CALIFORNIA HIGH-SPEED TRAIN

Program Environmental Impact Report/Environmental Impact Statement

Los Angeles–Orange County–San Diego

CULTURAL RESOURCES TECHNICAL EVALUATION

January 2004

Prepared for:

California High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

CALIFORNIA HIGH SPEED RAIL AUTHORITY

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CALIFORNIA HIGH-SPEED TRAIN PROGRAM EIR/EIS

Los Angeles–Orange County–San Diego

Cultural Resources Technical Evaluation

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for

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ACRONYMS

APE	AREA OF POTENTIAL EFFECT
AUTHORITY	CALIFORNIA HIGH-SPEED RAIL AUTHORITY
CEQA	CALIFORNIA ENVIRONMENTAL QUALITY ACT
CHRIS	CALIFORNIA HISTORIC RESOURCES INFORMATION SYSTEM
CRHR	CALIFORNIA REGISTER OF HISTORICAL RESOURCES
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
MTA	METROPOLITAN TRANSPORTATION AUTHORITY
NHPA	NATIONAL HISTORIC PRESERVATION ACT
NRHP	NATIONAL REGISTER OF HISTORIC PLACES
RTP	REGIONAL TRANSPORTATION PLAN
SHPO	STATE HISTORIC PRESERVATION OFFICER

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.

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

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, 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 Cultural Resources 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 1.1.1). 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 1.1.1 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.

Figure 1.1.1
No-Project Alternative - California Transportation System

Table 1.1.1
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 8-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

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 1.2.2 and 1.2.3) 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 1.2.2 summarizes the highway expansion components of the Modal Alternative for this Region

Table 1.1.2
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 Lanes[1] (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 Town Center	2
I-5	University Town Center 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.

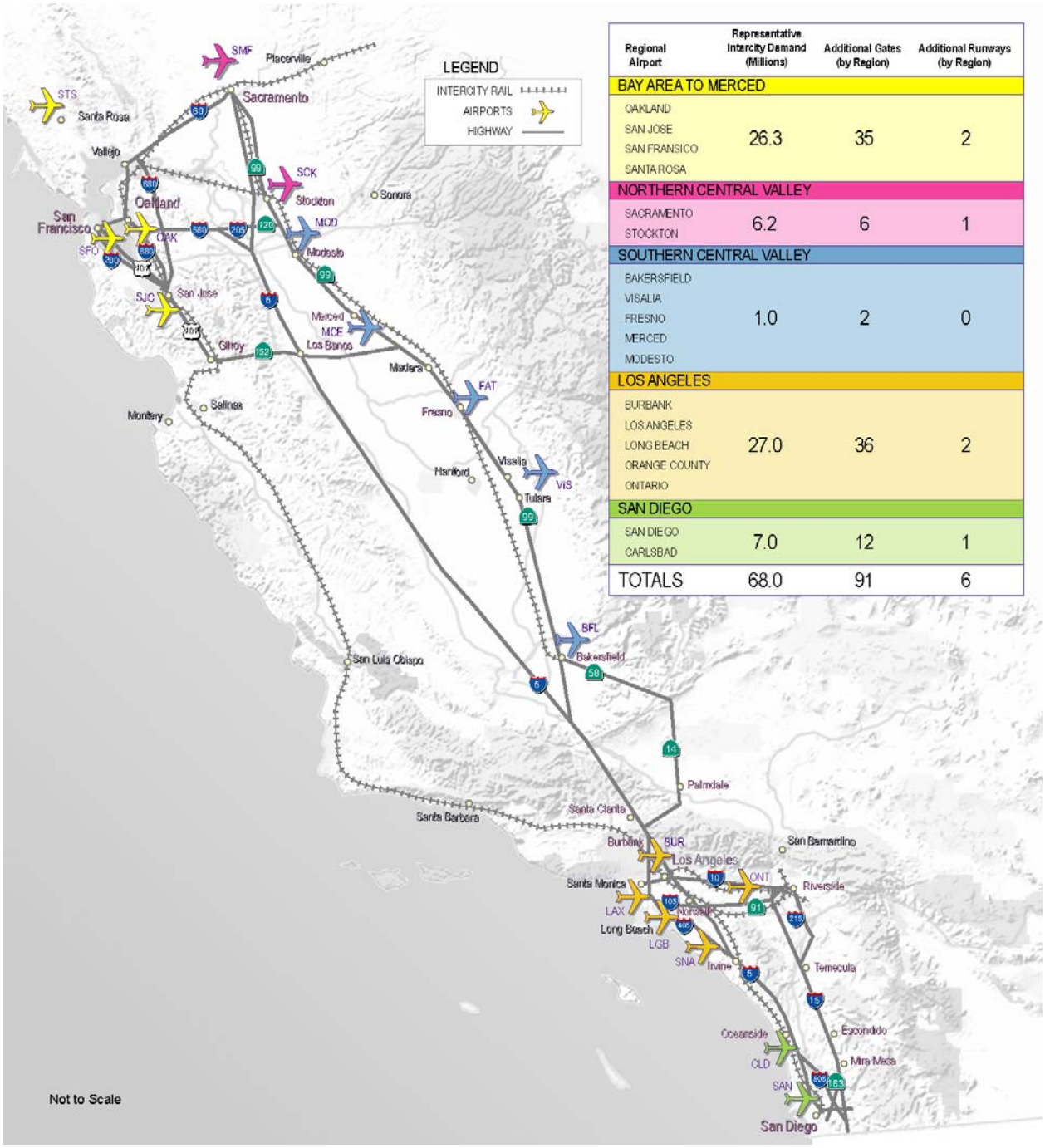
1.1.3 High Speed Train Alternative

The Authority has defined a statewide high speed train (HST) 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 1.1.4).

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.

Figure 1.1.2
Modal Alternative - Highway Component

Figure 1.1.3
Modal Alternative - Aviation Component



Regional Airport	Representative Intercity Demand (Millions)	Additional Gates (by Region)	Additional Runways (by Region)
BAY AREA TO MERCED			
OAKLAND SAN JOSE SAN FRANSICO SANTA ROSA	26.3	35	2
NORTHERN CENTRAL VALLEY			
SACRAMENTO STOCKTON	6.2	6	1
SOUTHERN CENTRAL VALLEY			
BAKERSFIELD VISALIA FRESNO MERCED MODESTO	1.0	2	0
LOS ANGELES			
BURBANK LOS ANGELES LONG BEACH ORANGE COUNTY ONTARIO	27.0	36	2
SAN DIEGO			
SAN DIEGO CARLSBAD	7.0	12	1
TOTALS	68.0	91	6

Figure 1.1.4
High-Speed Train Alternative – Corridors and Stations for Continued Investigation

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 1.1.3 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 1.1.5A, 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 Repo*rt (Authority, 2003).

TABLE 1.1.3

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

Alignment Segments and Station Locations Evaluated[1]	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:	
AT-GRADE between Walnut Ave (Orange) and E. 17th St. (Santa Ana)	Grade separations at street intersections between Walnut Ave. (in Orange) and E. 17th 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.
TRENCH between Walnut Ave (Orange) and E. 17th St. (Santa Ana)	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 1.1.3

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

Alignment Segments and Station Locations Evaluated[1]	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	
Covered TRENCH/Cut-Fill between Trabuco Creek and Avenida Aeropuerto (trench goes under San Juan Creek); Double tracking	*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*
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	
Dana Point Curve Realignment; San Clemente - SHORT TRENCH; Double Tracking	*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.*
Dana Point Curve Realignment; San Clemente - LONG TRENCH; Double Tracking	*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.*
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 1.1.3

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

Alignment Segments and Station Locations Evaluated[1]	Description of Proposed Options & Improvements
San Clemente - LONG ONE-SEGMENT TUNNEL ; Double Tracking (crosses San Mateo and San Onofre Creeks)	*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).*
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 1.1.3

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

Alignment Segments and Station Locations Evaluated[1]	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.
Encinitas - LONG TRENCH; Double Tracking; crosses San Elijo Lagoon	*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.*
Stations	
Solana Beach	Existing station. Proposed improvements include platform modifications and parking expansion.
Del Mar(Solana Beach Station to I-5/805 Split)	
Alignments	
COVERED TRENCH on bluffs; crosses San Dieguito and Los Penasquitos Lagoons	*Double-tracking in a covered trench in the existing rail corridor alignment along the bluffs.*
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 1.1.5A

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

FIGURE 1.1.5B

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

FIGURE 1.1.5C

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

2.0 BASELINE/AFFECTED ENVIRONMENT

2.1 STUDY AREA (AREA OF POTENTIAL EFFECT) DEFINED

The study area for cultural resources is the Area of Potential Effect (APE) that was defined in consultation with the State Historic Preservation Officer (SHPO). At this programmatic Tier 1 level of analysis, the APE is the area within which information about the locations of archaeological sites was obtained from the Information Centers of the California Historical Resources Information System (CHRIS). No APE was defined for structures from the historical period because individual structures from the historical period were not identified during this programmatic Tier 1 level of analysis.

The APE for this undertaking is defined as 500 feet on each side of the centerline of proposed rail routes in non-urban areas and 100 feet from the centerline in urban areas. The APE for freeway routes and around airports is defined as 100 feet beyond the existing freeway right-of-way and 100 feet beyond the existing airport property boundary. The reason for using 100 feet for urban rail corridors, freeways, and airports is that very little additional right-of-way would be affected in these areas. The 500 feet on each side of the railroad centerline in non-urban areas provides information on wider corridors where additional right-of-way could be affected.

Locations of easements and construction-related facilities, such as equipment staging areas, borrow and disposal areas, access roads, and utilities, have not been yet been identified. Locations for these will be identified as part of the construction design program for the alternatives selected for more detailed analysis in the next phase of the project. Thus, these items are not considered in the program level Tier-1 analysis, but this information will be available for Tier-2 site-specific environmental evaluations. The APE will be modified to include these items as part of the Tier-2 analysis.

2.2 CULTURAL BACKGROUND (PREHISTORIC, ETHNOGRAPHIC, AND HISTORIC) OF REGION

2.2.1 Prehistoric Background

The following section provides a brief overview of the prehistory of the Project region. Discussions of the putative "Early Man" Period and the scientifically established Paleo-Indian Period apply to all portions of the project region. Subsequent regional variations are then discussed for Los Angeles, Orange, and San Diego counties.

A. LOS ANGELES COUNTY

<u>"Early Man" Period</u>

Several sites in southern California, the most well known of which is Calico Hills, have been tentatively assigned to an "Early Man Period" with relative dates ranging from 12,000 years ago to as far back as 50,000 years ago (Moratto 1984[1]). Various geologic and experimental dating methods have been used to provide these extreme temporal assignments. Thus far, however, none of these "Early Man" sites have withstood scientific scrutiny. Improved dating techniques have usually demonstrated that very old dates based on experimental methods are flawed, and are much later than originally believed. Despite claims for artifacts of "Early Man" in the

[1] Moratto, M. J. *California Archaeology*. New York: Academic Press, 1984.

California deserts, it appears that existing evidence of humans in southern California is limited to the last 12,000 years.

Paleo-Indian Period ca. (12,000–7000 B.P. [ca. 10,000–5000 B.C.])

The earliest humans known to have occupied southern California are believed to have been highly mobile hunters and gatherers, called Paleo-Indians. Paleo-Indian sites within southern California were assigned by Rogers (1966)[1] to the San Dieguito Culture. The type site for the San Dieguito Complex is the C. W. Harris site, CA-SDI-149, located near Escondido, in San Diego County. The earliest cultural deposits at the Harris site have been dated to 9,000 years before present (B.P.). Moratto (1984:92) notes that San Dieguito artifact assemblages are similar to those of Lake Mojave and other Paleo-Indian cultures in southern California. Moratto goes on to suggest that assemblages of this early era be divided into a Fluted Point tradition (12,000–10,000 B.P.) and, following Bedwell[2] (1970), a Western Pluvial Lakes Tradition (10,000-7000 B.P.). Tule Lake, in Kern County north of the Project area, has yielded more fluted point finds than in the remainder of California (Dillon 2002[3]); however, no fluted points have been recovered in Los Angeles County.

Perhaps the earliest evidence of human occupation in the Los Angeles region was recovered from the tar pits of Rancho La Brea. In 1914, the partial skeleton of a young woman was discovered in association with a mano (Merriam 1914[4]). During the early 1970s, complex chemical methods were used to decontaminate the human bone of intrusive carbon, and a treated collagen sample was dated at 9000 ± 80 B.P. (UCLA-1229 BB) (Berger et al. 1971[5]).

In addition, projectile points similar to the Lake Mojave and San Dieguito types as well as crescentics have been recovered at the Del Rey Bluffs immediately south of Ballona Lagoon, adjacent to a former mouth of the Los Angeles River (Lambert 1983[6]). The presence of these point types along the region's coast suggests connections with the cultures of the southeastern California desert regions.

The 7500 to 5000 B.P. Interval (Middle Holocene Period)

The Topanga Complex is perhaps the best known component of this time period in the Los Angeles area. Treganza and Bierman[7] (1958) identified two phases of the Topanga Complex during excavations at two sites in Topanga Canyon. Topanga Phase I, dated to earlier than 5000 B.P., includes scraper-planes, scrapers, choppers, core/cobble tools, an extensive ground stone tool assemblage, few projectile points, and secondary burials. Phase II, dated to ca. 5000-3000 B.P., is distinguished by small projectile points, incised and cogged stones, and fewer core/cobble tools; reburial continues along with the introduction of extended burials. Phase III,

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1 Rogers, Malcolm J. *Ancient Hunters of the Far West.* Union-Tribune Publishing, San Diego, California. 1966

2 Bedwell, S.F. *Prehistory and Environment of the Pluvial Fork Rock Lake Area of South Central Oregon*. Ph.D. dissertation, Department of Anthropology, Eugene, Oregon: University of Oregon, 1970.

3 Dillon, Brian D. California PaleoIndians: Lack of Evidence or Evidence of a Lack? In *Essays in California Archaeology, A Memorial to Franklin Fenenga*. Edited by William J. Wallace and Francis A. Riddell, pp. 110–128, 2002.

4 Merriam, C. H. Distribution of Indian Tribes in the Southern Sierra and Adjacent Parts of the San Joaquin Valley, California. *Science* 19:912–917, 1914.

5 Berger, R., et al. New Radiocarbon Dates Based on Bone Collagen of California Paleoindians. Berkeley: *Contributions of the University of California Research Facility* 12:43–49, 1971.

6 Lambert, V. A Surface Collection from the Del Ray Hills, Los Angeles County, California. *Journal of New World Archaeology* (5) 3: 7–19, 1983.

7 Treganza, A. E., and A. Bierman. The Topanga Culture: Final Report on Excavations, 1948. *University of California Anthropological Records* 20(2). 1958.

dated to ca. 3000–2000 B.P. (Johnson 1966:15, 20[1]), includes large rock-lined ovens, pressure-flaked points, core tools, mortars and pestles, and plentiful milling stones.

Aside from the sites in Topanga Canyon, the only evidence of prehistoric occupation of the Los Angeles Basin dating to this interval is a discoidal or cogged stone occasionally recovered from sites dating to more recent periods of prehistory.

The 5000–1500 B.P. Interval (Middle to Late Holocene)

Within the Los Angeles Basin, few sites have been identified from the 5000 to 1500 B.P. interval. As discussed previously, the Phase-II and Phase-III components at sites in Topanga Canyon are dated to this period. In addition, several sites south of Ballona Lagoon on the Del Rey bluffs include well-developed components from this period (Van Horn 1987[2]; Van Horn and Murray 1985[3]).

The Post 1500 B.P. Interval (Late Holocene)

Most chronological sequences for southern California recognize the introduction of the bow and arrow by 1500 B.P., marked by the appearance of small arrow points and arrow shaft straighteners. Reliance on the bow and arrow for hunting, along with the use of bedrock mortars and milling slicks, mark the beginning of this period, dating from about 1500 B.P. (A.D. 500) to the time of Spanish contact (approximately A.D. 1769).

Diagnostic artifacts include small triangular projectile points, mortars and pestles, steatite ornaments and containers, perforated stones, circular shell fishhooks, and numerous and varied bone tools, as well as bone and shell ornamentation. Elaborate mortuary customs along with generous use of asphaltum and the development of extensive trade networks are also characteristic of this period. During the latter half of the late prehistoric occupation of the southern California coastal region, pottery, ceramic pipes, cremation urns, rock paintings, and some European trade goods were added to the previous cultural assemblage (Meighan 1954[4]).

Late prehistoric coastal sites are numerous. First settled approximately 2,000 years ago, the Arroyo Sequit Site (Curtis 1959[5], 1963[6]) is a late prehistoric occupation site and persisted until the Mission Period (ca. A.D. 1800–1830). Probably one of the richest sites in coastal southern California, the Malibu Site (CA-LAN-264) at the mouth of Malibu Creek also was occupied during this period (Walker 1951[7]).

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1 Johnson, J. J. A Preliminary Survey of the Archaeological Resources of Lower Mill Creek. Davis, California: Ms. on file, Department of Anthropology, University of California, 1966.

2 Van Horn, D. M. *Excavations at the Del Rey Site (LAN-63) & Bluff Site (LAN-64), City of Los Angeles*. Sun City: Archaeological Associates, 1987.

3 Van Horn, D. M., and J. R. Murray. *The Loyola Marymount Archaeological Project: Salvage Excavations at LAN-61A-C*. Environmental Impact Report, July 30, 1985.

4 Meighan, C. W. A Late Complex in Southern California Prehistory. *Southwestern Journal of Anthropology* 10(2):215–227, 1954.

5 Curtis, F. *Arroyo Sequit*. Archaeological Survey Association of Southern California, Paper No. 4. Los Angeles: Southwest Museum, 1959.

6 Curtis, F. *Arroyo Sequit: Archaeological Investigations in Leo Carrillo Beach State Park, Los Angeles County, California*. Sacramento: Department of Parks and Recreation, Division of Beaches and Parks. The Resources Agency, State of California Archaeological Report No. 9, 1963.

7 Walker, E. F. *Five Prehistoric Archaeological Sites in Los Angeles County, California*. Los Angeles: Publications of the F. W. Hodge Anniversary Publication Fund 6, 1951.

Increased hunting and widespread exploitation of acorns and holly-leaf cherry provided reliable and storable food resources. This, in turn, promoted greater sedentism, with related increases in population size, economic complexity, and permanent habitation. Related to this increase in resource utilization and sedentism are sites with deeper middens, suggesting centrally based wandering or permanent habitation. These habitations would have been the villages, or rancherias, noted by the early European explorers (Goldberg et al. 1999[1]). By 500 B.P. (A.D. 1500), strong ethnic patterns developed among native populations in southern California. This may reflect accelerated cultural change brought about by increased efficiency in cultural adaptation and diffusion of technology from the central coastal region of California and the southern Great Basin (Douglas et al. 1981:10[2]).

B. ORANGE COUNTY

Located between San Diego and Los Angeles counties, the cultural elements of Orange County reflect both unique cultural traits and a mixture of regional influences. Cultural periods defined for Orange County prehistory include the Paleo-Coastal, the Milling Stone period or horizon, the Intermediate Horizon and the Late Prehistoric (Erlandson 1994,[3] Mason and Peterson 1994[4].)

Paleo-Coastal

This period, equivalent to the Paleo-Indian Period, is best seen in Orange County at CA-ORA-64, a site located on the Pacific coast. At CA-ORA-64, dates show evidence of habitation by 8000 B.P.; the assemblage exhibits some characteristics of the San Dieguito culture (Drover 2001[5]). Typically these components lack milling equipment.

Milling Stone

The Milling Stone period, or horizon, is typified by milling equipment, including not only manos and metates, but also “discoidals” and “cog stones” on coastal sites. Beginning at roughly 6000 years B.P., coastal lagoons supported large populations, as evidenced by the numerous radiocarbon-dated sites adjacent to these lagoons; local variations have been grouped as the La Jolla Complex and the Encinitas Tradition. The Encinitas Tradition reflects coastal adaptations and is seen from San Diego to Santa Barbara.

Intermediate Period

Environmental conditions between 2000 to 1000 B.C. beginning the Intermediate period, forced a shift of habitation locations away from the coast with more emphasis on bays and inland areas, as is also evidenced in San Diego County. These sites exhibit mortar and pestle use suggesting the switch to a heavy reliance on acorns.

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[1] Goldberg, S. K., et al. *The Metropolitan Water District of Southern California Headquarters Facility Project. The People of Yaanga?: Archaeological Investigations at CA-LAN-1575/H*. Altadena, California: Submitted to Union Stations Partners on behalf of The Metropolitan Water District of Southern California, Los Angeles, 1999.

[2] Douglas, R. C., et al. Archaeological, Historical/Ethnohistorical, and Paleontological Assessment, Weir Canyon Park-Road Study, Orange County, California. Tustin, California: Larry Seeman Associates. Ms. on file, University of California Institute of Archaeology, Los Angeles, 1981.

[3] Erlandson, Jon M. Early Hunter-Gatherers of the California Coast. New York: Plenum Press, 1994.

[4] Mason, R. D. and M. L. Peterson, Newport Coast Archaeology Project: Newport Coast Settlement Systems, Analysis and Discussion. Fullerton, California: On file at the South Central Coastal Information Center, California State University, 1994.

[5] Drover, Christopher. A Phase I Cultural Resource Inventory for the 1,226 Acre Planning Area 9, Irvine, California. Fullerton, California: On file, South Central Coastal Information Center, 2001.

Late Period (Post 1350 B.P.)

Late Period sites date to after 1350 B.P. and reflect an increase in population density and a shift to more sedentary habitation. The introduction of the bow and arrow between A.D. 400 to 600, as well as ceramics and evidence of long distance trade, are characteristic of the Late Period just before European contact. In coastal Orange County, the Irvine Complex (Ross 1969[1]) reflects a coastally oriented adaptation; the San Luis Rey Complex (Meighan 1954[2]) reflects an inland-oriented lifeway.

C. SAN DIEGO COUNTY

Archaeological studies have indicated Native American occupation of the region for at least 9,000 years. However, controversy surrounds which cultural groups lived in San Diego County, the chronology of cultural occupations and the subsistence practices of these people. Movement of early groups into San Diego may have been spurred by the gradual desiccation of a vast pluvial lake system that had dominated the inland basins and valleys during the Pleistocene and early Holocene. This is suggested by similarities between Great Basin assemblages and those of Early Period sites in San Diego County. Several researchers recognized the regional similarity of artifacts and grouped these complexes under the Western Pluvial Lakes Tradition or the Western Lithic Co-tradition (Bedwell 1970[3]; Davis et al. 1969[4]; Moratto 1984[5]; Rogers 1939[6]; Warren 1967[7]).

Early Period 9000–3000 B.P.

Early Period sites such as the Harris site (SDi-149) are found in San Diego County, dating as early as 8000 to 9000 years before present (B.P.). It is believed that the people in this Early Period occupation of the western and central parts of the county came to exploit the rich coastal and inland natural resources—shellfish, fish, plants and animals (Gallegos and Carrico 1984[8]; Kaldenberg 1982[9]; Moriarty 1967[10]). At the regional level, this is generally recognized as the San Dieguito Culture. Cultural patterns associated with Early Period occupation include large dart or atlatl points, obsidian from the Coso Range in eastern California, inhumation of the dead, and an absence of pottery.

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1 Ross, L. A. The Irvine Complex: A Late Prehistoric Horizon Archaeological Complex for the Newport Bay Area, California. M.A. Thesis. Pullman: Department of Anthropology, Washington State University, 1969.

2 Meighan, C. W. A Late Complex in Southern California Prehistory. *Southwestern Journal of Anthropology* 10(2):215–227, 1954.

3 Bedwell, S. F. *Prehistory and Environment of the Pluvial Fork Rock Lake Area of South Central* Oregon. Ph.D. dissertation, Department of Anthropology, Eugene, Oregon: University of Oregon, 1970.l

4 Davis, E. L., et al. The Western Lithic Co-Tradition. *San Diego Museum Papers* 6. San Diego: San Diego Museum of Man, 1969.

5 Moratto, M. J. *California Archaeology*. New York: Academic Press, Inc., 1984.

6 Rogers, Malcolm J. Early Lithic Industries of the lower Basin of the Colorado River and Adjacent Desert Area. *San Diego Museum Papers* Vol 3. San Diego: San Diego Museum of Man, 1939.

7 Warren, Claude N. The San Dieguito Complex: A Review and Hypothesis. *American Antiguity* 32(2):168–185, 1967.

8 Gallegos, D. R., and R. L. Carrico. *Windsong Shores Data Recovery Program for Site W-131, Carlsbad, California*. San Diego: Ms. On file, South Coastal Information Center, San Diego State University, 1984.

9 Kaldenburg, Russell. Rancho Park North, a San Dieguito-La Jolla Shellfish Processing Site in Coastal Southern California. *Occasional Paper* 6. El Centro, California: Imperial Valley College Museum Society, 1982.

10 Moriarty, James R. III. The San Dieguito Complex: Suggested Environmental and Cultural Relationships. *Anthropological Journal of Canada* 7(3):2–18. 1969.

Beginning at roughly 6000 years B.P., coastal lagoons supported large populations, evidenced by the numerous radiocarbon-dated sites adjacent to these lagoons. In San Diego County, this occupation lasted until about 1300 B.P.; local variations have been grouped as the La Jolla Complex and the Encinitas Tradition. The Encinitas Tradition reflects coastal adaptations and is seen from San Diego to Santa Barbara.

Intermediate Period 3000–1500 B.P.

From about 3000 to 1500 years B.P., there was an apparent hiatus in occupation in northern, but not southern or eastern, San Diego County. Sites dated to circa 2000 B.P. are found closer to San Diego Bay where shellfish were still abundant; this time period may represent the end of the La Jolla Complex (Gallegos and Kyle 1988[1]). The absence of archaeological sites in north county dating to this period has been attributed to the siltation of coastal lagoons and depletion of shellfish and other lagoon resources (Gallegos 1985[2]; Miller 1966[3]; Warren and Pavesic 1963[4]).

The termination of the Early Period involved both developmental processes and an influx of new populations with different cultural backgrounds. Two cultural divisions began to emerge near the end of the Early Period.

By around 2000 B.P., Yuman people had occupied the Gila/Colorado River drainage (Moriarty 1969[5]). At roughly the same time, Uto-Aztecan (Shoshonean) people expanded from northern portions of the Great Basin into that portion of the Colorado-Mojave Desert region situated north and west of the Colorado River. Uto-Aztecan peoples ultimately occupied much of southern California including desert, mountain, coastal areas and several of the Channel Islands, north of the Yuman groups who occupied what are approximately present San Diego and Imperial counties (Kroeber 1925[6]; Moratto 1984[7]).

Late Period: The Post 1500 B.P. Interval

Late Period occupation from 1,500 years ago to historic contact is well documented in San Diego County. Perhaps as early as 1200 B.P., and certainly by 800 B.P., the technology of ceramic manufacture had been introduced from the eastern deserts and become an established part of the Late Period artifact assemblage. Artifacts and cultural patterns of the Late Period include small projectile points, ceramics, permanent or semi-permanent seasonal village sites, a proliferation of acorn milling sites in the uplands, obsidian from Obsidian Butte (located near the Salton Sea in the Mojave Desert), and cremation of the dead.

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1 Gallegos, D. R. and Carolyn Kyle, *Five Thousand Years of Maritime Subsistence at Ballast Point Prehistoric Site Sdi-48 (W-164), San Diego, California*. San Diego: Ms. On file, South Coastal Information Center, San Diego State University, 1988.

2 Gallegos, Dennis. Batiquitos Lagoon Revisited. *Casual Papers* 2(1):1–13. San Diego: Department of Anthropology, San Diego State University, 1985.

3 Miller, Jacqueline. The Present and Past Molluscan Faunas and Environments of Four Southern California Coastal Lagoons. Master's thesis. San Diego: University of California at San Diego, 1966.

4 Warren, Claude N. and M. G. Pavesic, Shell Midden Analysis of Site SDI-603 and Ecological Implications for Cultural Development of Batiquitos Lagoon, San Diego County. Los Angeles: *Archaeological Survey Annual Report* 1962–1963:407–438, 1963.

5 Moriarty, James R. III. The San Dieguito Complex: Suggested Environmental and Cultural Relationships. *Anthropological Journal of Canada* 7(3):2–18. 1969.

6 Kroeber, Alfred L. *Handbook of the Indians of California*. Washington, D.C.: Bureau of American Ethnology Bulletin 78, 1925.

7 Moratto, Michael J. *California Archaeology*. New York: Academic Press, Inc., 1984.

Late Period subsistence patterns are seen in the distribution of site types, with a sedentary or semi-sedentary village, strategically located within a territory, surrounded by more remote special-use procurement camps. Small bands or family units utilized a day-to-day procurement strategy to provide for their daily needs. In addition, a surplus food procurement strategy was employed, which may have included larger numbers of individuals. Such activities included collection, processing and storage of acorns, seeds, cactus, and hunting of rabbit, and mule deer (Byrd 1970[1]).

In central San Diego County, the Late Period is represented by the Cuyamaca Phase. This is followed in the protohistoric period by the Yuman Tradition (Moratto 1984[2]; True 1970[3]). Northern San Diego County, north of the San Luis Rey River, was occupied by Shoshonean people, with Late Period cultures represented by the San Luis Rey Complex, forebears of the Luiseño culture (Moratto 1984:155[4]).

2.2.2 Ethnographic Background

The Los Angeles-Orange County-San Diego Region traverses the territories of several Native American tribes. These include the Gabrielino, Juaneño, Luiseño, and Kumeyaay (Tipia and Ipai) (Figure 2.2.1). While hunter-gatherer economies generally defined the survival strategy of these groups, social structure and religious practices both differed and overlapped.

The territories encompassed various eco-zones that provided many resources for local populations. Differences in local environments dictated specific availability of resources, but in general the tribes of southern California used a similar subsistence strategy. The ocean provided fish and shellfish, as well as sea mammals, to be used for food, implements, and adornment. Marshes and rivers provided reeds and fresh water fish. Grasslands provided material for basketry and seed for food. Rodents, lizards, insects, larvae, and birds made up much of the everyday diet. Harvesting of acorns, pinyon nuts and agave, and hunting of deer and big horn sheep at higher elevations required group participation and planning.

A. GABRIELINO

The Gabrielino tribe spoke the Cupan language, of the Takic family, part of the Uto-Aztecan linguistic stock. This language group is often referred to as southern California Shoshonean. This tribe shared the Cupan language with the Luiseño and Juaneño, as well as many other traits. The Gabrielino had a rich material culture, a large population and much influence in southern California.

The Los Angeles Basin was part of Gabrielino territory. It is believed that the total Gabrielino territory covered more than 1,500 square miles, and included the watersheds of the Los Angeles River, San Gabriel River, Santa Ana River, and Rio Hondo, as well as the islands of Santa Catalina, San Clemente, and San Nicolas.

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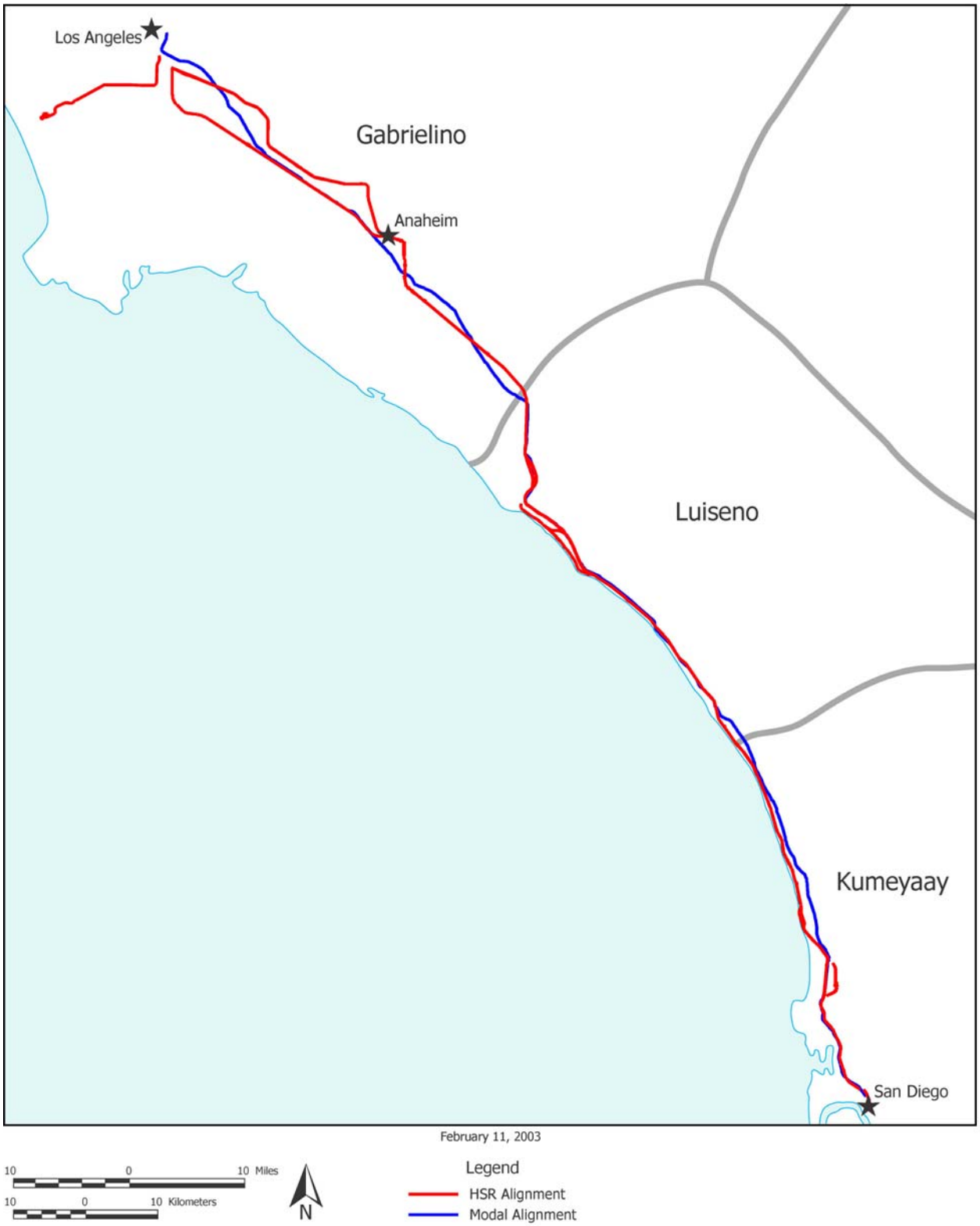
1 Byrd, Brian F. *Camping in the Dunes:* Archaeological and Geomorphological Investigations of Late Holocene Settlements West of Rogers Dry Lake. , San Diego, California: Prepared by AMS Affiliates, 1970.

2 Moratto, Michael J. *California Archaeology*. New York: Academic Press, Inc., 1984.

3 True, D. L. Investigations of a Late Prehistoric Complex in Cuyamaca Rancho State Park, San Diego County. Los Angeles: *Archaeological Survey Monographs 1*, University of California, Los Angeles 1970.

4 Moratto, Michael J. *California Archaeology*. New York: Academic Press, Inc., 1984.

Figure 2.2.1
Approximate Location of Native American Groups
In Project Region at the Time of European Contact



Within this large territory were more than 100 residential communities with populations that ranged from approximately 50 to 200 individuals. Thought to perhaps represent a classic chieftain social structure, each community consisted of one or more lineages that maintained a permanent geographic territory that included a permanent village and a variety of hunting and gathering areas as well as ritual sites.

Settlement patterns included primary subsistence villages and secondary temporary campsites. Village sites may have been occupied year round and were located inland from the ocean. Secondary camps were located along the shore and in the mountains. Settlements on the islands were either near the shoreline or in the mountain areas near water sources. In major villages, structures were large, sometimes big enough to accommodate 50 or more people. Other structures were the sweathouse, menstrual house, and a ceremonial enclosure with a wicker fence.

The Gabrielino were adept at sculpting steatite and other rock into bowls, pestles and pots, ornaments, animal carvings, ritual items, pipes, and utility items. They also decorated items with *Haliotus* shell inlay using asphaltum. Shell ornaments and beads, baskets, bone tools, flint weapons and drills, fishhooks, mortars and pestles, wooden bowls and paddles, shell spoons and wooden war clubs are among the many artifact types common in descriptions of Gabrielino culture (Blackburn 1963[1]).

Social structure was similar to the Luiseño, with a chief heading up the lineal family group or clan that might oversee more than one village. The chief's authority was manifested as keeper of the sacred bundle, a package of rocks, crystals, feathers and other "power" items. Shaman powers were imbued by taking datura and having visions. Like the Mohave, Gabrielino shamans could heal but could also hurt, and power could be stripped from them by other shamans if misused.

The wealth of resources, coupled with an effective technology and a well-developed intra- and extra-territorial trade, and elaborate ritual system, resulted in a society that was among one of the most materially wealthy and culturally sophisticated groups in California (McCawley 1996:141[2]). The management of food resources by the chief was the heart of the Gabrielino economy; a portion of each day's hunting, fishing, or gathered food resources was given to the chief who was responsible for managing the community's food reserves. Each family also kept a food supply for use in lean times.

Population estimates are difficult to make, but it may have been as many as 20,000 if 100 village complexes each had 200 members. This population was heavily diminished by European contact and by the early 1900s there were only a few Gabrielino left.

B. JUANEÑO

The Juaneño, usually considered a sub-tribe of the Gabrielino, occupied a territory immediately to the south of the Gabrielino proper, and shared many of the same social and religious structures. Unlike other southern Californian groups, the Juaneño had an elaborate calendar system, and waged war not for territory, but for revenge.

[1] Blackburn, Thomas. Ethnohistoric Descriptions of Gabrielino Material Culture. Los Angeles: *UCLA Archaeological Survey Annual Reports* 5:1–50, 1963.

[2] McCawley, W. *The First Angelinos*. Malki Museum Press/Ballena Press Cooperative Publication, 1996.

C. LUISEÑO

Like the Gabrielino, the Luiseño were a Shoshonean people, speaking a Cupan language, in the Takic subfamily of the Uto-Aztecan language family. This language group is often referred to as southern California Shoshonean. This language group was a relative late comer to southern California perhaps extending here from the Great Basin approximately 1000 A.D., although some archaeological evidence suggests the movement to have been possibly as early as 1500 B.C. (Moratto 1984:165[1]). Cultural traits that accompany this language may have included cremation, ceramics, sand painting and possibly horticulture. Luiseño tribal territory is located to the south of the Gabrielino, extending from the ocean, skirting around the Juaneño territory, north to Santiago Peak and south to Palomar Mountain.

The Luiseño were typically insular and had relations with neighbors only through territorial expansion or marriage. They practiced highly strict and structured social rule, which included a social hierarchy beginning with a hereditary chief, ruling families, and an initiated warrior class. The Luiseño lacked moieties and were patrilineal. The chief ruled a group, perhaps a clan, which was based on kinship. Several clans together constituted a religious grouping, although the grouping could include “clan-less” individuals. Religious ritual was ordered by the chief but executed by an assistant. Ritual manifestations, such as a song or dance, could “belong” to a group or a clan.

The Luiseño practiced sand painting, which is directly associated with the Chingichngish cult. Luiseño conceptual references of the world were represented by non-physical or spiritual symbols.

The Luiseño house was conical with adjacent rectangular ramadas. Ritual circles were fenced, had an altar place, and were centrally located within the village. Sweathouses were perhaps more substantial than the Kumeyaay version, and were semi-subterranean and covered with earth.

Population counts may have been as many as 8,000 within 50 villages at European contact. Many Luiseño were moved into the Spanish missions, but during secularization left the missions to work as ranch and farm laborers. The Mexican government established pueblos in rancherias such as at Santa Margarita and Los Flores. Eventual eviction of these people from their land resulted in American establishment of reservations at Pala, Pauma, and La Jolla.

D. KUMEYAAY

San Diego County is the traditional territory occupied by the Kumeyaay or Diegueño people. This Native American tribe is a Yuman-speaking group of the Hokan stock, unlike the Shoshonean speakers to the north.

The Kumeyaay are made up of two subgroups, the Tipai and Ipai; previously referred to as the Diegueño and Kamia. The terms Tipai and Ipai reflect territorial and dialectic differentiations between these two loosely connected bands. The two together are often referred to as the Diegueño, but the term Kumeyaay is now preferred.

Traditionally, clan relations defined social groups, with each clan made up of smaller band units. These small migratory band units consisted of around 30 individuals, each defined by clan names. Placenames, as well as flora and fauna, might be used by the tribal member to identify himself as a clan member. They referenced other tribes and groups by relative directions.

[1] Moratto, Michael J. *California Archaeology*. New York: Academic Press, Inc., 1984.

Ipai territory extended from just north of Mission Bay to the San Luis Rey River and east from the coast to San Felipe Creek. Tipai territory covers most of the rest of San Diego County, half of Imperial County to the east, and extends into Baja California.

Kumeyaay settlements functioned primarily as temporary camps from which resources were accessed; camps were used throughout the year by various groups. A winter camp might include more than one clan, with these clans then dispersing in the spring. Structures included light windbreaks for summer, and pit houses for winter. Pit houses were dome-shaped and constructed of available materials, generally with brush thatch, but with palm thatch in desert locations and bark in the mountains. Other structures included a ceremonial circle with a brush fence, a rectangular version of the same, acorn storage structures, and sweathouses.

While hunting and gathering was the primary resource strategy, horticulture was practiced along the flooded Colorado River by the Valley Tipais producing beans, maize and melons. The Kumeyaay also managed their lands in other ways including setting fires to grasslands to stimulate new growth. Harvesting occurred where and when resources came into season often from the shore to the mountains, causing a vertical migratory movement through the landscape.

Social organization included a clan chief who was knowledgeable about ceremonial activities and guided the clan in social matters; a hunt master who organized and lead hunts; and a shaman who controlled weather, knew herbal uses, hunted large game, and provided dream interpretation. Marriages were arranged by parents, with marriage outside the father's clan and residence near the groom's parents. Patrilineal decent is similar to Luiseño to the north. Trade was primarily limited to exchange among the Kumeyaay groups.

While Kumeyaay religion shared basic elements with the Luiseño, it also had ritual elements similar to the Mohave, songs similar to both the Mohave and the Gabrielino, and a color direction association used in sand painting, perhaps a cultural remnant from the southwest. A local variation of the Chingichngish puberty ceremony practiced by other regional tribes was also practiced by the Kumeyaay but not named as such. For young women this included lying in a hot, stone-lined pit for a week ending with tattooing on the chin. The use of the hallucinogenic toloache (*Datura meteloides*) root during the ceremony for young men is thought to have been introduced to Kumeyaay culture very late, perhaps just before the Spanish arrival (Luomala 1978: 603[1]). Internment was by cremation, usually with the remains placed in a ceramic jar or olla. Personal items were burned. The *kδruk*, the image ceremony, involved dancing with doll-like images of the dead from dusk to dawn when the images were then burned.

Mission records suggest a registered population of about 3,000 individuals, but the population may have been as many as 8,000 people in 80 villages around the time of European contact. Due to the resistance of the Kumeyaay to European influences, many remained in their villages and did not move into the missions. After the establishment of reservations at San Pasqual and Viejas, many moved to these and other local reservations, while some dispersed to the Quechan reservation or into Baja California.

Ethnographic evidence suggests that several Native American settlements were located along the High Speed Rail corridor, indicating a potential for archaeological discovery of village sites dating to the ethnohistoric contact period. Ethnohistoric villages known in Los Angeles County near the Project corridor include *Lukup*, *Pubu*, and *Apachia* located along the river, and *Yaanga*, adjacent to Union Station. In Orange County, villages near the Project corridor included *Ru-tuid-em*,

[1] Loumala, K., Tipai-Ipai. In *Handbood of North American Indians*, Vol 8. pp. 592–609. Edited by R. F. Heizer. Washington, D.C.: Smithsonian Institution, 1978.

Moyo, and *Ahachmai,* located near San Juan Capistrano. Sites in San Diego County that are known to be in the vicinity of the Project corridor including *Ystagua* in Sorrento Valley, *Kulauma,* and *Wiawio,* along the coast, *Hechmai,* located near Arroyo San Onofre, and *Panhe* located at the mouth of the Arroyo San Mateo.

2.2.3 Historic Background

Historic-era developments in the Los Angeles Basin, the coastal plain of Orange County, and the lagoons and mesa of San Diego County are linked by common themes. The quest for inhabitable land and a means of living by a newly arrived Euro-American population, as well technological advances, created long distance trade networks and resulted in population shifts across the landscape of southern California. Euro-American history in southern California can be divided into seven temporal periods (City of Santa Barbara 2002: 56-57[1]).

During the **Spanish Period (1769–1821)**, European inhabitants first occupied parts of California from Spanish-ruled Mexico. This period, marked by the establishment of missions and the Christianization of large parts of the Native American population.

The subsequent **Mexican Period (1821–1848)** was marked by the end of the Mission system, and the rise of the large ranchos.

The United States acquired California in 1848, and the subsequent history of California can be divided into five periods. The **Hispanic to American Transition Period (1848–1870)**, is marked by the arrival of relatively large numbers of *Americanos* into California, especially during the Gold Rush, the establishment or growth of cities in the region, and the spread of American endeavors, such as mining, oil production, land reclamation, and ranching to all parts of the Project region.

The **American Period (1870–1900)** is the era of the railroads: with the arrival of rail connections in California, cities such as Los Angeles boomed, smaller towns such as San Diego grew more populous, and rural development, whether for farming, citrus orchards or ranching, also increased. At the beginning of this period, portions of southern California were still empty land. By the end of the period, only the steep mountain ranges were not occupied by at least a few people, and places such as Los Angeles had taken on the look of a modern city, with multi-story buildings, street cars, and electric lighting.

The subsequent period, the **Early Twentieth Century (1900–1929)**, is notable for continued growth, the development of industries in Los Angeles such as aircraft production and motion pictures, and the continued infilling of neighborhoods and rural spaces with a denser population. In San Diego, home port of the Pacific fleet, naval support industries spurred growth. The following **Mid-Twentieth Century Period (1930-1958)** is marked by similar growth and development. San Diego also developed major industrial and aircraft production facilities during this period. After a hiatus during the Great Depression, California grew spectacularly in population during World War II. The birth of the modern automobile suburb occurred in southern California at this time, and freeways came to be a hallmark of the region. These developments, an influx of population, and the building of new communities, continues to the present in the Project region. Structures from the **Post-1958 period** are not old enough to be considered historic under state or federal statutes and guidelines.

Within this context, the following sections present a history of the Project region's three counties, Los Angeles, Orange, and San Diego, focused on developmental changes that occurred in the history of significant communities within these counties crossed by the High Speed Train alignments.

[1] City of Santa Barbara Master Environmental Assessment: Guidelines for Archaeological Resources and Historic Structures and Sites. Santa Barbara, California, 2002.

A. EUROPEAN CONTACT

The first direct contact between the Europeans and the native tribes in California is thought to have occurred in 1542 with the arrival of Cabrillo's small fleet at Cabrillo Point in San Diego, and later in 1602 when the Sebastian Vizcaino expedition visited the area (McCawley 1996:207[1]). Later in 1769, the Gaspar de Portolá expedition crossed the tribal territories twice. A series of missions was established along the coast by the Spanish. From these locations "missionization" of local Native American populations and governing of lands began. The accompanying economic strategies, life styles, and culture dramatically changed the use of the landscape. The introduction of horses, cattle, agricultural techniques, and European goods, and Spanish law and religious practice resulted in the disruption of Native American lifeways (Gallegos and Harris 1999[2]; "http://www.sandiegohistory.org"[3]).

B. SPANISH PERIOD

Spanish colonization of the area produced lasting effects on the local landscape and its inhabitants. In San Diego, Fernando Rivera established a hospital, corral and huts for his men on the location of Old Town. Later, to protect the soldiers and others from attacks by Natives, the Spanish established the San Diego Presidio and the San Diego de Alcalá Mission on a hill overlooking the San Diego River Valley; Father Junipero Serra dedicated the location in 1769. The mission was later permanently moved six miles inland to its present location after several attacks had driven its inhabitants back to the Presidio.

Mission San Luis Rey, located in what would become northern San Diego County, was established in 1798 in Luiseño and Juaneño territory. Mission San Juan Capistrano was established in 1776 in what would become Orange County.

Mission San Gabriel was founded on 1771 at a location near the Whittier Narrows, in what would become Los Angeles. Because of conflict, recruitment and conversion of the Indians remained slow for the first few years of this mission's existence. Sometime around 1774, Mission San Gabriel was moved to its present location to obtain more suitable land for agriculture. A second mission, San Fernando, was established within Gabrielino territory in 1797.

At Los Angeles the pueblo was first established in the flood plain of the Los Angeles River in 1788. After a disastrous flood in 1815, which forced the river west to Alameda Street, the church was moved onto the bluff and settlers quickly followed (Costello et al. 1998:19[4]).

The economic strategies, life styles, and culture accompanying the establishment of the Missions dramatically changed southern California. The introduction of horses, cattle and agricultural techniques and goods, and Spanish law and religious practice resulted in the disruption of Native American lifeways. The "missionization" of Native Americans is well documented, with forced movement of the native populations to the mission grounds where religious and industrial education took place.

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[1] McCawley, W., *The First Angelinos*. Malki Museum Press/Ballena Press Cooperative Publication, 1996.

[2] Gallegos, Dennis R., and Nina Harris. Cultural Resources Literature Review for the North Coast Transportation Study Coaster Alternatives, San Diego County, California. San Diego: On file, South Coastal Information Center, San Diego State University, 1999.

[3] From www.sandiegohistory.org.: Chapters from The History of San Diego written by Richard F. Pourade, *Time of the Bells* and *The Glory Years*.

[4] Costello, Julia G., et al. *Historic Archaeology at the Headquarters Facility Project Site*. Los Angeles: The Metropolitan Water District of Southern California. On file, South Central Coastal Information Center, California State University, Fullerton, 1998.

Mission life was highly regimented and contrasted sharply with the traditional tribal lifeways; as a result, colonization had a dramatic and negative effect on native society, including numerous deaths due to introduced European diseases. The occupation of the landscape and movement of local inhabitants to the missions eventually precipitated uprisings by the native peoples (Gallegos and Harris 1999[1]; www.sandiegohistory.org[2]).

C. MEXICAN PERIOD

Although Mexico declared independence from Spain, the new regime was unable to capitalize on interest in Alta California. In an attempt to strengthen control of the territory, and to reduce the influence of missions, the Colonization Act of 1824 was passed. It allowed for private and foreign land grants. The Secularization Act of 1833 went further and opened mission lands to Mexican loyalists seeking grants. Newly privatized lands were used for extensive cattle grazing, which characterized the culture and economy of the Mexican Era.

It was during this time that major portions of land were granted to residents of California. The huge ranchos often took up large sections of entire counties. In Los Angeles County about 22 ranchos, in Orange County 18 ranchos, and in San Diego County 27 ranchos were established. Acreage for the Ranchos varied from more than 50,000 acres to less than 600 acres.

Land use around Los Angeles continued much as it did before, focusing on agricultural and livestock production. Generally, there was an increase in ranching at the expense of dry farming and extensive cattle ranches emerged to dominate the landscape. These operations were linked closely to the British tallow and hide trade that began during the Mission Period. Anglo influence in the region increased, and between 1827 and 1833, 40 foreigners—most of whom were Anglo—settled in the Los Angeles area (Costello et al. 1998:42[3]).

With the abandonment of the mission system, the Pueblo of San Diego, which was begun in the 1820s as the center of the hide and tallow trade, became a town by 1834. The garrison and the town declined however, and native uprisings and revolution left the area in disarray. In 1840 only about 140 people occupied San Diego.

D. AMERICAN PERIOD

The Mexican-American War ended Mexico's tenuous hold on Alta California. The Treaty of Guadalupe Hidalgo brought the former Mexican territories in the west under the United States flag in 1848. Migration of American settlers and traders to the region increased in the following decades. Population increased around existing Spanish settlements, and communities developed along trails and roads that had been established between the once prosperous Spanish missions.

The discovery of gold and silver in California brought many people to California in 1849. In southern California this meant a blending of Anglo American and Hispanic cultures. As the population grew New Town was begun by a group of investors who formally laid out San Diego's

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1 Gallegos, Dennis R., and Nina Harris. Cultural Resources Literature Review for the North Coast Transportation Study Coaster Alternatives, San Diego County, California. San Diego: On file, South Coastal Information Center, San Diego State University, 1999.

2 From www.sandiegohistory.org.: Chapters from The History of San Diego written by Richard F. Pourade, *Time of the Bells* and *The Glory Years*.

3 Costello, Julia G., et al. *Historic Archaeology at the Headquarters Facility Project Site*. Los Angeles: The Metropolitan Water District of Southern California. On file, South Central Coastal Information Center, California State University, Fullerton, 1998.

city streets along the harbor. But this location was not popular and Old Town was again the city focus.

In San Diego, False Bay, later named Mission Bay, was created in 1853 to reroute the San Diego River to keep the harbor from silt build up. This was perhaps the first large-scale project in the area. Around this time, development focused on New Town along the ocean front; a major fire at Old Town centered the city permanently along the harbor front.

For Los Angeles, the Gold Rush meant a business opportunity to supply the miners with goods, and businesses and storage warehouses were built to accommodate the supply needs. Near San Diego, gold was discovered in Julian in 1869, and similar needs were met from San Diego.

Both San Diego and Los Angeles counties were established in 1850. Formerly a part of Los Angeles County, Orange County was established in 1889.

During the 1830s–1860s, the Orange County area drew its economic strength from the cattle industry. Drought in the 1860s led to a collapse of the region's cattle-based economy. Title to many of Southern California's original ranchos were transferred to American and European interests. During this period men such as James Irvine purchased large tracts of land. Irvine, hailing from Ireland, bought 110,000 acres, converting the land to sheep grazing.

In 1887, silver was discovered in the Santa Ana Mountains. After the rush for riches that followed, prospective silver miners settled in what became several of the region's earliest towns, including Buena Park, Fullerton, and El Toro.

The construction of the California Southern Railroad in the early 1880s, extending up the coast to Oceanside, through the Temecula Canyon and Cajon Pass to Barstow, encouraged San Diego to develop as a tourism destination and as a trade port. The resulting economic boom in San Diego was followed by a bust in 1888 and then another boom, strengthened by John Spreckels' investments in trolley lines and water works, as well as in the San Diego and Arizona Railroad.

In about 1880, William Spurgeon provided money to back railroad development in Orange County. The Southern Pacific Railroad came from San Diego to Santa Ana, but was stalled through Irvine when James Irvine refused to grant a right-of-way through his ranch. The rail line eventually continued to Los Angeles. The development of the Atchison, Topeka and Santa Fe railway set off a price war between the rail lines and people flocked to California on cheap rail tickets. The population of California rose an additional 200,000, creating a real estate boom.

During this period of Urbanization, the Southern Pacific Railroad arrived in Los Angeles (1876). In approximately 10 years, the Santa Fe Railway also reached the city (1885). The railroads' actions precipitated a California real estate boom from which Los Angeles and its environs benefited until 1888.

Perhaps better defined as a period of intensive urbanization, the Los Angeles area experienced unprecedented regional growth in industry, residential development, and commerce. Population figures speak to the development of the period. In 1790, following the mapping of the pueblo, the population was only 139. In 1800, it had increased to 310, and by 1830 the area had sustained a modest growth reaching 1,000 individuals. Following the first rail connection to the city in 1876, population increased 12-fold, reaching 12,000 people. In 1890, the city had grown to 50,100. In the following decades the population increased incrementally—102,500 in 1900; 319,000 in 1910; and 577,000 in 1920.

Local transit lines like the Pacific Electric Railway and the Los Angeles Transit Line provided intracity passenger transportation; residential communities began to develop along its lines, spawning early suburbanization. Commercial and service-oriented businesses began to appear along these lines and small ethnic enclaves or neighborhoods arose. Electric lights arrived in Los Angeles in 1882 in the cities downtown and telegraph service was installed. In 1889 a cable car system ran on major streets supplemented by horse drawn trams on smaller streets.

E. TWENTIETH CENTURY

The development of oil production in southern California again spurred a population influx in Los Angeles. The petroleum industry was not novel to Los Angeles since products such as kerosene and lubricants had been manufactured here prior to 1880s. With improved drilling technology however, such companies as Pioneer Oil Company and Union Oil Company became established. The conversion of stream engines to fuel engines both on trains and in stream ships, along with the advent of the automobile, began cultural changes, which prompted explosive movement of people and goods.

Despite an endless stream of people to southern California, perhaps the biggest growth spurt occurred during the World War II when Los Angeles became a center for military manufacturing and supply (Dillon 1994[1]; Rolle 1963[2]). The Second World War brought large military industry to San Diego as well, with shipyards and airplane manufacturing. San Diego has remained a military town since then and much of the development of industry has been tied to the military. San Diego now has a high technology industrial base, accompanied by tourism, military installations, and the development of the aerospace industry. Only recently, since the 1960s, has San Diego become a major location for residential development.

By the 1920s, automobiles, the Pacific Coast Highway and new residential subdivisions brought a population boom to Orange County. The 1940s–1950s witnessed the discovery of oil and the arrival of the aviation industry; ranch lands underwent further subdivision as they were converted into parcels for industry, military bases, and housing developments. Cities quadrupled in population as the post-WW II era brought to the county prosperity and affordable housing. During the 1960s, the aerospace industry established bases in Orange County; citrus orchards virtually disappeared as residential subdivisions continued to blossom and industry replaced agriculture as the region's economic base.

2.2.4 Chronology of Settlement and Incorporation

The following timelines provide a brief outline of urban growth in Los Angeles, Orange, and San Diego counties. These timelines focus on the development of the numerous cities crossed by the project APE.

A. LOS ANGELES COUNTY TIMELINE[3]

1771 Mission San Gabriel founded.
1781 Founding of *El Pueblo de la Reina de Los Angeles* (*sobre el Rio de la Porciuncula*)—Town of the Queen of the Angels (on the River Porciuncula) with 44 inhabitants.

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1 Dillon, Brian D. *Alameda District Plan, Los Angeles California: Prehistoric and Early Historic Archaeological Research.* Fullerton., California: On file, South Central Coastal Information System, California State University, Fullerton. 1994.

2 Rolle, Andrew F. *California: A History*. New York: Thomas C. Cromwell, 1963.

3 Sources: *Results of Phase II Testing, Analysis and Evaluation, and Development of a Phase III Research Design, Caltrans District 7 Headquarters Replacement Project*, Keith Warren, Dina M. Coleman and M. Colleen Hamilton. Applied EarthWorks, Inc., 2001.
Websites for the listed cities.

1797 Mission San Fernando founded.
1800 Los Angeles Pueblo relocated uphill to the present location at Olvera Street.
1830 Pueblo population is 1,000 individuals.
1834 Centinela adobe constructed as part of Rancho Aquaje de la Centinela.
1836 Official census counts 2,228 people in City of Los Angeles.
1846 America declares war on Mexico.
1848 Mexico signs peace agreement known as Treaty of Guadalupe Hidalgo.
1850 Los Angeles becomes one of California's 27 original counties.
1850 California admitted to the Union.
1870 Census counts 5,728 individuals in Los Angeles.
1874 City of Downey (est. 1873) incorporated.
1876 Southern Pacific Railroad arrives in Los Angeles. Population 12,000.
1887 City of Buena Park formed out of part of Rancho Los Coyotes.
1888 City of Long Beach incorporated.
1888 City of Inglewood founded at Centinela adobe.
1888 La Mirada Ranch formed out of part of Rancho Los Coyotes.
1891 Ocean Park amusement pier opens, later called Venice Pier.
1900 Census counts 102,500 people.
1905 City of Venice founded, canal system built.
1905 City of Vernon founded and incorporated.
1908 City of Inglewood incorporated.
1913 Water begins to arrive via Owens Valley Aqueduct.
1927 Mines Field, later LAX, founded in Inglewood.
1941 Colorado River Aqueduct brings Colorado River water to Los Angeles.
1953 La Mirada Ranch ceases operations, is sold for subdivision.
1953 City of Buena Park incorporated.
1956 City of Cerritos incorporated.
1957 City of Santa Fe Springs incorporated.
1957 City of Norwalk incorporated, the 66th incorporated city in Los Angeles County.
1960 City of Commerce incorporated.
1958 City of Pico Rivera incorporated out of two agricultural areas, Pico and Rivera.
1960 City of La Mirada incorporated.

B. ORANGE COUNTY TIMELINE[1]

1878 Anaheim (established 1857) is incorporated with a population of 881.
1886 Santa Ana (est. 1869) is incorporated with a population of 2000.
1888 Orange (est. 1869) is incorporated with a population of 600.
1889 Orange County separates from Los Angeles, Santa Ana is named County Seat.
1894 Santa Fe Railroad establishes permanent depot at San Juan Capistrano.
1904 Fullerton (est. 1887) is incorporated with a population of 1,719.
1904 Pacific Electric Railway connects Orange County with Los Angeles County.
1906 Newport Beach is incorporated with a population of 445.
1908 The Plaza, Orange County's first mall, becomes symbolic center of the Orange community.
1909 Huntington Beach is incorporated with a population of 915.
1915 Seal Beach is incorporated with a population of 250.
1917 Brea is incorporated with a population of 732.
1920 Walter Knott begins farming boysenberries in Buena Park.

[1] Source: County of Orange, "OC History: Orange County Timeline," available online at www.oc.ca.gov/history/octimeline.asp.

1923 Eddie Martin Airport opens on property north of John Wayne Airport.
1925 La Habra is incorporated with a population of 2,100.
1926 Pacific Coast Highway opens connecting Huntington Beach and Los Angeles.
1926 Placentia is incorporated with a population of 800.
1927 Tustin (est. 1870s) is incorporated with a population of 500.
1928 San Clemente (est. 1925) is incorporated with a population of 650.
1943 El Toro Marine Base opens on 4,000 acres of Irvine Ranch.
1953 Buena Park (est. 1887) is incorporated with a population of 5,483.
1953 Costa Mesa is incorporated with a population of 16,840.
1954 Santa Ana Freeway (Interstate 5) opens.
1955 Disneyland opens.
1955 City of Dairyland is incorporated, changing its name to La Palma.
1956 Stanton is incorporated with a population of 1,500.
1956 Garden Grove is incorporated with a population of 42,000.
1956 Cypress is incorporated with a population of 1,500.
1957 Fountain Valley is incorporated with a population of 597.
1957 Westminister is incorporated with a population of 1,750.
1960 Los Alamitos is incorporated with a population of 1,750.
1961 San Juan Capistrano (est. 1776) is incorporated with a population of 1,287.
1962 Villa Park is incorporated with a population of 830.
1965 Mission Viejo's master plan is approved by the County.
1966 Anaheim Stadium opens as home to the California Angels baseball team.
1967 Yorba Linda is incorporated with a population of 11,433.
1971 Dana Point Harbor opens.
1971 Irvine is incorporated with a population of 14,231.
1988 Mission Viejo is incorporated with a population of 70,293.
1989 Dana Point is incorporated with a population of 29,972.
1989 Laguna Niguel is incorporated with a population of 42,998.
1991 Laguna Hills is incorporated with a population of 22,938.
1991 Lake Forest is incorporated with a population of 56,065.
1999 Laguna Woods is incorporated with a population of 18,000.
2001 Aliso Viejo is incorporated.

C. SAN DIEGO COUNTY TIMELINE[1]

1769 Founding of San Diego Mission, first European settlement in California.
1774 Presidio at San Diego given formal status.
1774 Mission San Diego removed from Presidio and moved to present site.
1775 Mission San Diego destroyed during Native American uprising.
1784 Granting of first private ranchos in California by Gov. Pedro Fages.
1822 San Diego officially under Mexican rule.
1823 First of private ranchos granted in San Diego County.
1825 Population begins to move downhill from San Diego Presidio to Old Town.
1829 First hide house built in San Diego by carpenters of trading ship, *Brookline*.
1833 Secularization Act passed by Mexican congress, signaling end of Mission San Diego.
1835 San Diego made a pueblo.
1838 San Diego made a sub-prefecture of Los Angeles, pueblo status revoked.
1846 America declares war on Mexico.
1848 Mexico signs peace agreement known as Treaty of Guadalupe Hidalgo.
1850 San Diego becomes first county created by State Legislature.

[1] Adapted in part from: Richard F. Pourade, *The History of San Diego: Chronology*, San Diego Historical Society online at www.sandiegohistory.org.

1850 City of San Diego is incorporated.
1850 California admitted to the Union.
1881 Encinitas founded.
1882 California Southern Railway service begins in San Diego.
1885 Oceanside founded.
1886 Carlsbad founded.
1886 Solana Beach area settled by American ranching family.
1887 Imperial Beach founded.
1887 Pacific Beach founded.
1891 Coronado secedes from City of San Diego.
1909 Balboa Park named.
1911 Cardiff founded.
1922 Solana Beach platted.
1923 U.S. Naval Training commissioned.
1923 Dedication of first southern all-weather transcontinental highway terminating at San Diego.
1931 San Diego State College dedicated.
1942 Camp Pendleton created.
1947 Colorado River water arrives via San Diego Aqueduct.
1952 Carlsbad incorporated.
1956 Imperial Beach incorporated.
1986 Solana Beach incorporated.

2.3 DATA SOURCES

A literature and records search was conducted at the South Central Coastal Information Center, located at California State University, Fullerton, and at the South Coastal Information Center located at San Diego State University, San Diego, both part of the California Historical Resources Information System. The records search included a review of previously conducted cultural resource studies, and of previously recorded archaeological sites. For review purposes the study area included a 500-foot APE on either side of the alignment centerline. Site records were copied for each resource identified within the Project APE, with site locations drawn on Project maps.

Other records reviewed include the National Register of Historic Places, California Inventory of Historic Resources, California Historical Landmarks, California Register of Historical Resources, and California Points of Historical Interest. Historical maps were reviewed, and copies obtained as appropriate.

In addition, a field reconnaissance was conducted of structures along the Project alignments. This field reconnaissance was limited to contextual-level surveys along proposed corridors and around facilities to identify general areas of development and approximate years of construction. Additionally, the following agencies, organizations, registers and other sources were consulted, primarily via the Internet:

National Park Service
- National Register of Historic Places
- Historic American Engineering Record
- Historic American Building Survey

U.S. Congressional Districts 49, 50, 52, and 53
U.S. Marine Corps
U.S. Navy
California State Assembly Districts 66, 73, 74, 75, and 76

State of California
- State Historic Preservation Office
- California Register of Historic Places
- Center for Military History

CERES: California Environmental Resources Evaluation System
California Historical Society
County of Los Angeles
City of Los Angeles
City of Inglewood
City of Los Angeles
City of Commerce
City of Maywood
City of Bell
City of Bell Gardens
City of Cudahy
City of South Gate
City of Montebello
City of Bell Gardens
City of Downey
City of Pico Rivera
City of Norwalk
City of Whittier
City of Santa Fe Springs
City of Cerritos
City of La Mirada
City of Walnut Park
City of Huntington Park
City of Florence
City of Vernon
County of Orange
City of Anaheim
- Anaheim Public Library, Elizabeth J. Schultz Anaheim History Room
- Redevelopment Agency
- Housing and Neighborhood Preservation Division

City of Santa Ana
- Planning and Building Agency
- Historic Resources Commission
- Register of Historic Properties
- Historically Sensitive Areas
- Districts of Historical Significance
- Santa Ana Public Library (Santa Ana History Room)
- Santa Ana Historical Preservation Society

City of Buena Park
- Buena Park Historical Society
- Buena Park Library

City of Orange
- Orange Public Library Local History Collection
- Community Resources
- Orange Community Historical Society

City of Fullerton
- Fullerton Public Library, Launer Room Fullerton Local History
- Fullerton Museum Center

City of Tustin
- City and Redevelopment Agency
- Tustin Public Library
- Tustin Area Historical Society
- Old Town Streetscape and Enhancement Project
- Tustin Area Museum

City of Irvine
UC Irvine
- Regional History Collection, Special Collections and Archives

City of El Toro
City of Laguna Hills
- Laguna Hills Public Library

City of Laguna Niguel
- Laguna Niguel Public Library

John Wayne Airport
El Toro Marine Corps Air Station
City of Mission Viejo
- Heritage Committee
- Mission Viejo Land Conservancy
- Mission Viejo Library

City of San Juan Capistrano
- Planning Services Department
- Inventory of Historic and Cultural Landmarks
- San Juan Capistrano Regional Library
- San Juan Capistrano Historical Society
- San Juan Capistrano Mission Preservation Foundation

City of Escondido
- Old Escondido Historic District
- Escondido Historical Society
- Pioneer Room (Local History Room), Escondido Library

City of San Clemente
- San Clemente Historical Society

County of San Diego
City of San Diego
- San Diego Public Library California Room
- San Diego Historical Society

City of Oceanside
- Oceanside Public Library

City of Carlsbad
- Historic Preservation Commission
- Cole Library Carlsbad Local History Room
- Carlsbad Historical Society

City of Encinitas
- Encinitas Historical Society

City of Cardiff
- Cardiff Chamber of Commerce

City of Solana Beach
City of Del Mar
Torrey Pines State Park
Camp Pendleton Marine Base
Marine Corps Air Station, Miramar
City of Leucadia
City of Clairemont

City of Pacific Beach
City of Ocean Beach
    Ocean Beach Main Street Association
    Ocean Beach Historical Society
Old Towne San Diego
City of Mission Hills

A letter describing the project was sent to the Native American Heritage Commission (NAHC) in Sacramento. The letter provided project location information and requested a search of the Sacred Lands File to identify any traditional cultural properties that could be potentially impacted or affected by the project. In addition, lists of Native Americans to contact for the areas that could be affected by the project were requested. Letters were sent to the Native Americans on the contact lists provided by the NAHC. The letters provided information about the project and requested information about traditional cultural properties that the Native Americans believe could be affected by the project.

2.4 ARCHAEOLOGICAL SITES

Prehistoric archaeological sites in California are places where Native Americans lived or carried out activities during the prehistoric period before A.D. 1769. Prehistoric sites contain artifacts and subsistence remains, and may contain human burials. Artifacts are objects made by people and include tools (projectile points, scrapers, and grinding implements, for example), waste products from making flaked stone tools (debitage), and non-utilitarian artifacts (beads, ornaments, ceremonial items, and rock art). Subsistence remains include the non-edible portions of foods, such as animal bone and shell, and edible parts that were lost and not consumed, such as charred seeds.

Prehistoric archaeological sites types commonly found along the High Speed Train alignments in the Los Angeles–Orange County–San Diego region include lithic scatters, milling stations, shell middens and quarries. Less common are habitation or village sites, which can include midden, rock features and in some cases human burials. These site types are described briefly below:

Lithic scatter: A location with lithic debitage and perhaps stone tools. Lithic scatters reflect the production and maintenance of flaked stone artifacts.

Milling station: A location with bedrock mortars or milling slicks, used to process floral, and perhaps faunal, resources.

Quarry: A source of geologic material—such as obsidian, quartzite, chert, basalt—used by Native Americans for manufacture, as well as debitage or other debris from this manufacture.

Shell midden: A special purpose processing area where numerous shell ecofacts and sometimes cultural artifacts are present.

Habitation: These are locations with evidence of habitation, including hearths, house remains, midden soils, tool and debitage scatters, and milling stations. These sites may also contain mortuary features and rock art.

Mortuary site: These include any place used for disposal of the dead, such as cemeteries, cremations, funerary caves, crevice or talus burials, and annual mourning sites.

Historic archaeological sites in California are places where human activities were carried out during the historic period between and A.D. 1769 and 50 years ago. Some of these sites may be the result of Native American activities during the historic period, but most are the result of Spanish, Mexican, or Anglo-American activities. Most historic archaeological sites are places where houses formerly existed

and contain ceramic, metal, and glass refuse resulting from the transport, preparation, and consumption of food. Such sites can also contain house foundations and structural remnants, such as window pane glass, lumber, and nails. Historical archaeological sites can also be non-residential, resulting from ranching, farming, industrial, and other activities.

2.5 STRUCTURES FROM THE HISTORIC PERIOD

Structures from the historic period consist of houses, outbuildings, stores, offices, factories, barns, corrals, mines, dams, bridges, roads, and other facilities that served, residential, commercial, industrial, agricultural, transportation, and other functions during the historic period (more than 50 years ago).

For purposes of this document, historical periods used in analysis are specified as before 1900, 1900 to 1929, and 1930 to 1958. This division was chosen because historic structures in California occur primarily in the 1900 to 1929 and 1930 to 1958 periods. Structures dating from before 1900 are relatively rare.

Historic structures in the Los Angeles–Orange County–San Diego region, as might be expected from the historic background developed above, are primarily 20th century residential, commercial, and industrial structures located within cities. Large tracts of residential houses are most common, with industrial and commercial structures largely confined to existing railroad rights-of-way in the Los Angeles and San Diego areas. However, many of the medium sized cities of the region, such as Anaheim, Fullerton, and San Clemente, began as small towns in the late 19th or early 20th century. The historic core areas of these cities often preserve some buildings from this time period.

Structures dating to before 1900 are rare. In many areas of the region, structures from this time period were few and far between, and were built in perishable vernacular styles. However, there are notable exceptions to this, especially the Spanish and Mexican Period development in downtown San Juan Capistrano (1769-1848) and Hispanic to American Transition Period (1848-1870) development along the waterfront of San Diego. In the largest cities of the region, Los Angeles and San Diego, large sections of houses and commercial structures built originally before 1900 have been replaced by subsequent development.

Table 2.5 below lists the general years of development of presently standing structures along the High Speed Rail and Conventional Rail alignments within cities and towns of the Los Angeles–Orange County–San Diego region. Historic districts listed under the Special Considerations column include both NRHP districts and other areas considered to be historically sensitive by federal, state, and/or city agencies and commissions.

Table 2.5 General Areas of Development and Approximate Years of Construction

(*Special considerations include both NRHP districts and other areas considered to be historically sensitive by federal, state, and/or city agencies and commissions.)

City	Years of Construction	Special Considerations
UNION STATION TO IRVINE STATION		
LOS ANGELES		
El Pueblo de Los Angeles/Old Downtown District Alameda St./LAUS	1800s–1930s	Historic District
Southeast L.A.	1900–1940s	Sensitive
Industrial District /Los Angeles River	1910–1930s	Historic District
Inglewood		
Northwest Inglewood	1900–1950s and 1960s–1970s	
Vernon		
Manufacturing District	1920s–1950s	Sensitive
Walnut Park		
East Walnut Park	1920s–1950s	
Huntington Park		
East Huntington Park	1920s–1950s	
Florence		
North and East Florence	1920s–1950s	
Commerce		
Southeast Industrial Area	1920s–1950s	
North Commerce	1950s–1960s	
Maywood		
West Maywood	1920s–1950s	
East Maywood	1920s–1960s	
Bell		
North Bell	1920s–1960s	
SOUTHGATE		
Northeast Southgate	1920s–1950s	
Bell Gardens		
Northeast Bell Gardens	1930s–1960s	
Montebello		
Southwest Montebello	1920s–1950s	
Southeast Montebello	1920s–1950s	
Downey		
City Center	1920s–1960s	
South/Southeast Downey	1940s–1960s	
Pico Rivera		
East Pico Rivera	1940s–1960s	
Central Pico Rivera	1940s–1960s	

City	Years of Construction	Special Considerations
Norwalk		
North Norwalk	1900–1950s	
Southeast Norwalk	1940s–1960s	
Santa Fe Springs		
Oil Well District	1920s–1950s	
South Santa Fe Springs	1920s–1950s	
La Mirada		
Citywide	1950–1960s	
Cerritos		
Northeast Cerritos	1920s–1950s	
Southeast Cerritos	1920s–1960s	
Buena Park		
North Buena Park	1950s	
Fullerton		
Southwest Fullerton	1920s–1950s	
Central Fullerton	1870s–1940s	Historic District(s)
Anaheim		
Central Anaheim	1875–1949	Historic District(s)
Southeast Anaheim	1950s	
Orange		
Southwest Orange	1875–1949	Historic District(s)
Santa Ana		
Northeast Santa Ana	1875–1949	Historic District(s)
Tustin		
Northwest Tustin	1880s–1940s	Sensitive
Southeast Tustin	1920s–1950s	Sensitive
IRVINE STATION TO DANA POINT		
Irvine		
Northeast Irvine	1950s–1960s	
El Toro Marine Corps Air Station		
South E.T.M.C.A.S.	Early 1940s	
Lake Forest (El Toro)		
South Lake Forest	1950s	
Laguna Hills		
North Laguna Hills	1960s	
Mission Viejo		
South Mission Viejo	1960s	
San Juan Capistrano		
North San Juan Capistrano	1940s–1950s	
Downtown San Juan Capistrano	1776–1949	Historic District(s)
South San Juan Capistrano	1800s–1940s	
DANA POINT TO CARLSBAD		
Dana Point		
Dana Point	1940s–1960s	
SAN CLEMENTE		
North/South San Clemente	1920s	
Camp Pendleton		
Southcoast Camp Pendleton	1940s	
Las Flores		
Las Flores Asistencia	1820s–1840s	Sensitive

City	Years of Construction	Special Considerations
OCEANSIDE		
North Oceanside	1880s–1920s	Sensitive
South Oceanside	1900–1950s	
CARLSBAD (NORTH OF BUENA VISTA LAGOON) THROUGH SOLANA BEACH STATION		
Carlsbad		
Coastal Carlsbad to I-5	1880s–1940s	Sensitive
Leucadia		
Coastal Leucadia	1900–1950s	
Encinitas		
West Encinitas	1920s–1950s	Sensitive
Cardiff		
Cardiff	1914-1950s	
Solana Beach		
North Solana Beach	1920s–1960s	
SOLANA BEACH (SOUTH OF STATION) TO I-5/805 SPLIT		
Solana Beach		
South Solana Beach (Eden Gardens)	1940s–1960s	
East Solana Beach (Lomas Santa Fe)	1960s–1970s	
Del Mar		
Del Mar Fairgrounds	1930s–1990s	
Del Mar	1910–1950s	Sensitive
Torrey Pines		
Torrey Pines State Reserve	1899–1920s	Sensitive
Torrey Pines Park Road	1930s	Sensitive
Torrey Hills (San Diego)		
Formerly Sorrento Hills	1950s–1980s	
I-5/805 Split to Santa Fe Depot (San Diego)		
City of San Diego		
UC San Diego	1950s	
La Jolla		
East La Jolla	1920s–1950s	Sensitive
Clairemont		
Morena Blvd.	1920s–1950s	Sensitive
PACIFIC BEACH		
East Pacific Beach	1940s–1950s	
San Diego		
Old Town	1880s–1930s	Historic District
USMC Depot	1940s	Historic District
Centre City	1920s–1930s	Historic District

2.6 TRADITIONAL CULTURAL PROPERTIES

Traditional cultural properties are places associated with the cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community. Examples include "a location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world" and "a location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice" (National Park Service n.d.). Traditional cultural properties are identified by consulting with Native American groups that have a history of use of the project area.

The Native American Heritage Commission did not identify any traditional cultural properties that could be affected by the project in the Los Angeles–Orange County–San Diego Region. Native Americans contacted by letter did not identify traditional cultural properties that could be affected by the project in this region.

3.0 METHODS FOR CULTURAL RESOURCES ANALYSIS

The cultural resources analysis for this program-level EIR/EIS is focused on a broad comparison of potential impacts to cultural resources along corridors for each of the alternatives (high-speed train and modal alternatives) and around stations. The potential impacts for each of these alternatives are compared with the No-Project Alternative.

3.1 DATA COLLECTION

An Area of Potential Effect (APE) or study area was defined for the project. The APE for archaeological sites was defined as 500 feet on each side of the centerline of proposed and existing rail routes in non-urban areas and 100 feet from the centerline in urban areas. The APE for freeway routes and around airports was defined as 100 feet beyond the existing freeway right-of-way and 100 feet beyond the existing airport property boundary.

Records searches were obtained from the appropriate Information Centers of the California Historic Resources Information System (CHRIS). The records searches provided the locations of archaeological sites within the APE. The number of archaeological sites within the APE for each alternative was compared to assess the relative degree of potential impacts or effects for each alternative. In order to assess impacts to structures from the historic period, the percentage, based on miles, of each alternative route that passes through areas that originally developed in specific, pre-defined historical time periods (before 1900, 1900 to 1929, and 1930 to 1958) was determined by using historical maps and knowledge of local history.

3.2 CEQA AND NHPA SIGNIFICANCE CRITERIA FOR CULTURAL RESOURCES

Under both state and federal guidelines for cultural resources, impacts are potentially significant only if the resource being impacted has been determined to be significant. Under federal guidelines (36 CFR 800.4) implementing Section 106 of the National Historic Preservation Act (NHPA), significant cultural resources are those that are eligible for the National Register of Historic Places (NRHP). The NRHP eligibility criteria (36 CFR 60.4) state that the quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, association, and:

(a) That are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) That are associated with the lives of persons significant in our past; or

(c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) That have yielded, or may be likely to yield, information important to prehistory or history.

In addition, the cultural resource must be over 50 years old unless it is exceptionally important.

In CEQA, significant cultural resources are called "Historical Resources". Historical resources are resources that are eligible for listing in the California Register of Historical Resources (CRHR) or that are listed in the historical register of a local jurisdiction (county or city). Generally, a resource shall be considered by a lead agency to be "historically significant" if the resource has integrity and meets the criteria for listing on the California Register of Historical Resources, as follows [Title 14, California Code of Regulations, Section 15064.5(a)(3)]:

(A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

(B) Is associated with the lives of persons important in our past;

(C) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

(D) Has yielded, or may be likely to yield, information important in prehistory or history.

As can be seen, the NRHP and CRHR criteria are almost identical. Any resource determined eligible for the NRHP is also automatically eligible for the CRHR. However, the CEQA definition of an Historical Resource also includes resources listed on local historical registers.

CEQA also contains a section addressing "unique" archeological resources and provides a definition of such resources (Public Resources Code, Section 21083.2). This section establishes limitations on the cost of mitigation and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the limitations in this section do not apply when an archeological resource has already met the definition of a Historical Resource [Title 14, California Code of Regulations, Section 15064.5(c)(2)].

Impacts to NRHP eligible resources are adverse "when an undertaking may alter, directly, or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association" [36 CFR 800.5(1)]. Examples of adverse effects include physical destruction or damage to all or part of the property, alteration that is not consistent with the Secretary of the Interior's standards for the treatment of historic properties, removal of the property from its historic location, change in the type of use or of the physical characteristics of the setting, introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features, and neglect resulting in deterioration [36 CFR 800.5(2)]. Note that historic properties include prehistoric archaeological sites. Archaeological sites are usually adversely affected only by physical destruction or damage, whereas all of the examples can apply to historic buildings and structures.

Impacts to CRHR eligible resources, or resources listed on local registers, constitute a significant effect on the environment (significant impacts that must be disclosed in a CEQA environmental document) if the project may cause a substantial adverse change in the significance of a historical resource. "Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" [Title 14, California Code of Regulations, Section 15064.5(b)(1)]. Materially impaired means that the historical resource will be demolished or the physical characteristics of the resource that made the resource eligible will be adversely altered such that the resource would no longer be eligible for the CRHR nor listed in a local historical register [Title 14, California Code of Regulations, Section 15064.5(b)(2)].

3.3 RANKING POTENTIAL IMPACTS TO CULTURAL RESOURCES BY ALTERNATIVE

At this Tier 1 programmatic level of analysis, individual archaeological sites were not evaluated for eligibility. Instead, the archaeological sites identified as a result of the records searches are assumed to be potentially eligible and the number of archaeological sites identified in the APE for each alternative is used as one indicator of the relative degree of potential impacts on cultural resources for that alternative, should it be selected for construction.

In addition, the preparer's knowledge of regional prehistory was used to supplement the records search results. For example, if it is known that numerous sites have been recorded along a particular river drainage, but the records search did not yield recorded sites along the river in the APE for a particular alternative route, the preparer increased the ranking for sites expected for that route. Similarly, rankings were increased in areas where buried archaeological sites could be expected to occur. If this was done, it is discussed under the applicable alternative in Section 4.

Specific structures from the historic period were not identified at this Tier 1 programmatic level of analysis. Instead, the percentage, based on miles, of each alternative route that passed through areas that originally developed in specific, pre-defined historical time periods (before 1900, 1900 to 1929, and 1930 to 1958) was determined from historical maps and knowledge of the history of the region. The percentages were used as indicators of the potential for a particular alternative to impact or affect potentially eligible structures from the historical time periods. Percentages of route lengths that developed in various periods were then translated into qualitative rankings of Low, Medium, and High, with greater weight given for structures or districts known to be listed on or eligible for the National Register of Historic Places, and for segments that were developed in earlier periods.

Traditional cultural properties were assessed on a presence/absence basis for each alternative route. Because no traditional cultural properties were identified, they did not figure into rankings of alternatives.

4.0 CULTURAL IMPACTS

Table 4.0 below lists each segment of the Los Angeles to Orange to San Diego Region for the No-Project, Modal, and High Speed Train alternatives. The number of archaeological sites recorded within each APE, the percentage of historical development, and the presence or absence of traditional cultural properties, are listed in Table 4.0. A brief discussion of each segment is provided following the table.

Table 4.0 Analysis/Comparison Table
Impacts to Cultural Resources

	Number of Archaeo-logical Sites	Percentage of Route Developed During Historic Periods			Traditional Cultural Properties (Yes/No)
		<1900	1900-1929	1930-1958	
No-Project Alternative					
No-Project	n.a.	n.a.	n.a.	n.a.	n.a.
Modal (I-5 and Airport Expansion)					
Highways					
Union Station to LAX (HST only)	n.a.	n.a.	n.a.	n.a.	n.a.
Union Station to Fullerton Station	0	1.0	20.5	71.5	0
Fullerton Station to Irvine Station	0	1.5	18.0	68.0	0
Irvine Station to San Juan Capistrano City Limits	21	<0.1	0.5	10.5	0
San Juan Capistrano	8	10.5	15.0	20.5	0
Dana Point/San Clemente	15	<0.1	2.5	38.0	0
Camp Pendleton	20	<0.1	0.5	5.5	0
Oceanside/Carlsbad	15	<0.1	25.0	46.5	0
Encinitas/Solano Beach	6	<0.1	5.0	55.0	0
Del Mar	16	<0.1	5.0	25.5	0
I-5/805 Split to Hwy 52	2	<0.1	1.5	25.0	0
Hwy 52 to Santa Fe Depot	5	20.5	15.0	55.0	0
Airports					
Long Beach Municipal Airport	0	<0.1	5.0	45.0	0
HST Corridors and Station Options					
Alignments					
14 Union Station to LAX (HSR) – electrified exclusive tracks; some elevation	7	2.0	10.5	45.5	0
Stations					
14.A. LAX Station – new underground station	0	<0.1	0.5	5.5	0
Alignments					
15. Union Station to Anaheim (HSR) – follows UPRR branch; NOT within LOSSAN corridor; elevated (or grade separated)	3	1.5	20.5	30.5	0

	Number of Archaeo-logical Sites	Percentage of Route Developed During Historic Periods			Traditional Cultural Properties (Yes/No)
		<1900	1900-1929	1930-1958	
Stations					
15.A. Norwalk Station – new elevated station; parking	0	<0.1	2.5	10.5	0
15.B. Anaheim Station – new underground station beneath existing station; parking	0	<0.1	<0.1	<0.1	0
Alignments					
16. Union Station to Irvine (HSR) – electrified; shares LOSSAN tracks but would be fully grade separated	21	2.0	21.0	55.5	0
Stations					
16.A. Norwalk Station – expanded platform; parking; bypass tracks	0	<0.1	2.5	10.5	0
16.B. Fullerton Station – bypass tracks	0	<0.1	2.5	10.5	0
16.C. Anaheim Station – expanded platform; parking; bypass tracks	0	<0.1	<0.1	<0.1	0
16.D. Santa Ana Station – bypass tracks	0	<0.1	1.5	50.5	0
16.E. Irvine Station – expanded platform; parking; "terminal" tracks	0	<0.1	<0.1	<0.1	0
Conventional Rail (LOSSAN) & Station Options					
Alignments					
1. Union Station to Fullerton Station – 4th main track	6	2.0	21.0	55.5	0
Alignments					
2.1. Fullerton Station to Irvine Station – AT-GRADE between Walnut Ave. (Orange) and E. 17th St. (Santa Ana)	15	2.5	23.5	69.5	0
2.2. Fullerton Station To Irvine Station – TRENCH between Walnut Ave (Orange) and E. 17th St. (Santa Ana)	15	2.5	23.5	69.5	0
Stations					
2.A. Fullerton Station – parking spaces OR parking spaces/bypass tracks	0	<0.1	2.5	10.5	0
2.B. Anaheim Station – parking spaces OR parking spaces/bypass tracks	0	<0.1	<0.1	<0.1	0
2.C. Santa Ana Station – parking spaces OR parking spaces/bypass tracks	0	1.5	10.5	45.0	0
2.D. Irvine Station – parking spaces OR parking spaces/bypass tracks	0	<0.1	<0.1	1.5	0

	Number of Archaeo-logical Sites	Percentage of Route Developed During Historic Periods			Traditional Cultural Properties (Yes/No)
		<1900	1900-1929	1930-1958	
Alignments					
3. Irvine Station to San Juan Capistrano City Limits – (no improvements)	No improvements are proposed for this segment.				
Alignments					
4.1.1 San Juan Capistrano – (San Juan Capistrano City Limits to Avenida Aeropuerto) – Covered TRENCH/Cut-Fill between Trabuco Creek and Avenida Aeropuerto (trench goes under San Juan Creek); Double tracking	19	10.5	15.0	20.5	0
4.2. San Juan Capistrano (San Juan Capistrano City Limits to Avenida Aeropuerto) – TUNNEL along I-5 between Hwy 73 and Avenida Aeropuerto (tunnel under Trabuco Creek and San Juan Creek); Double tracking	8	1.0	15.0	20.5	0
4.3. San Juan Capistrano (San Juan Capistrano City Limits to Avenida Aeropuerto) –OPEN TRENCH along Trabuco Creek	2	1.0	15.0	20.5	0
Stations					
4.A. San Juan Capistrano Station – parking spaces OR parking spaces/bypass tracks	6	10.0	45.5	25.0	0
Alignments					
5.1. Dana Point/San Clemente (Avenida Aeropuerto to San Onofre Power Plant) – Dana Point Curve Realignment; San Clemente – SHORT TRENCH; Double Tracking	16	<0.1	2.0	35.5	0
5.2. Dana Point/San Clemente (Avenida Aeropuerto to San Onofre Power Plant) – Dana Point Curve Realignment; San Clemente – LONG TRENCH; Double Tracking	16	<0.1	2.0	35.5	0
5.3. Dana Point/San Clemente (Avenida Aeropuerto to San Onofre Power Plant) – Dana Point Curve Realignment; San Clemente – SHORT TUNNEL; Double Tracking	9	<0.1	2.0	36.0	0

	Number of Archaeo-logical Sites	Percentage of Route Developed During Historic Periods			Traditional Cultural Properties (Yes/No)
		<1900	1900-1929	1930-1958	
5.4. Dana Point/San Clemente (Avenida Aeropuerto to San Onofre Power Plant) ; San Clemente – LONG ONE-SEGMENT TUNNEL; Double Tracking	11	<0.1	2.0	35.5	0
5.5. Dana Point/San Clemente (Avenida Aeropuerto to San Onofre Power Plant) –San Clemente – LONG TWO-SEGMENT TUNNEL; Double Tracking	11	<0.1	2.0	35.5	0
Stations					
5.A. San Clemente Station – parking spaces OR parking spaces/bypass tracks	0	<0.1	25.0	26.5	0
Alignments					
6. Camp Pendleton (San Onofre Power Plant to Oceanside City Limits) – Double Tracking; crosses San Mateo, San Onofre, and Santa Margarita	41	<0.1	0.5	5.5	0
Alignments					
7.1. Oceanside/Carlsbad Oceanside City Limits To Encinitas City Limits – Carlsbad – AT-GRADE; double tracking; crosses San Luis Rey, Buena Vista L, Aqua Hedionda L, Batiquitos, L	6	<0.1	25.5	45.5	0
7.2. Oceanside/Carlsbad Oceanside City Limits To Encinitas City Limits – Carlsbad – TRENCH; double-tracking; crosses San Luis Rey, Buena Vista L, Aqua Hedionda L, Batiquitos, L	6	<0.1	25.5	45.5	0
Stations					
7.A. Oceanside Station – parking spaces OR parking spaces/bypass tracks	0	<0.1	10.5	27.5	0
Alignments					
8.1. Encinitas/Solana Beach Encinitas City Limits To Solana Beach Station – Encinitas – AT-GRADE; Double Tracking; crosses San Elijo L	4	<0.1	15.5	49.5	0
8.2. Encinitas/Solana Beach Encinitas City Limits To Solana Beach Station – Encinitas – SHORT TRENCH; Double Tracking; crosses San Elijo L	4	<0.1	15.5	49.5	0

	Number of Archaeo-logical Sites	Percentage of Route Developed During Historic Periods			Traditional Cultural Properties (Yes/No)
		<1900	1900-1929	1930-1958	
8.3. Encinitas/Solana Beach Encinitas City Limits To Solana Beach Station – Encinitas – LONG TRENCH; Double Tracking; crosses San Elijo L	4	<0.1	15.5	49.5	0
Stations					
8.A. Solana Beach Station – parking spaces OR parking spaces/bypass tracks	0	<0.1	2.0	5.5	0
Alignments					
9.1. Del Mar Solana Beach Station To Interstate 5 – COVERED TRENCH on bluffs; crosses San Dieguito L, Los Peñasquitos L	12	<0.1	5.0	25.5	0
9.2. Del Mar Solana Beach Station To Interstate 5 – TUNNEL under Camino Del Mar; crosses San Dieguito L, Los Peñasquitos L	2	<0.1	5.0	25.5	0
9.3. Del Mar Solana Beach Station To Interstate 5 – TUNNEL along I-5; crosses San Dieguito L, Los Peñasquitos L	8	<0.1	5.0	25.5	0
Alignments					
10.1. Interstate 5 To Highway 52 – Miramar Hill Tunnel/UTC Station	7	<0.1	1.5	25.0	0
10.2. Interstate 5 To Highway 52 – I-5 Tunnel	3	<0.1	1.5	25.0	0
Stations					
10.A. UTC Station – new underground station and parking; NOTE: UTC Station is associated ONLY with Option 10.1.	0	<0.1	<0.1	10.0	0
Alignments					
11. Highway 52 To Santa Fe Depot (Curve realignment; Double Tracking; San Diego River Bridge; Trench between Sassafras St and Cedar St)	12	2.5	10.0	25.0	00
Stations					
13.A. Santa Fe Depot – parking spaces OR parking spaces/bypass tracks	0	<0.1	90.5	5.0	0

4.1 NO-PROJECT ALTERNATIVE (BASELINE, FUTURE BASELINE 2020)

The No-Project Alternative, as defined for this document are shown on Table 1-3 in Section 1. The No-Project Alternative includes the implementation of programmed improvements to highways and existing, conventional rail corridors by the year 2020. Environmental studies are being completed for these improvements, and they are not part of this Project. No additional impacts to cultural resources would occur beyond those addressed in environmental documents for those projects.

4.2 MODAL ALTERNATIVE

4.2.1 Highways

A. UNION STATION TO LAX

There is no modal alternative proposed between Union Station and LAX.

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.

4.2.2 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.

4.3 HIGH SPEED TRAIN CORRIDORS AND STATION OPTIONS

4.3.1 High Speed Rail Alignments

A. UNION STATION TO LAX

(HSR 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 (ATSF)

(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.

4.3.2 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.

4.4 CONVENTIONAL RAIL (LOSSAN) ALIGNMENTS AND STATION OPTIONS

4.4.1 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)

No rail improvements are currently proposed in this segment, so no impact to cultural resources would occur. 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 area 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 archaeological 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 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 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 route 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.

4.4.2 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 tructures; 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.

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APPENDIX A

Appendix A
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 A-1 and A-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.

The archaeological sites per mile and the potential for historic structures is shown by sub-segments in Table A-3. These sub-segments are combined in Table 1.3.1 (Chapter 1) to show the overall comparison of the Modal and the High-Speed Train Alternative.

Table A-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 A-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

Table A-3
Summary of Potential
Impacts/Effects To Cultural Resources by Sub-Segment

	Known Archaeological Sites per Mile	Potential for Structures
No-Project Alternative		
No-Project	n.a.	n.a.
Modal (I-5 and Airport Expansion)		
Highways		
Union Station to LAX (HST only)	n.a.	n.a.
Union Station to Fullerton Station	0	High
Fullerton Station to Irvine Station	0	High
Irvine Station to San Juan Capistrano City Limits	0.21	Medium
San Juan Capistrano	1.68	High
Dana Point/San Clemente	1.45	Medium
Camp Pendleton	1.25	Low
Oceanside/Carlsbad	1.47	Medium
Encinitas/Solano Beach	0.87	Medium
Del Mar	2.48	Low
I-5/805 Split to Hwy 52	0.43	Low
Hwy 52 to Santa Fe Depot	0.56	High
Airports		
Long Beach Municipal Airport	0	High
HST Corridors and Station Options		
Alignments		
14 Union Station to LAX (HSR) – electrified exclusive tracks; some elevation	0.44	High
Stations		
14.A. LAX Station – new underground station	0	Low
Alignments		
15. Union Station to Anaheim (HSR) – follows UPRR branch; NOT within LOSSAN corridor; elevated (or grade separated)	0.12	High
Stations		
15.A. Norwalk Station – new elevated station; parking	0	Medium
15.B. Anaheim Station – new underground station beneath existing station; parking	0	Low
Alignments		
16. Union Station to Irvine (HSR) – electrified; shares LOSSAN tracks but would be fully grade separated	0.5	High
Stations		
16.A. Norwalk Station – expanded platform; parking; bypass tracks	0	Low
16.B. Fullerton Station – bypass tracks	0	Low
16.C. Anaheim Station – expanded platform; parking; bypass tracks	0	Low
16.D. Santa Ana Station – bypass tracks	0	Medium
16.E. Irvine Station – expanded platform; parking; "terminal" tracks	0	Low
Conventional Rail (LOSSAN) & Station Options		
Alignments		
1. Union Station to Fullerton Station – 4th main track	0.29	High
Alignments		
2.1. Fullerton Station to Irvine Station – AT-GRADE between Walnut Ave. (Orange) and E. 17th St. (Santa Ana)	0.75	High

	Known Archaeological Sites per Mile	Potential for Structures
2.2. Fullerton Station To Irvine Station – TRENCH between Walnut Ave (Orange) and E. 17th St. (Santa Ana)	0.75	High
Stations		
2.A. Fullerton Station – parking spaces OR parking spaces/bypass tracks	0	Low
2.B. Anaheim Station – parking spaces OR parking spaces/bypass tracks	0	Low
2.C. Santa Ana Station – parking spaces OR parking spaces/bypass tracks	0	Medium
2.D. Irvine Station – parking spaces OR parking spaces/bypass tracks	0	Low
Alignments		
3. Irvine Station to San Juan Capistrano City Limits – (no improvements)	0.11	Medium
Alignments		
4.1.1 San Juan Capistrano – (San Juan Capistrano City Limits to Avenida Aeropuerto) – Covered TRENCH/Cut-Fill between Trabuco Creek and Avenida Aeropuerto (trench goes under San Juan Creek); Double tracking	2.40	High
4.2. San Juan Capistrano (San Juan Capistrano City Limits to Avenida Aeropuerto) – TUNNEL along I-5 between Hwy 73 and Avenida Aeropuerto (tunnel under Trabuco Creek and San Juan Creek); Double tracking	1.60	High
4.3. San Juan Capistrano (San Juan Capistrano City Limits to Avenida Aeropuerto) – AT-Grade/Open TRENCH along east side of Trabuco Creek	0.28	High
Stations		
4.A. San Juan Capistrano Station – parking spaces OR parking spaces/bypass tracks	6 Sites	High
Alignments		
5.1. Dana Point/San Clemente (Avenida Aeropuerto to San Onofre Power Plant) – Dana Point Curve Realignment; San Clemente – SHORT TRENCH; Double Tracking	0.71	Medium
5.2. Dana Point/San Clemente (Avenida Aeropuerto to San Onofre Power Plant) – Dana Point Curve Realignment; San Clemente – LONG TRENCH; Double Tracking	0.71	Medium
5.3. Dana Point/San Clemente (Avenida Aeropuerto to San Onofre Power Plant) – Dana Point Curve Realignment; San Clemente – SHORT TUNNEL; Double Tracking	0.40	Low
5.4. Dana Point/San Clemente (Avenida Aeropuerto to San Onofre Power Plant) ; San Clemente – LONG ONE-SEGMENT TUNNEL; Double Tracking	0.49	Low
5.5. Dana Point/San Clemente (Avenida Aeropuerto to San Onofre Power Plant) –San Clemente – LONG TWO-SEGMENT TUNNEL; Double Tracking	0.49	Low
Stations		
5.A. San Clemente Station – parking spaces OR parking spaces/bypass tracks	0	Medium
Alignments		
6. Camp Pendleton (San Onofre Power Plant to Oceanside City Limits) – Double Tracking; crosses San Mateo, San Onofre, and Santa Margarita	2.62	Medium
Alignments		

	Known Archaeological Sites per Mile	Potential for Structures
7.1. Oceanside/Carlsbad Oceanside City Limits To Encinitas City Limits – Carlsbad – AT-GRADE; double tracking; crosses San Luis Rey, Buena Vista L, Aqua Hedionda L, Batiquitos, L	0.61	Medium
7.2. Oceanside/Carlsbad Oceanside City Limits To Encinitas City Limits – Carlsbad – TRENCH; double-tracking; crosses San Luis Rey, Buena Vista L, Aqua Hedionda L, Batiquitos, L	0.61	Medium
Stations		
7.A. Oceanside Station – parking spaces OR parking spaces/bypass tracks	0	Medium
Alignments		
8.1. Encinitas/Solana Beach Encinitas City Limits To Solana Beach Station – Encinitas – AT-GRADE; Double Tracking; crosses San Elijo L	0.57	High
8.2. Encinitas/Solana Beach Encinitas City Limits To Solana Beach Station – Encinitas – SHORT TRENCH; Double Tracking; crosses San Elijo L	0.57	High
8.3. Encinitas/Solana Beach Encinitas City Limits To Solana Beach Station – Encinitas – LONG TRENCH; Double Tracking; crosses San Elijo L	0.57	High
Stations		
8.A. Solana Beach Station – parking spaces OR parking spaces/bypass tracks	0	Medium
Alignments		
9.1. Del Mar Solana Beach Station To Interstate 5 – COVERED TRENCH on bluffs; crosses San Dieguito L, Los Peñasquitos L	1.31	Medium
9.2. Del Mar Solana Beach Station To Interstate 5 – TUNNEL under Camino Del Mar; crosses San Dieguito L, Los Peñasquitos L	0.22	Medium
9.3. Del Mar Solana Beach Station To Interstate 5 – TUNNEL along I-5; crosses San Dieguito L, Los Peñasquitos L	0.86	Low
Alignments		
10.1. Interstate 5 To Highway 52 – Miramar Hill Tunnel/UTC Station	0.75	Low
10.2. Interstate 5 To Highway 52 – I-5 Tunnel	0.75	Low
Stations		
10.A. UTC Station – new underground station and parking; NOTE: UTC Station is associated ONLY with Option 10.1.	0	Low
Alignments		
11. Highway 52 To Santa Fe Depot (Curve realignment; Double Tracking; San Diego River Bridge; Trench between Sassafras St and Cedar St)	1.17	High
Stations		
13.A. Santa Fe Depot – parking spaces OR parking spaces/bypass tracks	0	High