

CALIFORNIA HIGH-SPEED TRAIN

Program Environmental Impact Report/Environmental Impact Statement

System-Wide Agricultural Resources and Farmlands Report

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

System-Wide Agricultural Resources And Farmlands Report

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ACRONYMS

Authority	California High-Speed Rail Authority
APZ	Agricultural Protection Zoning
BNSF	Burlington Northern – Santa Fe Railroad
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
DLRP	California Department of Conservation, Division of Land Resource Protection
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMMP	Farmland Mapping and Monitoring Program (Under the California Dept. of Conservation)
FPPA	Farmland Protection Policy Act (under the USDA Natural Resources Conservation Service)
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GPI	Greatest Potential Impact(s)
LESA	Land Evaluation and Site Assessment System (under the FPPA)
LOSSAN	Los Angeles to San Diego Coastal Study Region
LPI	Least Potential Impact(s)
MTA	Metropolitan Transportation Authority
NEPA	Nation Environmental Policy Act
NRCS	United States Department of Agriculture, Natural Resources Conservation Service
RTP	Regional Transportation Plan
STIP	State Transportation Improvement Program
SWGPI	System-Wide Alignment Combination with Greatest Potential Impact(s)
SWLPI	System-Wide Alignment Combinations with Least Potential Impact(s)
TDR	Transfer of Development Rights
USDA	United States Department of Agriculture
UP	UP Railroad
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

1.0 EXECUTIVE SUMMARY

1.1 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 (high-speed train) system.¹ After completing a number of preliminary 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 next logical 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 developing a high-speed train system. This system 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. 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. The environmental review would 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. 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. The conceptual stage of decision-making includes selecting a preferred corridor and general station locations for future right-of-way preservation, and identifying potential phasing options. No permits are being sought for this programmatic level of environmental review. Later stages of project development would include project-specific detailed environmental documents to assess the potential 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 for the future. FRA is the federal lead agency for the preparation of the Tier I 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, regional, and local agencies will use the Program EIR/EIS in reviewing the proposed program, and in developing feasible and practicable programmatic analysis and mitigation strategies for the project-level detailed environmental review process, which would be expected to follow the approval of a high-speed train system.

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

1.2 SUMMARY OF PROJECT ALTERNATIVES

1.2.1 No Project/No Action Alternative

The No Project/No Action Alternative addresses the geographic area serving the same intercity travel market as the proposed high-speed train and serves as the baseline for the comparison of Modal and High-Speed Train alternatives. The No Project/No Action Alternative represents the state's transportation system (highway, air, and conventional rail) as it exists and as it would be after implementation of programs or projects already approved and that are expected to be implemented by 2020. The No Project/No Action 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. It is assumed that improvements under the No Project/No Action Alternative have already been accounted for, including mitigation of their impacts to FMMP-listed farmlands and agricultural resources. The No Project/No Action Alternative defines the existing and future statewide improvements 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)

1.2.2 Modal Alternative

The Modal Alternative consists of expansion of highways, airports, and intercity and commuter rail systems serving the markets identified for the High-Speed Train Alternative. The Modal Alternative uses the same intercity 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/No Action 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.

1.2.3 High-Speed Train Alternative

The High-Speed Train system project would include the development of an approximately 1,127-kilometer (700-mile) long rail system capable of conveying High-Speed Trains at speeds in excess of 322 kilometers (200 miles) per hour.² The High-Speed Train would include a dedicated, fully grade separated track with state-of-the-art safety, signaling, and automated train control systems. The High-Speed Train system would connect and serve the major metropolitan areas located within the San Francisco Bay, Central Valley, Los Angeles, Inland Empire (western portion of Riverside and San Bernardino Counties) and San Diego areas. Once complete, 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. The High-Speed Train Alternative includes several corridor alignment and station options. A steel-wheel-to-steel-rail, electrified train is planned, primarily on exclusive right-of-way with portions of the corridor on shared track with other rail. Conventional "non-electric" improvements are also being considered along the existing Los Angeles to San Diego (LOSSAN) rail corridor. 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.

² The 1,127 Km (700 Mi) distance is based on the linear distances between the communities that would be served by the High-Speed Train alternative.

1.3 ANALYSIS METHOD SUMMARY

Based on the statewide scope of the proposed high-speed train system, the Authority and FRA had determined that the project would be best analyzed by separating it into five study regions. These study regions are comprised of: Bay Area to Merced, Sacramento to Bakersfield, Bakersfield to Los Angeles, Los Angeles to San Diego via the Inland Empire, and Los Angeles-Orange County-San Diego. This report represents an analysis of each of the five study regions that will be summarized in the Program EIR/EIS, and will be part of the administrative record supporting the environmental review of alternatives.

Geographic Information Systems (GIS) were used to evaluate the potential impacts to farmland and agricultural resource areas of the project improvements proposed in the Modal Alternative and High-Speed Train Alternative. The following farmland and agricultural resource categories were evaluated based on the California Department of Conservation, Division of Land Resource Planning (DLRP) Farmland Mapping and Monitoring Program (FMMP) (2000) data:

- Prime Farmlands
- Farmlands of Statewide Importance
- Unique Farmlands
- Farmlands of Local Importance

Acreages of potentially impacted farmland were determined by creating potential impact zones, utilizing GIS, around alignment options that would exist under the Modal and High-Speed Train Alternatives. The potential impact zones represent the additional rights-of-way that would be required to develop the alternatives.

1.3.1 Modal Alternative Potential Impact Zones

For the Modal Alternative, potential impact zones are 25-foot-wide zones along the outside edge of the existing roadways that would be widened for additional lanes. In areas where lanes may be added to the center portion of the roadway right-of-way, no potential impact zones are defined, and it is assumed that no agricultural resource impacts would occur.

1.3.2 High-Speed Train Alternative Potential Impact Zones

Under the High-Speed Train Alternative, there exists the potential to either share existing rail rights-of-way, or develop the high-speed train alignment options immediately adjacent to them. In the areas where High-Speed Train alignment options may be developed within existing rail rights-of-way, it is assumed that no agricultural resource impacts would occur. In the areas where high-speed train alignments would be developed immediately adjacent to existing rail rights-of-way, a 100-foot potential impact zone is defined on one side of the rail right-of-way, as selected by the regional study teams and as indicated on their respective engineering drawings. In areas containing no existing rail rights-of-way, the high-speed train alignment's potential impact zones are defined as 100 feet wide.

The 100 foot wide potential impact zone represents a conservative assumption, and allows for greater flexibility in civil design (drainage and access facilities), operational facilities (siding/passing tracks) as well as future expansion of the system. This potential impact zone width may be reduced to 50 feet, thereby further reducing the High-Speed Train's level of impact. Moreover, it is possible that the entire High-Speed Train line may fit within existing rail rights-of-way, given agreements with existing rail operators. Considering this, High-Speed Train related impacts may be reduced to near negligible levels.

Under the High-Speed Train Alternative each study region would include many potential alignment options that would allow for a number of different alignment combinations. The method utilized identifies one alignment combination per study region that would generate the *least* amount of potential farmland and agricultural resource impacts (hereafter referred to as the Least Potential Impact [LPI] alignment combination), and one alignment combination per study region that would generate the *greatest* amount of potential farmland and agricultural resource impacts (hereafter referred to as the Greatest Potential Impact [GPI] alignment combination).

1.4 TYPICAL IMPACTS AND MITIGATION

According to the 1997 Census of Agriculture (the most recently published), the State of California had 74,126 farms on 27,698,779 acres throughout the state³. Between the years of 1988 and 1998 the state of California experienced an urbanization of farmland at an average rate of loss of 49,700 acres a year⁴. The primary impacts to farmlands and agricultural resources from urbanization include the permanent loss of farmland by conversion and the severing of formerly contiguous farmland. Secondary impacts to farmland from urbanization include: reduced crop yields from air pollution; livestock predation by domestic pets and displaced wild animals; crop disease generated or exacerbated by ornamental vegetation; increases in pests as a result of restrictions on pesticides and fertilizer use; water scarcity brought on by demands from urban uses; crop pilferage; and noise, odor and dust complaints from adjacent urban land uses. A number of ways to minimize or avoid impacts to farmland resulting from acquisition and conversion have been raised by farming advocates, slow growth/no growth proponents and the state in the recent past. State-level measures include Williamson Act contracts, agricultural district programs, growth management laws, right-to-farm laws, and differential tax assessment laws. Local-level mitigation measures include agricultural protection zoning (APZ) ordinances, mitigation ordinances, right-to-farm ordinances, transfers of development rights and conservation easements. These mitigation strategies are discussed further under Section 3.3 Regulatory Setting.

1.5 SUMMARY OF POTENTIAL PROJECT-RELATED IMPACTS TO FARMLAND

Table 1.5-1, *Potential System-Wide Farmland and Agricultural Resource Impacts per Alternative* includes a comparison of the potential impacts to farmlands and agricultural resources that would result from the implementation of the alternatives being considered. The impacts represented within this table are to FMMP-listed farmlands and agricultural resources only, and do not include impacts to Williamson Act farmlands or other protected farmlands. Project-related potential impacts to Williamson Act farmlands and other protected farmlands will be considered during a subsequent project-level detailed environmental review process.

The No Project/No Action Alternative primarily represents improvements with relatively minor infrastructure development. Considering this, minor farmland acquisition and conversion is likely to occur. Although farmland and agricultural resource acquisition and conversion would occur under the No Project/No Action Alternative, it would not be on the same order of magnitude as the Modal or High-Speed Train Alternatives. Additionally, the No Project/No Action Alternative includes improvements that are already approved, hence their potential impacts to FMMP-listed farmlands and agricultural resources will have been previously addressed. Thus, no project-related impacts associated with the No Project/No Action Alternative are included within this report.

It is important to note that the No Project/No Action Alternative represents an alternative that already has approved plans and programs and the Modal Alternative represents an alternative that would not create additional alignments, but would expand infrastructure currently available. Considering this, both the No Project/No Action and Modal Alternatives represent alternatives with relatively fixed programmatic and project improvements. Conversely, the High-Speed Train Alternative represents an alternative with a varying degree of alignment options. These alignment options are currently being analyzed, and the

³ Based on the 1997 Census of Agriculture by the United States Department of Agriculture. According to Ms. Sharon Powers, Market Information Analyst for the National Agricultural Statistics Service, a year 2002 agricultural census was performed. However, data from the 2002 census will not be available until February 2004.

⁴ Kuminoff, N. V., Sokolow, A. D., and Sumner D. A., "Farmland Conversion: Perceptions and Realities." *Agricultural Issues Center AIC Issues Brief*, May 2001: pp. 1-2. Note: The authors utilized data generated from the California State Department of Conservation Farmland Mapping and Monitoring Program to determine the average rate of urbanized acreage per year.

final alignment configuration of the state-wide High-Speed Train system will be ultimately defined by its ability to generate the least amount of impacts while still providing a high level of service.

**Table 1.5-1
Potential System-wide Farmland and Agricultural Resource Impacts per Alternative**

Alternative	Study Region	Prime Farmland (acres)	Unique Farmland (acres)	Statewide Importance (acres)	Local Importance (acres)	Study Region Totals (acres)
Modal Alternative	Bay Area to Merced	168	31	56	7	262
	Sacramento To Bakersfield	323	54	181	51	609
	Bakersfield to Los Angeles	1	0	1	0	2
	Los Angeles-Riverside-San Diego	106	1	3	107	217
	Los Angeles-Orange-San Diego (LOSSAN)	15	4	1	8	28
<i>Modal Alternative System-Wide Totals</i>		613	90	242	173	1,118
High-Speed Train Alternative (SWLPI)⁵	Bay Area to Merced	244	46	248	11	549
	Sacramento To Bakersfield	1,263	154	566	113	2,096
	Bakersfield to Los Angeles	0	0	0	0	0
	Los Angeles-Orange-San Diego (LOSSAN)	0	0	0	0	0
	Los Angeles-Riverside-San Diego (Inland)	7	0	0	17	24
<i>High-Speed Train Alternative (SWLPI) Totals</i>		1,514	200	814	141	2,669
High-Speed Train Alternative (SWGPI)	Bay Area to Merced	305	175	207	83	770
	Sacramento To Bakersfield	1,532	370	868	232	3,002
	Bakersfield to Los Angeles	62	0	1	0	63
	Los Angeles-Orange-San Diego (LOSSAN)	0	0	0	0	0
	Los Angeles-Riverside-San Diego (Inland)	8	0	1	16	25
<i>High-Speed Train Alternative (SWGPI) Totals</i>		1,907	545	1,077	331	3,860

* Alternative's system-wide totals for all agricultural categories shown in bold italics

** The SWLPI and SWGPI potential impacts are based on the conservative assumption that the High-Speed Train potential impact zone would be 100 feet wide in rural areas adjacent to existing rail rights-of-way. The 100 foot width may be reduced to 50 feet wide in areas of high agricultural impact, and may further be reduced to near negligible levels should right-of-way agreements be made with the existing rail operators.

⁵ The High-Speed Train Alternative system-wide alignment combinations with the least potential impact are denoted as SWLPI. Conversely, the High-Speed Train Alternative system-wide alignment combinations with the greatest potential impact are denoted as SWGPI. The amounts thereof were determined by separately summing the impact amounts of the LPI and GPI alignment combinations per study region, for all five study regions. This function was performed for each FMMP category.

1.5.1 Total FMMP-listed Farmlands Potentially Acquired/Converted

The potential system-wide impacts to FMMP-listed farmlands related to the Modal Alternative and the HST Alternative System-Wide Least Potential Impact Alignment Combination (SWLPI) and System-Wide Greatest Potential Impact Alignment Combination (SWGPI) were ascertained by adding the potential impact amounts of LPI and GPI alignment combinations within each study region as indicated in the text of Sections 4.4.1, 4.4.2, 4.4.3, 4.4.4 and 4.4.5. Review of Table 1.5-1 indicates that:

- Modal Alternative
The Modal Alternative would potentially impact 1,118 acres of FMMP-listed farmlands. This would include impacts to: 613 acres of Prime Farmland; 90 acres of Unique Farmland; 242 acres of Farmland of Statewide Importance and 173 acres of Farmland of Local Importance.
- System-Wide Least Potential Impact Alignment Combination (SWLPI)
The SWLPI would potentially impact 2,669 acres of FMMP-listed farmlands. This would include impacts to: 1,514 acres of Prime Farmland; 200 acres of Unique Farmland; 814 acres of Farmlands of Statewide Importance and 141 acres of Farmlands of Local Importance.
- System-Wide Greatest Potential Impact Alignment Combination (GWLPI)
The SWGPI “worst-case” would potentially impact 3,860 acres of FMMP-listed farmlands. This would include impacts to: 1,907 acres of Prime Farmland; 545 acres of Unique Farmland; 1,077 acres of Farmlands of Statewide Importance and 331 acres of Farmlands of Local Importance.

1.5.2 Comparative Analysis of Alternatives

The results of comparative analysis, including each of the FMMP-listed farmland categories as well as the regional category totals for each of the alternatives, indicate that:

- The Modal and High-Speed Train Alternatives each represent an increase over the amount of impacts under the No Project/No Action Alternative, with the highest potential impacts attributed to the High-Speed Train Alternative SWGPI.
- Based on the conservative assumption that the High-Speed Train requires 100 feet of right-of-way immediately adjacent to existing corridors, the High-Speed Train Alternative represents a system-wide impact from 1,551 to 2,425 additional acres of farmland over the Modal Alternative within Prime Farmland, Unique Farmland and Statewide Importance FMMP categories. However, the High-Speed Train right-of-way width could be reduced to 50 feet in the areas of impact. This right-of-way width reduction would further reduce the High-Speed Train level of impact and lead to a more even comparison between the High-Speed Train and Modal Alternatives. Moreover, it is possible to fit the High-Speed Train alignment options into existing rail rights of way in constrained areas given agreements with private rail operators. This would reduce the potential impacts of the High-Speed Train Alternative to a nearly negligible level of impact.
- The High-Speed Train Alternative SWLPI has the potential to generate fewer impacts than the Modal Alternative within the Local Importance FMMP category.
- The study regions that represent the greatest potential impacts to farmlands and agricultural resources are the Bay Area to Merced and Sacramento to Bakersfield study regions.
- Compared to the Modal Alternative, the High-Speed Train Alternative has higher potential impacts in two out of five study regions (Sacramento to Bakersfield and Bay Area to Merced), similar impacts in one study region (Bakersfield to Los Angeles) and fewer impacts in two study regions (Los Angeles to San Diego [LOSSAN] and Los Angeles to San Diego Inland).

- Compared to the state's potential farmland loss of 49,700 acres per year (nearly 845,000 acres by 2020), the Modal, High-Speed Train (SWLPI) and High-Speed Train (SWGPI) Alternatives would each represent well below 1 percent of the total farmland loss.
- The High-Speed Train loops/bypasses and connections on new alignments would represent more potential impacts due to severance than the alignment options within or adjacent to existing rail rights-of-way.

2.0 PROPOSED PROJECT AND ALTERNATIVES

2.1 NO PROJECT/NO ACTION ALTERNATIVE

The No Project/No Action Alternative addresses the geographic area serving the same intercity travel market as the proposed high-speed train and serves as the baseline for the comparison of Modal and High-Speed Train alternatives. The No Project/No Action Alternative represents the state's transportation system (highway, air, and conventional rail) as it exists and as it would be after implementation of programs or projects already approved and that are expected to be implemented by 2020. The No Project/No Action 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. It is assumed that improvements under the No Project/No Action Alternative have already been accounted for, including mitigation of their impacts to FMMP-listed farmlands and agricultural resources. The No Project/No Action Alternative defines the existing and future statewide improvements 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)

2.2 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 (e.g. Amtrak) on freight and/or commuter rail tracks. The Modal Alternative consists of expansion of highways, airports, and intercity and commuter rail systems serving the markets identified for the High-Speed Train Alternative. The Modal Alternative incorporates the same intercity 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, airports, and passenger rail described under the No Project/No Action 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.

2.3 HIGH-SPEED TRAIN ALTERNATIVE

The High-Speed Train system project would include the development of an approximately 1,127-kilometer (700-mile) long rail system capable of conveying High-Speed Trains at speeds in excess of 322 kilometers (200 miles) per hour.⁶ The High-Speed Train would include a dedicated, fully grade separated

track with state-of-the-art safety, signaling, and automated train control systems. The High-Speed Train system would connect and serve the major metropolitan areas located within the San Francisco Bay, Central Valley, Los Angeles, Inland Empire (western portion of Riverside and San Bernardino Counties) and San Diego areas. Once complete, 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. The High-Speed Train Alternative includes several corridor and station options. A steel-wheel-to-steel-rail, electrified train is planned, primarily on exclusive right-of-way with portions of the corridor on shared track with other rail. 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. Conventional "non-electric" improvements are also being considered along the existing Los Angeles to San Diego (LOSSAN) rail corridor.

During the preliminary development and definition of the High-Speed Train Alternative, a number of potential alignments and station locations were considered, but eliminated due to potentially high levels of farmland impacts (these areas are shown in detail in the Alternatives section). These alignment options were proposed to traverse undeveloped land on new corridors, apart from existing rail rights-of-way. The alignment options would result in converting large amounts of farmlands and severing the vast majority of parcels traversed. Due to the high level of potential impacts to agricultural resources that this would generate, the FRA and Authority have sought to focus on alignment options in and/or immediately adjacent to existing transportation rights of way.

The Sacramento to Bakersfield study region represents the study region with the greatest amount of farmland. Throughout this study region a total of ten alignment options and seven station locations were considered, but eliminated due to their high potential to convert and severe farmlands. Potential conversion impacts were related to the fact that none of the alignments had the ability to be within or adjacent to existing corridors, thereby necessitating new corridor construction through farmlands. An additional concern was, most of the alignment options would have run north-northwest to south-southeast. Throughout the Central Valley, farmland parcels are oriented in a north-south manner, alignment options would have run diagonally through these farmlands, cause numerous severances. All other study regions represented less potential for impacts based on amount of farmlands and farmland proximities to alignment options and station locations. The locations and amounts of High-Speed Train alignment options developed within or adjacent to existing rail rights-of-way, and new potential alignment options are discussed further in Section 4.3.

3.0 BASELINE AND AFFECTED ENVIRONMENT

3.1 STUDY AREA AND METHOD

3.1.1 Distribution of Analysis Areas (Study Regions)

As stated above, the Authority had determined that the project would be best analyzed by separating it into five study regions: Bay Area to Merced, Sacramento to Bakersfield, Bakersfield to Los Angeles, Los Angeles to San Diego via the Inland Empire, and Los Angeles to Orange County to San Diego.

3.1.2 Data Acquisition and Analysis

Geographic Information Systems (GIS) were used to evaluate the potential impacts to farmland and agricultural resource areas of the improvements proposed in the Modal and High-Speed Train Alternatives. A GIS Farmland shapefile was acquired from California Department of Conservation, Division of Land Resource Planning (DLRP) Farmland Mapping and Monitoring Program (FMMP) (2000). The following farmland and agricultural resource categories were evaluated:

- Prime Farmlands
- Farmlands of Statewide Importance
- Unique Farmlands
- Farmlands of Local Importance

Acres of potentially impacted farmland were determined by creating potential impact zones around the Modal Alternative and High-Speed Train Alternatives. The potential impact zones represent the additional rights-of-way that would be required to develop the alternatives.

3.1.2.1 Modal Alternative

The Modal Alternative potential impact zone was developed with the general assumption that all existing roadways under the Modal Alternative have an average right-of-way width of 100 feet. This assumption was verified by aerial photographic analysis of the roadways that would be improved under the Modal Alternative that exist in agricultural areas. All roadway segments observed on the aerial photos that exceed the 100-foot width assumption were observed to either have sufficient space to add lanes to the center portion of the roadway, or did not exist with agricultural areas. The Modal Alternative, as shown in the *System-Wide Alternatives Definition*, prepared by Parsons Brinckerhoff (February 27, 2003), would add one lane to each direction of travel to Interstates 5, 10, 15, 80, 215, 280, 580, 880, State Routes 14, 99, 152 and Highway 101. The Modal Alternative would also add two lanes to each direction of travel of the Interstate 5 through Los Angeles. A Caltrans average lane width is 12 feet. Considering this, the potential impact zone was set at the edge of the existing right-of-way and extended outward 25 feet on both sides. The 25-foot distance is assumed to accommodate the added lanes with shoulders or other required additions. The 100-foot existing roadway was excluded from GIS analysis under the assumption that no farmland impacts could occur within the right-of-way of an existing roadway. This is illustrated below in Figure 3.1-1, *Modal Alternative Potential Impact Zone (Highways)*.

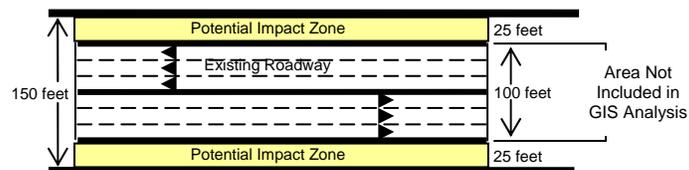


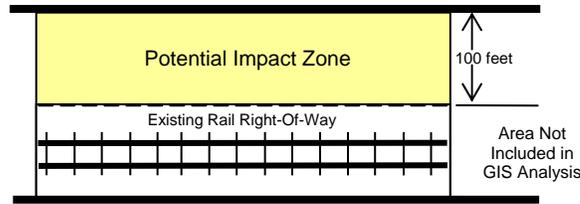
Figure 3.1-1, Modal Alternative Potential Impact Zone (Highways)

3.1.2.2 Modal Alternative Airport Improvements

Potential farmland and agricultural resource impacts related to the Modal Alternative airport improvements were evaluated by applying the design “footprint” of the facility (e.g. runway) being improved over the FMMP GIS shapefiles, and calculating the impacts to the FMMP-listed farmlands. The potential impact zones for the study region airports included the land required to develop the proposed improvements to runways, taxiways and terminals. This method assumed that the potential impact was limited to the geographic extent of the improvements only, with no extra area surrounding them.

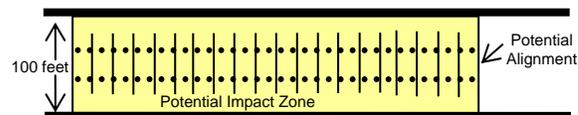
3.1.2.3 High-Speed Train Alternative

Two versions of the potential impact zone were developed for the High-Speed Train Alternative. The first version was developed for alignment options adjacent to existing rail corridors. In these cases, the potential impact zones extended 100 feet from the rail right-of-way on the side that has been selected by the regional study teams and indicated in the study region’s engineering drawings. This is illustrated in Figure 3.1-2, *High-Speed Train Alternative Potential Impact Zone (Adjacent to Existing Rail Rights-Of-Way)*. This case represents a conservative approach to quantifying potential impacts, since it is possible to fit the High-Speed Train within a 50 foot right-of-way in areas of high agricultural impact. Moreover, it is possible to fit the entire High-Speed Train line into existing rail corridors given agreements with private rail operators. This would reduce the potential impacts of the High-Speed Train Alternative to a nearly negligible level of impact.



**Figure 3.1-2, High-Speed Train Alternative Potential Impact Zone
(In Existing Railway Areas)**

The second version was developed with the assumption the potential impact zone would include the entire potential impact zone of 50 feet on either side of the rail centerline, for a total width of 100 feet in undeveloped areas. This is illustrated below in Figure 3.1-3, *High-Speed Train Alternative Potential Impact Zone (In Undeveloped Areas)*.



**Figure 3.1-3, High-Speed Train Alternative Potential Impact Zone
(In Undeveloped Areas)**

In order to ascertain the potential farmland and agricultural resource impacts, the Modal Alternative and High-Speed Train Alternative potential impact zones were overlain atop the FMMP farmland GIS shapefile. Once overlain, the GIS system calculated the acreage of farmland within the potential impact zones for each of the FMMP categories. This analysis was performed for each study region and subsequently calculated to indicate potential system-wide farmland and agricultural resource impacts. This analysis accounts for proposed improvements that expand existing transportation corridors, potential alignments that are adjacent to existing transportation corridors and potential alignments that would traverse undeveloped areas. The station facilities that would exist under the High-Speed Train Alternative are assumed to be located primarily within the study areas considered.

3.2 AFFECTED ENVIRONMENT

The No Project/No Action, Modal and High-Speed Train Alternatives would include potential improvements that would be developed in areas that contain existing agricultural land uses. The statewide locations of the potential improvements and discussions thereof may be found in Section 4.0, and are shown in Figures 4.1-1, 4.2-1 and 4.3-1.

3.2.1 Bay Area to Merced Study Region

3.2.1.1 Modal Alternative

The Bay Area to Merced Study Region includes agricultural areas on the east side of the Central Valley and between points south of San Jose and east of Gilroy. These agricultural areas contain primarily Prime Farmlands, and lesser amounts of Farmlands of Statewide Importance and Farmlands of Local Importance. Within this study region the existing roadways relevant to this agricultural analysis include: Interstates 80, 580 and 880, State Route 152 and Highway 101. These roadways are varied in that some allow for the inside addition of one lane in each direction under the Modal Alternative and some do not.

The locations of the Modal Alternative potential improvements for this study region and discussions thereof may be found Section 4.4.1, and are shown in Figure 4.4-1. Based on aerial photo analysis:

- Interstate 80 runs through the agricultural areas of the northeastern portion of the Central Valley and also appears able to accommodate a single lane in each direction along its existing center median, from approximately the outskirts of Sacramento to the Vacaville area;
- Interstate 580 (at its eastern end) runs through the agricultural areas of the northeastern portion of the Central Valley and also appears able to accommodate a single lane each way in its existing center median, from Interstate 205 to Interstate 5, located west of Tracy.
- Interstate 880 runs through the primarily urban areas of the eastern portion of the lower San Francisco Bay, and does not appear able to accommodate the addition of inside lanes. However, it should be noted that agricultural uses are minimal along this roadway.
- Highway 101 runs through the agricultural areas in the south portion of the Santa Clara Valley. Although Highway 101 appears to have an open center median in agricultural areas, it is doubtful that the center median width is sufficient to accommodate two additional lanes.
- State Route 152 winds its way from the south portion of the Santa Clara Valley in a east-northeast direction to the Central Valley around Los Banos. Agricultural uses along State Route 152 are located within the south portion of the Santa Clara Valley and on the eastern portion of the Central Valley. State Route 152 was observed to be able to accommodate the addition of one lane in each direction in the center median area from approximately the San Luis Reservoir to Interstate 5.

3.2.1.2 High-Speed Train Alternative

The High-Speed Train Alternative would include the development of a statewide rail system that has the potential to be distributed along many different alignment options throughout each study region. The Bay Area to Merced Study Region includes farmlands in all of the FMMP categories. However the prevalent FMMP category represented in this study region is Prime Farmland. Alignment options would begin at either San Francisco or Oakland, turn eastward at either San Jose or Gilroy (Diablo Direct and Pacheco Pass alignment options) and would continue on to Merced. There are negligible amounts of farmlands between San Francisco and San Jose and Oakland and San Jose. Farmlands are prevalent in the Santa Clara Valley from south of San Jose to the eastern area of Gilroy. However, topography between San Jose or Gilroy and the western edge of the Central Valley permits little agricultural opportunity. The eastern portion of the Bay Area to Merced Study Region includes part of the Central Valley, and agricultural lands west of Merced. The locations of the farmlands in this study region are shown in Figure 4.4-2.

3.2.2 Sacramento to Bakersfield Study Region

3.2.2.1 Modal Alternative

The Sacramento to Bakersfield Study Region lies within an area that is primarily agricultural land. All FMMP category farmlands are included within this study region. The primary FMMP farmland category represented is Prime Farmlands, followed by Farmlands of Statewide Importance, then Unique Farmlands and lastly, Farmlands of Local Significance. Within this study region the existing roadways relevant to this agricultural analysis include: Interstates 5 and 80, and State Routes 99 and 152. Similar to the Bay Area to Merced Study Region analysis, these roadways are varied in that some allow for the addition of one lane each way within the existing center median under the Modal Alternative and some do not. The locations of the Modal Alternative potential improvements for this study region and discussions thereof

may be found Section 4.4.2, and are shown in Figures 4.4-3A and 4.4-3B. Based on aerial photo analysis:

- Interstate 5 runs through the agricultural areas along the majority of its length from Sacramento to Bakersfield. It is important to note that although agricultural areas are apparent on aerial photos, the agricultural analysis contained herein was unable to ascertain agricultural impacts along Interstate 5 in Fresno County, because the FMMP indicates that no farmlands are recorded for this area. All other counties are registered with the FMMP. However, Interstate 5 is able to add one lane in each direction of travel within its center median for its entire length, with the exception of areas within the outskirts nearest to Sacramento. Considering this, no Modal Alternative related agricultural impacts are assumed to occur along the length of Interstate 5 from Bakersfield to the outskirts of Sacramento.
- State Route 99, similar to Interstate 5, runs through agricultural lands for the majority of its length, with minor exceptions near Fresno. Although State Route 99 appears to have an open center median in agricultural areas, it is doubtful that the center median width is sufficient to accommodate two additional lanes.
- State Route 152 runs through areas of agriculture from Interstate 5 to State Route 99. Similar to State Route 99, State Route 152 appears to have open center median areas. However, the center median often becomes constrained around Los Banos and through the slough and pond areas east of Los Banos.
- Interstate 80 runs through the agricultural areas of the northeastern portion of the Central Valley and also appears able to accommodate a single lane in each direction in its existing center median from approximately the outskirts of Sacramento to the Vacaville area.

Under the Modal Alternative, the Sacramento to Bakersfield Study Region would also include runway related improvements to the Sacramento International Airport that would consist of lengthening runways 1 and 2. These runways are adjacent to FMMP listed farmlands that primarily consist of Farmlands of Statewide Importance and secondarily of Prime Farmlands.

3.2.2.2 High-Speed Train Alternative

The Central Valley region of California represents the most active agricultural region in the United States. The Sacramento to Bakersfield Study Region includes approximately three-quarters of the Central Valley region. Alignment options run primarily north-northwest to south-southeast either within or adjacent to existing Union Pacific (UP) or Burlington Northern-Santa Fe (BNSF) rail alignments. The locations of the farmlands and are shown in Figures 4.4-4A and 4.4-4B. Within this study region, the BNSF corridor traverses a greater number of farmland acres than does the UP corridor. A comparison of these corridors is as follows:

- **Sacramento to Merced.** The High-Speed Train alignment options along the existing BNSF mainline corridor between Sacramento and Merced would be located within the existing right-of-way of the corridor between Sacramento to north of Stockton, on new alignment north of and through Stockton and would be developed adjacent to the existing BNSF right-of-way between Stockton and Merced. The BNSF corridor along this length generally travels through farmland areas circumventing the urban areas. The High-Speed Train alignment options along the existing UP corridor would be developed adjacent to the existing UP right-of-way, and would travel through more urban areas than that of the alignment options along the BNSF corridor. It is assumed that a downtown station would exist within Stockton. However, high-speed service through Stockton's urban area is not possible. Considering this, the existing tracks through Stockton would need to be improved to serve stopping trains, and express tracks bypassing Stockton's urban areas would need to be developed to facilitate high-speed travel through the

Stockton area. The Modesto express loop/bypass on the UP mainline would run on new alignment that would pass through farmland areas.

- **Merced to Fresno.** High-Speed Train alignment options along the existing BNSF corridor between Merced and Fresno would run through more agricultural areas than the alignment options along the UP mainline. It should be noted that one of the alignment options along the BNSF corridor would include new alignments connecting to the UP corridor through downtown Fresno, which corresponds to the current rail consolidation plans in this area. The connecting alignments between the BNSF and UP corridors would sever a number of farmland parcels.

The Merced bypass, on the BNSF corridor, would run through farmlands on new alignment. It should be noted that the Merced bypass traverses a greater amount of farmland than the portion of the BNSF corridor that it would bypass. Options have been defined for the Merced Station on the BNSF corridor or the Merced loop/bypass.

The High-Speed Train alignment options along the existing UP corridor would traverse more urban areas than those on the BNSF corridor.

- **Fresno to Bakersfield.** High-Speed Train alignment options along the existing BNSF corridor between Fresno and Bakersfield would run on new alignments in the areas around Fresno, Hanford and just north of Bakersfield, but would be developed adjacent to existing right-of-way for the majority of the spans between these cities. An express loop/bypass would be required around Hanford due to the existing tight curves in the area.

High-Speed Train alignments along the existing UP corridor would run through roughly the same amount of farmland as those along the BNSF corridor.

The Fresno bypass would require the development of a new alignment through farmlands on the outskirts of Fresno and would run through more farmlands than the BNSF and UP corridors that it would circumvent (the existing BNSF and UP corridors run through the urban area in Fresno).

3.2.3 Bakersfield to Los Angeles Study Region

3.2.3.1 Modal Alternative

Adjacent FMMP-listed agricultural land within the Bakersfield to Los Angeles Study Region is located mainly around the Bakersfield area and is comprised largely of Prime Farmland and Farmland of Statewide Importance. Within this study region the existing roadways relevant to this agricultural analysis include: Interstate 5 and State Routes 99 and 58. The locations of the Modal Alternative potential improvements for this study region and discussions thereof may be found Section 4.4.3, and are shown in Figure 4.4-5. Based on aerial photograph review:

- Interstate 5 runs through the agricultural areas at points south and west of Bakersfield. These areas are not included in the FMMP database and are thus not included within this agricultural analysis. However, the portion of Interstate 5 within the agricultural areas appears to have sufficient center median area for the addition of one lane in each direction to the point where it connects with State Route 99. South of the Interstate 5/State Route 99 connection lay the foothills of the mountains south of the Central Valley, with increasingly fewer agricultural uses. Once Interstate 5 is within the mountainous areas, the northbound and southbound lanes appear separate in many places. However, they are topographically at different grades in many locations, and are thus unable to accommodate the central lane additions.
- State Route 99, similar to Interstate 5, runs through agricultural lands south of Bakersfield. Although State Route 99 appears to have an open center median in agricultural areas, it is doubtful that the center median width is sufficient to accommodate two additional lanes.

- State Route 58 runs through the agricultural areas south and east of Bakersfield. Although State Route 58 appears to have an open center median in agricultural areas, it is doubtful that the center median width is sufficient to accommodate two additional lanes. Additionally, although State Route 158 appears separate in many locations throughout the mountainous areas, the southeast-bound and northwest-bound lanes are separate topographically.

3.2.3.2 High-Speed Train Alternative

The Bakersfield to Los Angeles Study Region represents the transition from high agricultural use areas to urban uses. Agricultural uses within this area are far fewer than those of the Sacramento to Bakersfield Study Region. From Bakersfield southward there are two potential alignment options entering the Los Angeles area. The westernmost alignment would traverse the eastern portion of the Tehachapi Mountains, but would encounter farmland areas south of the City of Bakersfield. The easternmost alignment would progress into the Palmdale/Lancaster area and would encounter far less farmland as it travels east out of the City of Bakersfield. Within the Los Angeles region these alignments would join in the Sylmar area. The locations of farmlands in this study region are shown in Figure 4.4-6.

3.2.4 Los Angeles to San Diego (LOSSAN) Study Region

3.2.4.1 Modal Alternative

FMMP-listed agricultural land within the Los Angeles to San Diego (LOSSAN) Coastal Study Region is very sparse and is located between Santa Ana and Irvine, and around Oceanside. The farmland between Santa Ana and Irvine is comprised primarily Prime Farmland with a lesser amount of Unique Farmland. The farmland around Oceanside is comprised entirely of Farmlands of Local Importance. Under the Modal Alternative one northbound and one southbound lane would be added to Interstate 5. However, within this study region Interstate 5 does not have the capability of adding lanes to the center median due to the lack of width.

Considering this, additional right-of-way would need to be acquired to develop the outside lanes. The locations of the Modal Alternative potential improvements for this study region and discussions thereof may be found Section 4.4.4, and are shown in Figure 4.4-7.

3.2.4.2 High-Speed Train Alternative

The Los Angeles area to the San Diego (LOSSAN) Study Region is primarily comprised of alignment options through the south portion of Los Angeles County, and along the coastal areas of Orange and San Diego Counties. Additionally, an alignment would run from the central Los Angeles area to the Los Angeles International Airport (LAX). Considering the high urbanization of Los Angeles County and the Southern California coastal region (with the exception of Camp Pendleton's military uses), very limited amounts of farmland and agricultural resources are present. The agricultural areas along the LOSSAN alignments are primarily between Santa Ana and Irvine, and around the Oceanside area. The LOSSAN study region includes alignment options that would be either electric (High-Speed Train) or non-electric (conventional trains). The existing UP Santa Ana Branch would be a High-Speed Train alignment option. The existing LOSSAN alignment from Los Angeles to Irvine is being considered for shared operation of High-Speed Train and conventional train service or just conventional service. South of Irvine, only non-electric conventional train service is being considered. The locations of farmlands in this study region are shown in Figure 4.4-8.

3.2.5 Los Angeles to San Diego Inland Study Region

3.2.5.1 Modal Alternative

Adjacent FMMP-listed agricultural land within the Los Angeles to San Diego Inland Study Region is located mainly between Lake Elsinore and Escondido, and is comprised largely of Farmland of Local Importance and, to a lesser extent Unique Farmlands. Within this study region the existing roadways relevant to this agricultural analysis include Interstates 15 and 215. The locations of the Modal Alternative potential improvements for this study region and discussions thereof may be found Section 4.4.5, and are shown in Figure 4.4-9.

Based on aerial photograph review:

- Interstate 15 runs through the agricultural areas south of Lake Elsinore, continuing on to Escondido. Interstate 15 appears to have sufficient center median within these agricultural areas to accommodate two additional lanes. However, due to topographic grade changes between the northbound and southbound lanes, no center lanes may be added.
- Interstate 215 runs through the more sparse agricultural areas west of Lake Perris. Interstate 215 does not appear to have sufficient center median width within these agricultural areas to accommodate two additional lanes.

Under the Modal Alternative, the Los Angeles to San Diego Inland Study Region would also include runway related improvements to the Ontario International Airport that would consist of adding a third runway. The existing runways that are adjacent to FMMP listed Prime Farmland.

3.2.5.2 High-Speed Train Alternative

Compared to the LOSSAN Study Region alignments, the Los Angeles to San Diego (Inland) Study Region represents a greater potential for farmland and agricultural resource impacts. These alignments would progress eastward out of Los Angeles to San Bernardino and would then continue south to San Diego, encountering most of the study region farmland and agricultural resource areas between Lake Elsinore and Escondido. The locations of the High-Speed Train Alternative potential improvements for this study region and discussions thereof may be found Section 4.4.5, and are shown in Figure 4.4-10.

3.3 REGULATORY SETTING

Numerous mitigation measures and regulation strategies in the forms of laws, ordinances and zoning programs are utilized to protect farmlands and agricultural resources. Those most relevant to the state of California are listed below.

3.3.1 Williamson Act

The California state legislature passed the California Land Conservation Act, more commonly known as the Williamson Act, in 1965. This act provides a tax incentive for retaining lands in certain open space and agricultural uses. In order to benefit from the Williamson Act, a landowner must enter into a contract with local government, usually a county or a city. The contract restricts the possible uses of the land to those compatible with agriculture, wildlife habitat, scenic corridors, recreational uses or open space. As part of this contract, local government calculates the property tax assessment based on the actual use of the land instead of the potential land value assuming full development. The Williamson Act also has certain eligibility requirements, including that the land must be designated as agricultural preserve, scenic highway corridor or wildlife habitat area and it must be actively used as such for three years immediately preceding the beginning of the Williamson Act contract. Williamson Act contracts are for ten years. After the first year of the ten-year period, one more year is added to the term of the contract so that the contract is always valid for a ten-year period. A Williamson Act contract will continue

indefinitely, unless the property owner files a "Notice of Non-Renewal" on their contract. In which case, the Williamson Act contract will cease ten years after the filing of the Notice of Non-Renewal.⁷

3.3.2 Agricultural District Programs

Agricultural district programs enable farmers to designate areas where commercial agriculture is protected and encouraged. These programs are authorized by state law and implemented at a local level. The programs tend to stabilize the land base through encouraging the development of laws and ordinances that protect farmlands from annexation and eminent domain, limit the development of public infrastructure, and provide protection from private nuisance lawsuits. Additionally, the agricultural district programs may offer automatic eligibility for differential tax assessment and property tax credits.

3.3.3 Growth Management Laws

Growth management laws are designed to control the timing and phasing of urban growth and determine the type of land use that will be permitted at a local and regional level. The growth management laws ensure that most new construction is concentrated within designated urban growth boundaries that may be set by the cities, counties or regional agencies. Although not considered farmland or agricultural resource protection laws exclusively, these laws provide a more ordered urban development and in most cases guide the development of adjacent agricultural/urban use areas.

3.3.4 Right-to-Farm Laws

State right-to-farm laws are intended to protect farmers from nuisance lawsuits from existing and future adjacent urban land uses. Additional protection afforded by the right-to-farm laws may also include the prohibition of local governments to impose unreasonable restrictions on agricultural operations.

3.3.5 Differential Tax Assessment

Similar to the Williamson Act, differential tax assessment laws direct local governments to assess agricultural land at its value for agriculture, instead of its full market value. Costs associated with maintaining these laws are borne at the local level.

3.3.6 Agricultural Protection Zoning Ordinances

Agricultural protection zoning ordinances (APZ) designate areas where the primary land use is farming and discourage other land uses within those areas. Under an APZ, land use densities may be restricted to levels as low as one residence per 640 acres of land. In order to convert farmlands within an APZ, a zone change must be obtained from the respective city or county, thus the successfulness of an APZ is largely determined by the local jurisdiction's willingness to defend the APZ.

3.3.7 Mitigation Ordinances

Mitigation ordinances are, in practice, laws that require farmlands that are to be converted to non-agricultural uses to be replaced at a predetermined ratio. Mitigation ordinances vary in ratio and acceptable mitigation locations per local jurisdiction. As an example, the City of Davis, California enacted a mitigation ordinance that requires converted farmland to be replaced at a 1:1 ratio and allows developers to create farmland easements in other parts of the City or pay a fee to satisfy the mitigation requirement.

3.3.8 Right-to-Farm Ordinances

Right-to-farm ordinances are, in many ways, similar to the state-level right-to-farm laws. However, they are enacted and enforced on the local level. In some instances a right-to-farm ordinance may require

⁷ Williamson Act properties are not mapped on GIS and have not been identified in this Tier 1 analysis. Analysis of Williamson Act properties will be included in the Tier 2 detailed environmental review process.

deed notices be placed on all properties in local areas to inform potential buyers that they may experience dust, noise, odors and other agricultural-related inconveniences.

3.3.9 Transfer of Development Rights

Transfers of development rights (TDR) are generally implemented through local zoning ordinances. The use of a TDR allows a landowner to “convey” the development rights from one parcel of land to another “receiver” parcel of land. This practice allows the conveying parcel to be held as a conservation easement (see below), and the receiving parcel to be developed at a density higher than ordinarily permitted in its base zoning.

3.3.10 Conservation Easements

Conservation easements are, in practice, the transfer of development rights from the farmer to another entity, be it the local jurisdiction or an agricultural protection organization, that allows the land to be farmed and owned by the farmer, but does not allow the land to be developed with urban uses. These transfers may be contractually drafted to indicate terminal durations or may indicate that the easement be held in perpetuity.

3.4 FARMLAND MAPPING AND MONITORING PROGRAM (FMMP)

Categories under the FMMP differ from the farmland and agricultural resource mitigation and regulation strategies discussed above, by virtue of the fact that they are largely determined by their physical/chemical attributes. These factors provide the basis for listing in the FMMP. Farmlands are inventoried under the FMMP at the state level, thus information regarding their locations is readily available. Conversely, the lands protected by the various mitigation and regulation strategies discussed above are more difficult to identify because they are listed and administered locally. Considering this, this report uses only the FMMP inventoried farmlands categories as a basis for estimating Tier 1, program-level potential impact areas. Farmlands and agricultural resources listed under the FMMP include the following.

3.4.1 Prime Farmlands

Prime Farmlands may be described as lands with the best combination of physical and chemical features able to sustain long-term production of agricultural crops. These lands have a soil quality, growing season, and moisture supply needed to produce sustained high yields. Prime Farmlands must have been used for production of irrigated crops at some time during the last four years prior to the mapping date by the FMMP.

3.4.2 Farmland of Statewide Importance

Farmlands of Statewide Importance are similar to Prime Farmlands but with minor differences, such as greater slopes or less ability of the soil to store moisture. Farmlands of Statewide Importance must have been used for production of irrigated crops at some time during the four years prior to the mapping date.

3.4.3 Unique Farmland

Unique Farmlands are of lesser quality soils than Prime Farmlands or Farmlands of Statewide Importance and are used for the production of the state’s leading agricultural crops. These lands are usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Unique Farmlands must have been in crops at some time during the four years prior to the mapping date.

3.4.4 Farmland of Local Importance

Farmlands of Local Importance are farmlands that are important to the local agricultural community as determined by each county’s board of supervisors and local advisory committee.

3.5 COORDINATION WITH THE NATIONAL RESOURCES CONSERVATION SERVICE (NRCS)

The United States Department of Agriculture's Natural Resources Conservation Service (NRCS) oversees the Farmland Protection Policy Act (FPPA). The FPPA (a subtitle of the 1981 Farm Bill) is the national legislation designed to protect farmland. The FPPA states its purpose is to "minimize the extent to which Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses." The projects and programs to which the FPPA would apply are those that are sponsored or financed in whole or in part by the federal government. The FPPA does not apply to private construction projects subject to federal permitting and licensing, projects planned and completed without any assistance from a federal agency, federal projects related to national defense during a national emergency, and projects proposed on land already committed to urban development. The FPPA calls for federal programs to the extent practical to be compatible with state, local and private efforts to protect farmland. Because the proposed High-Speed Train Alternative may seek some federal funding in the future, the FPPA is considered in the analysis.

4.0 POTENTIAL FARMLAND AND AGRICULTURAL RESOURCE IMPACTS

Under the Appendix G of CEQA (2002) a potential farmland and agricultural resource impact would be reviewed using the following criteria:

- Would the project Convert Prime Farmland, Unique Farmland, Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to a non-agricultural use?
- Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?
- Would the project involve other changes in the existing environment which due to their location or nature, could result in conversion of Farmland to non-agricultural use.

NEPA requires farmland to be analyzed for impacts, but does not provide the same level of impact determination criteria as CEQA. Additionally, FRA's Procedures for Considering Environmental Impacts indicate that if farmland conversion is proposed on state or locally owned farmlands, the state or local authorities shall be consulted. The CEQA impact criteria are used to guide review of potential farmland impacts within the following section. As indicated above in Section 1.0 Executive Summary, this report is a Tier 1 program-level document. Based on the magnitude of the high-speed train system and numerous potential alignments, this analysis concentrates on identifying potential impacts to farmlands and agricultural resources at a program level and therefore, only analyzes those farmlands and agricultural resources listed under the FMMP. Locally protected farmlands (i.e. farmlands with special zoning or Williamson Act contracts) would be considered in a subsequent Tier 2 detailed environmental review process.

4.1 NO PROJECT/NO ACTION ALTERNATIVE

4.1.1 No Project/No Action Alternative Improvements

The No Project/No Action Alternative includes actions to be approved, funded and implemented by "others", including state and local agencies (i.e. Caltrans, counties and cities) (see Figure 4.1-1 *No Project/No Action Alternative*). Improvements to the state's air and ground transportation systems identified under the No Project/No Action Alternative are defined to reflect a generic increase in lane or runway size and capacity to meet the intercity travel demand. It is assumed that improvements under the No Project/No Action Alternative have already accounted for the potential impacts to FMMP-listed farmlands and agricultural resources, so they are not included in the impacts analysis in this document.

The No Project/No Action actions are considered as the baseline for comparison with the build alternatives.

4.2 MODAL ALTERNATIVE

4.2.1 Modal Alternative Improvements

Potential farmland and agricultural resource impacts under the Modal Alternative would represent increases over that of the No Project/No Action Alternative. The Modal Alternative would include the approved improvements and/or expansion of existing highways, airports, and rail systems that are included within the No Project/No Action Alternative (see Figure 4.2-1 *Modal Alternative*). The improvements and/or expansions of these facilities are assumed to meet the future travel demand without the high-speed train system as part of the overall system.

4.2.2 Summary of Modal Alternative Potential Impacts

The potential system-wide impacts of the Modal Alternative to FMMP-listed farmlands would be approximately 613 acres of Prime Farmland, 90 acres of Unique Farmland, 242 acres of Farmland of Statewide Importance and 173 acres of potential impact on Farmlands of Local Importance. The total amount of potential farmland and agricultural resource impacts under the Modal Alternative would be approximately 1,118 acres. These amounts would be over the baseline (No Project/No Action Alternative). Compared to the SWLPI and SWGPI of the High-Speed Train Alternative, the Modal Alternative would represent less potential impacts in all FMMP categories, with the exception of affecting an additional 32 acres of Farmlands of Local Importance more than the High Speed Rail Alternative SWLPI.

Figure 4.1-1
No Project/No Action Alternative

Figure 4.2-1
Modal Alternative

4.3 HIGH-SPEED TRAIN ALTERNATIVE

4.3.1 High-Speed Train Alternative Improvements

The High-Speed Train system project would include the development of an approximately 1,127-kilometer (700-mile) long rail system capable of conveying High-Speed Trains at speeds in excess of 322 kilometers (200 miles) per hour (see Figure 4.3-1, *High-Speed Train Alternative*). The High-Speed Train would include a dedicated, fully grade separated track with state-of-the-art safety, signaling, and automated train control systems. The High-Speed Train system would connect and serve the major metropolitan areas located within the San Francisco Bay, Central Valley, Los Angeles, Inland Empire (western portion of Riverside and San Bernardino Counties) and San Diego areas.

4.3.2 High-Speed Train Alternative Configuration Options

As indicated in Section 2.3, the High-Speed Train Alternative has the potential for three configuration options, with respect to placement of the High-Speed Train rail alignments. The potential configuration options include: developing potential alignments within existing rail rights-of-way; developing High-Speed Train rail alignments adjacent to existing rail rights-of-way; and/or constructing new High-Speed Train rail alignments in areas that contain no existing rail facilities. These High-Speed Train alignment options developed within and adjacent to existing rail rights-of-way, and new locations were considered in the GIS analysis for this report. High-Speed Train alignment options developed within existing rail rights-of-way were considered to have no farmland impacts. Adjacent and new alignment locations were analyzed based on the methods shown in Section 3.1.

The locations of High-Speed Train alignment options developed within and adjacent to existing rail rights-of-way, and new High-Speed Train alignment options are shown in: Figure 4.3-2, *High-Speed Train Alternative Rail Locations, Bay Area to Merced Study Region*; Figure 4.3-3A, *High-Speed Train Alternative Rail Locations, Sacramento to Bakersfield Study Region, North*; Figure 4.3-3B, *High-Speed Train Alternative Rail Locations, Sacramento to Bakersfield Study Region, South*; Figure 4.3-4, *High-Speed Train Alternative Rail Locations, Bakersfield to Los Angeles Study Region*; Figure 4.3-5, *High-Speed Train Alternative Rail Locations, Los Angeles to San Diego (LOSSAN) Study Region*; and Figure 4.3-6, *High-Speed Train Alternative Rail Locations, Los Angeles to San Diego Inland Study Region*.

Table 4.3-1, *Relation of Alignment Options to Existing Rights-of-Way*, indicates the amount of High-Speed Train alignment options developed within and adjacent to existing rail rights-of-way, and new alignments in miles per study region.

Table 4.3-1
Relation of Alignment Options to Existing Rights-of-Way
(in miles)

Study Region	Within	Adjacent	On New Alignment	Region Total*
Bay Area to Merced	144	9	313	466
Sacramento To Bakersfield	98	413	246	757
Bakersfield to Los Angeles	27	62	176	265
Los Angeles-Riverside-San Diego	20	160	50	230
Los Angeles-Orange-San Diego (LOSSAN)	180	0	19	199
System-Wide Total	469	644	804	1,917

* Includes all alignment options in each region

The above *system-wide* total includes all potential alignment option combinations that are being considered within this report. It is important to note freight rail rights-of-way are generally at least 100 feet wide, thus there is good potential that rights-of-way may be acquired for development within and adjacent, thereby reducing the potential acquisition impacts to farmland.

**Figure 4.3-1,
High-Speed Train Alternative**

Figure 4.3-2
High-Speed Train Alternative Rail Locations
Bay Area to Merced;

Figure 4.3-3A
High-Speed Train Alternative Rail Locations
Sacramento to Bakersfield, North

Figure 4.3-3B
High-Speed Train Alternative Rail Locations
Sacramento to Bakersfield, South

Figure 4.3-4
High-Speed Train Alternative Rail Locations
Bakersfield to Los Angeles

Figure 4.3-5
High-Speed Train Alternative Rail Locations
Los Angeles to San Diego (LOSSAN)

Figure 4.3-6
High-Speed Train Alternative Rail Locations
Los Angeles to San Diego Inland

4.4 COMPARISON OF ALTERNATIVES PER REGION

The discussion below includes a comparative analysis of the Modal and High-Speed Train Alternatives per study region. The No Project/No Action Alternative, as indicated earlier in this document, is considered as the baseline for the analysis of the Modal and High-Speed Train Alternatives. Based on this, analysis of the No Project/No Action Alternative is not included in the discussion below. The locations of improvements under the Modal Alternative are limited to existing roadway rights-of-way and airport runways. Conversely, the improvement locations under the High-Speed Train Alternative are more variable, in that some alignment options may or may not be developed in certain locations based on the final decision of the Authority and FRA. Thus, the Modal Alternative is discussed in terms of one development scenario per study region and the High-Speed Train Alternative is discussed in two scenarios per study region (“least potential farmland impacts per study region” [LPI] and “greatest potential impacts per study region” [GPI]). These scenarios represent the low and high ends of the range of potential impacts for the High-Speed Train Alternative.

The LPI is derived by identifying the least impact alignments per segment [as shown in the *Total Farmland (acres)* category in the far right column of Tables 4.4-1 through 4.4-5] making sure that the alignments logically connect (through map analysis), and adding the segment alignments together for the study region total. The GPI is derived by a similar process based on the greatest impact alignments per segment. After this step, the LPI and GPI alignment combinations were checked for regional connectivity (the ability to connect with the adjacent segments and study regions).

Within some of the discussions below, alignments that would have *no* farmland or agricultural resource impacts are included in the tabular data and within the discussions of alignments that have impacts, in order to include all impacts as one progresses through the study region from north to south. Additionally, within the discussion of LPI and GPI alignment combinations, some alignments may be included within the both LPI and GPI categories. This is based on the fact that some alignments may be the only alignments along their respective segments.

The potential impacts under the High-Speed Train Alternative are quantified based on the conservative assumption that the High-Speed Train requires 100 feet of right-of-way immediately adjacent to existing corridors. However, the High-Speed Train right-of-way width could be reduced to 50 feet in the areas of impact, thereby reducing the potential level of impact. Moreover, it is possible to fit the entire High-Speed Train line into existing rail corridors given agreements with private rail operators, thus reducing the level of impact to nearly negligible levels.

System-wide, assuming the full right of way width of 100', the High-Speed Train Alternative SWLPI and SWGPI would represent 1,551 and 2,742 acres of potential farmland impact above the Modal Alternative, respectively. The High-Speed Train Alternative LPI and GPI alignment combinations would have potentially higher impacts in all FMMP categories, with the exception of Farmlands of Local Importance under the Modal Alternative, which are higher than the High-Speed Train (LPI). Potential farmland impacts would be the greatest in the Sacramento to Bakersfield study region due to the size of the study region, farmland concentration within and the potential for diagonal severances of farmland parcels. System-wide totals for potential farmland impacts are indicated in Table 1.5-1 and are summarized below.

- **Modal Alternative.** 613 acres of Prime Farmland, 90 acres of Unique Farmland, 242 acres of Farmland of Statewide importance, 173 acres of Farmland of Local Importance and 1,118 total acres.
- **High-Speed Train Alternative (LPI).** 1,514 acres of Prime Farmland, 200 acres of Unique Farmland, 814 acres of Farmland of Statewide importance, 141 acres of Farmland of Local Importance and 2,669 total acres.

- **High-Speed Train Alternative (GPI).** 1,907 acres of Prime Farmland, 545 acres of Unique Farmland, 1,077 acres of Farmland of Statewide importance, 331 acres of Farmland of Local Importance and 3,860 total acres.

4.4.1 Bay Area to Merced Study Region

The Bay Area to Merced study region is the study region with the second highest concentration of farmlands. A comparison between the Modal and High-Speed Train Alternative indicated that the High-Speed Train Alternative (LPI and GPI) would have higher impacts in all FMMP categories. The total FMMP category acreage potentially impacted in this region would be 262 acres (Modal Alternative), 549 (High-Speed Train Alternative [LPI]), and 770 (High-Speed Train Alternative [GPI]), thus indicating that the High-Speed Train Alternative (LPI and GPI) would exceed the potential impact of the Modal Alternative by 287 and 508 acres, respectively.

4.4.1.1 Modal Alternative

Areas along the existing roadways that are able to accommodate the addition of one lane in each direction within the center median were assumed to not generate farmland impacts, based on the fact that they would not require the acquisition and conversion of adjacent agricultural lands. Considering this, the regional number of farmland acres impacted within the Bay Area to Merced Study Region for the Modal Alternative would be: 168 acres of Prime Farmlands, 31 acres of Unique Farmlands, 56 acres of Farmlands of Statewide Importance, and 7 acres of Farmlands of Local Importance. The total amount of Modal Alternative-related farmland affected would be 262 acres for this study region. Figure 4.4-1, *Modal Alternative Improvement Locations, Bay Area to Merced Study Region* indicates the locations of the Modal Alternative Improvements for the study region.

4.4.1.2 High-Speed Train Alternative

Table 4.4-1, *Potential High-Speed Train Farmland Impacts, Bay Area to Merced Study Region* indicates the farmland impacts per FMMP category within the Bay Area to Merced Study Region under the High-Speed Train Alternative. This study region includes potential alignment options that could extend southward from either San Francisco or Oakland to San Jose or Gilroy and on to Merced. Farmland and agricultural resources in this study region are located primarily in the east along the west margin of the Central Valley and secondarily south of San Jose and around Gilroy.

A very sparse amount of farmlands are found in the San Francisco and Oakland urban areas. The Diablo Direct and Pacheco Pass alignment options would connect the Bay area to the Merced area. The Diablo Direct alignment option would have less potential farmland impacts because it would travel through urban and mountainous areas, and would not extend as far east into the Central Valley farmland areas as the Pacheco Pass.

The Pacheco Pass alignment option would be located Gilroy area. Within this area there would exist three alignment options (Inner/Outer and Morgan Hill Pacheco Passes). Farmland impact acreage amounts associated with these express loops/bypasses are included in the analysis results shown on Table 4.4-1 below. The Caltrain/Morgan Hill/Pacheco Pass alignment option would impact an additional 26 acres of farmland than the Caltrain/Gilroy Inner Pacheco Pass alignment option. This is mainly due to the Caltrain/Gilroy Inner Pacheco Pass being closer to suburban areas with fewer agricultural uses than the more agriculturally based areas of the Caltrain/Morgan Hill/Pacheco Pass.

**Figure 4.4-1:
Modal Alternative Improvement Locations,
Bay Area to Merced Study Region**

Within this study region the LPI alignment combination would utilize the Caltrain alignment from San Francisco to San Jose and the Diablo Range Direct Route 130 alignment from San Jose to Merced potentially impacting 549 acres of total farmland. All of the 549 acres impacted would be located in the western part of the central valley at the east end of this alignment. The GPI alignment combination would utilize the Hayward/I-880 alignment from Oakland to San Jose and the Caltrain/Gilroy Outer Pacheco Pass alignment from San Jose to Merced. This alignment combination would impact 770 acres of total farmland (approximately 221 acres more impact than the LPI alignment combination). Approximately 629 of the 770 acres impacted would be attributable to the farmlands located in the western part of the central valley at the east end of this alignment.

Figure 4.4-2, *LPI and GPI Alignment Combinations, Bay Area to Merced Study Region* indicates the locations of the LPI and GPI alignment combinations for the study region. Based on the above, the total farmland acreage impacts for the High-Speed Train Alternative LPI and GPI for the Bay Area to Merced study region would exceed the Modal Alternative total farmland impacts by 286 and 508 acres, respectively.

**TABLE 4.4-1
POTENTIAL FARMLAND IMPACTS, BAY AREA TO MERCED STUDY REGION**

Segment	Alignment	Prime Farmland (acres)	Unique Farmland (acres)	Statewide Importance (acres)	Local Importance (acres)	Total Farmland (acres)
San Francisco to San Jose	Caltrain	0	0	0	0	0
Oakland to San Jose	Hayward/I-880	0	0	0	0	0
	Hayward/ Niles/ Mulford	0	0	0	0	0
San Jose to Merced	Diablo Range Direct Rt. 130 Alignment	244	46	248	11	549
	Diablo Range Direct Minimum Tunnel Alignment	243	50	248	12	553
	Diablo Range Direct Increased Tunnel Alignment	241	50	248	12	551
	Caltrain/Gilroy Inner Pacheco Pass	291	175	208	69	743
	Caltrain/Gilroy Outer Pacheco Pass	305	175	207	83	770
	Caltrain/ Morgan Hill Pacheco Pass	330	175	175	76	756

**Figure 4.4-2:
LPI and GPI Alignment Combinations,
Bay Area to Merced**

4.4.2 Sacramento to Bakersfield Study Region

The Central Valley region of California represents the most active agricultural region in the United States. Considering this, the potential improvements to highways, airports, new High-Speed Train alignments and stations in the Sacramento to Bakersfield Study Region would generate the greatest amount of farmland and agricultural resource impacts out of all of the study regions analyzed. A comparison between the Modal and High-Speed Train Alternative indicated that the High-Speed Train Alternative (LPI and GPI) would have higher impacts in all FMMP categories. The total FMMP category acreage potentially impacted in this region would be 609 acres (Modal Alternative), 2,096 (High-Speed Train Alternative [LPI]), and 3,002 (High-Speed Train Alternative [GPI]), thus indicating that the High-Speed Train Alternative (LPI and GPI) would exceed the potential impact of the Modal Alternative by 1,487 and 2,393 acres, respectively.

4.4.2.1 Modal Alternative

Similar to the Bay Area to Merced Study Region, areas along the existing roadways that are able to accommodate the addition of one lane each way within the center median were assumed not to generate farmland impacts, based on the fact that they would not require the acquisition and conversion of adjacent agricultural lands. Considering this, the regional number of farmland acres impacted by roadway right-of-way acquisition within the Sacramento to Bakersfield

Study Region for the Modal Alternative would be: 287 acres of Prime Farmlands, 43 acres of Unique Farmlands, 124 acres of Farmlands of Statewide Importance and 48 acres of Farmlands of Local Importance. The total amount of Modal Alternative roadway-related farmland impacts would be 502 acres. Airport related improvements under this alternative would include the lengthening of runways 1 and 2 and the addition of a third runway at the Sacramento International Airport. These improvements would impact: 36 acres of Prime Farmlands, 11 acres of Unique Farmlands, 57 acres of Farmlands of Statewide Importance and 3 acres of Farmlands of Local Importance. The total amount of Modal Alternative airport-related farmland impacts would be 107 acres.

Collectively, the Modal Alternative improvements would impact: 323 acres of Prime Farmlands, 54 acres of Unique Farmlands, 181 acres of Farmlands of Statewide Importance and 51 acres of Farmlands of Local Importance. The total amount of Modal Alternative-related farmland impacts within the Sacramento to Bakersfield Study Region would be 609 acres. Figure 4.4-3A, *Modal Alternative Improvement Locations, Sacramento to Bakersfield Study Region, North Portion* and Figure 4.4-3B, *Modal Alternative Improvement Locations, Sacramento to Bakersfield Study Region, South Portion* indicate the locations of the Modal Alternative Improvements for the study region.

4.4.2.2 High-Speed Train Alternative

As indicated in Sections 3.2.2 and 4.3.2, High-Speed Train potential alignments in the Sacramento to Bakersfield study region are generally assumed to be developed adjacent to existing UP or BNSF rail rights of way. However, there are some segments where the alignment options that are assumed to be within existing rights-of-way (CCT from Sacramento to Stockton). The GIS analyses included herein have accounted for these alignment areas. Some alignment options within the Sacramento to Bakersfield study region, particularly the express loops/bypasses and connections between existing corridors will require new alignments apart from existing corridors. New alignment areas are indicated on Figures 4.3-3A and 4.3-3B. Also, as indicated in Section 3.1.2, the analysis contained herein is based on the potential amount of farmlands that would be converted to rail-serving uses within each study region. Along with farmland *conversion*, farmland *severance* may be an important issue.

Figure 4.4-3A:
Modal Alternative Improvements,
Sacramento to Bakersfield Study Region, North Portion

Figure 4.4-3B:

**Modal Alternative Improvements,
Sacramento to Bakersfield Study Region, South Portion**

While the precise amount of farmlands potentially severed by the High-Speed Train alignment options cannot be ascertained at this level of study, the High-Speed Train alignment options on new alignments traversing farmland areas would clearly sever the vast majority of parcels traversed due to the curving nature of the alignments⁸. The alignment options on new corridors identified above would sever existing farmlands. The area of greatest concern would be Stockton, followed by Fresno and the north portion of Bakersfield. Although the Merced area would include the potential for alignments on new corridors, they would not be in farmland areas.

Additionally, as indicated above, the Sacramento to Bakersfield Study Region has several express loops/bypasses under consideration. An example of an express loop/bypass is shown on Figure 4.4-4, *Fresno Express Loop/Bypass*. Express loops/bypasses are intended to circumvent the more congested urban areas to reduce costs and potential urban impacts such as noise. Considering this, they are generally routed through the agricultural areas surrounding the urban areas, thereby generating greater farmland impacts.

As shown below, in Table 4.4-2, *Potential Farmland Impacts: Loops/Bypasses vs. Mainlines Bypassed*, seven out of the eight loops/bypasses within the study region would have higher potential farmland impacts than the mainline alignments that they would bypass. The only exception to this, the Hanford Station loop/bypass, would have less potential farmland impacts because it would travel through Hanford's urban area. Although loops/bypasses are shown separately in Table 4.4-2, some areas may require the development of a loop/bypass *and* mainline alignment. Such instances have been accounted for in this report's LPI and GPI alignment combinations analysis, and are shown below in Table 4.4-3, *Potential Farmland Impacts, Sacramento to Bakersfield Study Region*. Express loops/bypasses not included in the LPI and GPI Alignment combinations will be discussed separately at the end of this section.

TABLE 4.4-2

POTENTIAL FARMLAND IMPACTS: LOOPS/BYPASSES VS. MAINLINES BYPASSED

Alignment	Loop/Bypass	Prime Farmland (acres)	Unique Farmland (acres)	Statewide Import. (acres)	Local Import. (acres)	Total Farmland (acres)	Difference Using Loop/Bypass (acres)
Stockton to Modesto	Modesto loop/bypass	141	0	0	0	141	+92
	Mainline Bypassed	49	0	0	0	49	
Modesto to Merced	Atwater Station loop/bypass	79	0	2	3	84	+7
	Mainline Bypassed	52	0	2	23	77	
	Merced loop/bypass (BNSF)	45	9	72	5	131	+65
	Mainline Bypassed	35	1	23	7	66	
	Merced loop/bypass (UP)	40	10	72	5	127	+50
	Mainline Bypassed	48	3	20	6	77	
Merced to Fresno	Fresno loop/bypass (BNSF)	149	76	63	5	293	+159
	Mainline Bypassed	70	23	32	9	134	
	Fresno loop/bypass (UP)	131	44	42	7	224	+209
	Mainline Bypassed	3	0	11	1	15	
Fresno to Tulare	Hanford Station loop/bypass	46	0	15	0	61	-26
	Mainline Bypassed	74	0	13	0	87	
Tulare to Bakersfield	Tulare loop/bypass	103	3	12	1	119	+44
	Mainline Bypassed	60	2	13	0	75	

⁸ Severance issues are of particular concern in the Sacramento to Bakersfield Study Region due to the High-Speed Train Alternative traveling primarily north-northwest to south-southeast, thereby diagonally severing a number of north-south oriented farmland parcels.

**Figure 4.4-4,
Fresno Express Loop/Bypass**

Based upon GIS analysis, it is evident that agricultural lands potentially impacted by the alignment options adjacent to the UP corridor are consistently fewer than those of the BNSF corridor. In order to understand the reason for this difference, map and aerial photograph review was performed. Based on observations made from the map and aerial photograph review, the UP corridor runs parallel to State Route 99. Much of the urban growth in the last 50 years in the Central Valley appears to have been around State Route 99⁹. Considering this, the nearby UP corridor would correspondingly be within urban areas, thereby indicating less agricultural severances or conversions. Correspondingly, potential High-Speed Train Alternative-related alignments adjacent to, or sharing these corridors would generate similar impacts.

The Sacramento to Bakersfield Study Region is shown in Figures 4.4-5A, *LPI and GPI Alignment Combinations, Sacramento to Bakersfield, North Portion*, and Figure 4.4-5B, *LPI and GPI Alignment Combinations, Sacramento to Bakersfield, South Portion*. Table 4.4-3, *Potential Farmland Impacts, Sacramento to Bakersfield Study Region* indicates the potential farmland impacts per FMMP category within the Sacramento to Bakersfield Study Region and includes all potential alignments *and express loop/bypass* combinations for the region.

As indicate earlier within this discussion, the LPI and GPI alignments are thus identified primarily by their quantified level of impact and secondarily by their ability to connect to the next successive alignment traveling south. Within the following discussion, those LPI or GPI alignments that are identified for any reason other than quantified impacts are thus noted. As indicated in Table 4.4-3, the LPI alignment combination would be as follows:

- Sacramento to Stockton using the BNSF Mainline to UP Mainline (Including BNSF Stockton bypass)
- Stockton to Modesto using the UP mainline
- Modesto to Merced using the UP mainline
- Merced to Fresno using the UP mainline (Including Fresno bypass)
- Fresno to Tulare using the UP mainline
- Tulare to Bakersfield using the UP mainline
- Bakersfield Station to I-5 (to Los Angeles) using the Bakersfield Station to SR-58 Connector

⁹ Based on the Caltrans District 6 Fact Sheet on State Route 99 found at: <http://www.dot.ca.gov/dist6/factsheets/sr99transinvestment.pdf>

Figure 4.4-5A:

**GPI and LPI Alignment Combinations,
Sacramento to Bakersfield Study Region,
North Portion**

Figure 4.4-5B:

**GPI and LPI Alignment Combinations,
Sacramento to Bakersfield Study Region,
South Portion**

Although the BNSF Mainline to Hanford Station express loop/bypass alignment from the Tulare to Bakersfield segment is shown on Table 4.4-3 to have fewer farmland impacts than the UP Mainline alignment, the UP Mainline alignment was selected as part of the above LPI alignment combination because it connects to the LPI alignments above and below itself. Although either of the Bakersfield Station to I-5 via Union Connector alignment and Bakersfield Station to I-5 via Wheeler Ridge alignment from the Bakersfield Station to I-5 alignment (also shown with asterisk) are shown on Table 4.4-3 to have fewer farmland acres of impact than the Bakersfield Station to SR-58 Connector alignment. The Bakersfield Station to SR-58 Connector alignment was selected because it connects to the LPI alignment to the south. Utilizing the alignment combinations indicated above, the total amount of farmland impacted would be 2,096 acres.

The GPI alignment combination would be as follows:

- Sacramento to Stockton using the UP to BNSF Mainline (Including the UP/SP Stockton Station loop/bypass)
- Stockton to Modesto using the BNSF mainline
- Modesto to Merced using the BNSF mainline to Atwater Station express loop/bypass to BNSF Merced bypass
- Merced to Fresno using the BNSF mainline to BNSF Fresno bypass (Including the BNSF Fresno bypass)
- Fresno to Tulare using the BNSF mainline (Including the Hanford Station loop/bypass)
- Tulare to Bakersfield using the BNSF mainline
- Bakersfield Station to I-5 (to Los Angeles) using the Bakersfield Station to I-5 via Wheeler Ridge

Although the UP Mainline to Modesto Express loop/bypass alignment from the Stockton to Modesto is shown on Table 4.4-3 to have greater farmland impacts than the BNSF Mainline alignment, it was not selected as part of the above GPI alignment combination because it is part of the LPI alignment and does not connect with the GPI alignment to the south. Utilizing the alignment combinations indicated above, the total amount of farmland impacted would be 3,002 acres.

The comparison between the LPI and GPI alignment combinations for this region indicates that the GPI alignment combination would generate 906 more acres of impact than the LPI alignment combination. However, this number only indicates the range in acreage impacts between the High-Speed Train Alternative's "best" and "worst" conditions. Based on the above, the total farmland acreage impacts for the High-Speed Train Alternative LPI and GPI for the Sacramento to Bakersfield Study Region would exceed the Modal Alternative total farmland impacts by 1,487 and 2,393 acres, respectively.

The GPI alignment combination for this study region runs primarily through agricultural lands that include all of the FMMP-listed farmlands. The LPI alignment combination runs primarily through the urbanized areas of southern Sacramento, downtown Stockton and downtown Modesto. Although the LPI alignment combination runs primarily through urban areas, it also would traverse portions of lands designated as Prime Farmland. However, the amount of Prime Farmland traversed or severed by the LPI alignment combination (2,096 acres) would be less than that of the GPI alignment combination (3,002 acres).

**TABLE 4.4-3
POTENTIAL FARMLAND IMPACTS, SACRAMENTO TO BAKERSFIELD STUDY REGION**

Segment	Alignment	Prime Farmland (acres)	Unique Farmland (acres)	Statewide Importance (acres)	Local Importance (acres)	Total Farmland (acres)
Sacramento to Stockton	UP ¹ Mainline (Including BNSF Stockton loop/bypass)	276	12	236	64	588
	BNSF Mainline (Including UP/SP Stockton Station loop/bypass)	232	2	203	23	460
	BNSF Mainline to UP Mainline (Including BNSF Stockton loop/bypass)	199	2	209	39	449
	UP Mainline to BNSF Mainline (Including UP/SP Stockton Station loop/bypass)	309	12	230	48	599
Stockton to Modesto	BNSF Mainline	37	55	28	38	158
	UP Mainline	72	0	13	2	87
	UP Mainline to Modesto express loop/bypass ²	163	0	13	2	178
Modesto to Merced	BNSF Mainline	211	6	57	80	354
	BNSF Mainline to Atwater Station express loop/bypass	238	6	57	60	361
	BNSF Mainline to Merced loop/bypass	222	14	106	77	419
	BNSF Mainline to Atwater Station express loop/bypass to BNSF Merced loop/bypass	248	14	106	57	425
	UP Mainline	132	7	74	6	219
	UP Mainline to UP Merced Bypass	124	13	127	5	269
	UP Mainline to BNSF Merced loop/bypass	127	12	138	5	282
Merced to Fresno	BNSF Mainline (Including BNSF Fresno loop/bypass)	349	220	108	83	760
	BNSF Mainline to UP Mainline (Including Fresno loop/bypass)	260	211	100	85	656
	UP Mainline to BNSF Mainline (Including Fresno loop/bypass) ³	211	131	122	40	504
	UP Mainline (Including Fresno loop/bypass)	300	140	130	38	608
Fresno to Tulare	BNSF Mainline (Including Hanford Station loop/bypass)	276	31	53	3	363
	UP Mainline	105	2	98	24	229

TABLE 4.4-3 (CONTINUED)

Segment	Alignment	Prime Farmland (acres)	Unique Farmland (acres)	Statewide Importance (acres)	Local Importance (acres)	Total Farmland (acres)
Tulare to Bakersfield	BNSF Mainline	313	38	343	3	697
	UP Mainline	428	3	42	4	477
	UP Mainline to Tulare loop/bypass	472	4	41	6	523
	UP Mainline to BNSF Mainline	448	3	42	4	497
	UP Mainline to Tulare loop/bypass to BNSF Mainline	491	4	41	6	542
	BNSF to UP ⁴	346	38	343	3	730
Bakersfield to I-5	Bakersfield Station to I-5 Via Union Connector ³	0	0	0	0	0
	Bakersfield Station to I-5 Via Wheeler Ridge ³	0	0	0	0	0
	Bakersfield Station to SR-58 Connector ²	27	0	0	0	27

1. The abbreviation UP refers to the UP corridor in this table and the following tables.
2. Although the Alignment represents the most potential farmland acreage impacts for the segment, it does not connect to the next successive GPI alignment and would disrupt the SWGPI alignment combination, therefore it is not included in this study region's GPI alignment combination.
3. Although the Alignment represents the least potential farmland acreage impacts for the segment, it does not connect to the next successive LPI alignment and would disrupt the SWLPI alignment combination, therefore it is not included in this study region's LPI alignment combination.
4. In general the GPI follows the BNSF corridor from Fresno to Bakersfield, this small segment is has slightly more potential impact due to the length of the connection over agricultural land.

Within the LPI and GPI alignment combinations analysis for this region, the Modesto express loop/bypass and the Tulare bypass become isolated. Potential farmland and agricultural resource impacts related to these are indicated below:

- **Modesto Loop/Bypass (Shown in Figure 4.4-5A as a dashed line immediately south of Modesto).** As shown in Table 4.4-2, the Modesto loop/bypass would have 141 acres of impact to Prime Farmlands, with no other FMMP listed farmlands affected. Comparatively, the more urban located mainline alignment that the Modesto loop/bypass would circumvent would have 49 acres of impact to Prime Farmlands, also with no other FMMP listed farmlands affected. Although the Modesto loop/bypass is located along the study region's LPI alignment combination route, it is not included within the LPI alignment combination because of the additional 92 acres of potential farmland impact associated with it. Additionally, the Modesto loop/bypass is not located along the study region's GPI alignment route.

- Tulare Loop/Bypass (Shown in Figure 4.4-5A as a dashed line immediately south of Visalia).** Also shown in Table 4.4-2, the Tulare loop/bypass would have 103 acres of impact to Prime Farmlands, 3 acres of impact to Unique Farmlands, 12 acres of impact to Farmlands of Statewide Importance, and 1 acre of impact to Farmlands of Local Importance. Comparatively, the more urban located mainline alignment that the Tulare loop/bypass would circumvent would have 60 acres of impact to Prime Farmlands, 2 acres of impact to Unique Farmlands, and 13 acres of impact to Farmlands of Statewide Importance, with no impacts to Farmlands of Local Importance. Similar to the Modesto loop/bypass, the Tulare loop/bypass is located along the study region's LPI alignment combination route, and is not included within the LPI alignment combination because of the additional 44 acres of potential farmland impact associated with it. Additionally, the Tulare loop/bypass is not located along the study region's GPI alignment route.

4.4.3 Bakersfield to Los Angeles Study Region

The Bakersfield to Los Angeles Study Region represents the transition from agricultural areas to urbanized areas. A comparison between the Modal and High-Speed Train Alternative indicated that the High-Speed Train Alternative (GPI) would have the highest potential impacts in all FMMP categories (63 acres), the Modal Alternative and the High-Speed Train Alternative (LPI) would have a similar level of impact (2 acres and 0 acres), respectively.

4.4.3.1 Modal Alternative

The portions of the existing roadways that are able to accommodate the addition of one lane in each direction within the center median were assumed not to generate farmland impacts. Considering this, the regional amount of farmland impacted within the Bakersfield to Los Angeles Study Region for the Modal Alternative would be: 1 acre of Prime Farmlands, 0 acres of Unique Farmlands, 1 acre of Farmlands of Statewide Importance, and 0 acres of Farmlands of Local Importance. The total amount of Modal Alternative-related farmland impacts would be 2 acres for this study region. Figure 4.4-6, *Modal Alternative Improvement Locations, Bakersfield to Los Angeles Study Region* indicates the locations of the Modal Alternative Improvements for the study region.

4.4.3.2 High-Speed Train Alternative

The FMMP database indicates that land uses along the Sylmar to Los Angeles alignment are all considered urban. The farmland and agricultural resource impacts per alignment are shown below in Table 4.4-4, *Potential Farmland Impacts Bakersfield to Los Angeles Study Region*.

**TABLE 4.4-4
POTENTIAL FARMLAND IMPACTS, BAKERSFIELD TO LOS ANGELES STUDY REGION**

Segment	Alignment	Prime Farmland (acres)	Unique Farmland (acres)	Statewide Importance (acres)	Local Importance (acres)	Total Farmland (acres)
Bakersfield to Sylmar	Union Avenue to Interstate 5 (I-5)	19	0	1	0	20
	Wheeler Ridge to I-5	62	0	1	0	63
	SR-58/Soledad Canyon	0	0	0	0	0
Sylmar to Los Angeles	Metrolink/UP	0	0	0	0	0
	Combined I-5/UP	0	0	0	0	0

Most of the farmland and agricultural resources are south and east of the outskirts of Bakersfield. However, virtually no FMMP-category farmlands are encountered throughout the region. The Union Avenue and Wheeler Ridge alignment options traverse these resources and thus have the greatest potential impacts. According to Table 4.4-4, the LPI alignment combination would be the SR-58/Soledad Canyon alignment along the Bakersfield to Sylmar segment, and either the Metrolink/UP or Combined I-5/UP portion along the Sylmar to Los Angeles segment. Utilizing this alignment combination, no farmland impacts would occur. The GPI alignment combination would be the Wheeler Ridge to I-5 alignment along the Bakersfield to Sylmar segment, and either the Metrolink/UP or Combined I-5/UP portions along the Sylmar to Los Angeles segment. Utilizing this alignment combination, impacts to 63 acres of farmland would occur. Figure 4.4-7, *LPI and GPI Alignment Combinations, Bakersfield to Los Angeles Study Region*, shows the above discussed alignment combinations.

4.4.4 Los Angeles to San Diego (LOSSAN) Coastal Study Region

The Los Angeles to San Diego (LOSSAN) Study Region includes very limited farmland areas located between Santa Ana and Irvine and near Oceanside. A comparison between the Modal and High-Speed Train Alternative indicates that the High-Speed Train Alternative (LPI and GPI) would have fewer potential impacts in all FMMP categories than the Modal Alternative. The total FMMP category acreage potentially impacted in this region would be 28 acres (Modal Alternative), 0 (High-Speed Train Alternative [LPI]), and 0 (High-Speed Train Alternative [GPI]), thus indicating that the Modal Alternative would exceed the potential impact of the High-Speed Train Alternative (LPI and GPI) by 28 acres.

4.4.4.1 Modal Alternative

FMMP-listed agricultural land within the Los Angeles to San Diego (LOSSAN) Coastal Study Region is very sparse and is located between Santa Ana and Irvine and around Oceanside. The farmland between Santa Ana and Irvine is comprised primarily of Prime Farmland with a lesser amount of Unique Farmland. The farmland around Oceanside is comprised entirely of Farmlands of Local Importance. Under the Modal Alternative one northbound and one southbound lane would be added to Interstate 5. However, within this study region Interstate 5 does not have the capability of adding lanes to the center median due to the lack of width. Considering this, additional right-of-way would need to be acquired to develop the outside lanes. The regional amount of farmland impacts within the LOSSAN Study Region for the Modal Alternative would include: 15 acres of Prime Farmlands, 4 acres of Unique Farmlands, 1 acre of Farmlands of Statewide Importance and 8 acres of Farmlands of Local Importance. The total amount of Modal Alternative-related farmland impacts would be 28 acres for this study region. Figure 4.4-8, *Modal Alternative Improvement Locations, Los Angeles to San Diego (LOSSAN) Study Region* indicates the locations of the Modal Alternative Improvements for the study region.

4.4.4.2 High-Speed Train Alternative

The Los Angeles to San Diego (LOSSAN) Coastal Study Region runs primarily along the Southern California coastal areas through Los Angeles, Orange and San Diego Counties. This study region includes alignment options from the central Los Angeles to (LAX), and from the central Los Angeles area to San Diego. Alignment options throughout this study region are being considered for electric (High-Speed Train) and non-electric (conventional trains). The existing UP Santa Ana Branch would be a High-Speed Train alignment option. The existing LOSSAN alignment from Los Angeles to Irvine is being considered for shared High-Speed Train and conventional passenger train service or just conventional passenger train service. South of Irvine is being considered for non-electric conventional train service only. The High-Speed Train alignment options that would be developed within the existing LOSSAN corridor right-of-way would only require bypasses to be developed. However, they impact no farmland resources. Considering that the High-Speed Train alignment options would be developed within the existing LOSSAN corridor and would not generate bypass-related farmland impacts, no farmland impacts would occur within this study region. The Los Angeles to San Diego (LOSSAN) Coastal Study Region alignment is shown in Figure 4.4-9, *Alignment Options Los Angeles to San Diego (LOSSAN) Study Region*.

**Figure 4.4-6:
Modal Alternative Improvements,
Bakersfield to Los Angeles Study Region**

4.4-7:

**LPI and GPI Alignment Combinations,
Bakersfield to Los Angeles Study Region**

Figure 4.4-8:
Modal Alternative Improvements,
Los Angeles to San Diego Coastal (LOSSAN) Study Region

Figure 4.4-9:

**LPI and GPI Alignment Combinations,
Los Angeles to San Diego Coastal (LOSSAN) Study Region**

4.4.5 Los Angeles to San Diego Inland Study Region

The Los Angeles to San Diego Inland Study Region includes farmland areas located mainly along Interstate 15 between Riverside and south of Escondido. A comparison between the Modal and High-Speed Train Alternative indicates that the High-Speed Train Alternative (LPI and GPI) would have fewer potential impacts in all FMMP categories than the Modal Alternative. The total FMMP category acreage potentially impacted in this region would be 217 acres (Modal Alternative), 24 (High-Speed Train Alternative [LPI]), and 25 (High-Speed Train Alternative [GPI]), thus indicating that the Modal Alternative would exceed the potential impact of the High-Speed Train Alternative (LPI and GPI) by 193 and 192 acres, respectively.

4.4.5.1 Modal Alternative

As discussed in Section 3.2.5, Interstates 15 and 215 do not offer the potential to add lanes to their center medians, thus additional right-of-way would be required. Considering this, the regional amount of farmland impacted by roadway right-of-way acquisition within the Los Angeles to San Diego Inland Study Region for the Modal Alternative would be: 25 acres of Prime Farmlands, 1 acre of Unique Farmlands, 3 acres of Farmlands of Statewide Importance, and 107 acres of Farmlands of Local Importance. The total amount of Modal Alternative roadway-related farmland impacts would be 136 acres.

Airport related improvements under this alternative would include the addition of a third runway at the Ontario International Airport. This improvement would impact: 81 acres of Prime Farmlands, 0 acres of Unique Farmlands, 0 acres of Farmlands of Statewide Importance and 0 acres of Farmlands of Local Importance. The total amount of Modal Alternative airport-related farmland impacts would be 81 acres.

Collectively, the Modal Alternative improvements would impact: 106 acres of Prime Farmlands, 1 acre of Unique Farmlands, 3 acres of Farmlands of Statewide Importance and 107 acres of Farmlands of Local Importance. The total amount of Modal Alternative-related farmland impacts within the Los Angeles to San Diego Inland Study Region would be 217 acres. Figure 4.4-10, *Modal Alternative Improvement Locations, Los Angeles to San Diego Inland Study Region* indicates the locations of the Modal Alternative Improvements for the study region.

4.4.5.2 High-Speed Train Alternative

Compared to the LOSSAN alignments, the Los Angeles to San Diego Inland Study Region represents a greater potential for farmland and agricultural resource impacts. Potential alignments would travel eastward out of Los Angeles to San Bernardino and would then continue south from San Bernardino to San Diego. Most of the study region's farmland and agricultural resource areas are located between Lake Elsinore and Escondido. Potential express loops/bypasses within this study region would not generate impacts to farmlands or agricultural resources. Table 4.4.5, *Potential Farmland Impacts, Los Angeles to San Diego Inland Study Region*, indicates the number of farmland acres that would be impacted by the development of the various alignments within the study region.

Figure 4.4-10
Modal Alternative Improvement Locations
Los Angeles to San Diego
Inland Study Region

**TABLE 4.4-5
POTENTIAL FARMLAND IMPACTS
LOS ANGELES TO SAN DIEGO INLAND STUDY REGION**

Segment	Alignment	Prime Farmland (acres)	Unique Farmland (acres)	Statewide Importance (acres)	Local Importance (acres)	Total Farmland (acres)
Los Angeles to March Air Force Base	UP Colton Line	7	0	0	4	11
	UP Riverside-UP Colton Line	7	0	0	4	11
	UP Colton Line to San Bernardino	8	0	1	3	12
March Air Force Base to Mira Mesa	San Jacinto to I-15	0	0	0	13	13
Mira Mesa to San Diego	I-15 to Coast via Miramar Road	0	0	0	0	0
	I-15 to Coast via Carroll Canyon	0	0	0	0	0
	I-15 to Qualcomm Stadium	0	0	0	0	0

Within this study region the difference between the LPI alignment combination and the GPI alignment combination would be only one acre. The LPI alignment combination through the Los Angeles to San Diego Inland Study Region would be:

- The UP Colton Line alignment or UP Riverside-UP Colton Line alignment from the Los Angeles to March Air Force Base segment to
- The San Jacinto to I-15 alignment from the March Air Force Base to Mira Mesa segment to
- Any of the alignments in the Mira Mesa to San Diego segment

This LPI alignment combination would result in 24 acres of total farmland impacts. The GPI alignment combination through the Los Angeles to San Diego Inland Study Region would be:

- The UP Colton Line to San Bernardino alignment from the Los Angeles to March Air Force Base segment to
- The San Jacinto to I-15 Alignment from the March Air Force Base to Mira Mesa segment to
- Any of the alignments in the Mira Mesa to San Diego segment

This GPI alignment combination would result in 25 acres of total farmland impacts, shown in Figure 4.4-11, *LPI and GPI Alignment Combinations, Los Angeles to San Diego Inland Study Region*.

Figure 4.4-11
LPI and GPI Alignment Combinations,
Los Angeles to San Diego Inland Study Region

4.4.6 Worst Case System-Wide Alignment Combinations

Based on the above analysis, the SWGPI would represent the “worst case” system-wide alignment combination. The SWGPI would result from implementing alignments with a high number of express loops/bypasses and connectors in areas that include high amounts of FMMP-listed farmlands. As also indicated, the greatest amount of system-wide potential farmland impacts would occur in the Central Valley region between Sacramento and Bakersfield. The SWGPI would result in 3,860 acres of potential impacts to FMMP-listed farmlands. Compared to the Modal Alternative, the High-Speed Train Alternative's worst case system-wide alignment combination would result in 2,425 additional acres of potential impact. The SWLPI and SWGPI are shown in Figures 4.4-12A *SWLPI and SWGPI Alignment Combinations, North Portion of State* and 4.4-12B, *SWLPI and SWGPI Alignment Combinations, South Portion of State*.

4.4.7 Farmland Conversion Impact Rating

To rate the relative impact of projects on lands subject to the FPPA, federal agencies fill out a Farmland Conversion Impact Rating form (Form AD-1006). The rating form is based on the Land Evaluation and Site Assessment System (LESA). LESA is a numerical system that measures the quality of farmland based on the results of land evaluation and site assessment. Lands receiving a combined score of less than 160 do not require further evaluation. The AD-1006 form will be completed as appropriate during the Tier 2 detailed environmental review process.

4.5 CUMULATIVE IMPACTS

Cumulative impacts discussion will be provided under separate cover along with the growth analysis. This discussion will qualitatively analyze farmland and agricultural resource impacts as related to projects already approved under the No Project/No Action Alternative, and those included within the forthcoming Land Use and Growth reports.

**Figure 4.4-12A:
SWGPI and SWLPI Alignment Locations,
Northern Portion of State**

**Figure 4.4-12B:
SWGPI and SWLPI Alignment Locations,
Southern Portion of State**

5.0 SUBSEQUENT ANALYSIS REQUIREMENTS

5.1. SUBSEQUENT ANALYSIS REQUIRED

This document is a program-level document, with the general assumption that it would be utilized primarily as an aid in decision-making with respect to the comparison of system-wide alternatives and alignment options. Subsequent analysis would be required of localized impacts to the FMMP-listed farmlands, as well as analysis of Williamson Act contract farmlands and farmlands that are protected locally in the project-level detailed environmental review process. Additionally, more detailed and refined engineering information will be necessary to perform the project-level detailed environmental review analysis.

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GIS Data

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Rail system alignments data provided by: Parsons Brinckerhoff

Graphic Imagery

LANDSAT Imagery 2003

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Telephone Interview

Ms. Sharon Powers, Market Information Analyst for the National Agricultural Statistics Service, *RE: 1997 and 2002 Census of Agriculture by the United States Department of Agriculture.*

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