for analysis of data in the Los Angeles-Orange County-San Diego region. All areas in the study area for this region that are not considered developed are considered sensitive, thus requiring the 0.5-mile parameter be used for data analysis of all undeveloped areas.

All other data for this 4(f) and 6(f) evaluation report (land use and biological) were obtained from a GIS database of information on publicly owned parks, government conservation lands, and wildlife and waterfowl refuges. No GIS information on recreational lands was available for this study although some of the properties listed as parks may also be recreational lands. Using GIS tools, it was possible to identify individual parks, conservation lands, and refuge properties, and assess “use” and “constructive use” for each. A ranking of High, Medium, or Low was assigned to each resource based upon its distance from the centerline, with High being any resource intersected within 150’ feet of the centerline, Medium being intersected between 150’-500’, and Low being intersected greater than 500’ away from centerline.

The results of the analysis are summarized in the text and table in Section 3.0.

3.0 LOS ANGELES-ORANGE COUNTY-SAN DIEGO SECTION 4(F) AND 6(F) ANALYSIS

3.1 IDENTIFICATION OF POTENTIAL SECTION 4(F) AND 6(F) RESOURCES

The Section 4(f) and 6(f) resources are summarized in Table 3-1 on the following pages. Because the NRHP resources were not specifically identified in the *Los Angeles-Orange County-San Diego Cultural Resources Technical Evaluation* (Authority 2003), Section 3.3 and Appendix A provide a more detailed discussion on how the overall ranking was achieved.

As shown previously in Table 1-3 (Chapter 1), there are numerous alignment and construction options in the Conventional Rail portion of the High-Speed Train Alternative. To allow a reasonable comparison of impacts among the No Project, Modal, and High-Speed Train Alternative in Table 3-1, the Conventional Rail improvement options are summarized by showing a range of potential impacts. This range is represented by two of many possible route combinations between Union Station and San Diego: (1) a Higher Level Infrastructure route, and (2) a Lower Level Infrastructure route. The Higher Level route is based on combining the alignment/construction options (one from each sub-segment) that would involve the most extensive infrastructure investment and/or construction complexity. For example, where a sub-segment has both an at-grade option and a trenching option in the same general alignment, the trenching option was used for the Higher Level route, and the at-grade option was used in the Lower Level route. Where two tunnel options are the only options in one sub-segment, the longer tunnel was included in the Higher Level route. In this way, a range of potential impacts could be bracketed to allow a valid comparison of the High-Speed Train Alternative to the No Project and the Modal Alternative.

The specific alignment and construction options included in both the Higher and the Lower Level routes are provided in Appendix B. These representative routes do not include any of the options that were eliminated from further consideration during the LOSSAN screening process. It must be emphasized that these routes serve only to provide a reasonable range of impacts for comparative purposes. They do *not* represent any selection of a particular option as preferred. No selection of preferred alignment options will be done until subsequent stages of this project.

TABLE 3-1

Summary Analysis/Comparison Table – Impacts to Section 4(f) and 6(f) Resources

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	¹ Potential for Impacts to NHRP Listed, Eligible, or Potentially Eligible Resources Within Cultural APE (H,M,L)
NO-PROJECT ALTERNATIVE			
NO-PROJECT	² The No-Project Alternative assumes that others would complete projects including local, state, and interstate transportation system improvements designated in existing plans and programs (refer to Table 1-1). No additional impacts to 4(f) or 6(f) resources would occur under the No-Project Alternative beyond those addressed in environmental documents for those projects.		
MODAL ALTERNATIVE			
LAX to UNION STATION	³ n/a	³ n/a	³ n/a
UNION STATION TO IRVINE	L – 13 M – 4 H – 5	L – 1 H - 1	High
IRVINE TO OCEANSIDE	L – 5 M – 4 H – 6	M - 1	Medium
OCEANSIDE TO SAN DIEGO	L – 13 M – 5 H - 7	H - 1	Medium
LONG BEACH AIRPORT	None	None	Low
HIGH-SPEED TRAIN ALTERNATIVE			
<i>High-Speed Rail</i>			
LAX to UNION STATION	L – 3 H – 2	None	High
Stations			
LAX	L – 1	None	Medium

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ High, Medium, and Low rankings were obtained from the *Los Angeles-Orange County-San Diego Cultural Resources Technical Evaluation* (Authority 2003)

² See Section 3.1 for description of the No-Project Alternative

³ No expansion of I-5 in this section

TABLE 3-1
Summary Analysis/Comparison Table
Impacts to Section 4(f) and 6(f) Resources (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	¹ Potential for Impacts to NHRP Listed, Eligible, or Potentially Eligible Resources Within Cultural APE (H,M,L)
UNION STATION TO IRVINE			
Alignment Options			
Union Station To Anaheim Station via UPRR	L – 3 M – 3 H – 3	None	High
Stations			
Norwalk	H – 1	None	Medium
Anaheim	None	None	Medium
Union Station To Irvine Station via LOSSAN	L – 5 M – 5 H – 5	L – 1	High
Stations			
Norwalk	H – 1	None	Low
Fullerton	M – 1	None	Medium
Anaheim	None	None	Medium
Santa Ana	M – 1	None	Medium
Irvine	H – 1	None	Medium
CONVENTIONAL RAIL (LOSSAN) & STATION OPTIONS			
UNION STATION TO IRVINE			
Alignment Options			
Higher Level Infrastructure Improvements	L – 5 M – 5 H – 7	L – 1	High
Lower Level Infrastructure Improvements	L – 5 M – 5 H – 7	L – 1	High

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ High, Medium, and Low rankings were obtained from the *Los Angeles-Orange County-San Diego Cultural Resources Technical Evaluation* (Authority 2003)

² See Section 3.1 for description of the No-Project Alternative

³ No expansion of I-5 in this section

TABLE 3-1
Summary Analysis/Comparison Table
Impacts to Section 4(f) and 6(f) Resources (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	¹ Potential for Impacts to NHRP Listed, Eligible, or Potentially Eligible Resources Within Cultural APE (H,M,L)
Stations			
Fullerton	M – 1	None	Medium
Anaheim	None	None	Medium
Santa Ana	M – 1	None	Medium
Irvine	H – 1	None	Medium
IRVINE TO OCEANSIDE			
Alignment Options			
Higher Level Infrastructure Improvements	L – 3 M – 3 H – 8	H - 2	Medium
Lower Level Infrastructure Improvements	L – 2 M – 3 H – 9	H - 2	High
Stations			
San Juan Capistrano (Lower Level Improvements Only)	None	None	High
San Clemente	None	None	High
OCEANSIDE TO SAN DIEGO			
Alignment Options			
Higher Level Infrastructure Improvements	L – 9 M – 5 H – 12	H - 2	Medium
Lower Level Infrastructure Improvements	L – 8 M – 6 H – 14	M – 1 H - 1	High

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ High, Medium, and Low rankings were obtained from the *Los Angeles-Orange County-San Diego Cultural Resources Technical Evaluation* (Authority 2003)

² See Section 3.1 for description of the No-Project Alternative

³ No expansion of I-5 in this section

TABLE 3-1
Summary Analysis/Comparison Table
Impacts to Section 4(f) and 6(f) Resources (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	¹ Potential for Impacts to NHRP Listed, Eligible, or Potentially Eligible Resources Within Cultural APE (H,M,L)
Stations			
Oceanside	M - 3	None	Medium
Solana Beach	None	None	Medium
UTC (Higher Level Improvements Only)	L - 1 H - 1	None	Low
Santa Fe Depot	L - 1 M - 1	None	High

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ High, Medium, and Low rankings were obtained from the *Los Angeles-Orange County-San Diego Cultural Resources Technical Evaluation* (Authority 2003)

² See Section 3.1 for description of the No-Project Alternative

³ No expansion of I-5 in this section

3.2 PUBLICLY OWNED PARKS, RECREATIONAL LANDS AND WILDLIFE AND WATERFOWL REFUGES

Table 3-2 identifies the 4(f) and (6(f) resources that have the potential to be considered a “use” or “constructive use”. A discussion of which alternative would potentially have the greatest impact on these resources is provided in Section 3.4.

TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
NO-PROJECT	n/a ¹	n/a ¹	n/a ¹	n/a ¹	n/a ¹
MODAL					
Union Station to LAX (HST only)	n/a ²	n/a ²	n/a ²	n/a ²	n/a ²
Union Station To Fullerton Station	Wardlow Park – Low; Boisseranc Park – Low; Wilderness Park –Low; Veterans Memorial Park – Low; Bristow Park – Medium; Santa Fe Springs Park – Medium; Bellis Park – Medium; Orr Park – Medium; Norwalk Park – High; Dennis the Menace Park – High	None	Norwalk Park – High; Dennis the Menace Park – High	Wardlow Park – Low; Boisseranc Park – Low; Wilderness Park –Low; Veterans Memorial Park – Low; Bristow Park – Medium; Santa Fe Springs Park – Medium; Bellis Park – Medium; Orr Park – Medium	Noise walls; Visual screening as appropriate
Fullerton Station To Irvine Station	El Toro Marine Corps Air Station – Low; Frontier Park – Low; Cabrillo Park – Low; Logan Park – Low; Fisher Park - Low; Santiago Park – Low; Morrison Park – Low; Brookhurst Park – Low; John Marshall Park – Low; Heritage Park – High; Prentice Park – High; Santa Ana Zoo - High	El Toro Community Park Acquisition – Low; Santa Ana Zoo - High	Heritage Park – High; Prentice Park – High; Santa Ana Zoo - High	El Toro Marine Corps Air Station – Low; Frontier Park – Low; Cabrillo Park – Low; Logan Park – Low; Fisher Park - Low; Santiago Park – Low; Morrison Park – Low; Brookhurst Park – Low; John Marshall Park – Low	Noise walls; Visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2
Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
Irvine Station To San Juan Capistrano City Limits	Granada Park – Low; Madrid Fore Park – Low; El Toro Marine Corps Air Station – High	None	El Toro Marine Corps Air Station – High	Granada Park – Low; Madrid Fore Park – Low	Noise walls; Visual screening as appropriate
San Juan Capistrano	Cook Park – Low; Serra Park – High	None	Serra Park – High	Cook Park – Low	Noise walls; Visual screening as appropriate
Dana Point/San Clemente	Bonito Canyon Park – Low; Verde Park – Low; San Clemente State Beach – Medium; Sunset Park – Medium; San Luis Rey Park – Medium; San Onofre State Beach – High; Camp Pendleton Marine Corps Base – High; San Geronio Park – High	San Clemente State Beach – Medium	San Onofre State Beach – High; Camp Pendleton Marine Corps Base – High; San Geronio Park – High	Bonito Canyon Park – Low; Verde Park – Low; San Clemente State Beach – Medium; Sunset Park – Medium; San Luis Rey Park – Medium	Noise walls; Visual screening as appropriate
Camp Pendleton	San Onofre State Beach – Medium; Camp Pendleton Marine Corps Base – High	None	Camp Pendleton Marine Corps Base – High	San Onofre State Beach – Medium	Noise walls; Visual screening as appropriate
Oceanside/Carlsbad	South Oceanside Park – Low; Balderama Park – Low; South Carlsbad State Beach – Low; Batiquitos Lagoon Ecological Reserve – High; Recreation Park – High	None	Batiquitos Lagoon Ecological Reserve – High; Recreation Park – High	South Oceanside Park – Low; Balderama Park – Low; South Carlsbad State Beach – Low	Noise walls; Visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
Encinitas/Solana Beach	View Point Park – Low; Orpheus Park – Low; Paul Ecke Sports Park – Medium; San Elijo Lagoon Ecological Reserve – High	San Elijo Lagoon Acquisition – High	San Elijo Lagoon Ecological Reserve – High	View Point Park – Low; Orpheus Park – Low; Paul Ecke Sports Park – Medium	Noise walls; Visual screening as appropriate
Del Mar	Torrey Pines State Reserve – Low; Soalan Highlands Park – Low; Surf and Turf Recreational Park – Medium; San Dieguito Lagoon Ecological Reserve – High	None	San Dieguito Lagoon Ecological Reserve – High	Torrey Pines State Reserve – Low; Soalan Highlands Park – Low; Surf and Turf Recreational Park – Medium	Noise walls; Visual screening as appropriate
I-5/805 Split To Hwy 52	Villa La Jolla Park – Low; Soledad Park – Low; Torrey Pines State reserve – Low; Marian Bear Memorial Park – Medium; UC San Diego – High; Naval Reservation – High	None	UC San Diego – High; Naval Reservation – High	Villa La Jolla Park – Low; Soledad Park – Low; Torrey Pines State reserve – Low; Marian Bear Memorial Park – Medium	Noise walls; Visual screening as appropriate
Hwy 52 To Santa Fe Depot	Naval Reservation – Low; Heritage Park – Low; Mission Bay Park – Low; Marian Bear Memorial Natural Park – Medium; Marine Corps Recruit Depot – Med; Old Town San Diego Historic Park – High	None	Old Town San Diego Historic Park – High	Naval Reservation – Low; Heritage Park – Low; Mission Bay Park – Low; Marian Bear Memorial Natural Park – Medium; Marine Corps Recruit Depot – Medium	Noise walls; Visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
HST CORRIDORS & STATION OPTIONS					
LAX To Union Station	Pueblo de Los Angeles – Low; Ashwood Park –Low; City Park – Low; Rogers Park – High; Centinela Park – High	None	Rogers Park – High; Centinela Park – High	Pueblo de Los Angeles – Low; Ashwood Park –Low; City Park – Low	Limit construction to within ROW; noise walls; visual screening as appropriate
Stations					
LAX	Carl Nielsen Park – Low	None	None	Carl Nielsen Park – Low	Limit construction to within ROW; noise walls; visual screening as appropriate
Union Station To Anaheim Station via UPRR	Norwalk Park – Low; Brookhurst Park – Low; Boisseranc Park – Low; Bellis Park – Medium; John Marshall Park – Medium; Rio San Gabriel Park – Medium; Vista Verde Park – High; White Park – High; Municipal Park – High	None	Vista Verde Park – High; White Park – High; Municipal Park – High	Norwalk Park – Low; Brookhurst Park – Low; Boisseranc Park – Low; Bellis Park – Medium; John Marshall Park – Medium; Rio San Gabriel Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
Stations					
Norwalk	Vista Verde Park – High	None	Vista Verde Park – High	None	Limit construction to within ROW; noise walls; visual screening as appropriate
Anaheim	None	None	None	None	None
Union Station To Irvine Station via LOSSAN	Tustin Centennial Park – Low; Hart Park – Low; El Camino Park – Low; Ford Park – Low; Adlena Park – Low; Logan Park – Medium; Neff Park – Medium; Lemon Park – Medium; Independence Park – Medium; Pacific Park – Medium; Amerige Park – High; Zimmerman Park – High; El Toro Marine Corps Air Station – High; Marine Corps Air Station (helicopter) – High; Hoeptner Park – High	El Camino Park Development – Low	Amerige Park – High; Zimmerman Park – High; El Toro Marine Corps Air Station – High; Marine Corps Air Station (helicopter) – High; Hoeptner Park – High	Tustin Centennial Park – Low; Logan Park – Medium; Hart Park – Low; El Camino Park – Low; Ford Park – Low; Adlena Park – Low; Neff Park – Medium; Lemon Park – Medium; Independence Park – Medium; Pacific Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2
Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
Stations					
Norwalk	Zimmerman Park – High	None	Zimmerman Park – High	None	Limit construction to within ROW; noise walls; visual screening as appropriate
Fullerton	Lemon Park – Medium	None	None	Lemon Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
Anaheim	None	None	None	None	None
Santa Ana	Logan Park – Medium	None	None	Logan Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
Irvine	El Toro Marine Corps Air Station – High	None	El Toro Marine Corps Air Station – High	None	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
CONVENTIONAL RAIL (LOSSAN) & STATION OPTIONS					
Union Station To Fullerton Station (4th main track)	Ford Park – Low; Adlena Park – Low; Independence Park – Medium; Pacific Park – Medium; Neff Park – Medium; Zimmerman Park – High; El Toro Marine Corps Air Station – High; Marine Corps Air Station (helicopter) – High; Amerige Park – High	None	Zimmerman Park – High; El Toro Marine Corps Air Station – High; Marine Corps Air Station (helicopter) – High; Amerige Park – High	Ford Park – Low; Adlena Park – Low; Independence Park – Medium; Pacific Park – Medium; Neff Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
Fullerton Station To Irvine Station					
Alignments					
AT-GRADE between Walnut Ave (Orange) and E. 17th St. (Santa Ana)	Hart Park – Low; El Camino Park – Low; Tustin Centennial Park – Low; Logan Park – Medium; Lemon Park – Medium; El Toro Marine Corps Air Station – High; Marine Corps Air Station (helicopter) – High; Hoeptner Park – High;	El Camino Park Development – Low	El Toro Marine Corps Air Station – High; Marine Corps Air Station (helicopter) – High; Hoeptner Park – High	Tustin Centennial Park – Low; Logan Park – Medium; Hart Park – Low; El Camino Park – Low; Lemon Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2
Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
TRENCH between Walnut Ave (Orange) and E. 17th St. (Santa Ana)	Tustin Centennial Park – Low; Logan Park – Medium; Hart Park – Low; El Camino Park – Low; Lemon Park – Medium; El Toro Marine Corps Air Station – High; Marine Corps Air Station (helicopter) – High; Hoeptner Park – High	El Camino Park Development	El Toro Marine Corps Air Station – High; Marine Corps Air Station (helicopter) – High; Hoeptner Park – High	Tustin Centennial Park – Low; Hart Park – Low; El Camino Park – Low; Lemon Park – Medium; Logan Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
Stations					
Fullerton	Lemon Park – Medium	None	None	Lemon Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
Anaheim	None	None	None	None	None
Santa Ana	Logan Park – Medium	None	None	Logan Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
Irvine	El Toro Marine Corps Air Station – High	None	El Toro Marine Corps Air Station – High	None	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
Irvine Station To San Juan Capistrano City Limits (no improvements)	n/a ³	n/a ³	n/a ³	n/a ³	n/a ³
San Juan Capistrano (City Limits to Avenida Aeropuerto)					
Alignments					
Covered TRENCH/Cut-Fill between Trabuco Creek and Avenida Aeropuerto (trench goes under San Juan Creek); Double tracking	Rio Oso Park – Medium; Serra Park – High	None	Serra Park – High	Rio Oso Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
TUNNEL along I-5 between Hwy 73 and Avenida Aeropuerto (tunnel under Trabuco Creek and San Juan Creek); Double tracking	Cook Park – Low; Serra Park – High		Serra Park – High	Cook Park – Low	Limit construction to within ROW; noise walls; visual screening as appropriate
AT-GRADE and Open TRENCH along east side of Trabuco Creek	Rio Oso Park - High	None	Rio Oso Park - High	None	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
Stations					
San Juan Capistrano	None	None	None	None	None
Dana Point/San Clemente (Avenida Aeropuerto To San Onofre Power Plant)					
Alignments					
Dana Point Curve Realignment; San Clemente – SHORT TRENCH; Double Tracking (crosses San Mateo and San Onofre Creeks)	Mission Bell Park – Low; Del Obispo Park – Low; Plaza Park – Low; Pine Park – Medium; San Onofre State Beach – High; Camp Pendleton Marine Corps Base – High; San Clemente State Beach – High; Doheny State Beach – High; Calafia Park – High; Leyton Park – High; Palisades Gazebo Park – High; Parque Del Mar – High;	Doheny Beach Acquisition – High; San Clemente State Beach – High	San Onofre State Beach – High; Camp Pendleton Marine Corps Base – High; San Clemente State Beach – High; Doheny State Beach – High; Calafia Park – High; Leyton Park – High; Palisades Gazebo Park – High; Parque Del Mar – High;	Mission Bell Park – Low; Del Obispo Park – Low; Plaza Park – Low; Pine Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
Dana Point Curve Realignment; San Clemente – LONG TRENCH; Double Tracking (crosses San Mateo and San Onofre Creeks)	Mission Bell Park – Low; Del Obispo Park – Low; Plaza Park – Low; Pine Park – Medium; San Onofre State Beach – High; Camp Pendleton Marine Corps Base – High; San Clemente State Beach – High; Doheny State Beach – High; Calafia Park – High; Leyton Park – High; Palisades Gazebo Park – High; Parque Del Mar – High;	Doheny Beach Acquisition – High; San Clemente State Beach – High	San Onofre State Beach – High; Camp Pendleton Marine Corps Base – High; San Clemente State Beach – High; Doheny State Beach – High; Calafia Park – High; Leyton Park – High; Palisades Gazebo Park – High; Parque Del Mar – High;	Mission Bell Park – Low; Del Obispo Park – Low; Plaza Park – Low; Pine Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
Dana Point Curve Realignment; San Clemente – SHORT TUNNEL; Double Tracking (crosses San Mateo and San Onofre Creeks)	Mission Bell Park – Low; Del Obispo Park – Low; Bonito Canyon Park – Medium; Pine Park – Medium; San Luis Rey Park – Medium; San Onofre State Beach – High; Camp Pendleton Marine Corps Base – High; San Clemente State Beach – High; Doheny State Beach – High; Leyton Park – High; Palisades Gazebo Park – High	Doheny Beach Acquisition – High; San Clemente State Beach – High	San Onofre State Beach – High; Camp Pendleton Marine Corps Base – High; San Clemente State Beach – High; Doheny State Beach – High; Leyton Park – High; Palisades Gazebo Park – High	Mission Bell Park – Low; Del Obispo Park – Low; Bonito Canyon Park – Medium; Pine Park – Medium; San Luis Rey Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
San Clemente – LONG ONE-SEGMENT TUNNEL; Double Tracking (crosses San Mateo and San Onofre Creeks)	Verde Park – Low; Mission Bell Park – Low; San Luis Rey Park – Medium; Sunset Park – Medium; Bonito Canyon Park – Medium; San Onofre State Beach – High; Camp Pendleton Marine Corps Base – High; San Clemente State Beach – High; Doheny State Beach – High; San Geronio Park – High	Doheny Beach Acquisition – High; San Clemente State Beach – High	San Onofre State Beach – High; Camp Pendleton Marine Corps Base – High; San Clemente State Beach – High; Doheny State Beach – High; San Geronio Park – High	Verde Park – Low; Mission Bell Park – Low; San Luis Rey Park – Medium; Sunset Park – Medium; Bonito Canyon Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
San Clemente – LONG TWO-SEGMENT TUNNEL; Double Tracking (crosses San Mateo and San Onofre Creeks)	Verde Park – Low; Mission Bell Park – Low; San Luis Rey Park – Medium; Sunset Park – Medium; Bonito Canyon Park – Medium; San Onofre State Beach – High; Camp Pendleton Marine Corps Base – High; San Clemente State Beach – High; Doheny State Beach – High; San Geronio Park – High	Doheny Beach Acquisition – High; San Clemente State Beach – High	San Onofre State Beach – High; Camp Pendleton Marine Corps Base – High; San Clemente State Beach – High; Doheny State Beach – High; San Geronio Park – High	Verde Park – Low; Mission Bell Park – Low; San Luis Rey Park – Medium; Sunset Park – Medium; Bonito Canyon Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
San Clemente	None	None	None	None	None

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
Camp Pendleton (San Onofre Power Plant to Oceanside City Limits – Double tracking; crosses Santa Margarita River)	Camp Pendleton Marine Corps Base – High; San Onofre State Beach – High	None	Camp Pendleton Marine Corps Base – High; San Onofre State Beach – High	None	Noise Walls and/or visual screening as appropriate
Oceanside/Carlsbad (Oceanside City Limits to Encinitas City Limits)					
Alignments					
Carlsbad – AT-GRADE; double tracking; crosses San Luis Rey, Buena Vista , Aqua Hedionda, and Batiquitos Lagoons	Leucadia State Beach – Low; Pacific Street Linear Park – Low; Rotary Park – Low; Carlsbad State Beach – Medium; South Carlsbad State Beach – High; Batiquitos Lagoon Ecological Reserve – High; Camp Pendleton Marine Corps Base – High;	None	South Carlsbad State Beach – High; Batiquitos Lagoon Ecological Reserve – High; Camp Pendleton Marine Corps Base – High;	Leucadia State Beach – Low; Pacific Street Linear Park – Low; Rotary Park – Low; Carlsbad State Beach – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
Carlsbad –TRENCH; double- tracking; crosses San Luis Rey, Buena Vista, Aqua Hedionda, and Batiquitos Lagoons	Leucadia State Beach – Low; Pacific Street Linear Park – Low; Rotary Park – Low; Carlsbad State Beach – Medium; South Carlsbad State Beach – High; Batiquitos Lagoon Ecological Reserve – High; Camp Pendleton Marine Corps Base – High	None	South Carlsbad State Beach – High; Batiquitos Lagoon Ecological Reserve – High; Camp Pendleton Marine Corps Base – High	Leucadia State Beach – Low; Pacific Street Linear Park – Low; Rotary Park – Low; Carlsbad State Beach – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2
Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
Stations					
Oceanside	Tyson Street Park – Medium; Pacific Street Linear Park – Medium; Rotary Park – Medium	None	None	Tyson Street Park – Medium; Pacific Street Linear Park – Medium; Rotary Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
Encinitas/Solana Beach (Encinitas City Limits to Solana Beach Station)					
Alignments					
Encinitas – AT-GRADE; Double Tracking; crosses San Elijo Lagoon	Leucadia State Beach – Low; South Carlsbad State Beach – Low; Orpheus Park – Low; View Point Park – Medium; Moonlight State Beach – Medium; Cardiff State Beach – Medium; San Elijo Lagoon Ecological Reserve – High; San Elijo State Beach – High;	San Elijo Lagoon County Park and Ecological Preserve – High	San Elijo Lagoon Ecological Reserve – High; San Elijo State Beach – High	Leucadia State Beach – Low; South Carlsbad State Beach – Low; Orpheus Park – Low; View Point Park – Medium; Moonlight State Beach – Medium; Cardiff State Beach – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
Encinitas – SHORT TRENCH; Double Tracking; crosses San Elijo Lagoon	Leucadia State Beach – Low; South Carlsbad State Beach – Low; Orpheus Park – Low; View Point Park – Medium; Moonlight State Beach – Medium; Cardiff State Beach – Medium; San Elijo Lagoon Ecological Reserve – High; San Elijo State Beach – High	San Elijo Lagoon County Park and Ecological Preserve – High	San Elijo Lagoon Ecological Reserve – High; San Elijo State Beach – High	Leucadia State Beach – Low; South Carlsbad State Beach – Low; Orpheus Park – Low; View Point Park – Medium; Moonlight State Beach – Medium; Cardiff State Beach – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
Encinitas – LONG TRENCH; Double Tracking; crosses San Elijo Lagoon	Leucadia State Beach – Low; South Carlsbad State Beach – Low; Moonlight State Beach – Medium; Cardiff State Beach – Medium; San Elijo Lagoon Ecological Reserve – High; San Elijo State Beach – High	San Elijo Lagoon County Park and Ecological Preserve – High	San Elijo Lagoon Ecological Reserve – High; San Elijo State Beach – High	Leucadia State Beach – Low; South Carlsbad State Beach – Low; Moonlight State Beach – Medium; Cardiff State Beach – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
Stations					
Solana Beach	None	None	None	None	None
Del Mar (Solana Beach Station to I-5/805 Split)					
Alignments					
COVERED TRENCH on bluffs; crosses San Dieguito and Los Peñasquitos Lagoons	Torrey Pines State Beach – High; Torrey Pines State Reserve – High; Powerhouse Park – High; San Dieguito Ecological Preserve - Med	San Dieguito Ecological Preserve - Med	Torrey Pines State Beach – High; Torrey Pines State Reserve – High; Powerhouse Park – High	San Dieguito Ecological Preserve - Med	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
TUNNEL under Camino Del Mar; crosses San Dieguito and Los Peñasquitos Lagoons	Torrey Pines State Beach – High; Torrey Pines State Reserve – High; Powerhouse Park – High; San Dieguito Ecological Preserve - Med	San Dieguito Ecological Preserve - Med	Torrey Pines State Beach – High; Torrey Pines State Reserve – High; Powerhouse Park – High	San Dieguito Ecological Preserve - Med	Limit construction to within ROW; noise walls; visual screening as appropriate
TUNNEL along I-5; crosses San Dieguito Lagoon and avoids Los Peñasquitos Lagoon	Torrey Pines State Reserve - High; San Dieguito Lagoon Ecological Reserve - High	San Dieguito Lagoon Ecological Reserve - High	Torrey Pines State Reserve - High; San Dieguito Lagoon Ecological Reserve - High	None	Limit construction to within ROW; noise walls; visual screening as appropriate
I-5/805 Split To Hwy 52					
Alignments					
Miramar Hill Tunnel	Villa La Jolla Park – Low; Marian Bear Memorial Natural Park – Medium; Naval Reservation – High; UC San Diego – High;	None	Naval Reservation – High; UC San Diego – High;	Villa La Jolla Park – Low; Marian Bear Memorial Natural Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate
I-5 Tunnel	Marian Bear Memorial Natural Park – Medium; Naval Reservation – High; UC San Diego – High; Mandell Weiss Eastgate Park – High	None	Naval Reservation – High; UC San Diego – High; Mandell Weiss Eastgate Park – High	Marian Bear Memorial Natural Park – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



TABLE 3-2

Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges (continued)

	Section 4(f) Parks/ Recreational Resources within 900' of Centerline (H,M,L)	Section 6(f) Water Conservation Fund Properties within 900' of Centerline (H,M,L)	Potential for Direct Impacts	Potential for Constructive Use	Probable Measures to Minimize Harm
Stations					
UTC (Only applies to Miramar Hill Tunnel)	UC San Diego – Low; Mandell Weiss Eastgate Park – High	None	Mandell Weiss Eastgate Park – High	UC San Diego – Low	Limit construction to within ROW; noise walls; visual screening as appropriate
Hwy 52 To Santa Fe Depot (Curve realignment; Double Tracking; San Diego River Bridge; Trench between Sassafras St and Cedar St)	Naval Reservation – Low; Presidio Park – Low; Old Town San Diego Historic Park – High; Mission Bay Park – High; Marian Bear Memorial Natural Park – High	None	Old Town San Diego Historic Park – High; Mission Bay Park – High; Marian Bear Memorial Natural Park – High	Naval Reservation – Low; Presidio Park – Low	Limit construction to within ROW; noise walls; visual screening as appropriate
Stations					
Santa Fe Depot	Pantoja Park – Low; Naval Reservation – Medium	None	None	Pantoja Park – Low; Naval Reservation – Medium	Limit construction to within ROW; noise walls; visual screening as appropriate

HIGH = resources within 150' of centerline and constitutes a "use"; MEDIUM = resources between 150'-500' of centerline and is considered a "constructive use"; LOW = resources are > 500' from centerline but are still within study area and considered a "constructive use"

¹ See Section 3.1 for description of the No-Build Alternative

² No expansion of I-5 in this section

³ No improvements in this section of the rail corridor



3.3 NATIONAL REGISTER OF HISTORIC PLACES (NRHP) LISTED AND ELIGIBLE AREAS

Because cultural resources were analyzed using a different methodology than other potential 4(f) and 6(f) resources, more information on the NRHP properties is included in Appendix A of this report. The appendix provides an analysis of each section of the various alternatives and an explanation of how the overall ranking of High, Medium, and Low was determined in the potential impacts to NRHP resources column of Table 3-1. Although no specific identification is made regarding the 4(f) status in each of the sections of the alternatives, it can be assumed that there is a potential for any of these cultural resources to also be protected by 4(f). There is also the possibility that some historic resources associated with parks or recreational lands may have obtained funding through the Land and Water Conservation Fund thus allowing them further protection under Section 6(f). The determination of which cultural resources are protected by 4(f) and 6(f) will be made during subsequent project-level analysis. Further detail on the cultural resources analysis can be found in *Los Angeles-Orange County-San Diego Cultural Resources Technical Evaluation* (Authority 2003).

3.4 COMPARISON OF ALTERNATIVES

4(f) and 6(f) Publicly Owned Parks, Government Conservation Lands, and Wildlife/Waterfowl

The No-Project Alternative assumes that others would complete projects including local, state, and interstate transportation system improvements designated in existing plans and programs (refer to Table 1-1). No additional impacts to 4(f) or 6(f) resources would occur under the No-Project Alternative beyond those addressed in environmental documents for those projects.

Available GIS data indicates that the Modal alternative would result in fewer 4(f) and 6(f) resources being affected by a “use” (shown as “High” potential impacts on Table 3-1) than would the overall High-Speed Train alternative (high-speed rail and conventional rail combined). However, between Union Station and Irvine, the Modal Alternative would potentially affect more resources in the “High” impact category than the High-Speed Rail alignments.

Although construction of the Conventional Rail portion of the High-Speed Train Alternative is expected to occur within 150 feet of some parks, government lands, or refuge lands, the majority of the activities would be within the existing rail corridor. The railroad was originally constructed in the 1800s making it probable that parks and conservation lands have been established around the railroad since that time. It is also unlikely that any of these parks or conservation lands would have been established within rail rights-of-way. In addition, tunneling options within several sections of the corridor would likely reduce or avoid impacts to some of the 4(f) and 6(f) public properties. Because tunneling could result in the removal of existing above-ground track, there may also be the potential for beneficial effects on 4(f) and 6(f) properties by restoring parkland from use or constructive use back to public use. Specific areas where this could occur, but would need to be confirmed during Tier 2 studies, include the Del Mar Bluffs area, the San Clemente coastal area, and the San Juan Capistrano area.

Overall, the GIS-level data used for this evaluation does not show a significant difference in the number of resources that could be affected by “use” between the Modal and the High-Speed Train Alternative. Because most of the two alternatives occur along existing transportation/rail corridors, the potential for impacts is probably lower than the data would suggest.

There is a potential for some of the 4(f) and 6(f) resources near the Conventional Rail segments to be affected by “constructive use” due to an increase in noise and vibration. Those impacts are addressed in a separate report entitled *Noise and Vibration Technical Evaluation* (Authority 2003).

4(f) Cultural Resources

Data from the *Los Angeles-Orange County-San Diego Cultural Resources Technical Evaluation* (Authority 2003) indicates that there would be a medium impact on cultural resources and a medium to high potential to encompass previously unrecorded resources with the Modal Alternative. Improvements to highways and airports, at least for the purposes of the cultural study, were confined to a 100-foot-wide Area of Potential Effect. The construction of additional lanes on I-5 would likely expand farther than 100' feet from the centerline in many areas, and would therefore likely impact additional 4(f) cultural protected resources.

Both High-Speed Rail alignments between Los Angeles and Irvine (Union Station to Anaheim via UPRR and Union Station to Irvine via LOSSAN) have a high potential to encompass previously unrecorded cultural resources. The Union Station to LAX High-Speed Rail alignment would also have a high potential to encompass previously unrecorded cultural resources. All of these alternatives rank high primarily because they are located in urban areas. Experience on similar rail projects (e.g., Alameda Corridor), demonstrates that buried archaeological sites, primarily from the historic era, are common under the fabric of streets and buildings that make up the modern southern California cityscape.

The Conventional Rail corridor overall ranks medium to high, with the high occurring in the same intensely urbanized areas the High-Speed Rail alignments passes through. Various construction alternatives within the Conventional Rail corridors can result in potentially lower impacts/effects to cultural resources (tunneled portions of some alignment options would likely avoid impacts to cultural resources), compared to the overall high ranking for the High-Speed Rail corridors. In addition, the majority of the construction of the Conventional Rail options would occur within an already disturbed, existing rail corridor.

Overall, there is no "fatal flaw" regarding 4(f) and 6(f) resources in either the Modal or the High-Speed Rail Alternative. While the Modal Alternative data shows a lower potential for affecting cultural resources, it may not be much different from the High-Speed Train Alternative due to the latter's location in or near existing rail corridors, and the tunneling options that would avoid impacts in a number of areas.

3.5 LIKELIHOOD OF ADDITIONAL RESOURCES BEING IDENTIFIED AT PROJECT LEVEL

4(f) and 6(f) Parks, Government Conservation Lands, and Wildlife/Waterfowl Refuges

At this programmatic level of analysis and the use of available GIS data, there is a possibility that not all parks and conservation lands protected 4(f) and 6(f) were identified. Because of the recreational nature of many of the coastal areas along the rail and freeway corridors in southern California, it is likely that new parks and associated trails will be planned near these corridors. Future project-level analysis would verify the possible existence of any new or additional resources in or near the alternatives being analyzed.

4(f) Cultural Resources

The likelihood of encountering previously unrecorded cultural resources was included as part of the overall ranking of NHRP resources identified on Table 3-1. Because of the programmatic level of this study, individual sites or areas of cultural resources were not specifically identified, particularly in terms of their NRHP status. Therefore, as information is obtained regarding NRHP status, it is likely that additional 4(f) resources will be identified. Additionally, because the Modal Alternative was only analyzed using a 100' APE, it is probable that additional resources would be encountered during project-level analysis of the highway expansion. Because of the expected prevalence of cultural resources in the region from Los Angeles to San Diego, regardless of the alternative, the likelihood of identifying additional resources at the project-level that would also be protected by 4(f) is high.

3.6 AVOIDANCE ALTERNATIVES OR REASONS FOR NO PRUDENT OR FEASIBLE ALTERNATIVE FOR 4(F) OR 6(F) USE

Without further information on the potential impacts to 4(f) and 6(f) sites, particularly with regards to historic sites, it is not possible at this time to complete a detailed assessment of the viability of the avoidance alternatives as being feasible and prudent. Feasible is defined as whether it is possible to construct using sound engineering practices regardless of limitations and cost. Prudent is defined as not creating extraordinary cost (relative to the "value" of the 4(f) resource) nor substantive community disruption. Factors defining "prudent" are: unique engineering or construction problems, extraordinary costs, disruption of extraordinary magnitude, severe adverse environmental impacts, greater impacts on other 4(f) resources, failure to fulfill urgent public needs, development prevention, or other truly unusual factors. Location and design alternatives will be identified and evaluated before and during project-level analysis.

3.7 OUTLINE OF FUTURE PROJECT-LEVEL SECTION 4(F) AND 6 (F) EVALUATION

The 4(f) and 6(f) evaluation process will become more focused at the project specific level. Given the broad level of analysis for the programmatic study, the primary goal for the Tier 2 detailed analysis would be to identify 4(f) and 6(f) resources and uses in greater detail, and the appropriate measures to minimize harm (i.e. mitigation measures). The more focused 4(f) and 6(f) evaluations at the project specific level would include the following items:

- A description of the proposed action in its entirety (plans and profiles);
- A description of the 4(f)- and 6(f)-protected resources that would be used, including information regarding their size, uses, annual patronage, unique qualities, and relationship to other lands in the project vicinity¹; and an explanation of the significance of the properties as determined by the Federal, State, or local officials having jurisdiction thereof;
- A detailed description of the 4(f) use that the federal action proposes to have on the protected properties (temporary or permanent use) and the process followed to identify those uses;
- A description - including location, routing or design - of every prudent and feasible alternative (to the one proposed), including the alternative of "no action". Each description should analyze, as appropriate, the technical feasibility, cost estimates (with figures showing percentage differences in-total project costs), the possibility of community or ecosystem disruption, and other significant environmental impacts of each alternative, to show that the financial, social, or ecological costs or adverse environmental impacts of each alternative other than that proposed, would present unique problems or reach extraordinary magnitudes;
- An appropriate number of maps to demonstrate the spatial relationship of the proposed alternative to the 4(f) resources.
- A description of all planning efforts undertaken to minimize harm to the 4(f)- and 6(f)-protected resources from the proposed action. This should include a description of actions which will be taken to mitigate adverse environmental impacts, such as beautification measures, replacement of land or structures or their equivalents on or near their existing site(s), tunneling, cut and cover, cut and fill, treatment of embankments, planting, screening, installation of noise barriers, or establishment of pedestrian or bicycle paths;

¹ Any resources not listed in the HSRA database must be entered into the database and each listing must include name, address, city, owner, and type of facility.

- Evidence of concurrence or of efforts to obtain concurrence of the public official or officials having jurisdiction over the 4(f)-protected resources regarding the proposed action and the planning to minimize its harm.

If the alignment and station footprints change as the EIR/EIS is under development, then the project sponsors will have to re-evaluate 4(f) and 6(f) resources to ensure that the changes have not resulted in additional 4(f) and 6(f) uses.

Meetings will be required with Federal, State, Regional, County and local agencies. Coordination will also occur with individuals and non-government organizations known to have an interest in specific 4(f) and 6(f) properties.

4.0 REFERENCES

- California High-Speed Rail Authority. 2003. *Los Angeles-Orange County-San Diego Cultural Resources Technical Evaluation*. Prepared for the California High-Speed Rail Authority, U.S. Department of Transportation, and Federal Railroad Administration. March 2003.
- California High-Speed Rail Authority. 2003. *Los Angeles-Orange County-San Diego Noise and Vibration Technical Evaluation*. Prepared for the California High-Speed Rail Authority, U.S. Department of Transportation, and Federal Railroad Administration. March 2003.
- California Resources Agency Legacy Project. 2002. GIS data on Government Conservation Lands. November 8, 2002.
- California State Parks. Undated. Acquisition and Development Department. GIS data on State Parks.
- Geographic Data Technology, Inc. and Environmental Systems Research Institute, Inc. 2000. GIS data on Parks. November 1, 2000.
- Parsons Brinckerhoff. *Final Draft Environmental Analysis Methodologies*. Prepared for California High-Speed Rail Authority, November 7, 2002.
- Parsons Brinckerhoff. *Plans and Profiles*. Prepared for California High-Speed Rail Authority, November 2002.
- Parsons Brinckerhoff. *Screening Report*. Prepared for California High-Speed Rail Authority, April 2002.
- State of California Department of Parks and Recreation. 2003. Obtained lists of projects funded by the Land and Water Conservation Fund from the Office of Grants and Local Services.

5.0 PREPARERS

**Name
Title**

Education/Credentials.

Wendy Worthey
Environmental Specialist

M.S. in Biology, University of Louisville, Kentucky

APPENDIX A
CULTURAL RESOURCES ANALYSIS

APPENDIX A CULTURAL RESOURCES ANALYSIS

Because cultural resources were analyzed using a different methodology than other potential 4(f) and 6(f) resources, more information on the NRHP properties is included in this appendix regarding the analysis of each section of the various alternatives and an explanation of how the overall ranking of High, Medium, and Low was determined in the potential impacts to NRHP resources column of Table 3-1. Although no specific identification is made regarding the 4(f) status in each of the sections of the alternatives, it can be assumed that there is a potential for any of these cultural resources to also be protected by 4(f). There is also the possibility that some historic resources associated with parks or recreational lands may have obtained funding through the Land and Water Conservation Fund thus allowing them further protection under Section 6(f). The determination of which cultural resources are protected by 4(f) and 6(f) will be made during subsequent project-level analysis. Further detail on the cultural resources analysis can be found in the draft *Los Angeles-Orange County-San Diego Cultural Resources Technical Evaluation* (Authority 2003).

MODAL ALTERNATIVE

Highways

A. UNION STATION TO LAX

There is no modal alternative proposed for the Union Station to LAX HST option.

B. UNION STATION TO FULLERTON STATION

No archaeological sites are recorded along the Union Station to Fullerton Station modal alternative, which follows Interstate 5 (I-5). None of the APE for this station has been previously surveyed. Record search results indicate that previous studies have surveyed approximately 75 percent of this section of the APE. This segment passes largely through a built environment, with structures primarily dating from 1930 to 1958, but with a significant number of structures dating to 1900–1929, or even earlier, also present. This indicates there is a high potential to encounter previously unrecorded historic-era structures along this alignment.

Within this built environment, considering the limitations of surface survey due to urban development, and considering the proximity of the Rio Hondo and Los Angeles River and the possibility of buried sites, there is an unknown but possibly high potential for prehistoric and historical archaeological sites.

C. FULLERTON STATION TO IRVINE STATION

No sites are recorded for this section, which runs for 20.01 miles; approximately 20 percent of the APE has been previously surveyed. This segment passes largely through a built environment, with structures primarily dating from 1930 to 1958, but with a significant number of structures dating to 1900-1930 also present. This indicates there is a high potential to encounter previously unrecorded historic-era structures along this alignment. Within this built environment, considering the limitations of surface survey due to urban development, and the proximity of the Rio Hondo, San Gabriel, and Santa Ana rivers, the potential for unknown prehistoric and historical archaeological sites along this section is high.

D. IRVINE STATION TO SAN JUAN CAPISTRANO CITY LIMITS

Two archaeological sites are recorded within this section of I-5 from the Irvine Station to the San Juan Capistrano city limits, an average of 0.21 sites per mile for this 9.38 mile long section of the

APE. Record search results indicate that previous projects have surveyed approximately 80 percent of the APE.

Much of the northern portion of this section passes through a built environment, with most of this development occurring after 1958. This suggests that this portion of the APE has a low to moderate potential for unrecorded historic structures. Due to the proximity of water sources such as Trabuco Creek and its tributaries, and of Mission San Juan Capistrano, this alignment has moderate to high potential for previously unknown archaeological sites.

E. SAN JUAN CAPISTRANO

Eight archaeological sites are recorded within the 4.75 mile length of the San Juan Capistrano Modal section, an average of 1.68 sites per mile. Approximately 90 percent of the APE has been surveyed. Although the I-5 corridor passes east of the center of San Juan Capistrano, this general area encompasses numerous Spanish and Mexican period cultural resources. This entire area is highly sensitive for prehistoric, proto-historic (European contact period), and historic sites; this section has a high potential to contain previously unknown archaeological sites, and a moderate to low potential to encompass historic-era structures.

F. DANA POINT TO SAN CLEMENTE

Fifteen archaeological sites are recorded within the 10.38 mile length of the Dana Point to San Clemente Modal Alternative, an average of 1.45 sites per mile. Previous projects have surveyed only approximately 10 percent of this section of the APE. Much of the northern portion of this section passes through a built environment, with a large part of this development occurring after 1958. These factors suggest a moderate to low potential for unrecorded historic structures.

Two sites near the APE are prehistoric village sites known to have burials, CA-SDI-13077 and CA-SDI-22 (Rancho Boca de la Playa). Because of the proximity of this section of the APE to the Pacific Ocean and the mouths of San Onofre and San Mateo canyons, as well as these prehistoric villages, this section of the project has a high potential to encompass previously unknown prehistoric sites.

G. CAMP PENDLETON

Twenty archaeological sites are recorded along the 16.00 mile Camp Pendleton Modal segment, an average of 1.25 sites per mile. The majority of these are prehistoric. Record search results indicate that during previous studies approximately 80 percent of the APE was surveyed in this section. Historic-era structures are few in this segment, but there are potentially historic structures in proximity to and associated with Old Highway 101, Camp Pendleton Marine Corp Base, and the ATSF railroad. The potential for historical structures or sites is low to moderate in this section of the APE.

Prehistoric sites are abundant within the APE, due to proximity of this section to the Pacific coast, various side canyons and lagoons, and the Santa Margarita and San Luis Rey River. In addition, Native American burials have been recovered in the area. Due to the high number of sites already recorded and the proximity of the corridor to this rich coastal zone, the potential for unknown prehistoric sites is high in this section of the APE.

H. OCEANSIDE TO CARLSBAD

Fifteen archaeological sites are recorded along the 10.18 mile length of the Oceanside to Carlsbad-At Grade APE, an average of 1.47 sites per mile. Only approximately 5 percent of the

APE has been previously surveyed. Historic development began in these coastal towns before 1900, but occurred primarily in the years between 1930 and 1958. This suggests a moderate to low possibility of encountering previously unrecorded historic structures in this portion of the APE. Rivers flowing into lagoons along the Pacific Coast in this section are prime locations for prehistoric camp and habitation sites and the potential for unknown prehistoric sites is moderate to high in this section.

I. ENCINITAS TO SOLANA BEACH

Six archaeological sites are recorded along the 6.92 miles of the Encinitas to Solana Beach Modal segment, an average of 0.87 sites per mile. Of these, two are historical and the remaining prehistoric. Record search results indicate that previous studies have surveyed only approximately 5 percent of the APE. In general historic-era structures from 1900 to 1958 are common; this suggests a moderate to low potential for unrecorded historic structures. Within this built environment, considering the limitations of surface survey due to urban development, and the proximity of the corridor to the coast and to coastal rivers and lagoons, the potential for unknown archaeological sites along this section is moderate to high.

J. DEL MAR

The Del Mar modal segment runs for 6.44 miles south along the I-5 corridor. Sixteen archaeological sites are recorded in the APE of this section, an average of 2.48 sites per mile. Record search results indicate that previous studies have surveyed approximately 95 percent of the APE. Most of these recorded sites are prehistoric, focused along coastal and lagoon environments. Due to the high number of sites already recorded and the proximity of the corridor to lagoons, potential for unknown prehistoric sites is high. Historic-era development in the APE is primarily recent, indicating that there is a low potential for previously unrecorded historical structures in this portion of the APE.

K. I-5/805 SPLIT TO SR-52

The I-5/805 Split to SR 58 section measures 4.70 miles in length, and encompasses two recorded archaeological sites, an average of 0.43 sites per mile. Record search results indicate that approximately 90 percent of the APE has been previously surveyed. Historic-era development in this portion of the APE is primarily recent. This suggests that this section of the modal SPE has a low potential to encompass unrecorded historic structures. This area of the APE passes east of Mission Bay, an area that has been extensively dredged. In this near ocean location, despite urban development, the potential for unknown prehistoric sites is moderate to high.

L. SR-52 TO SANTA FE DEPOT

Five archaeological sites are recorded on the SR 52 to Santa Fe Depot to Taylor Street, an average of 0.56 sites per mile along this 8.94 mile long section. Record search results indicate that previous studies have surveyed only approximately 10 percent of the APE of this segment of the I-5 corridor. The I-5 modal alternative here extends along the eastern and northern portions of downtown San Diego and cuts south of Balboa Park. Within this built environment, considering the limitations of surface survey due to urban development, there is an unknown, but possibly high, potential for prehistoric archaeological sites.

Balboa Park itself is listed on the California Register of Historic Places and the corridor passes within ¼ mile of Old Town, while two other historic districts, the General Dynamics buildings and the U.S. Marine Corp Recruit Depot near Lindbergh Field, are adjacent to the corridor in the northern portion. In addition to known historic structures, additional unrecorded historic

structures may be present in the proximity of downtown San Diego. Beyond known historic sites, the portion of the I-5 corridor within the City of San Diego has a high potential for previously undocumented archaeological sites.

Airports

A. LONG BEACH MUNICIPAL AIRPORT

No archaeological sites are recorded within the Long Beach Airport APE. The Long Beach Airport is located within a built environment with structures dating primarily to the 1930s and 1940s, suggesting that there is a high potential for this portion of the modal APE to encompass previously unrecorded historical structures.

Considering the limitations of surface survey within this built environment, and that the Long Beach Airport is located between the Los Angeles River and the San Gabriel River, there is an unknown, but possibly high, potential for unknown prehistoric and historical archaeological sites in this location.

HIGH SPEED TRAIN ALTERNATIVE - CORRIDORS AND STATION OPTIONS

High Speed Rail Alignments

A. UNION STATION TO LAX

(HST Only)

Seven archaeological sites are recorded along the 15.75 mile long Union Station to LAX segment, an average of 0.44 sites per mile. Of these, six are historical and one is prehistoric. Record search results indicate that previous studies have surveyed approximately 60 percent of the APE. The Union Station to LAX segment follows existing ATSF tracks through a built environment, primarily dating from 1930 to 1958, but with a significant number of structures in this area of the APE that date to between 1900 and 1930. This indicates that there is a high potential to encounter previously unrecorded historic-era structures along this alignment.

Within this built environment, considering the limitations of surface survey due to urban development, and the proximity of the east end of this segment to the Los Angeles River, and of the west end to Ballona Creek and the Pacific coast, there is an unknown, but possibly high, potential for prehistoric archaeological sites.

B. Union Station to Anaheim via UPRR

(North Termination at Hobart, south of Union Station)

Three sites are recorded within the APE of this 25.21 mile long section of the Union Pacific Railroad (UPRR); approximately 20 percent of the APE has been surveyed. One site is the railroad itself, the Southern Pacific Rail Road alignment (CA-LAN-186110). Another is the historic-era Northam Station, also along the Southern Pacific. This segment passes largely through a built environment, with structures primarily dating from 1930 to 1958, but with a significant number of structures dating to 1900–1929, or even earlier, also present. This indicates there is a high potential to encounter previously unrecorded historic-era structures along this alignment.

A single previously recorded prehistoric site is noted as being "buried." Within this built environment, considering the limitations of surface survey due to urban development, and

considering the proximity of the section to the Rio Hondo, San Gabriel and Santa Ana rivers and the possibility of buried sites, the potential for unknown prehistoric sites along this section is high.

C. UNION TO IRVINE VIA LOSSAN

(North Termination at Hobart, south of Union Station)

Twenty-one archaeological sites are recorded along this 40.66 mile long section of the Atchison, Topeka and Santa Fe or LOSSAN rail corridor, an average of 0.5 sites per mile. Record search results indicate that previous studies have surveyed only approximately 20 percent of the APE. Neff Park, with an 1892 historic home, now listed on the National Register of Historic Places, is located within this segment. This segment passes largely through a built environment, with structures primarily dating from the 1930 to 1958 period, but with a significant number of structures dating to 1900–1929, or earlier, also present. This indicates there is a high potential to encounter previously unrecorded historic-era structures along this alignment.

Within this built environment, considering the limitations of surface survey due to urban development, and considering the proximity of the section to the Rio Hondo, San Gabriel and Santa Ana rivers and the possibility of buried sites, the potential for unknown prehistoric and historical archaeological sites along this section is high.

High Speed Rail Stations

A. LAX

No archaeological sites are recorded within the proposed LAX Station location, situated at the eastern edge of LAX airport. None of this station APE has been surveyed. This station is located within a built environment, developed in the 1960s and more recently. This suggests that there is probably a low potential for historical structures in this portion of the APE. Within this built environment, considering the limitations of surface survey due to urban development, and considering the proximity of the station location to the Pacific coast and Ballona Creek, there is an unknown, but possibly high, potential for prehistoric archaeological sites.

B. NORWALK STATION-NEW ELEVATED STATION

No archaeological sites are recorded in the immediate vicinity of the Norwalk Station - New Elevated Station option. This station location has not been surveyed. This proposed station location is within a built environment, with structures primarily dating from 1930 to 1958. These facts suggest there is a moderate potential to encounter previously unrecorded historic-era structures at this station location. Within this built environment, considering the limitations of surface survey due to urban development, there is an unknown, but possibly high, potential for previously unknown archaeological sites.

C. ANAHEIM STATION

No archaeological sites are recorded in the immediate vicinity of Anaheim Station, located at the current Metrolink Station north of Anaheim Stadium. None of the APE for this station has been surveyed. This station is located in a built environment, among parking lots and industrial buildings, primarily post-dating 1958. This suggests that this location has a low potential to encompass previously unrecorded historical structures. Considering the limitations of surface survey due to this urban development, and the proximity of the Santa Ana River, the potential for unknown prehistoric and historical archaeological sites in the APE is high.

D. NORWALK STATION-EXISTING STATION WITH NEW PLATFORM

This station option will consist of construction of a new platform at the existing Metrolink Norwalk Station. None of this station APE has been surveyed. No archaeological sites are recorded in the immediate vicinity of this portion of the APE. This station is located in a built environment, with structures primarily dating after 1958, but with some structures in the area dating to 1930–1958. These facts suggest there is a low potential to encounter previously unrecorded historic-era structures at this station location. Considering the limitations of surface survey within this built environment, there is an unknown, but possibly high, potential for archaeological sites.

E. FULLERTON STATION

No archaeological sites are recorded in the immediate vicinity of the Fullerton Station; none of this station location has been previously surveyed. This station is located in a built environment, with structures primarily dating after 1958. This suggests that there is a low potential to encounter previously unrecorded historic-era structures in this portion of the APE. Within this built environment, considering the limitations of surface survey due to urban development, there is an unknown, but possibly high, potential for archaeological sites.

F. SANTA ANA

No archaeological sites are recorded in the immediate vicinity of the Santa Ana Station. This station is located within a built environment, and none of the APE for this station has been surveyed. This segment passes through a built environment, with structures primarily dating from the 1930 to 1958 period. This indicates there is a moderate potential to encounter previously unrecorded historic-era structures in this portion of the APE. Within this built environment, considering the limitations of surface survey due to urban development, there is an unknown, but possibly high, potential for archaeological sites.

G. IRVINE

No archaeological sites are recorded in the immediate vicinity of the Irvine Station; 40 percent of the APE for this station location has been previously surveyed. This station is located within a built environment, primarily post-dating 1958. This indicates that there is a low potential to encounter previously unrecorded historic-era structures at this location. Within this built environment, considering the limitations of surface survey due to urban development, there is an unknown, but possibly high, potential for archaeological sites.

CONVENTIONAL RAIL (LOSSAN) ALIGNMENTS AND STATION OPTIONS

Conventional Rail Alignments

A. Union Station to Fullerton Station

(LOSSAN/4th main track-North termination at Hobart, south of Union Station)

Six archaeological sites are recorded along the 20.60 mile Union Station to Fullerton Station section corridor, an average of 0.29 sites per mile. This section also follows the LOSSAN Corridor, with new construction proposed as conventional rail technology. Record search results indicate that previous studies have surveyed approximately 50 percent of the APE. Within this built environment, considering the limitations of surface survey due to urban development, and considering the proximity of the section to the Rio Hondo and Los Angeles River and the

possibility of buried sites, there is an unknown, but possibly high, potential for prehistoric archaeological sites.

This segment passes largely through a built environment, with structures primarily dating from the 1930 to 1958 period, but with a significant number of structures dating to 1900-1929, or earlier, also present. This indicates there is a high potential to encounter previously unrecorded historic-era structures along this alignment.

B. FULLERTON STATION TO IRVINE STATION-AT GRADE

(AT-GRADE between Walnut (Orange) and E. 17th Street (Santa Ana))

Fifteen sites are recorded for this section, which runs for 20.01 miles along the existing ATSF (LOSSAN) railroad tracks, an average of 0.75 sites per mile. All but one of these sites are historic-era houses; the one prehistoric site is noted as being "buried." Approximately 20 percent of the APE has been previously surveyed.

This segment passes largely through a built environment, with structures primarily dating from the 1930 to 1958 period, but with a significant number of structures dating to 1900–1930 also present. This indicates there is a high potential to encounter previously unrecorded historic-era structures along this alignment. Within this built environment, considering the limitations of surface survey due to urban development, and the proximity of the Rio Hondo, San Gabriel, and Santa Ana rivers, as well as the record of one "buried site," the potential for unknown prehistoric and historic archaeological sites along this section is high.

C. FULLERTON STATION TO IRVINE STATION-TRENCH

(TRENCH between Walnut (Orange) and E. 17th Street (Santa Ana))

The partial trench option from Fullerton Station to Irvine Station also follows the existing Atchison, Topeka and Santa Fe (LOSSAN) rail line. This option varies only in that a below grade trench is proposed between Walnut Street in the City of Orange and E. 17th Street in the City of Santa Ana. This trench will be 2.30 miles (12,150 feet) in length.

Since this option encounters the same sites as Option B above, and proposes trenching as well as at-grade construction methods, Option C has the same high potential to encompass previously unknown historical structures, and a slightly higher potential to encounter previously unknown prehistoric and historical archaeological sites.

D. IRVINE STATION TO SAN JUAN CAPISTRANO CITY LIMITS

(Irvine Station to Northern City Limits, City of San Juan Capistrano)

One prehistoric archaeological site is the only site recorded within the 8.93 miles length of the Irvine Station to San Juan Capistrano City Limits APE, an average of 0.11 sites per mile. Record search results indicate that approximately 45 percent of this section of the APE has been surveyed during previous projects.

Much of the northern portion of this section passes through a built environment, with most of this development occurring after 1958. This suggests that this portion of the APE has a low to moderate potential for unrecorded historic structures. Due to the proximity of water sources such as Trabuco Creek and its tributaries, and of Mission San Juan Capistrano, this alignment has moderate to high potential for previously unknown archaeological sites.

E. SAN JUAN CAPISTRANO-COVERED TRENCH/CUT AND FILL

(Northern City Limits, City of San Juan Capistrano to Avenida Aeropuerto)

The covered trench and cut and fill option from the northern city limits of San Juan Capistrano to Avenida Aeropuerto in the southern part of the city follows the existing ATSF rail line through downtown San Juan Capistrano; it passes through the oldest, historic portion of the city in a subsurface covered trench, for a distance of about 1.44 miles (7,600 feet), followed by some cut and fill work south of San Juan Creek.

Nineteen sites are recorded within the 7.92 mile long APE for the San Juan Capistrano to Avenida Aeropuerto-Covered Trench segment, an average of 2.40 sites per mile. Of these, six are historic, one is protohistoric, and the remaining 12 are prehistoric. Yet, only approximately 20 percent of the APE has been previously surveyed. Historic San Juan Capistrano Depot is located immediately adjacent to the rail line. This section passes close to Mission San Juan Capistrano, which is listed on the National Register of Historic Places (NR #170), and extends through the Los Rios Historic District. This district encompasses Spanish and Mexican period cultural resources and includes historic structures listed on various historic lists. This entire area is highly sensitive for prehistoric, proto-historic (European contact period), and historical sites, and trenching in this area has a very high potential to expose previously unknown archaeological sites.

F. SAN JUAN CAPISTRANO-TUNNEL ALONG I-5

(Northern City Limits, City of San Juan Capistrano to Avenida Aeropuerto)

The tunnel along I-5 option from the northern city limits of San Juan Capistrano to Avenida Aeropuerto varies from the existing ATSF rail line north of downtown San Juan Capistrano, and veers east to the I-5 corridor. As this option turns inland, it enters a tunnel, approximately 4.64 miles (24,500 feet) long, which proceeds under the I-5 corridor to the south of San Juan Creek, where the alignment both surfaces and rejoins the existing ATSF alignment.

The APE for this option encompasses 8 archaeological sites over a length of 5.0 miles, for an average of 1.6 sites per mile. Since this option passes across relatively new neighborhoods in San Juan Capistrano, but otherwise is primarily underground, and avoids the older portions of that city, this option has a low potential to encounter previously unrecorded historical structures. However, this entire area is highly sensitive for prehistoric, proto-historic (European contact period), and historical sites, and construction associated with this segment, except for tunneling, has a moderate to high potential to expose previously unknown archaeological sites.

G. SAN JUAN CAPISTRANO-AT-GRADE/OPEN TRENCH ALONG EAST SIDE OF TRABUCO CREEK

(Northern City Limits, City of San Juan Capistrano to Avenida Aeropuerto)

The At-grade/Open Trench along the east side of Trabuco Creek option diverges from the existing ATSF rail line north of downtown San Juan Capistrano and veers approximately 400 meters west to Trabuco Creek. A portion of this alignment would occupy a length of open trench, and would pass west of downtown San Juan Capistrano before rejoining the existing ATSF alignment just south of the San Juan Creek. The southern portion of this segment extends through a built environment of housing and small businesses, to Avenida Aeropuerto.

Two archeological sites are recorded in this alignment, which runs for approximately 7.0 miles, an average of 0.28 sites per mile. Both of these sites are prehistoric habitation locations, one of

which may have already been destroyed. Approximately 90 percent of the APE has been previously surveyed.

This segment runs south along creek terraces on the edges of Trabuco Creek, and crosses San Juan Creek before rejoining the existing ATSF rail line. These streamside locations are sensitive for buried cultural deposits, and the potential for prehistoric sites along this segment is high. Since this alignment passes through relatively old neighborhoods in San Juan Capistrano, this option has a medium to high potential to encounter previously unrecorded historical structures. This entire area is highly sensitive for prehistoric, proto-historic (European contact period), and historical sites, and construction associated with this segment has a high potential to expose previously unknown archaeological sites.

H. DANA POINT/SAN CLEMENTE – SHORT TRENCH

(Avenida Aeropuerto to San Onofre Power Plant-SHORT TRENCH)

The Dana Point/San Clemente – Short Trench option from Dana Point to San Clemente (and beyond to the San Onofre Nuclear Power Station) follows the existing ATSF rail line along the Pacific coast for a length of 22.6 miles and includes an approximately 2.37 mile (12,500 feet) short trench section. This short trench section passes through San Clemente and the San Clemente station, which would be underground.

Sixteen archaeological sites are recorded within the 22.6-mile length of the Dana Point/San Clemente – Short Trench option, an average of 0.71 sites per mile. Previous projects have surveyed only approximately 10 percent of this section of the APE. Much of the northern portion of this section passes through a built environment, with a large part of this development occurring after 1958. However, some earlier historical structures are known to be present, such as the San Clemente Beach Club, which is on the National Register of Historic Places. The Dana Point Curve realignment, proposed for this segment, will pass through an existing neighborhood of what appear to be primarily very new structures. These factors suggest a moderate to low potential for unrecorded historic structures.

Two of the sites within the APE are prehistoric village sites known to have burials, CA-SDI-13077 and CA-SDI-22 (Rancho Boca de la Playa). Because these sites are already known within this section of the APE, and due to the proximity of the Pacific Ocean and the mouths of San Onofre and San Mateo canyons, as well as the proposed use of trench construction, this section of the APE has a high potential to encounter previously unknown prehistoric sites.

I. DANA POINT/SAN CLEMENTE- LONG TRENCH

(Avenida Aeropuerto to San Onofre Power Plant-LONG TRENCH)

The long trench option from Dana Point to San Clemente also follows the existing ATSF rail line along the Pacific coast for the same 22.6 miles, but includes an approximately 3.03 mile (16,000 foot) long trench section. This option varies only in that this longer below grade trench is proposed.

Since Option H encounters the same sites as Option G above, and proposes similar construction methods, this option also has the same high potential to encompass previously unknown prehistoric sites, and a moderate to low potential to include unrecorded historic structures.

J. DANA POINT/SAN CLEMENTE-SHORT TUNNEL

(Avenida Aeropuerto to San Onofre Power Plant-SHORT TUNNEL)

The short tunnel option from Dana Point to San Clemente (and beyond to the San Onofre Nuclear Power Station) runs for a length of 22.6 miles, and includes the Dana Point Curve realignment, but varies from the existing Atchison, Topeka and Santa Fe rail line north of downtown San Clemente, and veers inland to the I-5 corridor. As this option turns inland, it enters a tunnel, approximately 6.82 miles (36,000 feet) long, which proceeds under the I-5 corridor to near Baslione at San Onofre State Beach, where the segment both surfaces and rejoins the existing ATSF alignment.

The APE for this option encompasses nine archaeological sites over a the length of this 22.6 mile segment, for an average of 0.40 sites per mile. Since this option passes across relatively new neighborhoods in Dana Point and San Clemente, but otherwise is primarily underground, and avoids the older portions of San Clemente, this option has a low potential to encounter previously unrecorded historical structures.

Two of the sites within the APE are prehistoric village sites known to have burials, CA-SDI-13077 and CA-SDI-22 (Rancho Boca de la Playa, or possibly the ethnographic village of *Panhe*). Because these sites are already known within this section of the APE, and due to the proximity of the Pacific Ocean and the mouths of San Onofre and San Mateo canyons, this section of the APE has a high potential to encompass previously unknown prehistoric sites.

K. DANA POINT/SAN CLEMENTE-LONG ONE SEGMENT TUNNEL

(Avenida Aeropuerto to San Onofre Power Plant - LONG ONE-SEGMENT TUNNEL)

The long one-segment tunnel option from Dana Point to San Clemente also runs for a length of 22.6 miles, but varies from the existing Atchison, Topeka and Santa Fe rail line farther north of downtown San Clemente, and proceeds south by tunnel under the I-5 corridor and surfaces at San Onofre State Beach to rejoin the existing ATSF alignment. However, this option turns inland at Dana Point, and does not include the Dana Point Curve realignment. The long one-segment tunnel will be 9.09 miles (48,000 feet) long.

The APE for this option encompasses 11 archaeological sites over a the length of this 22.6 mile segment, for an average of 0.49 sites per mile. Since this option passes across relatively new neighborhoods in Dana Point and San Clemente, but otherwise is primarily underground, and avoids the older portions of San Clemente, this option has a low potential to encounter previously unrecorded historical structures.

Sites near the APE are prehistoric village sites known to have burials, CA-SDI-13077 and CA-SDI-22 (Rancho Boca de la Playa and possibly the ethnographic village of *Panhe*). Because these sites are already known close to this section of the APE, and due to the proximity of the Pacific Ocean and the mouths of San Onofre and San Mateo canyons, this section of the APE has a moderate to high potential to encompass previously unknown prehistoric sites.

L. DANA POINT/SAN CLEMENTE-LONG TWO SEGMENT TUNNEL

(Avenida Aeropuerto to San Onofre Power Plant-Long - LONG TWO-SEGMENT TUNNEL)

The long two-segment tunnel option from Dana Point to San Clemente and beyond to the San Onofre Nuclear Power Station follows the same alignment as the long one-segment tunnel, that is, it veers inland and proceeds south by tunnel in the I-5 corridor and surfaces at San Onofre State Beach. This option also does not include the Dana Point Curve realignment. This option

varies only in that the tunnel is broken up into two segments. The long two-segment trench will be 9.09 miles (48,000 feet) long.

Similar to the one-segment tunnel option discussed above, this option passes across relatively new neighborhoods in Dana Point and San Clemente, but otherwise is primarily underground; therefore this option has a low potential to encounter previously unrecorded historical structures. Similar to the one-segment tunnel option, this section of the APE has a moderate to high potential to encompass previously unknown prehistoric sites.

M. CAMP PENDLETON

(San Onofre Power Plant to Oceanside City Limits)

Forty-one archaeological sites are recorded within the 15.65 mile Camp Pendleton section, for an average of 2.62 sites per mile. Of these, 17 are historical, and the remaining are prehistoric. Record search results indicate that during previous studies approximately 80 percent of the APE was surveyed in this section. Historic-era structures are few in this segment, but there are potentially historic structures in proximity to and associated with Old Highway 101, Camp Pendleton Marine Corp Base, and the ATSF railroad. One known historic site within the APE is Las Flores Estancia, listed on the California Inventory of Historic Resources. The potential for historical structures and historical sites is high in this section of the APE.

Prehistoric sites are abundant within the APE, due to proximity of this section to the Pacific coast, various side canyons and lagoons, and the Santa Margarita and San Luis Rey rivers. In addition, Native American burials are known to have been recovered in the area. Due to the high number of sites already recorded and the proximity of the corridor to this rich coastal zone, the potential for unknown prehistoric sites is high in this section of the APE.

N. OCEANSIDE TO CARLSBAD-AT GRADE

(Northern City Limits of Oceanside to Northern City Limits of Encinitas)

Six prehistoric archaeological sites are recorded within the 9.88 mile length of the Oceanside to Carlsbad-At Grade APE, an average of 0.61 sites per mile. Only approximately 5 percent of the APE has been previously surveyed. The proximity of this section of the APE to the rich coastal environment, the limitations of surface survey due to development, and the presence of known prehistoric sites, all indicate that there is a high potential for unknown prehistoric sites in this part of the APE.

Historic development began in these coastal towns before 1900, but occurred primarily in the years between 1930 and 1958. Several buildings in Oceanside are listed as historic, and the Carlsbad Santa Fe terminal is listed on the California Inventory of Historic Resources. These facts suggest that there is a moderate to high potential for previously unrecorded historical structures in this section of the APE.

O. OCEANSIDE TO CARLSBAD-TRENCH

(Northern City Limits of Oceanside to Northern City Limits of Encinitas)

The Oceanside to Carlsbad-Trench option encompasses the same APE and archaeological sites as the at-grade option. However, a 0.95 mile (5,000 foot) long trench is proposed across downtown Carlsbad. Since sub-grade trenching increases the potential to encounter unknown archaeological sites, this option also has the same high potential for unknown prehistoric sites in the Oceanside to Carlsbad APE. As noted above, there is a moderate to high potential for previously unrecorded historical structures in this section of the APE.

P. ENCINITAS TO SOLANA BEACH-AT GRADE

(Northern City Limits of Encinitas to Solana Beach Station)

The Encinitas to Solana Beach-At Grade option follows the existing ATSF rail line along the Pacific coast for 6.99 miles. Four archaeological sites are recorded in the APE of this section, an

average of 0.57 sites per mile. Record search results indicate that previous studies have surveyed only approximately 10 percent of the APE. In general, historic-era structures from 1900 to 1958 are common; the Encinitas Historic District extends across part of the APE in the center of that town. These factors suggest a moderate to high potential for unrecorded historical structures. Within this built environment, considering the limitations of surface survey due to urban development, and the proximity of the corridor to the coast, and to coastal rivers and lagoons, the potential for unknown archaeological sites along this section is moderate to high.

Q. ENCINITAS TO SOLANA BEACH-SHORT TRENCH

(Northern City Limits of Encinitas to Solana Beach Station)

The Encinitas to Solana Beach-Short Trench option encompasses the same APE and archaeological sites as the at-grade option, above. However, a 1.52-mile (8,000-foot) long trench is proposed through downtown Encinitas. Since sub-grade trenching increases the potential to encounter unknown archaeological sites, this option has a high potential to discover unknown prehistoric sites, and, as noted above, there is a moderate to high potential for unrecorded historical structures in this section of the APE.

R. ENCINITAS TO SOLANA BEACH-LONG TRENCH

(Northern City Limits of Encinitas to Solana Beach Station)

The Encinitas to Solana Beach-Long Trench option encompasses the same APE and archaeological sites as the at-grade and short trench options, above. However, as part of this option, a 5.30-mile (28,000-foot) long trench would pass through downtown Encinitas and downtown Cardiff-by-the-Sea. Since sub-grade trenching increases the potential to encounter unknown archaeological sites, this option also has a high potential to encounter unknown prehistoric sites, and a moderate to high potential for unrecorded historical structures in this section of the APE.

S. DEL MAR-COVERED TRENCH

(Solana Beach Station to I-5)

This section will be placed in a trench, following the existing ATSF along the coastal bluffs adjacent to the town of Del Mar. Along the 9.15 mile length of this Del Mar-Covered Trench APE, 12 archaeological sites have been recorded, an average of 1.31 sites per mile. Of these, three are prehistoric, two are unknown, and the remaining are historical. Previous projects have surveyed approximately 95 percent of the APE. Historical sites in this section of the APE are primarily culverts and structural components associated with construction of Highway 101 and the Atchison, Topeka and Santa Fe rail line. The presence of many historic-era structures from the years 1900–1929 and 1930–1958 suggest that there is a moderate to high potential for previously unrecorded historical structures in this portion of the APE.

Because of the limitations of surface survey due to urban development, and considering the proximity of this portion of the APE to lagoons and the Pacific coast, as well as the presence of known sites, the potential for unknown prehistoric sites along this section is high.

T. DEL MAR-TUNNEL UNDER CAMINO DEL MAR

(Solana Beach Station to I-5)

The Del Mar-Tunnel under Camino Del Mar option proposes to continue the LOSSAN corridor in a straight line south at the point where the ATSF right-of-way bends west to the coast, and to tunnel under Main Street in Del Mar for a distance of 1.9 miles, then rejoin the ATSF alignment south of the City of Del Mar, and follow the existing tracks to I-5. Previous projects have surveyed about 50 percent of the APE for this section.

Two archaeological sites are recorded along this approximately 9.3-mile long tunnel option, an average of 0.22 sites per mile. One site is prehistoric and the other historical. The alignment is located primarily within a built environment. The presence of many historic-era structures from the years 1900–1929 and 1930– 1958 suggest that there is a moderate to high potential for previously unrecorded historical structures in this portion of the APE. Within this built environment, considering the limitations of surface survey due to urban development, and considering the proximity of the section to the coast, and San Dieguito River and Lagoon, and to known sites in the area, there is an unknown, but possibly high, potential for prehistoric archaeological sites.

U. DEL MAR-I-5 TUNNEL

(Solana Beach Station to I-5)

The Del Mar-I-5 Tunnel option would veer from the existing ATSF right-of way just north of Del Mar racetrack and turn inland, passing along the southern shore of San Dieguito Lagoon. The HST would then proceed in a tunnel (or trench) along the I-5 corridor. About 60 percent of the APE for this section has been previously surveyed.

Eight archaeological sites are recorded within the approximately 9.3 mile long Del Mar-I-5 Tunnel option, averaging 0.86 sites per mile. Numerous prehistoric sites are known to exist along the shores and bluffs of San Dieguito Lagoon. Due to the proximity of this option to the lagoon and coast, there is an unknown, but possibly high, potential for prehistoric archaeological sites. This section of the APE was mostly developed during the years 1930 to 1958; however, there are few standing structures within the APE. Therefore, this section has a low potential for previously unrecorded historical structures.

V. I-5/805 SPLIT TO HIGHWAY 52-MIRAMAR HILL TUNNEL

The I-5/805 Split to Highway 52-Miramar Hill Tunnel section measures 9.29 miles in length, and encompasses seven recorded archaeological sites, an average of 0.75 sites per mile. Record search results indicate that previous studies have surveyed approximately 20 percent of the APE. At present, construction details are not clear regarding the length of the Miramar Hill tunnel; this portion of the project is being assessed based on surface evidence from the length of the APE.

Historic-era development in this portion of the APE is primarily recent, from the 1960s and 1970s. This suggests that this option has a low potential to encompass unrecorded historical structures in this section of the APE. Given the section's proximity to Rose Canyon and the village site of *Ystaagua*, and because of the limitations of surface survey due to urban development in this area, the potential for unknown prehistoric sites is moderate to high.

W. I-5/805 SPLIT TO HIGHWAY 52-I-5 TUNNEL

This tunnel continues the I-5 tunnel from north of Del Mar, surfacing at various spots, before rejoining the ATSF ROW in Rose Canyon, just north of State Route 52. Approximately 50 percent of the APE for this section has been previously surveyed. Three archaeological sites are recorded along the I-5/805 Split to Highway 52-I-5 Tunnel option, approximately four miles long, for an average of 0.75 sites per mile. Of these sites, two are prehistoric. The segment passes through a relatively steep sided canyon with commercial, medical and educational facilities on the mesa tops, all built post 1960s. This indicates that there is a low possibility to find previously unrecorded historical structures. Due to the proximity of the segment to both Rose and Soledad canyons, and access to the coast, there is an unknown but possibly high potential for prehistoric archaeological sites.

X. SR 52 TO SANTA FE DEPOT

Twelve archaeological sites are recorded in the 10.28 mile long SR 52 to Santa Fe Depot section of the APE, an average of 1.17 sites per mile. Record search results indicate that only about 10 percent of the APE has been previously surveyed. At the northern end of this section, site CA-SDI-5017, the village site of La Rinconda de Jamo, is adjacent to the APE, but is not recorded as extending within the APE corridor. However, this prehistoric village could have buried components situated within the APE. Nine other prehistoric sites are recorded within this section, indicating that there is a high potential for unknown prehistoric archaeological sites in the APE.

The south end of the SR 52 to Santa Fe Depot section passes near two historic districts, the General Dynamics buildings and the U.S. Marine Corp Recruit Depot near Lindbergh Field, before terminating at the Santa Fe Depot on the waterfront in downtown San Diego. This portion of the APE is located within ¼ mile of the historic Gaslamp Quarter, Old Town San Diego Historic District, and the Presidio, and is a prime location for early historic maritime, transportation, and trade activities, as well as for prehistoric habitation. The terminal at Santa Fe depot and the Mission Brewery are listed on the California Inventory of Historic Resources. Given that a large amount of historic-era development occurred in this area in the period 1769 to 1958, the potential for historic structures or structural remains in the proximity to downtown San Diego is high.

Conventional Rail Stations

A. FULLERTON STATION

The Fullerton Station alternative for the Conventional Rail option is the same as the Fullerton Station alternative discussed above for High Speed Rail. As noted above, this portion of the APE, has a low potential to encounter previously unrecorded historic-era structures; there is an unknown, but possibly high, potential for archaeological sites.

B. ANAHEIM

The Anaheim Station alternative for Conventional Rail is also the same as the Anaheim Station alternative discussed above for High Speed Rail. This portion of the APE has a low potential to encounter previously unrecorded historic-era structures; there is a high potential for previously unknown archaeological sites.

C. SANTA ANA

The Santa Ana Station alternative for Conventional Rail is also the same as the Santa Ana Station alternative discussed above for High Speed Rail. As described above, this portion of the APE has a moderate potential to encompass previously unrecorded historic-era structures; there is an unknown, but possibly high, potential for previously unknown archaeological sites.

D. IRVINE

The Irvine Station alternative for Conventional Rail is also the same as the Irvine Station alternative discussed above for High Speed Rail. As described above, this portion of the APE has a low potential to encompass previously unrecorded historic-era structures; there is an unknown, but possibly high, potential for previously unknown archaeological sites.

E. SAN JUAN CAPISTRANO

The existing San Juan Capistrano Depot, located in the Project APE in downtown San Juan Capistrano, dates to 1894. There are five additional archaeological sites recorded within the immediate vicinity of this depot building. The entire APE for this station has been surveyed by previous projects.

The Los Rios Historic District encompasses downtown San Juan Capistrano, including the depot and proposed HST station location, as well as various Spanish and Mexican period cultural resources. One of these is Mission San Juan Capistrano, which is listed on the National Register of Historic Places (NR #170). This depot location is highly sensitive for prehistoric, proto-historic (European contact period), and historical sites. This location has a very high potential to expose previously unknown archaeological sites, and a moderate to low potential to encompass previously unrecorded historic structures. However, this station is surrounded by historical structures, and new construction at this location has a high potential to impact/effect historic-era building.

F. San Clemente

No archaeological sites are recorded in the vicinity of the proposed San Clemente Station, to be built in downtown San Clemente, possibly underground. None of the APE for this station location has been previously surveyed. This station location is within a built environment, with a large part of this built environment dating from the years 1900-1959. This indicates that there is a moderate to high potential for unrecorded historic structures in this portion of the APE. Because the San Clemente Depot is located adjacent to the Pacific coast, there is also a moderate to high potential for previously unknown archaeological sites in this portion of the APE.

G. OCEANSIDE

No archaeological sites are recorded in the vicinity of the proposed Oceanside Station; about 20 percent of the APE for this station location has been previously surveyed. Oceanside Station is located within a built environment and no archaeological sites are recorded in the vicinity. Historic development began in this coastal town before 1900, but occurred primarily in the years 1930 to 1958; several buildings in Oceanside are listed as historical resources. These facts suggest that there is a moderate to high potential for previously unrecorded historical structures in the Oceanside Station APE. Prehistoric sites are abundant in the vicinity due to proximity of this area to coastal lagoons along the Pacific. Because of the high number of sites already recorded and the proximity of the station APE to this rich coastal zone, the potential for unknown prehistoric sites is high.

H. SOLANA BEACH

There are no archaeological sites recorded within the Solana Beach station APE; about 25 percent of the APE for this station location has been previously surveyed. Solana Beach Station is located within a built environment, and some historic-era structures associated with Old Highway 101 may be present in the vicinity. On the whole, there is a low to moderate potential to encounter previously unrecorded historical structures in this portion of the APE. Considering the limitations of surface survey due to urban development, and the proximity of Solana Beach station to the San Dieguito River, San Elijo Lagoon, and the Pacific coast, the potential for unknown archaeological sites along this section is moderate to high.

I. UTC STATION

No archaeological sites are recorded within the immediate vicinity of the proposed UTC station, located on Miramar Mesa. Previous projects have surveyed about 40 percent of the APE for this station location. The station would be located within a built environment dating to the 1970s and later. There is a very low potential for this portion of the APE to encompass historical structures or historical archaeological sites.

Prehistoric archaeological sites have been found in the area; deposits are shallow in these sites due to the nature of mesa geology and the lack of alluvial deposits. There is no potential for buried archaeological sites, and a limited potential for previously unknown archaeological sites. Overall, this station location APE has a low to moderate potential to encompass previously unknown prehistoric archaeological sites.

J. SANTA FE DEPOT

The Santa Fe Depot station location is on the waterfront in downtown San Diego; a large amount of historic-era (1769–1958) development occurred in this area. Previous projects have surveyed about 40 percent of the APE for this station location; there are no recorded archaeological sites in the APE. Nonetheless, the Santa Fe Depot building is listed on the California Inventory of Historic Resources. This portion of the APE is also located within ¼ mile of the historic Gaslamp Quarter, Old Town San Diego Historic District, and the Presidio, and is a prime location for early historical maritime, transportation, and trade activities as well as for prehistoric habitation. These facts indicate that the potential for historical structures or prehistoric or historical archaeological sites is high in this portion of the project APE.

APPENDIX B
CONVENTIONAL RAIL ROUTE COMBINATIONS
FOR IMPACT COMPARISON

Appendix B

Conventional Rail Route Combinations for Impact Comparison

As described in Chapter 1 of this Technical Evaluation, there are numerous alignment and construction options in the Conventional Rail portion of the High-Speed Train Alternative for the Los Angeles – Orange County – San Diego Region. To allow a reasonable comparison of impacts among the No Project, Modal, and High-Speed Train Alternative, the Conventional Rail improvement options are summarized by showing a range of potential impacts (Table 1-4, Chapter 1). This range is represented by two of many possible route combinations between Union Station and San Diego: (1) a Higher Level Infrastructure route, and (2) a Lower Level Infrastructure route. The Higher Level route is based on combining the alignment/construction options (one from each sub-segment) that would involve the most extensive infrastructure investment and/or construction complexity. For example, where a sub-segment has both an at-grade option and a trenching option in the same general alignment, the trenching option was used for the Higher Level route, and the at-grade option was used in the Lower Level route. Where two tunnel options are the only options in one sub-segment, the longer tunnel was included in the Higher Level route. In this way, a range of potential impacts could be bracketed to allow a valid comparison of the High-Speed Train Alternative to the No Project and the Modal Alternative.

The specific alignment and construction options included in both the Higher and the Lower Level routes are shown in Tables B-1 and B-2. These representative routes do not include any of the options that were eliminated from further consideration during the LOSSAN screening process. It must be emphasized that these routes serve only to provide a reasonable range of impacts for comparative purposes. They do *not* represent any selection of a particular option as preferred. No selection of preferred alignment options will be done until subsequent stages of this project.

**Table B-1
LOWER LEVEL INFRASTRUCTURE IMPROVEMENTS**

CONVENTIONAL RAIL (LOSSAN) & STATION OPTIONS
Union Station To Fullerton Station (4th main track)
Fullerton Station To Irvine Station
Alignment
AT-GRADE between Walnut Ave (Orange) and E. 17th St. (Santa Ana)
Stations
Fullerton
Anaheim
Santa Ana
Irvine
Irvine Station To San Juan Capistrano City Limits (no improvements)
San Juan Capistrano (City Limits to Avenida Aeropuerto)
Alignment
AT-GRADE and Open TRENCH along east side of Trabuco Creek
Stations
San Juan Capistrano (New, below-grade station)
Dana Point/San Clemente (Avenida Aeropuerto To San Onofre Power Plant)
Alignment
Dana Point Curve Realignment; San Clemente - SHORT TUNNEL; Double Tracking (crossing San Mateo and San Onofre Creeks)
Stations
San Clemente (New Station – location to be determined)
Camp Pendleton (San Onofre Power Plant to Oceanside City Limits - Double tracking; crosses Santa Margarita River)
Oceanside/Carlsbad (Oceanside City Limits to Encinitas City Limits)
Alignments
Carlsbad - AT-GRADE; double tracking; crosses San Luis Rey, Buena Vista , Aqua Hedionda, and Batiquitos Lagoons
Stations
Oceanside
Encinitas/Solana Beach (Encinitas City Limits to Solana Beach Station)
Alignment
Encinitas - AT-GRADE; Double Tracking; crosses San Elijo Lagoon
Stations
Solana Beach
Del Mar (Solana Beach Station to I-5/805 Split)
Alignment
TUNNEL under Camino Del Mar; crosses San Dieguito and Los Penasquitos Lagoons
I-5/805 Split To Hwy 52
Alignment
I-5 Tunnel
Hwy 52 To Santa Fe Depot (Curve realignment; Double Tracking; San Diego River Bridge; Trench between Sassafras St and Cedar St)
Stations
Santa Fe Depot

**Table B-2
HIGHER LEVEL INFRASTRUCTURE IMPROVEMENTS**

CONVENTIONAL RAIL (LOSSAN) & STATION OPTIONS
Union Station To Fullerton Station (4th main track)
Fullerton Station To Irvine Station
Alignment
TRENCH between Walnut Ave (Orange) and E. 17th St. (Santa Ana)
Stations Fullerton Anaheim Santa Ana Irvine
Irvine Station To San Juan Capistrano City Limits (no improvements)
San Juan Capistrano (City Limits to Avenida Aeropuerto)
Alignment
TUNNEL along I-5 between Hwy 73 and Avenida Aeropuerto (tunnel under Trabuco Creek and San Juan Creek); Double tracking
Dana Point/San Clemente (Avenida Aeropuerto To San Onofre Power Plant)
Alignment
San Clemente - LONG TWO-SEGMENT TUNNEL; Double Tracking (crosses San Mateo and San Onofre Creeks)
Stations
San Clemente (New below-grade station between tunnel segments)
Camp Pendleton (San Onofre Power Plant to Oceanside City Limits - Double tracking; crosses Santa Margarita River)
Oceanside/Carlsbad (Oceanside City Limits to Encinitas City Limits)
Alignment
Carlsbad -TRENCH; double-tracking; crosses San Luis Rey, Buena Vista, Aqua Hedionda, and Batiquitos Lagoons
Stations
Oceanside
Encinitas/Solana Beach (Encinitas City Limits to Solana Beach Station)
Alignment
Encinitas - SHORT TRENCH; Double Tracking; crosses San Elijo Lagoon
Stations
Solana Beach
Del Mar (Solana Beach Station to I-5/805 Split)
Alignment
TUNNEL along I-5; crosses San Dieguito and Los Penasquitos Lagoons
I-5/805 Split To Hwy 52
Alignment
Miramar Hill Tunnel
Stations
UTC
Hwy 52 To Santa Fe Depot (Curve realignment; Double Tracking; San Diego River Bridge; Trench between Sassafras St and Cedar St)
Stations
Santa Fe Depot