

# CALIFORNIA HIGH-SPEED TRAIN

Program Environmental Impact Report/Environmental Impact Statement

*Los Angeles - Orange County - San Diego*

## HAZARDOUS MATERIALS/WASTES TECHNICAL EVALUATION

January 2004

*Prepared for:*

California High-Speed Rail Authority

U.S. Department of Transportation  
Federal Railroad Administration



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

## CALIFORNIA HIGH-SPEED TRAIN PROGRAM EIR/EIS

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# *Los Angeles - Orange County - San Diego* **Hazardous Materials/Wastes Technical Evaluation**

*Prepared by:*

*HDR*

*for*

*IBI Group*

*January 2004*

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## ACRONYMS

ADL	Aerially Deposited Lead
ASTM	American Society of Testing and Materials
AUTHORITY	California High-Speed Rail Authority
AWP	Annual Work Plan
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COG	Council of Governments
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
LAX	Los Angeles International Airport
LBP	Lead Based Paint
LOSSAN	Los Angeles to San Diego Conventional Rail Corridor
MTA	Metropolitan Transportation Authority
NEPA	National Environmental Policy Act
NPL	National Priority List
RTP	Regional Transportation Plan
SPL	State Priority List
STIP	State Transportation Improvement Program
SWLF	Solid Waste Landfill
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USFWS	United States Fish & Wildlife Service

## 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.<sup>1</sup> After completing a number of initial studies over the past six years to assess the feasibility of a high-speed train system in California and to evaluate the potential ridership for a variety of alternative corridors and station areas, the Authority recommended the evaluation of a proposed high-speed train system as the logical next step in the development of California's transportation infrastructure. The Authority does not have responsibility for other intercity transportation systems or facilities, such as expanded highways, or improvements to airports or passenger rail or transit used for intercity trips.

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

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

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

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

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

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<sup>1</sup> Chapter 796 of the Statutes of 1996; SB 1420, Kopp and Costa

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

The statewide high-speed train system has been divided into five regions for study: Bay Area-Merced, Sacramento-Bakersfield, Bakersfield-Los Angeles, Los Angeles-San Diego via the Inland Empire, and Los Angeles-Orange County-San Diego. This Hazardous Materials/Wastes 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.

The hazardous materials/wastes analysis for this program-level EIR/EIS is focused on a qualitative comparison of potential impacts to the public or the environment from hazardous materials or wastes. Database searches were performed for Federal National Priorities List (NPL) Superfund sites, State Priority List (SPL) sites, and State of California Solid Waste Landfills (SWLF).

For the Modal and High-Speed Train Alternatives, a buffer zone of 250 feet on either side of rail centerline and highway corridors were reviewed for the occurrence of recorded NPL, SPL, and SWLF sites. Based on these reviews, the number and location of the sites included in the database records were noted. Any sites located in the 250-foot buffer area and within 1,000 feet of a proposed station within the 250-foot buffer were also noted. The results of these findings are summarized in Section 1.4 and further discussed in Chapter 4.

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

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

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

The No-Project Alternative for the Los Angeles-Orange County-San Diego Region includes highway expansion as well as conventional rail improvements to the existing LOSSAN corridor that are programmed and funded for implementation through 2020. Table 1-1 summarizes the infrastructure components of the No-Project Alternative for this Region. As with all of the alternatives, the No-Project

FIGURE 1-1

No-Project Alternative – California Transportation System Train Alternatives Map



Alternative will be assessed against the purpose and need topics/objectives for congestion, safety, air pollution, reliability, and travel times.

### 1.1.2 Modal Alternative

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

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

### 1.1.3 High-Speed Train Alternative

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

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

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

TABLE 1-1

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

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

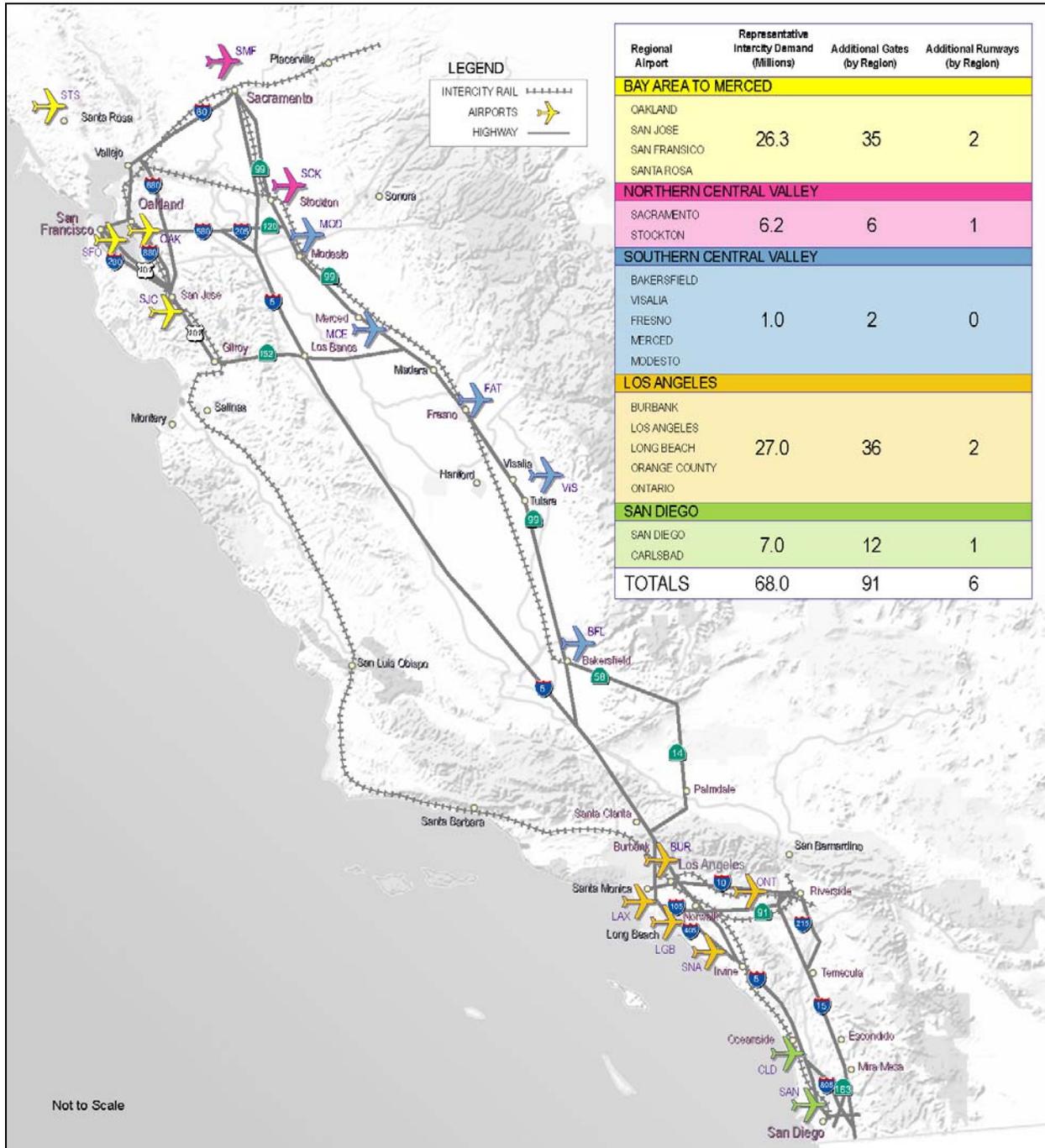
Source: Parsons Brinckerhoff, California High-Speed Train Program Environmental Impact Report/Environmental Impact Statement, *System Alternatives Definition*, November 18, 2002

**FIGURE 1-2**  
**Modal Alternative – Highway Component**



FIGURE 1-3

Modal Alternative – Aviation Component



Not to Scale

TABLE 1-2

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

Highway Corridor	Segment (To-From)	No. of Additional Lanes <sup>1</sup> (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.

FIGURE 1-4

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



TABLE 1-3

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

<b>Alignment Segments and Station Locations Evaluated<sup>1</sup></b>	<b>Description of Proposed Options &amp; Improvements</b>
<b>HIGH-SPEED RAIL (HSR) &amp; STATION OPTIONS</b>	
<b>Los Angeles International Airport (LAX) To Union Station</b>	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.
<b>Union Station To Anaheim Station via UPRR</b>	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.
<b>Union Station To Irvine Station via LOSSAN</b>	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.
<b>CONVENTIONAL RAIL (LOSSAN CORRIDOR) &amp; STATION OPTIONS</b>	
<b>Union Station To Fullerton Station 4<sup>th</sup> Main Track</b>	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.
<b>Fullerton Station To Irvine Station</b>	
Alignment Options:	
<i>AT-GRADE between Walnut Ave (Orange) and E. 17th St. (Santa Ana)</i>	Grade separations at street intersections between Walnut Ave. (in Orange) and E. 17 <sup>th</sup> Street in Santa Ana. At-grade curve straightening between Batavia Street and Walnut Ave. Improvements would be in existing rail corridor ROW, except for the curve realignment.
<i>TRENCH between Walnut Ave (Orange) and E. 17th St. (Santa Ana)</i>	Fully grade-separate existing rail corridor in a covered trench (same alignment as above), including curve straightening.
Stations	
Fullerton	Existing station. Proposed improvements include bypass tracks, platform reconfiguration, and additional parking.
Anaheim	Existing station. Proposed improvements include bypass tracks and additional parking.
Santa Ana	Existing station. Proposed improvements include bypass tracks and additional parking.
Irvine	Existing station. Proposed improvements include bypass tracks and additional parking.

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

**TABLE 1-3**

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

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

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

**TABLE 1-3**

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

<b>Alignment Segments and Station Locations Evaluated<sup>1</sup></b>	<b>Description of Proposed Options &amp; Improvements</b>
<i>San Clemente - LONG ONE-SEGMENT TUNNEL ; Double Tracking (crosses San Mateo and San Onofre Creeks)</i>	<i>Double-tracking via a long, one- segment tunnel following Interstate 5 from San Onofre State Beach to Avenida Aeropuerto in San Juan Capistrano. This option precludes the need for curve realignment at Dana Point. The existing rail corridor along the coast between southern San Clemente city limits to approximately Avenida Aeropuerto in San Juan Capistrano would be removed from service (or at least not be further improved from its existing condition).</i>
San Clemente - LONG TWO-SEGMENT TUNNEL; Double Tracking (crosses San Mateo and San Onofre Creeks)	Double-tracking via a long, two- segment tunnel following Interstate 5 from San Onofre State Beach to Avenida Aeropuerto in San Juan Capistrano. This option precludes the need for curve realignment at Dana Point. This tunnel would have the same alignment as the one-segment long tunnel above except in a one-mile stretch near Avenida Pico, it would veer to the east edge of I-5 and daylight into an open trench for about 1,000 feet. The existing rail corridor along the coast between southern San Clemente city limits to approximately Avenida Aeropuerto in San Juan Capistrano would be removed from service (or at least not be further improved from its existing condition).
<b>Stations</b>	
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.
<b>Camp Pendleton</b> (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 Build Alternative.
<b>Oceanside/Carlsbad</b> (Oceanside City Limits to Encinitas City Limits)	
<b>Alignments</b>	
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.
<b>Stations</b>	
Oceanside	Existing station. Proposed improvements include bypass tracks and parking expansion.

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

TABLE 1-3

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

<b>Alignment Segments and Station Locations Evaluated<sup>1</sup></b>	<b>Description of Proposed Options &amp; Improvements</b>
<b>Encinitas/Solana Beach</b> (Encinitas City Limits to Solana Beach Station)	
Alignments	
Encinitas - AT-GRADE; Double Tracking; crosses San Elijo Lagoon	Double-tracking primarily at-grade, with a short trench segment for the rail corridor on either side of Birmingham Drive. This option would include reconfiguring the street intersection at Birmingham Drive and San Elijo Avenue, and close Chesterfield Drive at San Elijo Avenue. Another grade separation would occur at Leucadia Boulevard where the tracks would be depressed. Pedestrian undercrossings would be placed along the route.
Encinitas - SHORT TRENCH; Double Tracking; crosses San Elijo Lagoon	Double-tracking in same alignment as at-grade option above, but with an additional covered trench under Encinitas Boulevard and a transitional open trench about 1,500 feet either side of Encinitas Boulevard.
<i>Encinitas - LONG TRENCH; Double Tracking; crosses San Elijo Lagoon</i>	<i>Double-tracking in same alignment as options described above. Tracks would be in an open trench south of the Batiquitos Lagoon, then drop into a covered trench as they approach the downtown area, then return to an open trench up to the north end of the San Elijo Lagoon, where they transition to at-grade. Chesterfield Drive at San Elijo Avenue would be closed. Pedestrian crossings would be placed along the route.</i>
Stations	
Solana Beach	Existing station. Proposed improvements include platform modifications and parking expansion.
<b>Del Mar</b> (Solana Beach Station to I-5/805 Split)	
Alignments	
<i>COVERED TRENCH on bluffs; crosses San Dieguito and Los Penasquitos Lagoons</i>	<i>Double-tracking in a covered trench in the existing rail corridor alignment along the bluffs.</i>
TUNNEL under Camino Del Mar; crosses San Dieguito and Los Penasquitos Lagoons	Double-tracking via a tunnel underneath Camino Del Mar. Tunnel would begin at Jimmy Durante Boulevard, and daylight at Carmel Valley Road where tracks would then connect with the existing alignment across Los Penasquitos Lagoon. The existing rail track on the bluffs would be removed from service.
TUNNEL along I-5; crosses San Dieguito and Los Penasquitos Lagoons	Double-tracking via a tunnel that would run under Interstate 5 and daylight along the southern boundary of San Dieguito Lagoon. Tracks would reconnect with the existing rail at-grade near the Del Mar race track. The existing rail track on the bluffs would be removed from service.
<b>I-5/805 Split To Hwy 52</b>	
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.
<b>Hwy 52 To Santa Fe Depot</b> (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.

<sup>1</sup> 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 1-5B

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



FIGURE 1-5C

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



### **LOSSAN Corridor Screening Process**

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

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

## 2.0 BASELINE/AFFECTED ENVIRONMENT

### 2.1 STUDY AREA

The Study Area for hazardous materials/wastes is defined as 250 feet from the centerline of identified rail and highway corridors for each of the build alternatives (i.e., the Modal and High-Speed Train Alternatives). The Study Area also includes a 250-foot perimeter around airport facilities that are located along or adjacent to the existing highway and proposed rail alignments that are included under the Modal and High-Speed Train Alternatives. This is the area where it is assumed that a recorded hazardous materials or waste site could potentially affect right-of-way acquisition or the safety of construction workers and persons using the proposed alternatives in the operational phase.

### 2.2 DATABASE RESEARCH

The hazardous materials/waste analysis performed for the Program EIR/EIS consisted of a database search based on geospatial data provided by Environmental Data Resources, Inc. (EDR), dated January 2003. At this stage of analysis, in order to determine the number of potential hazardous materials sites in the vicinity of the proposed alternative alignments and stations, the databases for major potential hazardous materials risks were accessed. The database for solid waste landfills (SWLFs) was also accessed. These databases are described as follows:

- Federal National Priorities List (NPL)/Superfund. This database lists those sites that pose an immediate public health hazard, and where an immediate response to the discovery was necessary. These listings are also found in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) database, also known as CERCLIS.
- State Priority List (SPL). Sites listed in this database are high-priority sites that were compiled from the Annual Work Plan (AWP). For the purpose of this program-level analysis only AWP sites were considered to comprise the SPL. (NOTE: It is assumed that only AWP sites listed after 1990 were included in the data provided by EDR, since prior to 1990 these sites were listed under a different database name. Sites listed prior to 1990 will be identified and analyzed further during Tier 2 of the Program EIR.)
- State of California Solid Waste Landfills (SWLF). The sites listed in this database have generally been identified by the state as accepting solid wastes. The sites can be either active or closed.

### 2.3 HAZARDOUS MATERIALS USED IN OPERATION, MAINTENANCE, AND CONSTRUCTION OF THE ALTERNATIVES

A qualitative description of potential operation, maintenance, and construction impacts will be included in the Program EIR/EIS. For the hazardous waste/materials investigation, site-specific operational and construction impacts will be addressed, if applicable, during the project-specific environmental document stage. In addition, construction impacts will need to be evaluated in detail during the project-specific environmental document stage. In some specific instances, operational and construction impacts should be analyzed for the Project Level EIR/EIS, if such information is available.

### 3.0 HAZARDOUS MATERIALS ANALYSIS METHODOLOGY

The hazardous materials/wastes analysis for this program-level EIR/EIS is focused on a qualitative comparison of potential impacts to the public or the environment from hazardous materials or wastes. This analysis is limited to proposed corridors, as described later in this section, for each of the build alternatives (high-speed train and modal alternatives), including proposed station locations. The potential impacts for each of these alternatives are compared with the No-Project Alternative. Under the No-Project Alternative it is assumed that hazardous materials/waste impacts that would be associated with other projects that would be constructed regardless of whether the proposed project were constructed, would be mitigated as part of those projects. Thus the No-Project Alternative is assumed to have no hazardous materials/waste impacts.

The hazardous materials/waste analysis performed for the Program EIR/EIS consisted of a search of the following databases, as provided by Environmental Data Resources, Inc. (EDR), dated January 2003:

- Federal National Priorities List (NPL)/Superfund. This database lists those sites that pose an immediate public health hazard, and where an immediate response to the discovery was necessary. These listings are also found in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) database, also known as CERCLIS.
- State Priority List (SPL). Sites listed in this database are high-priority sites that were compiled from the Annual Work Plan (AWP). For the purpose of this program-level analysis only AWP sites were considered to comprise the SPL.
- State of California Solid Waste Landfills (SWLF). The sites listed in this database have generally been identified by the state as accepting solid wastes. The sites can be either active or closed.

For the Modal and High Speed Train Alternatives, a study area of 250 feet along either side of rail or highway corridors was reviewed for the occurrence of recorded NPL, SPL, and SWLF sites. Any sites located within the study area for the rail corridor that were also located in the vicinity of the proposed station locations (i.e., approximately 1,000 feet from either end of the stations) were also noted. A study area of 250 feet around airports that are included as part of the Modal Alternative was also reviewed. The number and location of NPL, SPL, and SWLF sites occurring within the study area were noted. The results of these analyses are included in Sections 4.1 through 4.3 and Table 4-1.

## 4.0 HAZARDOUS MATERIALS/WASTES IMPACTS

Table 4-1 shows specific locations where NPL, SPL, and SWLF sites were identified, and in which alternative and route segment they occur.

**TABLE 4-1**

**Detailed Analysis/Comparison Table  
Hazardous Materials/Wastes Impacts  
Los Angeles – Orange County – San Diego**

	Superfund Sites within 250 feet	State Priority List Sites within 250 feet	Solid Waste Landfill Sites within 250 feet
<b>NO-PROJECT</b>	Under the No-Project Alternative, other agencies/entities would complete local, state, and interstate transportation system improvements currently designated in existing plans and programs, and impacts due to the presence of hazardous materials/wastes would be mitigated as part of those projects. No additional hazardous materials/wastes impacts would occur beyond those addressed in environmental documents for the No-Project Alternative.		
<b>MODAL</b>			
<b>Union Station to LAX (HST only)</b>	N/A	N/A	N/A
<b>Union Station To Fullerton Station</b>	0	0	1 Lakin Tire 12940 Firestone Blvd. Santa Fe Springs, CA
<b>Fullerton Station To Irvine Station</b>	0	0	0
<b>Irvine Station To San Juan Capistrano City Limits</b>	0	0	0
<b>San Juan Capistrano</b>	0	0	0
<b>Dana Point/San Clemente</b>	0	0	0
<b>Camp Pendleton</b>	0	0	0
<b>Oceanside/Carlsbad</b>	0	0	0
<b>Encinitas/Solana Beach</b>	0	0	1 Olympus Street Burnsite 600 Block Olympus Street Encinitas, CA
<b>Del Mar</b>	0	0	0
<b>I-5/805 Split To Hwy 52</b>	0	0	0
<b>Hwy 52 To Santa Fe Depot</b>	0	0	0
<b>Long Beach Airport</b>	0	0	0

**TABLE 4-1**

**Detailed Analysis/Comparison Table  
 Hazardous Materials/Wastes Impacts  
 Los Angeles – Orange County – San Diego (continued)**

	Superfund Sites within 250 feet	State Priority List Sites within 250 feet	Solid Waste Landfill Sites within 250 feet
<b>HST CORRIDORS &amp; STATION OPTIONS</b>			
<b>LAX To Union Station</b>	0	0	2 Fargo Tire & Rubber Company, Inc. 135 East 58th Street Los Angeles, CA  Mission Road Recycling & Transfer Station 840 South Mission Road Los Angeles, CA 90023
Stations			
LAX	0	0	0
<b>Union Station To Anaheim Station via UPRR</b>	0	0	1 Lakin Tire 12940 Firestone Blvd. Santa Fe Springs, CA
Stations			
Norwalk	0	0	0
Anaheim	0	0	0
<b>Union Station To Irvine Station via LOSSAN</b>	1 El Toro Marine Corps Air Station El Toro, CA	0	0
Stations			
Norwalk	0	0	0
Fullerton	0	0	0
Anaheim	0	0	0
Santa Ana	0	0	0
Irvine	1 El Toro Marine Corps Air Station El Toro, CA	0	0

TABLE 4-1

**Detailed Analysis/Comparison Table  
Hazardous Materials/Wastes Impacts  
Los Angeles – Orange County – San Diego (continued)**

	Superfund Sites within 250 feet	State Priority List Sites within 250 feet	Solid Waste Landfill Sites within 250 feet
<b>CONVENTIONAL RAIL (LOSSAN) &amp; STATION OPTIONS</b>			
<b>Union Station To Fullerton Station</b> (4th main track)	0	0	0
<b>Fullerton Station To Irvine Station</b>			
Alignments			
AT-GRADE between Walnut Ave (Orange) and E. 17th St. (Santa Ana)	1 El Toro Marine Corps Air Station El Toro, CA	0	0
TRENCH between Walnut Ave (Orange) and E. 17th St. (Santa Ana)	1 El Toro Marine Corps Air Station El Toro, CA	0	0
Stations			
Fullerton	0	0	0
Anaheim	0	0	0
Santa Ana	0	0	0
Irvine	1 El Toro Marine Corps Air Station El Toro, CA	0	0
<b>Irvine Station To San Juan Capistrano City Limits</b> (no improvements)	N/A	N/A	N/A
<b>San Juan Capistrano</b> (City Limits to Avenida Aeropuerto)			
Alignments			
Covered TRENCH/Cut-Fill between Trabuco Creek and Avenida Aeropuerto (trench goes under San Juan Creek); Double tracking	0	0	0
TUNNEL along I-5 between Hwy 73 and Avenida Aeropuerto (tunnel under Trabuco Creek and San Juan Creek); Double tracking	0	0	0
AT-GRADE and Open TRENCH along east side of Trabuco Creek	0	0	0
Stations			
San Juan Capistrano	0	0	0
<b>Dana Point/San Clemente</b> (Avenida Aeropuerto To San Onofre Power Plant)			
Alignments			
Dana Point Curve Realignment; San Clemente - SHORT TRENCH; Double Tracking (crosses San Mateo and San Onofre Creeks)	0	0	0

TABLE 4-1

**Detailed Analysis/Comparison Table  
Hazardous Materials/Wastes Impacts  
Los Angeles – Orange County – San Diego (continued)**

	Superfund Sites within 250 feet	State Priority List Sites within 250 feet	Solid Waste Landfill Sites within 250 feet
Dana Point Curve Realignment; San Clemente - LONG TRENCH; Double Tracking (crosses San Mateo and San Onofre Creeks)	0	0	0
Dana Point Curve Realignment; San Clemente - SHORT TUNNEL; Double Tracking (crosses San Mateo and San Onofre Creeks)	0	0	0
San Clemente - LONG ONE-SEGMENT TUNNEL; Double Tracking (crosses San Mateo and San Onofre Creeks)	0	0	0
San Clemente - LONG TWO-SEGMENT TUNNEL; Double Tracking (crosses San Mateo and San Onofre Creeks)	0	0	0
<b>Camp Pendleton</b> (San Onofre Power Plant to Oceanside City Limits - Double tracking; crosses Santa Margarita River)	0	0	0
<b>Oceanside/Carlsbad</b> (Oceanside City Limits to Encinitas City Limits)			
Alignments			
Carlsbad - AT-GRADE; double tracking; crosses San Luis Rey, Buena Vista, Aqua Hedionda, and Batiquitos Lagoons	0	0	0
Carlsbad - TRENCH; double-tracking; crosses San Luis Rey, Buena Vista, Aqua Hedionda, and Batiquitos Lagoons	0	0	0
Stations			
Oceanside	0	0	0
<b>Encinitas/Solana Beach</b> (Encinitas City Limits to Solana Beach Station)			
Alignments			
Encinitas - AT-GRADE; Double Tracking; crosses San Elijo Lagoon	0	0	0
Encinitas - SHORT TRENCH; Double Tracking; crosses San Elijo Lagoon	0	0	0
Encinitas - LONG TRENCH; Double Tracking; crosses San Elijo Lagoon	0	0	0
Stations			
Solana Beach	0	0	0
<b>Del Mar</b> (Solana Beach Station to I-5/805 Split)			
Alignments			
COVERED TRENCH on bluffs; crosses San Dieguito and Los Penasquitos Lagoons	0	0	0
TUNNEL under Camino Del Mar; crosses San Dieguito and Los Penasquitos Lagoons	0	0	0
TUNNEL along I-5; crosses San Dieguito and Los Penasquitos Lagoons	0	0	0

TABLE 4-1

**Detailed Analysis/Comparison Table  
Hazardous Materials/Wastes Impacts  
Los Angeles – Orange County – San Diego (continued)**

	Superfund Sites within 250 feet	State Priority List Sites within 250 feet	Solid Waste Landfill Sites within 250 feet
<b>I-5/805 Split To Hwy 52</b>			
Alignments			
Miramar Hill Tunnel	0	0	0
I-5 Tunnel	0	0	0
Stations			
UTC (Only applies to Miramar Hill Tunnel)	0	0	0
<b>Hwy 52 To Santa Fe Depot</b> (Curve realignment; Double Tracking; San Diego River Bridge; Trench between Sassafras St and Cedar St)	0	0	1 Rose Canyon Landfill
Stations			
Santa Fe Depot	0	0	0

Source: EDR, January 2003.

## 4.1 NO-PROJECT ALTERNATIVE

The No-Project Alternative assumes that others would complete projects including local, state, and interstate transportation system and airport improvements designated in existing plans and programs (refer to Table 1-1). It is assumed that no additional hazardous materials/wastes impacts would occur beyond those addressed in environmental documents for those projects and that any hazardous materials/wastes impacts would be mitigated as part of those projects. Therefore, the No Build Alternative is assumed to have no hazardous materials/wastes impacts.

## 4.2 MODAL ALTERNATIVE

The Modal Alternative study area contains two SWLF sites, one located in the Union Station to Fullerton Station segment and one in the Encinitas to Solana Beach segment.

### 4.2.1 Superfund Sites

No NPL/Superfund sites were identified within 250 feet from either side of centerline for the modal alternative alignment or in a 250-foot study area around the Long Beach Airport.

### 4.2.2 State Priority List Sites

No State Priority List sites were identified within 250 feet from either side of centerline for the modal alternative alignment or in a 250-foot study area around the Long Beach Airport.

### 4.2.3 Solid Waste Landfills

Two solid waste landfills were identified within the 250-foot buffer zone of the modal alternative alignment (Table 4-1 and Figure 1-6). The Lakin Tire landfill is located in Santa Fe Springs (Union Station to Fullerton segment), and the Olympus Street Burnsite is located in Encinitas (Encinitas to Solana Beach segment). No solid waste landfills were identified in the study area around the Long Beach Airport.

## 4.3 HIGH-SPEED TRAIN ALTERNATIVE

The High-Speed Train Alternative study area contains a total of 5 hazardous materials/wastes sites. One NPL site is located near the Irvine Station. Two SWLF sites are located in the LAX to Union Station segment, one SWLF site is located within the Union Station to Anaheim Station via UPRR segment, and another SWLF site is located within the Highway 52 to Santa Fe Depot segment.

Based on numbers of sites identified, the HST Alternative has more potential for project impacts, mitigation requirements, and associated costs related to hazardous materials and wastes. However, due to the complexity of hazardous materials/wastes sites, it was not possible to assign levels of severity of impacts without information addressing nature and extent of contamination and precise locations and boundaries of contamination zones.

### 4.3.1 Superfund Sites

#### High-Speed Rail

One NPL/Superfund site, the El Toro Marine Corps Air Station, was identified within the study area for the High-Speed Train Alternative (Table 4-1 and Figure 1-6). This site is located in El Toro along the rail corridor segment between Union Station and Irvine Station via the LOSSAN corridor alignment. In addition, this NPL site also has the potential to affect construction and operation at the Irvine Station.

## Conventional Rail

As mentioned above, the El Toro Marine Corps Air Station site is within the study area for the rail corridor between Union Station and Irvine Station, and the proposed station improvements at Irvine Station. This site would therefore affect the Conventional Rail segment near Irvine Station as well as the High Speed Rail alignment described above. No NPL/Superfund sites were identified within 250 feet of either side of centerline for the conventional rail corridor or at existing or proposed stations.

### 4.3.2 State Priority List Sites

No State Priority List sites were identified within 250 feet of either side of rail centerline or at existing or proposed stations for either the High-Speed Rail or Conventional Rail corridors.

### 4.3.3 Solid Waste Landfills

#### High-Speed Rail

Three solid waste landfills were identified within the 250-foot study area of the HST corridor (Table 4-1 and Figure 1-6). The Fargo Tire & Rubber Company and Mission Road Recycling & Transfer Station are both located in Los Angeles within the LAX to Union Station segment. The Lakin Tire landfill is located in Santa Fe Springs within the segment between Union Station and Anaheim Station via the UPRR rail corridor. No solid waste landfills were identified in the study areas around existing or proposed stations for the High-Speed Rail Corridor.

#### Conventional Rail

One solid waste landfill was identified within the 250-foot study area of the Conventional Rail corridor (Table 4-1 and Figure 1-6). The Rose Canyon Landfill is located in San Diego County (Highway 52 to Santa Fe Depot segment), south of Highway 52. This landfill does not affect existing or proposed stations in the Conventional Rail Corridor.

## 5.0 REFERENCES

American Society of Testing and Materials (ASTM). Standard Practice for Environmental Site Assessments – Phase I Environmental Site Assessment Process (E1527-00). 2000.

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## 6.0 PREPARERS

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- Project role: Principal investigator and document preparer - hazardous materials/wastes

# 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 Build, 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 Build 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.

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

<b>CONVENTIONAL RAIL (LOSSAN) &amp; STATION OPTIONS</b>
<b>Union Station To Fullerton Station</b> (4th main track)
<b>Fullerton Station To Irvine Station</b>
Alignment
AT-GRADE between Walnut Ave (Orange) and E. 17th St. (Santa Ana)
Stations
Fullerton
Anaheim
Santa Ana
Irvine
<b>Irvine Station To San Juan Capistrano City Limits</b> (no improvements)
<b>San Juan Capistrano</b> (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)
<b>Dana Point/San Clemente</b> (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)
<b>Camp Pendleton</b> (San Onofre Power Plant to Oceanside City Limits - Double tracking; crosses Santa Margarita River)
<b>Oceanside/Carlsbad</b> (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
<b>Encinitas/Solana Beach</b> (Encinitas City Limits to Solana Beach Station)
Alignment
Encinitas - AT-GRADE; Double Tracking; crosses San Elijo Lagoon
Stations
Solana Beach
<b>Del Mar</b> (Solana Beach Station to I-5/805 Split)
Alignment
TUNNEL under Camino Del Mar; crosses San Dieguito and Los Penasquitos Lagoons
<b>I-5/805 Split To Hwy 52</b>
Alignment
I-5 Tunnel
<b>Hwy 52 To Santa Fe Depot</b> (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**

<b>CONVENTIONAL RAIL (LOSSAN) &amp; STATION OPTIONS</b>
<b>Union Station To Fullerton Station</b> (4th main track)
<b>Fullerton Station To Irvine Station</b>
Alignment
TRENCH between Walnut Ave (Orange) and E. 17th St. (Santa Ana)
Stations
Fullerton
Anaheim
Santa Ana
Irvine
<b>Irvine Station To San Juan Capistrano City Limits</b> (no improvements)
<b>San Juan Capistrano</b> (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
<b>Dana Point/San Clemente</b> (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)
<b>Camp Pendleton</b> (San Onofre Power Plant to Oceanside City Limits - Double tracking; crosses Santa Margarita River)
<b>Oceanside/Carlsbad</b> (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
<b>Encinitas/Solana Beach</b> (Encinitas City Limits to Solana Beach Station)
Alignment
Encinitas - SHORT TRENCH; Double Tracking; crosses San Elijo Lagoon
Stations
Solana Beach
<b>Del Mar</b> (Solana Beach Station to I-5/805 Split)
Alignment
TUNNEL along I-5; crosses San Dieguito and Los Penasquitos Lagoons
<b>I-5/805 Split To Hwy 52</b>
Alignment
Miramar Hill Tunnel
Stations
UTC
<b>Hwy 52 To Santa Fe Depot</b> (Curve realignment; Double Tracking; San Diego River Bridge; Trench between Sassafras St and Cedar St)
Stations
Santa Fe Depot