California High-Speed Rail Authority

San Jose to Merced Project Section

Draft
Checkpoint B Summary Report
Addendum

August 2017

CALIFORNIA High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

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Figures

ACRONYMS AND ABBREVIATIONS

AA	Alternatives Analysis
ACS	American Community Survey
Authority	California High-Speed Rail Authority
BFE	Base flood elevations
BART	Bay Area Rapid Transit
Bay Area	San Jose in the San Francisco Bay Area
C.F.R.	Code of Federal Regulations
Caltrans	California Department of Transportation
CCED	California Conservation Easement Database
CDFW	California Department of Fish and Wildlife
CEMOF	centralized equipment maintenance and operations facility
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
C.F.R.	Code of Federal Regulations
CHP	California Highway Patrol
CHRI	California Historic Resource Inventory
CP	control point
CPAD	California Protected Areas Database
CVY	Central Valley Wye
CWA	Clean Water Act
DOT	U.S. Department of Transportation
DWR	Department of Water Resources
EIR	environmental impact report
EIS	environmental impact statement
FAQ	frequently asked questions
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FGDC	Federal Geographic Data Committee
FHZ	Flood Hazard Zone
FIRM	Flood Insurance Rate Maps
FMMP	Farmland Mapping and Monitoring Program
FRA	Federal Railroad Administration
GIS	Geographic Information System
GEA	Grasslands Ecological Area
HSR	high-speed rail

HUC	Hydrologic Unit Code
I	Interstate
LAFCO	Local Agency Formation Commission
LEDPA	least environmentally damaging practicable alternative
LMF	Light maintenance facility
MOA	Memorandum of Agreement
MOE	Maintenance of equipment
MOI	Maintenance of infrastructure
MOIS	Maintenance of infrastructure siding
MOU	Memorandum of Understanding
mph	miles per hour
MT	mainline track
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHD	National Hydrology Database
NOI	Notice of Intent
NOP	Notice of Preparation
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
PAA	Preliminary Alternatives Analysis
PG&E	Pacific Gas and Electric Company
PIM	public information meetings
Programmatic EIR/EIS	Final Program Environmental Impact Report/Environmental Impact Statement for the Proposed California High-Speed Train System
Project Section	San Jose to Merced Project Section
SAA	Secondary Alternatives Analysis
SB	(California) Senate Bill
SHPO	State Historic Preservation Officer
SR	State Route
SWRCB	State Water Resources Control Board
TAMC	Transportation Agency for Monterey County
TCS	Train Control Site
TPSS	Traction power substation
TWG	Technical Working Group
UPRR	Union Pacific Railroad
US	U.S. Highway
USACE	United States Army Corps of Engineers

USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VTA	Santa Clara Valley Transportation Authority

1 INTRODUCTION

In August and September of 2014 the U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA) concurred with the 2013 Checkpoint B Summary Report in Support of the San Jose to Merced Project Section 404(b)(1) Analysis and Draft Environmental Impact Report/Environmental Impact Statement (2013 Checkpoint B Summary Report) (Authority and FRA 2013). Subsequently, the Authority has undertaken further screening and refinement of design options within the San Jose to Merced Project Section (Project Section) of the California High-Speed Rail (HSR) System. This addendum documents the basis for changes and refinements to various design options evaluated in the 2012 Checkpoint B Summary Report. It also proposes new design options and withdraws ones previously identified.

The following terms are defined as follows for purposes of this report:

Project Section—Project sectionrefers to the San Jose to Merced project with the station termini.

Project Extents (3)—Project extent refers to the San Jose to Central Valey Wye (CVY), CVY (Carlucci Road to Ranch Road in the north and Avenue 19 in the south), and Merced North (Ranch Road in the south to the Merced Station) extents that collectively form the project section connecting San Jose and Merced.

Project Subsections (5)—Project subsections are the constituent parts of a given project extent. For the San Jose to CVY project extent there are five subsections: San Jose Diridon Station Approach, Monterey Corridor, Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley.

Design Options: Design options are the different alignments/profiles considered within a subsection.

Alternative: Alternatives are the end to end alternatives assembled from design options by subsection for consideration in the EIR/EIS.

This addendum was prepared to reflect changes in the Authority's design criteria, to reflect ongoing community input, and to reduce environmental and community impacts. With respect to design criteria the Authority has identified engineering methods for crossing faults in tunnels. This change affects the Pacheco Pass subsection where the Authority and FRA propose a North Pacheco Pass design option that would make greater use of tunneling and which would cross the Ortigalita Fault in a tunnel. The Authority is proposing changes in the Morgan Hill and Gilroy subsection in response to community concerns. Changes in Morgan Hill and Gilroy and Pacheco Pass subsections reduce impacts on multiple environmental and community resources.

The Authority and FRA propose to withdraw five of the six design options in the Morgan Hill and Gilroy Subsection and two of the design options in the Pacheco Pass Subsection that were previously carried forward in the 2013 Checkpoint B Summary Report. In addition to these design option, the Authority proposes to remove Coyote Valley Options A and B maintenance of equipment (MOE) and maintenance of infrastructure (MOI) facilities because they were associated with the U.S. Highway (US) 101 and West of Coyote Creek Parkway design options , which the Authority and FRA propose to withdraw.

The Authority and FRA propose four new design options for consideration in the EIR/EIS. These design options were developed in response to community input and as a result of additional research along the corridor. One of the options is in the Monterey Corridor, two of are in the Morgan Hill and Gilroy Subsection, and the fourth is in the Pacheco Pass Subsection.

This report is an addendum to the 2013 Checkpoint B Summary Report (Authority and FRA 2013). As an addendum, this document:

- Confirms the reasonable range of alternatives defined in the previous Checkpoint B Summary Report.
- Describes the changes in the design options, including the removal of some prior design options that were considered inferior environmentally, operationally, or both, and the addition of new design options that are operationally feasible and reduce impacts on the environment.
- Provides updated analysis and technical documentation to compare the design options.

As provided by the National Environmental Policy Act (NEPA)/404/408 Integration Process Memorandum of Understanding (MOU), the purpose of this Checkpoint B Summary Report Addendum (Checkpoint B Addendum) is to identify a reasonable range of project alternatives to be evaluated in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Project Section. A further purpose of the Checkpoint B Summary Report is to make certain that the range of project alternatives is likely to contain the Least Environmentally Damaging Practicable Alternative (LEDPA) according to the Clean Water Act (CWA) Section 404 (b)(1) Guidelines (40 Code of Federal Regulations [C.F.R.] § 230), to support the USACE's public interest review process and determination pursuant to 33 C.F.R. Part 320.4(a), and to support the USACE in determining the level of approval required for USACE Section 408 permission.[1]

1.1 Overview of the San Jose to Merced Project Section

The San Jose to Merced Project Section is a component of the statewide HSR system, as shown in Figure 1-1, which will connect the Central Valley to San Jose. It will provide HSR service from San Jose to Merced. Although the Project Section in its entirety is defined as the guideway and associated stations and other facilities that connect San Jose and Merced, the extent from Merced to Carlucci Road has been evaluated through the review process for the Merced to Fresno Project Section and the Central Valley Wye. Accordingly this report analyzes proposed changes in the project extent that ends at Carlucci Road (referred to as San Jose to the CVY in this document).

The project extent between Scott Boulevard and Carlucci Road covers approximately 90 miles of the approximately 145-mile-long San Jose to Merced Project Section, which includes dedicated HSR system infrastructure; station locations at San Jose and Gilroy; a combined maintenance of infrastructure (MOI) and vehicle light maintenance facility (LMF) in the Gilroy area; and an additional MOI siding between Turner Springs Road and Carlucci Road in the Central Valley. There are two options for the locating the transition between the dedicated aerial approach to San Jose Diridon Station and blended service north of the station: either at I-880 in San Jose or at Scott Boulevard in Santa Clara. The project extent is divided into five subsections. Table 1-1 shows the start and endpoints for each of the five subsections that occur within the project extent between Scott Boulevard and Carlucci Road.

The EIR/EIS will focus its analysis on the HSR project extent from Scott Boulevard to Carlucci Road. Although the Project Section is defined as the section of the high-speed rail system that connects San Jose and Merced (Figure 1-2) extents of the Project Section have been analyzed in the *Merced to Fresno Section Final EIR/EIS* (Merced to Fresno Final EIR/EIS) (Authority and FRA 2012) and will be analyzed the *Merced to Fresno Project Section: Central Valley Wye Supplemental EIR/EIS*, which is currently under development. Relevant project information and project-level analysis from the Merced to Fresno Final EIR/EIS and other associated environmental documents will be incorporated into the EIR/EIS as appropriate. This Checkpoint B Addendum focuses only on the project extent between Scott Boulevard and Carlucci Road.

[1] There is only one location where the project section crosses a feature that may be regulated under Section 14 of the Rivers and Harbors Act. The section crosses the upper Guadalupe River in the City of San Jose. The Authority understands that the USACE may construct facilities at this location that would be regulated under 33 US Code Section 408. The Authority is working with USACE to coordinate HSR with future USACE facilities.

Source: Authority and FRA 2016

Figure 1-1 Statewide High-Speed Rail System

Table 1-1 San Jose to CVY Project Extent, Limits of Each Subsection (See Figure 3.1)

Subsection	Northern or Western Limit	Southern or Eastern Limit
San Jose Diridon Station Approach (includes Diridon Station and overlaps southern portion of San Francisco to San Jose HSR Section)	Scott Boulevard (City of San Jose)	West Alma Avenue (City of San Jose)
Monterey Corridor	West Alma Avenue (City of San Jose)	Bernal Way (community of South San Jose, City of San Jose)
Morgan Hill and Gilroy (includes Gilroy Station)	Bernal Way (community of South San Jose, City of San Jose)	Casa de Fruta Parkway (community of Casa de Fruta, Santa Clara County)
Pacheco Pass	Casa de Fruta Parkway (community of Casa de Fruta, Santa Clara County)	Interstate (I)- 5/Santa Nella Boulevard (community of Santa Nella, Merced County)
San Joaquin Valley	I-5/Santa Nella Boulevard (community of Santa Nella, Merced County)	Carlucci Road (unincorporated Merced County)

Source: HNTB 2016

Source: Authority and FRA 2016

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Figure 1-2 Proposed San Jose to Merced Project Section

1.2 Scope of Analysis

Consistent with the MOU, this Checkpoint B Addendum evaluates design options considered for the EIR/EIS: those carried forward in the 2013 Checkpoint B Summary Report and subsequent addenda, those proposed to be removed from the range of alternatives, and the proposed additions (included herein as design options by subsection). Descriptions of these design options elements are provided in Section 3.2.

The San Jose to Central Valley Wye Project Extent is defined from Scott Boulevard to Carlucci Road. The Central Valley Wye Project Extent begins and continues eastward from Carlucci Road, as illustrated in Figure 1-2. The Authority initially analyzed alternatives for both project extents in the 2013 Checkpoint B Summary Report for San Jose to Merced. Due to delays to the San Jose to Merced Project Section, the Authority and FRA decided to evaluate the Central Valley Wye as a supplement to the Merced to Fresno Final EIR/EIS. To advance work on the Central Valley Wye Project Extent, the Authority and FRA submitted two addenda to the September 10, 2013 Supplemental Checkpoint B Summary Report. The second addendum defined and evaluated the range of alternatives solely for the Central Valley Wye Project Extent, which allowed the Central Valley Wye to proceed independently of other project extents within the San Jose to Merced Project Section. The selection of alternatives in the San Jose to Central Valley Wye Project Extent is independent of alternative selection for the Central Valley Wye Project Extent. All alternatives of both project extents have the same project alignment and design at Carlucci Road.

The design options are evaluated based on criteria identified in the MOU. These evaluation criteria include whether the alternatives will be found to satisfy the project Purpose and Need and overall project purpose, the extent to which the alternatives will avoid or minimize environmental impacts, and whether the alternatives will be found to be feasible and practicable. This analysis is based on information available at this conceptual stage of alternatives development, which precedes the evaluation of alternatives under NEPA and the California Environmental Quality Act (CEQA).

The evaluation of each design option's potential impacts on environmental resources is presented in Chapter 4, Aquatic Resources, through Chapter 8, Facilities Regulated Under Section 14 of the Rivers and Harbors Act, of this Checkpoint B Addendum. The evaluations considered impacts on aquatic resources; biological resources; other environmental and community resources including low-income and minority populations; residential and business displacements; important farmland; cultural resources; parks, recreation, and open space resources; Federal Emergency Management Agency (FEMA) flood hazard zones; Section 4(f) resources; and facilities regulated under Section 14 of the Rivers and Harbors Act (Section 408 facilities). Impacts on these resources were assessed by overlaying the conceptual engineering project footprint[2] for each design option (by subsection) with resource-specific data layers in geographic information system (GIS) software.

This analysis used the following resource-specific data layers:

- Aquatic resources data based on the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) database (USFWS 2016a).
- Extent of vernal pool complexes based on the Holland vernal pool complex database (Holland et al. 2014).

[2] *Project footprint* is the area needed to construct, operate, and maintain all permanent HSR features (including tracks and guideway structures, train signaling and controls and communications facilities, traction power distribution and substations, passenger platforms and stations, maintenance facilities, perimeter security controls, passenger station access, HSR facility operation and maintenance access, or other peripheral features owned and maintained by the Authority); roadway modifications; new or relocated utility features; access to new or relocated utility features; drainage facilities; any other physical changes within the area needed to construct and operate HSR; and HSR property rights or licenses to accommodate HSR construction, operation, and maintenance.

- Extent and quality of suitable habitat for state- and federally listed species[3] identified in the study area based on GIS habitat modeling (ICF 2016a), the USFWS Information for Planning and Consultation (IPaC) system, and the California Natural Diversity Database (CNDDB).
- Agricultural resource impacts based on the Department of Conservation Farmland Mapping and Monitoring Program (FMMP) and Williamson Act information from each of the counties (Santa Clara, San Benito, and Merced). Data on the extent of the 100-year flood hazard areas provided by the FEMA database.
- Low-income and minority populations[4] along the project extent based on data from the 2010–2014 American Community Survey (ACS) 5-Year Estimates for census tracts located partially or fully within 0.5 mile of the alternatives' project footprints and for surrounding counties.
- Potential residential, commercial, and business displacements based on a review of aerial imagery, parcel boundaries, and a conceptual engineering project footprint.
- Cultural resources, including known historic properties and archaeological resources identified through the National Register of Historic Places (NRHP), California Historic Resources Inventory (CHRI), and prior cultural resources studies.
- Parks and recreational resources identified from the California Protected Areas Database (CPAD). Conservation areas, including conservation easements and National Wildlife Refuges, were identified through the California Conservation Easement Database (CCED) and National Wildlife Refuge database (USFWS 2016b), respectively.
- Section 4(f) resources identified through an inventory of all public parks, recreation areas, NRHP-listed or potentially eligible historic properties, and wildlife/waterfowl refuges within the study area.

The engineering information used in this submittal reflects current conceptual-level engineering. A detailed list of the study area definitions and descriptions of the methods used to evaluate impacts of each design option within each subsection are provided in Section 4 for aquatic resources and in Section 5 for other environmental considerations.

As required by the MOU, information regarding environmental and community resources potentially present within the study area for each design option was obtained primarily from available GIS databases. A full list of the data sources used in this analysis is provided in Chapter 12, References.

This Checkpoint B Addendum builds from the previous San Jose to Merced Checkpoint B Summary Report and Addenda (September 2013, May and August 2014).

[3] State- and federally listed species are defined as species that are listed as threatened or endangered or proposed for listing under the California Endangered Species Act (CESA) and the federal Endangered Species Act (FESA), respectively.

[4] *Low-income in Santa Clara County* is defined as a person whose median household income is at or below 200 percent of the Department of Health and Human Services poverty guidelines. Low income in San Benito and Merced counties is defined as a person whose median income is at or below the Department of Health and Human Service povery guidelines. *Minority populations* are readily identifiable as a group or groups of minority persons who live in geographic proximity and include persons who are American Indian and Alaska Native, Asian, Black or African American, Hispanic or Latino, and Native Hawaiian and other Pacific Islander.

2 PURPOSE AND NEED

2.1 Purpose of the High Speed Rail System

The Statewide Program Tier 1 EIR/EIS established the purpose of the HSR system and identified and evaluated alternative HSR corridor alignments and stations as part of a statewide HSR system.

The purpose of the statewide HSR system is to provide a reliable high-speed electric-powered train system that links the major metropolitan areas of the state and that delivers predictable and consistent travel times. A further objective is to provide an interface with commercial airports, mass transit, and the highway network and to relieve capacity constraints of the existing transportation system as increases in intercity travel demand in California occur, in a manner sensitive to and protective of California's unique natural resources (Authority and FRA 2005).

2.2 Purpose of the San Jose to Merced Project Section

The project's purpose is to implement (including construction, maintenance, and operation) the San Jose to Merced Section of the California HSR System to provide the public with electric-powered high-speed train service that offers predictable and consistent travel times between San Jose and Merced and facilitates connectivity between Merced in the Central Valley and Gilroy and San Jose in the Bay Area. The San Jose to Merced Project Section will help achieve the objectives of the statewide HSR system, which include:

- Achieving HSR service that meets the Prop 1A travel time requirement between San Jose and Los Angeles.[5]
- Minimizing impacts to the natural environment and preserve wildlife corridors and wildlife movement and maximize compatibility with communities along the corridor.[6]
- Enhancing the connection between strong economic centers in the San Francisco Bay Area with the Central Valley, which is the fastest growing region in California.

Because the HSR system would transition from a blended system in the San Francisco to San Jose Project Section to a fully dedicated HSR system north of Diridon Station; the San Jose to Merced Project section includes a small portion of the blended system component to facilitate the transition between the two project sections. The system would be designed and operated to provide consistent and predictable travel between San Jose and Merced.

2.3 Overall Project Purpose Statement Pursuant to Clean Water Act Section 404(b)(1) Guidelines

The overall project purpose is to construct a reliable, high-speed, lower emissions transit system within the Central Valley, while providing predictable and consistent travel times between major urban centers and connectivity to airports, mass transit systems, and the highway network through the San Joaquin Valley. The project would implement the critical section of the HSR system that connects the Bay Area to the Central Valley HSR sections, specifically the San Jose to Merced (west to east) and the Merced to Fresno (north to south) Project Sections, consistent with the Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century (California Streets & Highways Code § 2704 et seq.).

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[5] Prop 1A states that the HSR system shall be designed to achieve a maximum nonstop service travel time of 2 hours and 10 minutes between San Jose and Los Angeles (§2704.09(b)(4)).

[6] Prop 1A states that the HSR system shall follow existing transportation and utility corridors to the extent feasible, as determined by the Authority (§2704.09 (g)), minimize urban sprawl and impacts on the natural environment (§2704.09(i)), and preserve wildlife corridors and mitigate impacts on wildlife movement where feasible, as determined by the Authority (§2704.09(j)).

3 SAN JOSE TO MERCED PROJECT SECTION

3.1 Background

In August and September 2014, the USACE and USEPA concurred with the 2013 Checkpoint B Summary Report and two subsequent addenda, and range of alternatives (concurrence letters are provided in Appendix A of this Checkpoint B Addendum). Pertinant to the San Jose to Central Valley Wye Project Extent, the agencies agreed that the following design options, as illustrated in Figure 3-1, should be carried forward as part of the reasonable range of alternatives to be studied in the project EIR/EIS:

San Jose Station Approach Subsection

1. SR 87/I-280
2. San Jose Diridon Station

Monterey Corridor Subsection

3. Refined Program Alignment

Morgan Hill and Gilroy Subsection

4. East of UPRR to Downtown Gilroy (Program Alignment)
5. US 101 to East Gilroy
6. US 101 to Downtown Gilroy
7. West of Coyote Creek Parkway to Downtown Gilroy
8. West of Coyote Creek parkway to East Gilroy
9. East of UPRR to East Gilroy
10. Downtown Gilroy (Four Track) Station
11. East Gilroy (Four Track) Station

MOE/MOI Facility Alternatives

12. Coyote Valley: A
13. Coyote Valley: B
14. South of Gilroy: C
15. South of Gilroy: D

Pacheco Pass Subsection

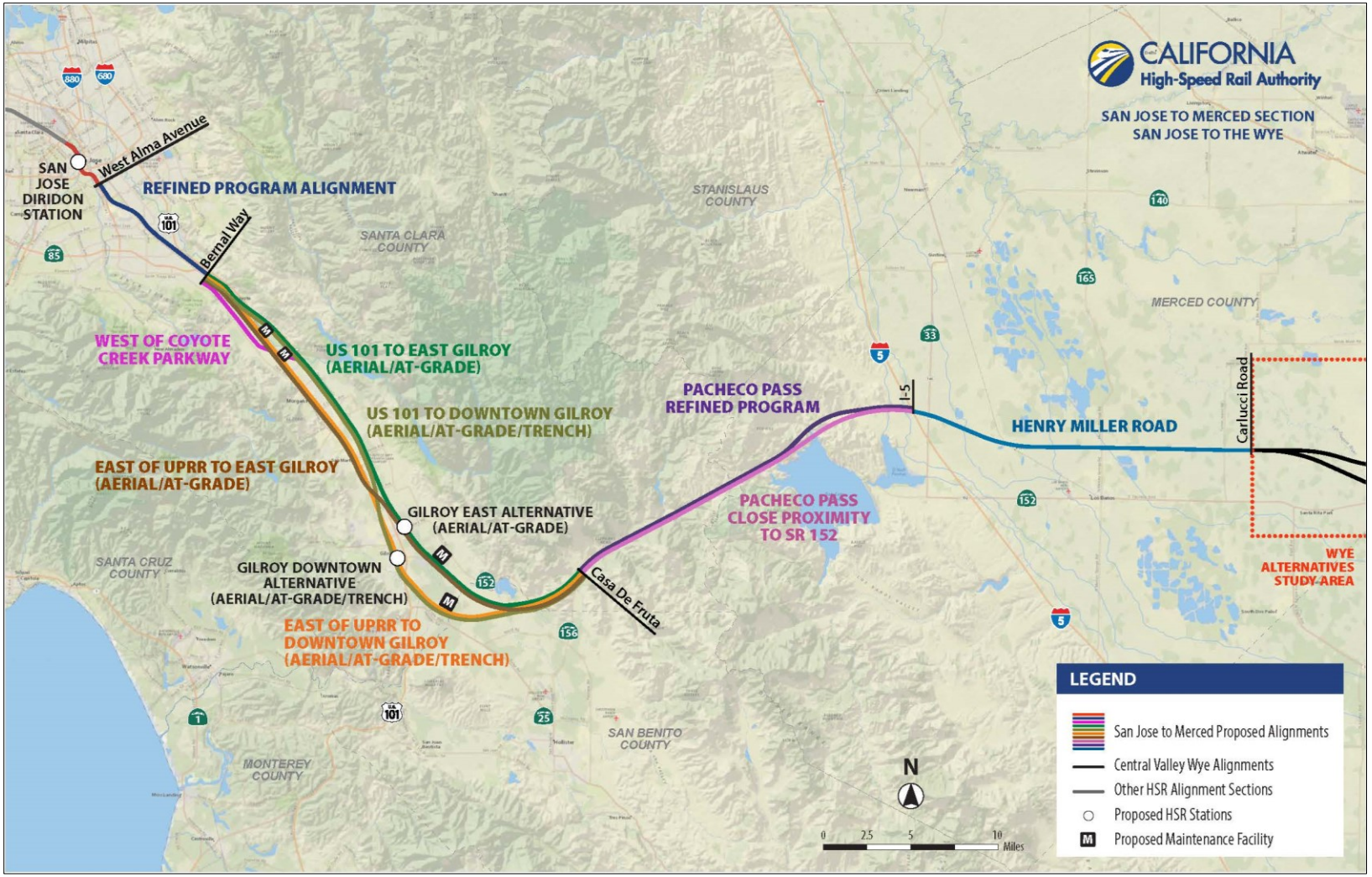
16. Close Proximity to SR 152
17. Refined Program Alignment

San Joaquin Valley Subsection

18. Henry Miller Road

3.2 Description of Design Options

Subsequent to the agency concurrence in 2014 on the last Checkpoint B Summary Report, the Authority continued to evaluate those design options. As indicated previously, the Authority and FRA propose to remove certain design options from those considered in the 2013 Checkpoint B Summary Report and to add new design options. All 16 design options are analyzed in this addendum report: the previously concurred options and the new options. Chapters 4 through 9 of this Checkpoint B Addendum provide the data and analysis associated with each of the design options with respect to environmental and community resources. Based on these data and analysis, the Authority and FRA propose to eliminate five design options carried forward in the last Checkpoint B Summary Report and add two new design options in the Morgan Hill and Gilroy Subsection and to add one new design option to the Monterey Corridor Subsection and to the Pacheco Pass Subsections. Chapter 11 provides the conclusions of the analysis and reasons for withdrawal of selected design options.



Source: Authority and FRA 2016

Figure 3-1 Design Options with 2014 Agency Concurrence

3.2.1 Design Options Carried Forward from 2013 Checkpoint B Summary Report

Table 3-1 shows the design options carried forward for analysis in the EIR/EIS from the 2013 Checkpoint B Summary Report. The 2013 document included several design options that extended into the Central Valley Wye. Those are being analyzed in a separate Checkpoint B process and supplemental EIR/EIS.

Table 3-1 Design Options Carried Forward from the 2013 Checkpoint B Summary Report

Design Option (Subsection)
SR 87/I-280 (San Jose Diridon Station Approach) (includes aerial station at Diridon)
Refined Program Alignment (Monterey Corridor Subsection)
East of UPRR to Downtown Gilroy (Program Alignment) (Morgan Hill and Gilroy) (includes the Downtown Gilroy Station and Gilroy D LMF)
US 101 to Downtown Gilroy (Morgan Hill and Gilroy) (includes the Downtown Gilroy Station and Gilroy D LMF)
West of Coyote Creek to Downtown Gilroy (Morgan Hill and Gilroy) (includes the Downtown Gilroy Station and Gilroy D LMF)
US 101 to East Gilroy Aerial (Morgan Hill and Gilroy) (includes the East Gilroy Station and Gilroy C LMF)
West of Coyote Creek to East Gilroy (Morgan Hill and Gilroy) (includes the East Gilroy Station and Gilroy C LMF)
East of UPRR to East Gilroy (Morgan Hill and Gilroy) (includes the East Gilroy Station and Gilroy C LMF)
MOE / MOI Facility Option "A" (Coyote Creek)[1]
MOE / MOI Facility Option "B" (Coyote Creek)[2]
MOE / MOI Facility Option "C" (south of Gilroy)
MOE / MOI Facility Option "D" (south of Gilroy)
Refined Program Alignment (Pacheco Pass)
Close Proximity to SR 152 (Pacheco Pass)

Source: Authority and FRA 2013

[1] As discussed in Chapter 11, this option is tied to a west of Coyote Creek alignment, which as shown in the analysis in Chapter 4 through 8 is likely to result in more environmental impacts than the other alignments. The MOE/MOI Facility Option "A" will also likely result in additional impacts to Section 4(f) resources (Coyote Creek Parkway) and result in wildlife corridor concerns. Thus, this option is not discussed further in Chapters 4 through 8.

[2] As discussed in Chapter 11, this option is likely to result in more environmental impacts that the other alignments. The MOE/MOI Facility Option "B" will also likely result in additional impacts to Section 4(f) resources (Coyote Creek Parkway) and result in wildlife corridor concerns. Thus, this option is not discussed further in Chapters 4 through 8.

SR = State Route, I- = Interstate, UPRR = Union Pacific Railroad, LMF = light maintenance facility, US = U.S. Highway, MOE = maintenance of equipment, MOI = maintenance of infrastructure

3.2.2 Design Options Developed after 2013 Checkpoint B Summary Report

Since receiving USACE and EPA concurrence in 2014, the Authority and FRA conducted additional community outreach and engineering along the corridor, leading to the development of the following additional design options. The Authority and FRA propose inclusion of four new design options in the San Jose to Merced Project Section EIR/EIS (Table 3-2). These design options are described in more detail in Section 3.3. The new design options are proposed for addition in the Monterey Corridor, Morgan Hill and Gilroy, and Pacheco Pass subsections.

Table 3-2 New Design Options Proposed to be Carried Forward in the EIR/EIS

Design Option (Subsection)
Monterey Highway Median Viaduct (Monterey Corridor)
Morgan Hill Bypass through Downtown Gilroy (Morgan Hill and Gilroy) (includes the downtown Gilroy Station and Gilroy D LMF)
Morgan Hill Bypass through East Gilroy (Morgan Hill and Gilroy) (includes the East Gilroy Station and Gilroy C LMF)
North Pacheco Pass (Pacheco Pass) (includes a single, continuous 13.6-mile tunnel)

Source: Authority and FRA 2016

3.3 Description of Design Options Analyzed in this Addendum

This section describes in more detail the design options identified in the 2013 Checkpoint B Summary Report and the USACE and EPA concurrences as well as those the Authority and FRA proposed to add in this Checkpoint B addendum.

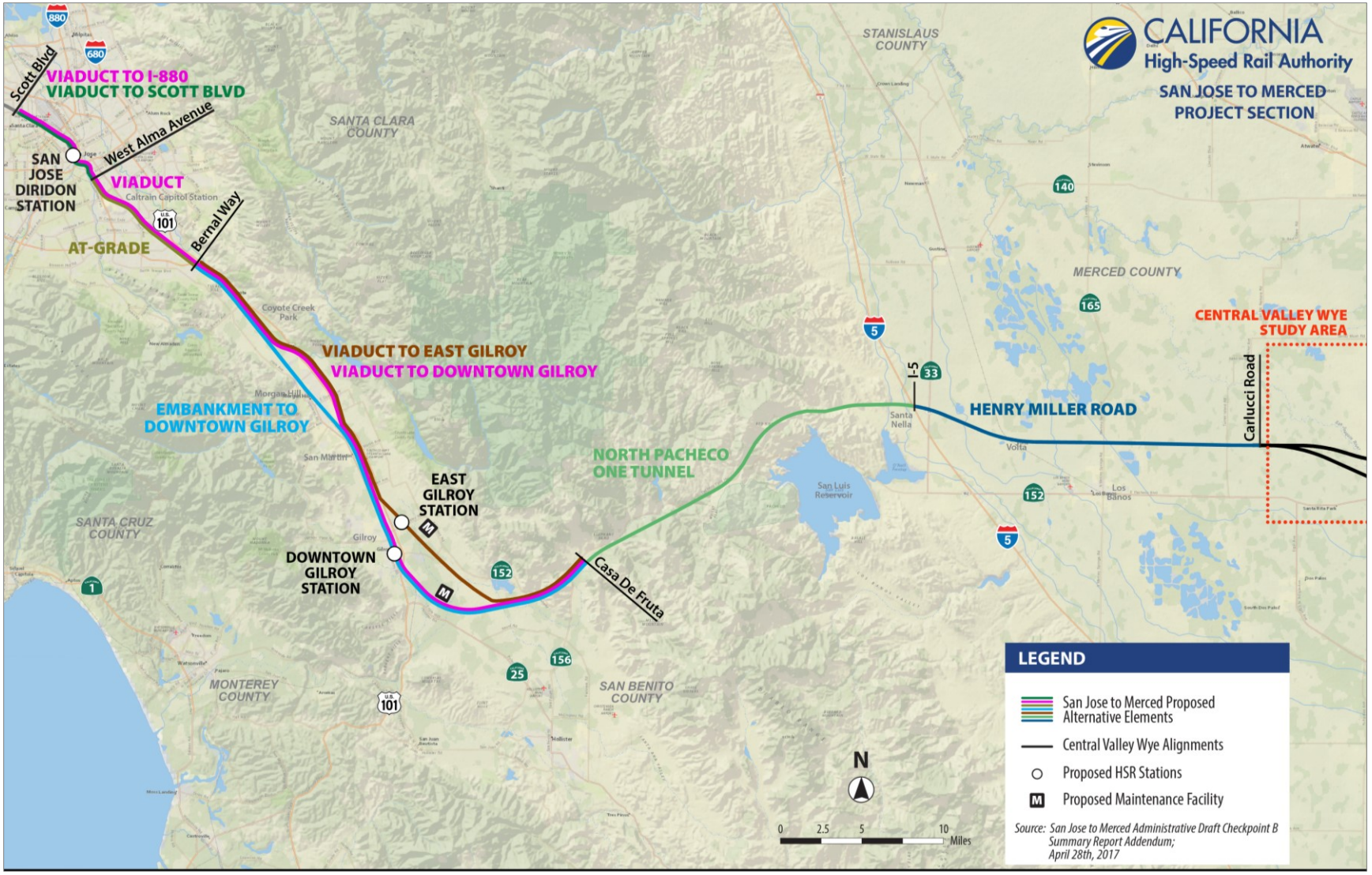
3.3.1 Common Features

The portion of the project extent between Scott Boulevard and Carlucci Road constitutes approximately 91 miles of the approximately 145-mile-long Project Section, which includes dedicated HSR system infrastructure and station locations at Diridon, Gilroy, and Merced; an LMF in the Gilroy area; and an additional MOI siding between Turner Springs Road and Carlucci Road in the Central Valley (Figure 3-2). HSR stations at San Jose Diridon and Gilroy would support transit-oriented development, provide an interface with regional and local mass transit services, and provide connectivity to the South Bay[7] and Central Valley highway network. The project extent consists of a Blended System north of the San Jose Diridon Station, transitioning into a fully dedicated system from approximately I-880 south to Gilroy, then east through the Pacheco Pass to Carlucci Road, the western boundary of the Central Valley Wye. Engineering cross-sections of typical profiles for the project extent are included in Appendix B.

The project extent comprises the following five subsections:

- **San Jose Diridon Station Approach**—Extends approximately 6 miles from north of San Jose Diridon at I-880 in San Jose or Scott Boulevard in Santa Clara to West Alma Avenue in San Jose. This subsection includes Diridon Station and overlaps the southern portion of the San Francisco to San Jose Project Section.
- **Monterey Corridor**—Extends approximately 8 miles from West Alma Avenue to Bernal Way in the community of South San Jose. This subsection is entirely within the city of San Jose.

[7] *South Bay* refers to Santa Clara County.



Source: Authority and FRA Compilation 2017

Figure 3-2 Design Options Analyzed in this Addendum Report

- **Morgan Hill and Gilroy**—Extends 28–31 miles from Bernal Way in the community of South San Jose to Casa de Fruta Parkway/State Route (SR) 152 in the community of Casa de Fruta in Santa Clara County.
- **Pacheco Pass**—Extends approximately 17 miles from Casa de Fruta Parkway/SR 152 to east of I-5 in Merced County.
- **San Joaquin Valley**—Extends approximately 18 miles from I-5 to Carlucci Road in unincorporated Merced County.

3.3.2 Description of Design Options by Subsection

This section describes the proposed design options of the project extent by subsection.

3.3.2.1 San Jose Diridon Station Approach (previously known as SR 87/I-280)

The San Jose Diridon Station Approach Subsection extends approximately 6 miles from Scott Boulevard in Santa Clara to West Alma Avenue in San Jose through the cities of Santa Clara and San Jose. The existing Caltrain track in this subsection consists of predominantly two-track and three-track at-grade alignment. South of De La Cruz Boulevard, Union Pacific Railroad (UPRR) tracks from the east converge with the Caltrain corridor and continue south adjacent to the east side of the corridor. Caltrain's Centralized Equipment Maintenance and Operations Facility (CEMOF), north of the San Jose Diridon Station, encompasses three mainline tracks, a maintenance building, and nine yard tracks.

Viaduct to I-880 Design Option

This design option carries a narrower footprint than the viaduct to Scott Boulevard; less curve straightening would be necessary to accommodate the alignment coming to grade near I-880. Between Scott Boulevard and Benton Street, HSR would operate on blended service tracks, entailing several minor track modifications of less than 1 foot between Scott Boulevard and I-880. Beginning at I-880, dedicated HSR tracks would diverge from the Caltrain Mainline Track (MT) 2 and MT3 tracks and would continue south along the east side of the existing Caltrain corridor. The UPRR/Caltrain MT1 tracks would be shifted east by up to 195 feet. North of Benton and traveling south, the HSR alignment would begin to rise on embankment, then transitions to aerial structure approximately 70 feet tall. From there, it would cross over West Taylor Street, Lenzen Avenue, Cinnabar Street, West Julian Street, and The Alameda to a new dedicated HSR aerial platform at the San Jose Diridon Station. The route south of Cinnabar Street would be the same as that for the Scott Boulevard design option.

Viaduct to Scott Boulevard Design Option

This design option would have a wider footprint than the I-880 option, requiring more curve straightening to accommodate the alignment coming to grade near Scott Boulevard. HSR would operate on blended service tracks north of Scott Boulevard, rising gradually south of Scott to an approximately 40-foot-tall dedicated HSR viaduct west of Lafayette Street. The aerial alignment would continue approximately 30 feet high over De La Cruz Boulevard to the Santa Clara Station. Beyond the Santa Clara Station, the viaduct would rise to approximately 60 feet over I-880 and cross over West Hedding Street, West Taylor Street, Lenzen Avenue, Cinnabar Street, West Julian Street, and The Alameda to a new dedicated HSR aerial platform at the San Jose Diridon Station. This aerial alignment would turn sharply east immediately south of the aerial San Jose Diridon station platform, continuing on an aerial structure. It would cross over the intersection of Bird Avenue and Auzerais Avenue, then over the I-280 and SR 87 interchange, and continue south along the east side of SR 87 to bypass the Greater Gardner neighborhood. It would continue on an aerial structure to pass over the Caltrain Tamien Station, running between Tamien Station and the SR 87 freeway, and then transition to the Monterey Corridor Subsection at West Alma Avenue. It would cross storm drain infrastructure near West San Carlos Street just past SR 87.

A new northbound platform would be constructed at the Santa Clara Station, and the southbound platform would remain unchanged. A new UPRR and Caltrain track would be constructed just north of the HSR guideway beginning near Benton Street to just past the Santa Clara Station. On the approach to West Hedding Street, Caltrain tracks would be realigned to accommodate the HSR tracks. The dedicated HSR tracks would transition from a two-track at-grade configuration to retained fill and finally to a four-track aerial profile. To accommodate the new track profile, the Hedding Street Overpass would be replaced with an undercrossing and two new bridges would be constructed: a roadway overpass on Stockton Avenue and a rail bridge over Hedding Street. Farther south, a new structure would be installed to carry the realigned UPRR/Caltrain MT1 tracks over the West Taylor Street underpass. The dedicated HSR tracks would continue south on aerial structure, with the top of rail elevated 60 feet above the ground surface. The dedicated HSR tracks would shift horizontally a maximum of 400 feet east of the existing UPRR/Caltrain mainline tracks before curving back toward the UPRR/Caltrain mainline tracks as the dedicated HSR tracks enter the San Jose Diridon Station on aerial viaduct.

Traction Power Sites and Power Connections

One new traction power substation (TPSS) would be constructed on the east side of the Caltrain corridor at one of two alternate sites located just south of I-880 in San Jose (just southeast of the I-880 overcrossing or at Lenzen Avenue). This facility would encompass approximately 42,000 square feet (210 by 200 feet) to accommodate three high-voltage power transformers and an approximately 450-square-foot control room. The TPSS and associated feeder gantry could be screened from view with a perimeter wall or fence. The TPSS site would have a 20-foot-wide access road (or easement) from the street access point to the protective fence perimeter.

Power would be supplied by Pacific Gas and Electric Company (PG&E) transmission lines. PG&E has indicated that existing lines may need to be reconstructed to serve the project. Such modifications could entail reconductoring transmission lines, installing new power poles, or both. When electrification of the system is required, PG&E would design and implement changes to their transmission lines, including completion of environmental review and clearance of the reconstruction activities. If the engineering design for new or upgraded PG&E facilities involves new or different significant environmental impacts, additional environmental review and analysis of the new equipment, including reconstruction of transmission lines, will be completed as part of the California Public Utilities Commission permit application process prior to construction.

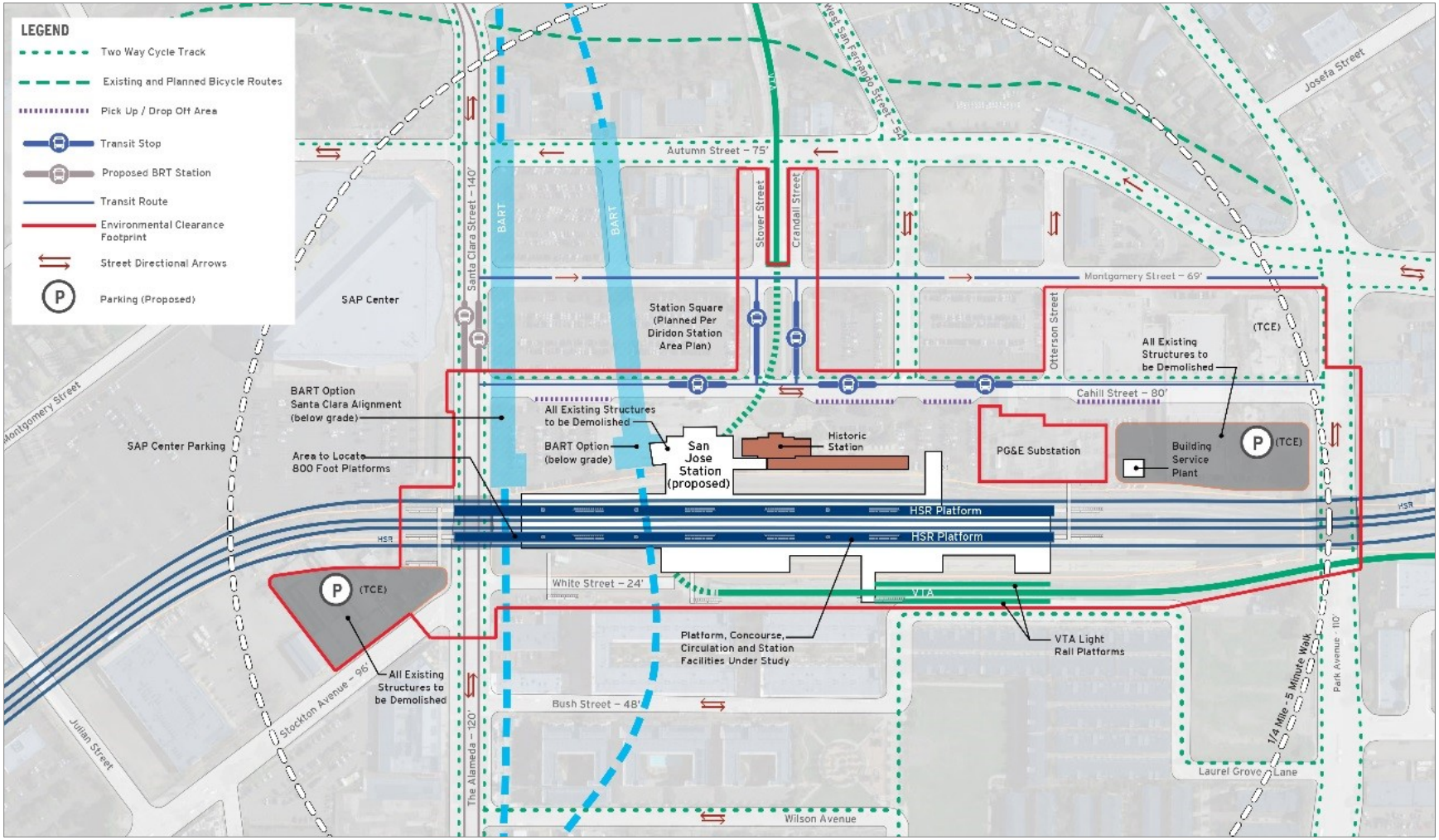
A train control site (TCS) would be located at Lenzen Avenue on the west side of the alignment.

San Jose Diridon Station

A four-track, aerial HSR station in San Jose would be constructed above the existing San Jose Diridon Station. Two 30-foot-wide and 800-foot-long dedicated HSR platforms would be constructed above the existing Caltrain tracks and platforms. As shown on Figure 3-3, the new HSR station facilities, including a station house area for ticketing and support services and an indoor station room for passengers, would be located north of the existing historic Caltrain corridor. The design of the station areas would provide pick-up and drop-off facilities along the newly constructed California Drive, as well as intermodal connectivity with Bay Area Rapid Transit (BART), Santa Clara Valley Transportation Authority (VTA) light rail, proposed BART lines, and buses. Circulation linkages between the station house and the station platforms may include hallways, an access bridge to cross over railroad tracks, stairs, escalators, elevators, and moving sidewalks. Parking would be provided at two parking lots along Cahill Street and Stockton Avenue, and a net 156 additional parking spaces would be provided. As a separate project, VTA has plans to construct new light rail station platforms. The existing PG&E substation is not part of the project.

Maintenance Facility

No maintenance facilities are proposed for this subsection.



Source: Authority 2016.

Figure 3-3 Diridon Station Site Plan

3.3.2.2 Monterey Corridor Subsection

The Monterey Corridor Subsection is approximately 8 miles long and entirely within the San Jose city limits. From the San Jose Diridon Station Approach subsection at West Alma Avenue just south of the Caltrain Tamien Station, the subsection continues primarily southeast to Bernal Way. There are two design options in this subsection: viaduct and at-grade.

Viaduct Design Option

From West Alma Avenue, the alignment would be on a viaduct between 55 and 85 feet above grade until its descent to embankment north of Almaden Road, where it would continue on embankment across West Almaden Expressway, Curtner Avenue, along the northern base of Communication Hill, to just before meeting Monterey Highway (just north of Hillsdale). The alignment would then transition to viaduct and continue southeast within the median of Monterey Highway, crossing Capitol Expressway, Skyway Drive, Branham Lane, Roeder Road/Chynoweth Avenue, Blossom Hill Highway, SR 85 and the West Valley Freeway, and Bernal Road. Two TPSSs would be constructed in this subsection: one just before Curtner Avenue with an alternative site just south of Curtner Avenue, and one between SR 85/West Valley Freeway and Bernal Road with an alternative site nearby.

The design assumes a reduction from six to four travel lanes on Monterey Highway, beginning north of Capital Expressway for the entire length of the corridor. Existing mid-block left-turn lanes would be closed because of substandard stopping sight distance. Additionally, the design assumes a combined left-turn and through lane at Palm Avenue.

At-Grade Design Option (previously known as Refined Program Alignment)

Beginning on aerial at West Alma Avenue, this design option would descend to embankment before Almaden Road. It would continue on embankment on the west side of the Caltrain/UPRR tracks across West Almaden Expressway and Curtner Avenue and along the northern base of Communication Hill, transitioning to a short stretch of aerial structure as it approaches Control Point (CP) Lick and Monterey Highway in the community of South San Jose. South of Curtner Avenue, the element would continue along the west side of the Caltrain/UPRR tracks. On approach to Monterey Highway, the aerial structure would cross over the UPRR tracks while curving southeast to return to grade within the Monterey Highway corridor just northwest of the Capitol Expressway. It would descend to trench at Capitol Expressway, continuing in trench past Senter Road. North of Skyway Drive the element would rise back to embankment for the remainder of the subsection between the highway and UPRR, crossing over Skyway Drive, Branham Lane, and Roeder Road/Chynoweth Avenue. Existing bridges at Capitol Expressway, Blossom Hill Road, and SR 85/West Valley Freeway would be demolished and reconstructed to allow HSR to pass underneath. The element would then cross Bernal Road, ending at Bernal Way.

Storm drain infrastructure would be constructed at the Guadalupe River crossing.

Traction Power Facilities

Two TPSSs would be constructed in this subsection: one just before Curtner Avenue with an alternative site just south of Curtner Avenue, and one between SR 85/West Valley Freeway and Bernal Road with an alternative site nearby.

Stations

No new HSR stations are proposed for this subsection.

Maintenance Facility

No maintenance facilities are proposed for this subsection.

3.3.2.3 Morgan Hill and Gilroy

The Morgan Hill and Gilroy Subsection is located south of the Monterey Corridor Subsection. From Bernal Way in South San Jose, the Morgan Hill and Gilroy Subsection would extend through either the downtown Gilroy or east Gilroy station, ending in the Pacheco Pass at Casa de Fruta Parkway/SR 152. There are three design options in this subsection: embankment to downtown Gilroy (approximately 31 miles long), viaduct to downtown Gilroy (approximately 30 miles long), and viaduct to east Gilroy station (approximately 28 miles long).

South of both Gilroy HSR station sites, the subsection would curve generally east across the Pajaro River floodplain and through a portion of northern San Benito County before entering a tunnel (Tunnel 1) at the base of the Diablo Range. It would exit the tunnel at Casa de Fruta Parkway/SR 152 in unincorporated eastern Santa Clara County, where it would transition to the Pacheco Pass Subsection.

Embankment to Downtown Gilroy Design Option (previously known as East of UPRR to Downtown Gilroy [Program Alignment])

At the beginning of the Morgan Hill and Gilroy Subsection, the HSR alignment would continue on embankment adjacent to and east of the UPRR right-of-way in the vicinity of Bernal Way in South San Jose. The tracks would continue south at-grade adjacent to Monterey Highway, crossing beneath Bailey Avenue. The bridge at Bailey Avenue would be demolished and reconstructed to accommodate the HSR beneath. The element would continue at-grade, crossing Palm Avenue and Live Oak Avenue, then crossing over Madrone Parkway and Monterey Road on aerial structure. Continuing south, it would run on embankment, crossing over Main, West Dunne, San Pedro, and Tennant Avenues, all of which would be depressed 17–30 feet below grade to maintain east-west connections. The existing bridge at Butterfield Boulevard would be demolished and reconstructed to allow HSR to pass beneath at-grade. East Middle Avenue and Church Avenue would be rebuilt to cross over HSR; East Middle Avenue would be realigned to travel southwest-northeast across HSR. San Martin would be closed and realigned between Murphy and Harding Avenues to connect to Oak Street at Llagas Avenue (north of the HSR alignment). HSR would travel over Oak Street, which would be below grade. Depot Street and Monterey Road, which parallel the HSR tracks at Oak Street, would cross the newly depressed Oak Street on at-grade bridges. After East Middle Avenue, the HSR would veer south to parallel Monterey Highway. Masten Avenue would be closed and realigned to the south and would be depressed beneath HSR; Rucker Avenue would also be depressed beneath HSR. HSR would cross over realigned Buena Vista and a new road between Cohansey and Las Animas on aerial structure. Las Animas would terminate in a cul-de-sac. The HSR tracks would pass over Leavesley Road, Ioof Avenue, Lewis Street, and East 6th Street on bridges before arriving at the embankment of downtown Gilroy station (approximately 16 feet high).

South of the downtown Gilroy Station, the element would be on embankment, crossing East 10th Street and Banes Lane before descending into a short stretch of trench prior to Luchessa Avenue. The design option would continue in trench under US 101, where existing bridges would be demolished and reconstructed to accommodate the undercrossing. Just beyond Southside Drive, the alignment would return to at-grade, veering slightly east. Bloomfield Avenue would be realigned to travel over the potential LMF site (South of Gilroy: D). Sheldon Avenue would become a cul-de-sac south of HSR and would be abandoned north of the HSR alignment. Before crossing the Pajaro River, the alignment would transition to viaduct. The alternative would cross an agricultural area that is part of a large floodplain for the upper Pajaro River. It would continue predominantly on embankment, crossing Lovers Lane, San Felipe Road, and SR 152 on viaduct. The alignment would begin its western ascent of Pacheco Pass just west of SR 152, crossing on aerial structure before entering Tunnel 1 from the Santa Clara Valley. Upon exiting Tunnel 1, the alignment would cross SR 152 and pass to the southern edge of the Pacheco Creek Valley on an aerial structure to behind Casa de Fruta, where it would transition to the Pacheco Pass Subsection, ascending onto embankment just beyond Southside Way.

New storm drainage infrastructure would be constructed on the west side of the alignment at Atherton Way and Carnadero Avenue. Drainage culverts would be constructed at Llagas Creek, between Howson Street and Lewis Street, and at the Pajaro River crossing. A retention pond is proposed at Cochrane Circle.

TPSSs would be constructed north of Coyote Creek Golf Drive with an alternative site south of Coyote Creek Golf Drive and at Masten Avenue and Rucker Avenue on the east side of the alignment.

Viaduct to Downtown Gilroy Design Option

This design option would begin diverging on low viaduct (approximately 40–50 feet above grade) from the Monterey Highway at-grade design option at Ogier Avenue, curving east. At Burnett Avenue the viaduct would parallel US 101 on the west, crossing over Cochrane Road, East Main Avenue, East Dunne Avenue, Tennant Avenue, Fisher Avenue, Maple Avenue, and East Middle Avenue, before rejoining the embankment element horizontally.

Between Cox Avenue and Luchessa Avenue, a low viaduct would begin north of Church Avenue, crossing over Butterfield Avenue, Santa Clara Avenue, Rucker Avenue, Denio Avenue, Buena Vista Avenue, Cohansey Avenue, Las Animas Avenue, Leavesley Road, Casey Street, Ioof Avenue, Lewis Street, Martin Street, and East 6th Street before arriving at the downtown Gilroy station on low viaduct (approximately 32 feet high). Leaving the downtown Gilroy station, the element would descend into a short stretch of trench prior to Luchessa Avenue, continuing in trench under US 101, where existing bridges would be demolished and reconstructed to accommodate the undercrossing. The remainder of this design option—to Casa de Fruta—would be the same as the Embankment to Downtown Gilroy design option.

Viaduct to East Gilroy Design Option

This design option would be the same as the viaduct to Downtown Gilroy design option through San Martin. North of Church Avenue, the alignment would veer southeast to cross on viaduct approximately 40 feet above grade over Church Avenue, Lena Avenue, Masten Avenue, and US 101 at Rucker Avenue. The design option would then cross over Denio Avenue, Buena Vista Avenue, and Cohansey Avenue, descending to an at-grade crossing at Las Animas Avenue, Leavesley Road, and Gilman Avenue; crossing Holsclaw Road on viaduct; then crossing under SR 152, through Old Gilroy east of Frazier Lake Road, and over Bloomfield Avenue, predominantly on embankment.

US 101 to Downtown Gilroy Design Option

The US 101 to Downtown Gilroy design option would be on an aerial structure through Gilroy. A trench design option would run below-grade through Gilroy, with bridge crossings provided for roadways crossing at existing grade.

This design option is the same as the US 101 to East Gilroy design option from the northern limit of this subsection, near Bernal Road, to the San Martin interchange on US 101, and as the East of UPRR to Downtown Gilroy design option from Ioof Avenue to Casa de Fruta. This element would require use of the MOE/MOI Facility South of Gilroy: D.

West of Coyote Creek Parkway to Downtown Gilroy Design Option

This design option, like the West of Coyote Creek Parkway to East Gilroy design option, would run at-grade adjacent to the Monterey Highway through Coyote Valley from the beginning of the Morgan Hill and Gilroy Subsection near Bernal Road in San Jose. This element would require relocation of Monterey Highway and the existing UPRR tracks in some areas. From Bernal Way to south of Forsum Road, the Monterey Highway would be reconstructed and shifted east to allow placement of the project alignment between the highway and the UPRR right-of-way. From south of Forsum Road to Coyote, the design option would follow the existing Monterey Highway on its west side. The UPRR tracks in this section would be relocated to the west to allow placement of the guideway between the UPRR right-of-way and the highway. Just south of Coyote, Monterey Highway would be relocated about 60 feet to the east to allow placement of the project alignment

between the highway and the UPRR right-of-way. New grade-separations would be built to carry major streets over the HSR tracks, the UPRR tracks, and Monterey Highway. Near Palm Avenue in Coyote Valley, the design option would turn east. The realigned Monterey Highway would curve more sharply east and ascend to pass over the HSR, then turn back to join its existing alignment north of Live Oak Avenue. The design option would continue east, cutting though orchards before ascending to an elevated structure. It then would curve south to pass over US 101 just north of Burnett Avenue. After passing over the Cochrane Road interchange, the design option would conform to and follow the previously described US 101 to Downtown Gilroy alignment alternative through the remainder of the subsection.

US 101 to East Gilroy Design Option

The US 101 to East Gilroy design option would leave the Embankment to Downtown Gilroy design option north of Coyote near Forsum Road. It would ascend to an aerial alignment and cross Monterey Highway and Coyote Creek, approaching US 101, then pass over Bailey Road and descend to follow the west side of the freeway at-grade. It would ascend to an aerial structure to cross US 101 and Coyote Creek near the northern city limits of Morgan Hill. Continuing on aerial structure, it would run along the east side of US 101, passing over the interchange at Cochrane Road, the East Main Street overcrossing, and the East Dunne Avenue interchange.

South of the East Dunne Avenue interchange, the design option would move away from the freeway to run east of Conduit Avenue, passing over the City of Morgan Hill's sports complex and passing east of the US 101/Tennant Avenue interchange. After passing over Tennant Avenue, it would descend back to grade as it curves to align with the east side of US 101 near East Middle Avenue. From there, it would descend into a trench to pass under the East San Martin Avenue interchange. The element would remain in trench past the South County Airport and under the California Highway Patrol (CHP) truck inspection facility north of the US 101/Masten Avenue interchange, where it would curve away from the freeway. After passing beneath Buena Vista Avenue, it would ascend back to grade to run toward the Leavesley Road HSR station location, approximately 0.5 mile east of US 101 on Leavesley Road.

The Leavesley Road HSR station would consist of four tracks. The inner two tracks would be for express HSR trains that would pass through the station without stopping. The outer tracks would extend about 3,000 feet in each direction from the station, to allow for stopping trains to brake or accelerate as they exit and rejoin the mainline. The platforms would be about 1,400 feet long. Leavesley Road would be depressed to pass under the tracks just south of the station. Heading south from the station, the alternative alignment would curve toward San Felipe, crossing agricultural land that is part of the Pajaro River floodplain on a short berm elevated above the level of potential floodwaters. Near SR 152 at San Felipe, the HSR embankment would gradually increase as it approaches the hills separating the Santa Clara Valley from the Pacheco Creek Valley. After passing over SR 152, the alternative alignment would enter a tunnel to bring it to the Pacheco Creek Valley near Casa de Fruta.

For this design option, MOE/MOI Facility South of Gilroy: C would be constructed west of the HSR mainline, south of the community of Old Gilroy. The facility would extend along the west side of the HSR mainline from approximately SR 152 to Bloomfield Avenue.

West of Coyote Creek Parkway to East Gilroy Design Option

At the beginning of the Morgan Hill and Gilroy Subsection near Bernal Road in San Jose, this design option would run at-grade adjacent to the Monterey Highway through the Coyote Valley. This would require relocation of Monterey Highway and the existing UPRR tracks in some areas. From Bernal Way to south of Forsum Road, the Monterey Highway would be reconstructed and shifted east to allow placement of the guideway between the highway and the UPRR right-of-way. South of Forsum Road to Coyote, the element would follow the west side of existing Monterey Highway. The UPRR tracks in this section would be relocated west to allow placement of the guideway between the UPRR right-of-way and the highway. Just south of Coyote, Monterey Highway would be relocated about 60 feet east to allow placement of the guideway between the

highway and the UPRR right-of-way. New grade-separations would be built to carry major streets over the HSR tracks, the UPRR tracks, and Monterey Highway. Near Palm Avenue in the Coyote Valley, the design option would turn east. The realigned Monterey Highway would curve more sharply east and ascend to pass over the HSR guideway, then turn back to join its existing alignment north of Live Oak Avenue. The design option would continue east, cutting though orchards before ascending to an elevated structure. It then would curve south to pass over US 101 just north of Burnett Avenue. After passing over the Cochrane Road interchange, the element would conform to and follow the previously described US 101 to East Gilroy design option through the remainder of the subsection.

The West of Coyote Creek Parkway to East Gilroy design option would minimize impacts on the Coyote Creek Parkway. This element could accommodate MOE/MOI Facility Alternatives Coyote Valley: A and South of Gilroy: C.

East of UPRR to East Gilroy Design Option

This design option combines the East of UPRR to Downtown Gilroy and US 101 to East Gilroy design options such that the HSR guideway would be placed immediately east of the UPRR line through the Coyote Valley, Morgan Hill, and San Martin before crossing over to the US 101 to East Gilroy design option near Masten Avenue. A station would be located at Leavesley Road, east of US 101. The design option would then follow the US 101 to East Gilroy design option to the Pacheco Creek Valley.

This design option would support both MOE/MOI Facility Alternatives Coyote Valley: B and South of Gilroy: C.

Traction Power Facilities

A TPSS would be constructed on the north side of the alignment where it diverges from Monterey Road, with a second TPSS at San Pedro Avenue.

Stations

There are three station options for Gilroy: downtown Gilroy aerial, downtown Gilroy embankment, and east of Gilroy embankment (Figures 3-4, 3-5, and 3-6). The downtown Gilroy station would be adjacent to the existing Caltrain station between 7th and East 10th Streets on the east side of the alignment. Parking would be accessed from Alexander Street and Old Gilroy Street. A new one-way access road would be constructed from Old Gilroy Street south, then east around the parking area to connect to Alexander Street. Potential off-site parking would be provided south of East 10th Street east of the right-of-way.

The proposed station in east Gilroy would be constructed on the north side of Leavesley Road. The station would be accessed from Leavesley Road and parking would be provided on both sides of the station.

Maintenance Facilities

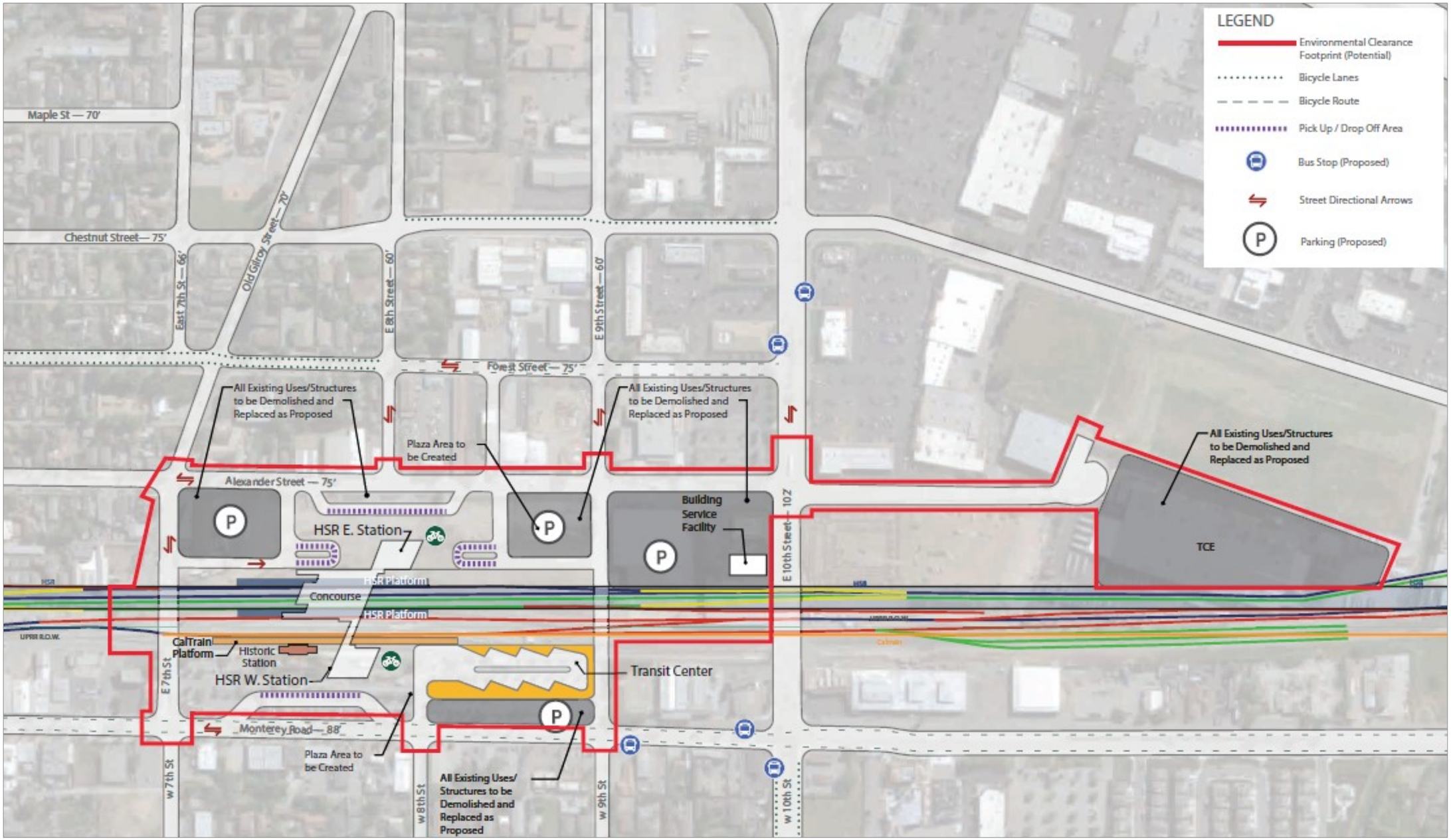
A light maintenance facility (LMF) is where HSR passenger trains are stored and have light maintenance performed, and where the vehicles, both rail vehicles and trucks, are based for maintenance of the HSR tracks and right-of-way (maintenance of infrastructure facility [MOIF]).

Four sites for LMFs have been under consideration for this subsection:

- **Maintenance Facility Coyote Creek A** would be located east of the HSR mainline between Sycamore and Palm Avenues. Monterey Highway would be relocated to the west side of the UPRR between approximately Sycamore and Kalana Avenues. The highway would make an “S” curve, turning away from the tracks before curving back to climb to an overcrossing to cross the HST and UPRR diagonally. After passing over the tracks, another “S” curve would bring the highway down along the west side of the UPRR. Another pair of “S” curves and an overcrossing would return Monterey Highway to the east side of the UPRR and HST.

- **Maintenance Facility Coyote Creek B** would be located east of the HSR mainline between Ogier and Live Oak Avenues. Monterey Highway would be relocated to the east of the MOE/MOI facility, between approximately San Bruno Avenue and Madrone Avenue.
- **Maintenance Facility East of Gilroy C** would be located east of the HSR mainline, south of the community of Old Gilroy. The MOE/MOI facility would extend along the east side of the HSR alignment from approximately 0.6 mile north of SR 152 to 0.25 mile north of Bloomfield Avenue as illustrated on Figure 3-7. This maintenance facility would serve the design options that travel through east Gilroy.
- **Maintenance Facility South of Gilroy D** would be located near Carnadero Avenue and extend south to just past Frazier Lake Road on the east side of the HSR alignment as illustrated on Figure 3-8. This maintenance facility would serve the design options that travel through Downtown Gilroy.

Each of the facilities would cover an area of approximately 40 acres along the HSR mainline, with a maximum width of 700–1,500 feet. The majority of the area would be for storage of rail vehicles on tracks parallel to the HSR mainline.



Source: Authority 2016

Figure 3-4 Downtown Gilroy Station Site Plan – Aerial Option

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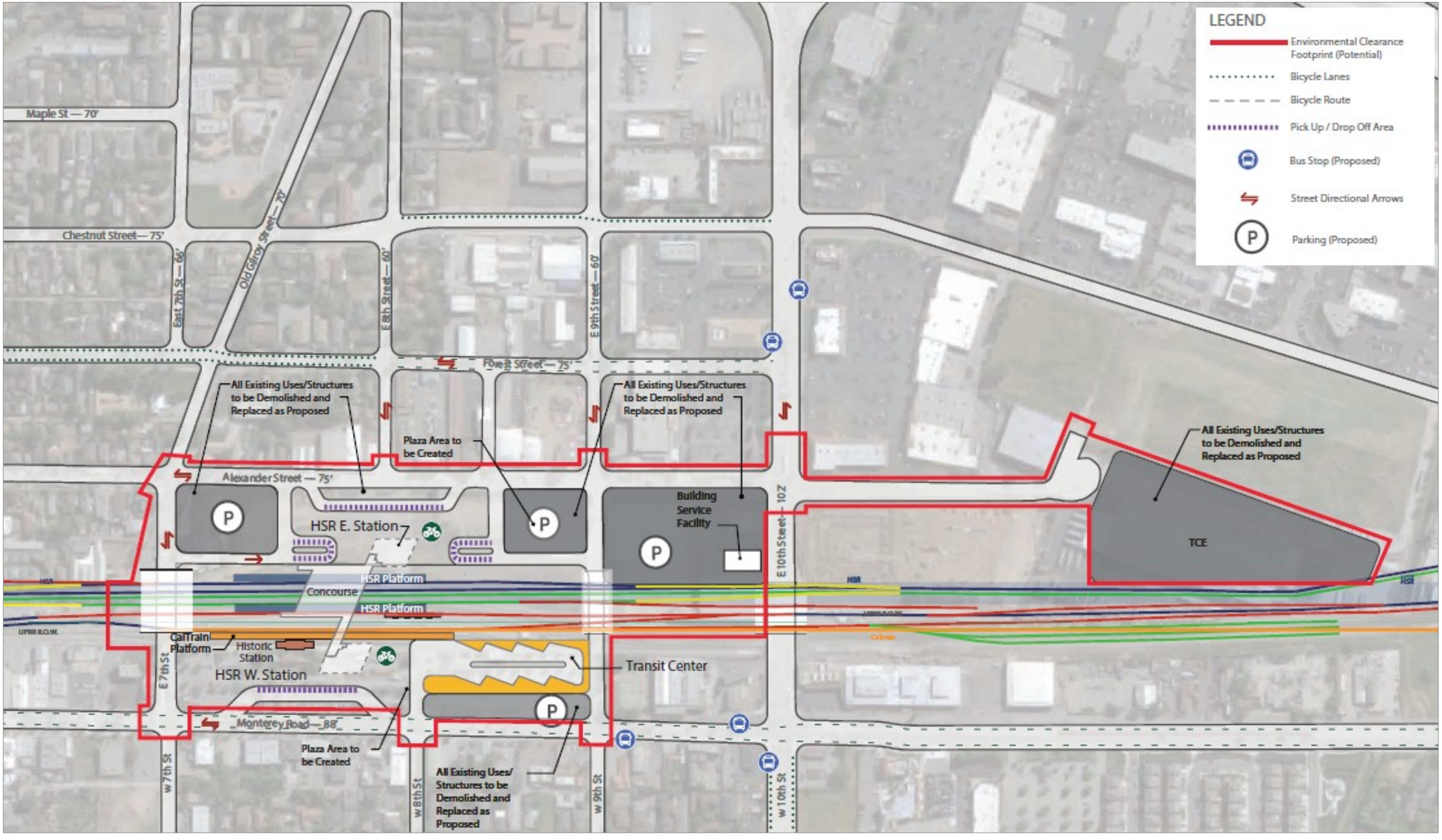

Source: Authority 2016.

Figure 3-5 Downtown Gilroy Station Site Plan – Embankment Option

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Source: Authority 2016.

Figure 3-6 East Gilroy Station Site Plan – At-Grade Option

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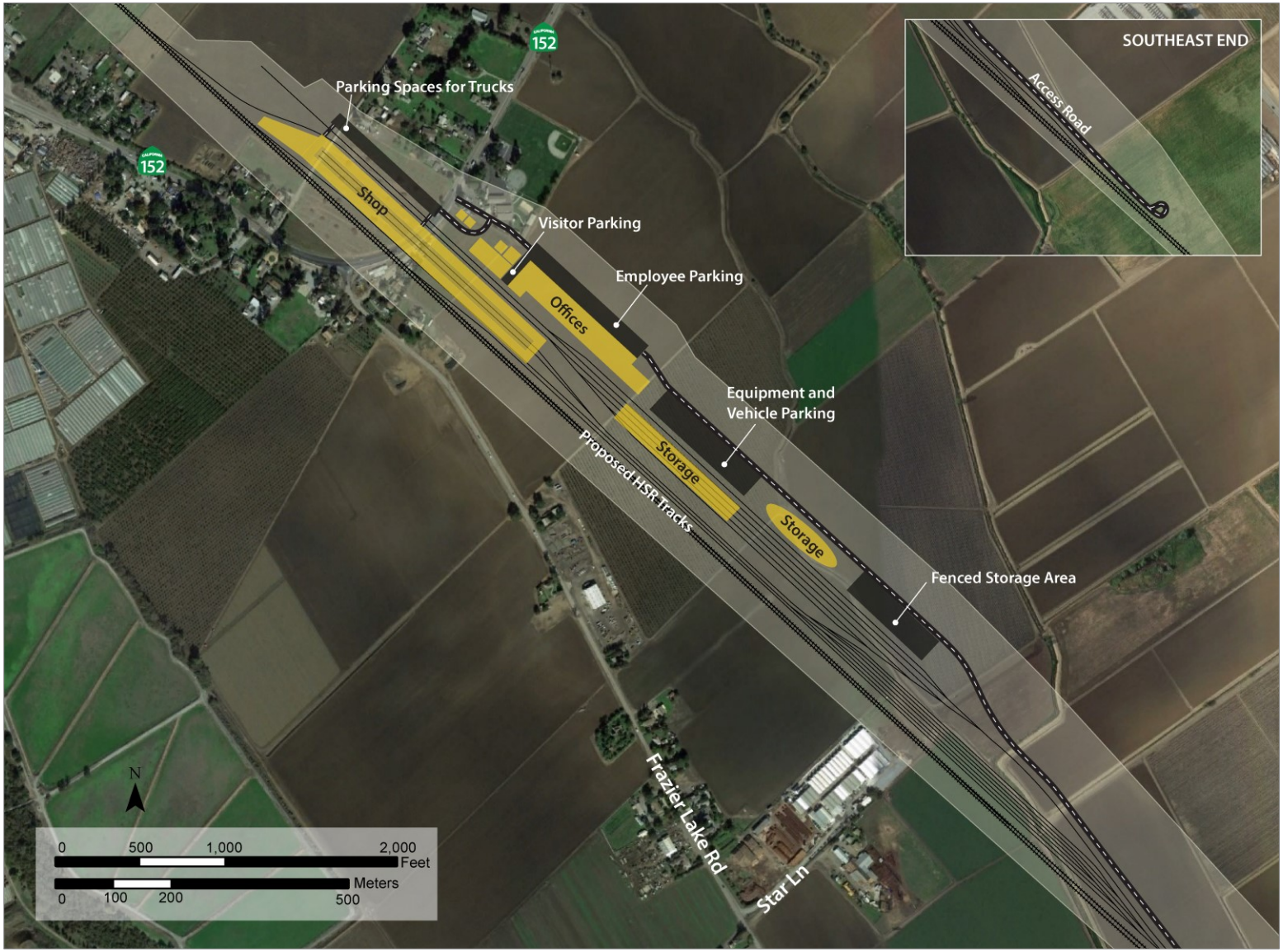
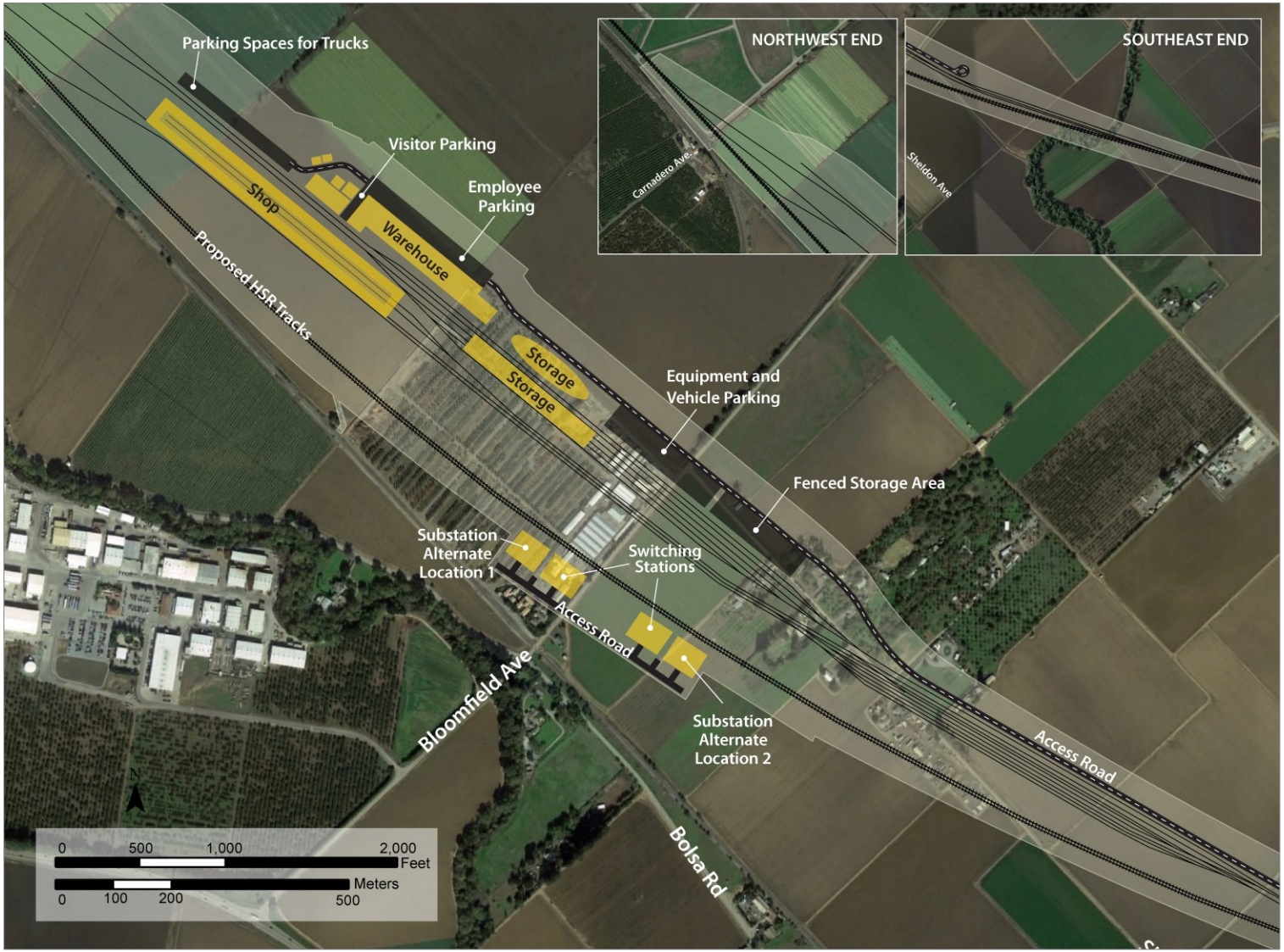


Source: Authority, 2016.

Figure 3-7 Maintenance Facility East of Gilroy



Source: Authority 2016.

Figure 3-8 Maintenance Facility South of Gilroy

3.3.2.4 Pacheco Pass

The Pacheco Pass Subsection extends approximately 25 miles from Casa de Fruta/SR 152 at the west end of the Pacheco Creek Valley to I-5 at Santa Nella Village in Merced County. There is only one alternative in this subsection. This alternative generally follows the existing SR 152 corridor for approximately 17 miles, where it diverges around the northern edge of the San Luis Reservoir before terminating at I-5.

Refined Program Alignment Design Option

The Refined Program design option would be identical to the Close Proximity to SR 152 design option from Casa de Fruta through the Pacheco Pass to the point where the guideway would cross over SR 152 adjacent to the San Luis Reservoir. After this crossing, the design option would enter a short tunnel (generally the same tunnel as under the Close to SR 152 design option but on a slightly different alignment). The element would then pass north of the Close Proximity to SR 152 design option to cross the Cottonwood Creek arm of the San Luis Reservoir, but on a shorter crossing than under the Close Proximity to SR 152 design option. After crossing the reservoir, the element would enter another tunnel before exiting the hills near Romero Creek, where it would pass north of the San Joaquin Valley National Cemetery and cross I-5 near Santa Nella Village. Locations for a PG&E switching station, HSR switching station, and HSR paralleling station are the same as under the Close Proximity to SR 152 alignment alternative.

Close Proximity to SR 152 Design Option

The Close Proximity to SR 152 design option would begin its western ascent of Pacheco Pass just west of SR 152 where the HSR mainline would emerge from the tunnel from the Santa Clara Valley. The element would cross SR 152 and pass to the southern edge of the Pacheco Creek Valley on an aerial structure. It would then pass through a short tunnel and resume following the bottom edge of the hillside along Pacheco Creek on a low, elevated structure. It would then enter a long tunnel just east of the mouth of Harper Canyon. The design option would emerge from the tunnel, cross the south fork of Pacheco Creek, and enter another tunnel to pass under Pacheco Pass. A switching station would be located near the east end of the aerial viaduct and a paralleling station (PS) would be located near the crossing of the south fork of Pacheco Creek.

The design option would emerge from the tunnel near the westernmost reach of San Luis Reservoir, just downslope and south of SR 152. It would cross a series of cuts and fills before crossing over SR 152 on an aerial structure. Once north of SR 152, it would enter a short tunnel and then run just north of and parallel to SR 152 in the vicinity of San Luis Reservoir. This alignment would minimize the length of access roads between SR 152 and the tunnel portals. A PS would be located near the east portal of the Pacheco Pass tunnel, with another potential PS adjacent to SR 152 or near the east end of the fill crossing Cottonwood Bay.

The design option would cross the Cottonwood Creek reach of San Luis Reservoir on fill just north of SR 152. The crossing would be placed on fill because the element crosses the Ortigalita fault at this location. The element would then enter a tunnel to emerge near Romero Creek, passing north of the San Joaquin Valley National Cemetery. It would exit the hills and cross I-5 north of Santa Nella Village near Witworth Road. The design option would end where it meets the Central Valley Wye, as it curves south to meet Henry Miller Road near the town of Volta. A PG&E switching station and HSR switching stations would be located where the O'Neill high voltage line crosses the HSR guideway, north of the San Joaquin Valley National Cemetery.

North Pacheco Pass

The alignment would transition from aerial to embankment behind Casa de Fruta, with some large cut/fill areas to accommodate landslip areas. It would ascend over Pacheco Creek along SR 152 before the portal to Tunnel 2, which would include a large staging area. Tunnel 2 would extend continuously approximately 13.6 miles to a portal and large staging area at McCabe Road. There would be a permanent access road to the east portal of Tunnel 2 along McCabe Road near Romero Creek. The alignment would continue on a combination of embankments and aerial structures to clear-span over Romero Creek, the California Aqueduct, and the Delta-Mendota

Canal. The alignment would cross over I-5 and connect to the San Joaquin Valley Subsection north of Santa Nella Village.

Stations

No new HSR stations are proposed for this subsection.

Maintenance Facilities

No maintenance facilities are proposed for this subsection.

3.3.2.5 San Joaquin Valley

The San Joaquin Valley Subsection extends 18 miles from I-5 just north of Santa Nella Village to Carlucci Road in Merced County, where it follows the south side of Henry Miller Road and connects with the Central Valley Wye. There is only one design option in this subsection: Henry Miller Road. The 2013 Checkpoint B Summary Report included design options through the Central Valley Wye. However, this addendum is not proposing any changes to those alternatives and they are not discussed further here. The alternative evaluated in this subsection runs south of Henry Miller Road and terminates at Carlucci Road.

Beginning at I-5, the alignment would complete the arc predominantly on embankment, with a viaduct overcrossing at Fahey Road, passing north of the community of Santa Nella, curving slightly south to align with and continue east along Henry Miller Road toward the community of Volta. Approaching Volta, it would ascend on viaduct over a branch line of the UPRR, returning to grade adjacent to the south side of Henry Miller Road. West of SR 165, an approximately 3.25-mile-long viaduct would cross over Ingomar Grade Road, then gradually descend to embankment until just north of Volta Road. A second viaduct approximately 0.6 mile long farther east would cross the creek just west of Monroe Avenue and descend to embankment just north of Wilson Road. East of SR 165, an approximately 1.6-mile HSR viaduct would begin east of the Santa Fe Grade. These viaducts would maintain wildlife crossings south of the Los Baños State Wildlife Area and Grasslands Ecological Area. Several local roadways (SR 165, Delta Road, Turner Island Road, and Carlucci Road) would be elevated over the HSR guideway, maintaining access to adjacent properties. The alignment would continue at-grade to connect with the Central Valley Wye at Carlucci Road.

Traction Power Facilities

TPSSs would be constructed at Volta Road, Mercy Springs Road, the Santa Fe Grade, and Box Car Road.

Stations

No new HSR stations are proposed for this subsection.

Maintenance Facility

A maintenance of infrastructure siding (MOIS) is proposed near Carlucci Road, the eastern terminus of this project extent. An MOIS supports infrastructure facility maintenance activities by providing a location for layover of MOI equipment and temporary storage of materials and other resources needed in the adjacent section. The goal is to reduce travel time required to arrive at the maintenance location, thereby enhancing the efficiency and productivity of the maintenance activities. Emergency access to this facility would parallel the canal west of Turner Island Road, south of Henry Miller Road.

4 AQUATIC RESOURCES

Aquatic resources (i.e., waters of the U.S., including special aquatic sites) identified in the study area are categorized as freshwater emergent wetlands, freshwater forested/shrub wetlands, riverine/channels, freshwater ponds, and lakes/reservoirs. For the purposes of this analysis, freshwater emergent wetlands and forested/shrub wetlands are considered wetlands and riverine/channels, freshwater ponds, and lakes/reservoirs are considered non-wetland waters. All aquatic resources identified have the potential to be regulated under federal or state law. This chapter defines the study area as it relates to aquatic resources, briefly describes the existing conditions, details the methods and data sources used in the analysis, and compares impacts on aquatic resources across each design option within each subsection.

Hydrologic regime definitions:

Perennial streams: Streams that have continuous flowing water year-round.

Intermittent streams: Streams that have flowing water periods during the wet season (winter-spring) but are normally dry during hot summer months. Intermittent streams do not have continuous flowing water year-round.

Ephemeral streams: Streams that have less flow than intermittent streams, are typically shallow, and have flowing water for brief periods in response to rainfall. Ephemeral streams and ditches are normally dry for most of the year.

4.1 Scope of Analysis

4.1.1 Study Area

For the purposes of this analysis, the study area for aquatic resources is the combined project footprint of all design options in each subsection. The project footprint is the area needed to construct, operate, and maintain all permanent HSR features, roadway modifications, new or relocated utility features, access to new or relocated utility features, drainage facilities, any other physical changes within the area needed to construct and operate HSR, and HSR property rights or licenses to accommodate HSR construction, operation, and maintenance. The project footprint therefore reflects the maximum area of direct disturbance for each individual design option, as opposed to the study area, which reflects the aggregate footprint of all design options.

4.1.2 Methods

Data on the extent of aquatic resources in the study area were derived from the USFWS NWI dataset (USFWS 2016a), as wetland delineation data are not presently available. Aquatic resource classification in the NWI dataset uses the Cowardin classification system (Cowardin et al. 1979; FGDC 2013). The NWI data (USFWS 2016a) classifies vernal pools as freshwater emergent wetlands. Vernal pools only occur in the San Joaquin Valley Subsection. There is no comprehensive set of remote sensing data for vernal pools; accurate accounting requires field verification. The NWI is the most comprehensive dataset available although it is sometimes incomplete when it comes to seasonal water features, such as shallow vernal pools. The potential discrepancy between the NWI data and the actual areal extent of vernal pools along the San Joaquin Valley subsection is not a critical factor for the analysis in this document, since there is only one alternative in the subsection under consideration.[8]

For the purposes of this analysis, analysts evaluated and reported all impacts on aquatic resources within the footprint of each design option. These impacts are assumed to be direct and permanent. The impact acreage does not correspond to the actual loss of aquatic resources, because the exact locations of features such as piers, abutments, and other temporary and permanent sources of fill have yet to be determined. Accordingly, all areas where the design option footprint crosses watercourses were identified as impacts, despite the fact that many of these crossings may involve construction of clear-span bridges that avoid direct impacts on

[8] An alternative source of data is the Holland et al. data on vernal pool complexes. Vernal pool complexes include both aquatic and upland areas. The Holland et al data does not distinguish between aquatic and upland areas within a vernal pool complex. Accordingly, this Checkpoint B Addendum relies instead on NWI data to determine the area of vernal pools. Vernal pool complexes in the study area—comprising both aquatic and upland components—are described and analyzed in detail in Chapter 5, *Biological Resources* using the Holland data set.

aquatic resources. Consequently, the total impacts on waters of the U.S. analyzed in this Checkpoint B Addendum are likely to be reduced as project design advances. The methods used in this document therefore overestimate impacts but provide a means of comparing the relative effect of the various design options on aquatic resources. Aquatic resources in the study area have not been verified by the USACE.

Aquatic resource impacts associated with each alternative are expressed quantitatively (total area), as California Rapid Assessment Method data describing the relative quality, functions, and services of aquatic resources are not presently available. A comprehensive table of all impacts for all design options is presented by subsection in Appendix C.

4.1.3 Existing Conditions

There is substantial variation in the relative quantity and characteristics of aquatic resources across the subsections.

- **San Jose Diridon Station Approach**—Aquatic resources in this subsection total approximately 0.3 acre and are characterized by their location in a well-developed urban environment. Only two aquatic resources occur in this subsection: Los Gatos Creek and the Guadalupe River, both of which flow to the San Francisco Bay.
- **Monterey Corridor**—There are no aquatic resources in the study area in this subsection.
- **Morgan Hill and Gilroy**—Aquatic resources in this subsection total approximately 64.6 acres in largely agricultural and suburban settings. Major water features in the study area include Coyote Creek, Llagas Creek (tributary to the Pajaro River), and the Pajaro River. Approximately 40 natural creeks and rivers, channelized creeks, and agricultural channels tributary to these major waterways intersect the study area. Waterways tend to be channelized or otherwise modified, though some natural portions of creeks are present in the study area. Wetlands and freshwater ponds are often present in confined areas adjacent to these waterways.
- **Pacheco Pass**—Aquatic resources in this subsection total approximately 194.0 acres in a largely rural setting characterized by steep terrain and relatively confined waterways. Of the more than 50 waterways in this subsection, all but one are ephemeral or intermittent streams, with one artificial path, or canal. The only perennial stream is the South Fork of Pacheco Creek, which is only designated as perennial for a portion of its entirety . The eastern portion of the subsection intersects major hydrologic features—the San Luis Reservoir, the California Aqueduct, and the Delta-Mendota Canal—before moving into a more agricultural landscape. Wetlands and freshwater ponds are often present in confined areas adjacent to waterways.
- **San Joaquin Valley**—Aquatic resources in this subsection total approximately 69.4 acres, occurring in a predominantly agricultural setting with mixed areas of natural or managed wetlands. Agricultural canals intersect the study area in numerous locations. Wetlands in this subsection include freshwater emergent wetlands such as vernal pools, marshes, and sloughs (namely, Mud Slough). Some wetlands occur on isolated parcels surrounded by agriculture, though the majority are concentrated in the middle portion of the subsection in the vicinity of Mud Slough.

4.1.3.1 Watershed Conditions

The study area lies within three Hydrologic Regions: San Francisco Bay Hydrologic Region, Central Coast Hydrologic Region, and San Joaquin River Hydrologic Region. The northern portion of the study area (San Jose Diridon Station Approach, Monterey Corridor Subsection, and the northern portion of the Morgan Hill and Gilroy Subsections) is in the Coyote watershed (Hydrologic Unit Code [HUC] 18050003); the watershed divide is in southern Santa Clara County near Morgan Hill. The middle portion of the study area (southern portion of the Morgan Hill and Gilroy Subsection and western half of the Pacheco Pass Subsection) is in the Pajaro watershed (HUC 18060002); the watershed divide is at the summit of Pacheco Pass. The eastern portion of

the study area (eastern half of Pacheco Pass Subsection and San Joaquin Valley Subsection) is in the Middle San Joaquin–Lower Chowchilla watershed (HUC 18040001) (USGS 2016).

Drainages in the Coyote watershed flow to the San Francisco Bay; drainages in the Pajaro watershed generally flow to the Pajaro River and Monterey Bay; and drainages in the Middle San Joaquin–Lower Chowchilla watershed flow to the San Joaquin River, which drains into the Sacramento–San Joaquin Delta before entering the San Francisco Bay.

Prominent watercourses in the study area are Los Gatos Creek, Guadalupe River, Coyote Creek, Fischer Creek, Llagas Creek, Pajaro River, Pacheco Creek, Cottonwood Creek, Los Banos Creek, the California Aqueduct, and Mud Slough. Watersheds in the study area are summarized in Table 4-1 and depicted on Figure 4-1.

Table 4-1 Watersheds in the Study Area

Subbasin (HUC)	Major Water Features in the Study Area	Watershed Area (acres)
Coyote (18050003)	Coyote Creek, Guadalupe River, Los Gatos Creek	3,732
Pajaro (18060002)	Coyote Creek, Guadalupe River, Pacheco–Santa Ana Creek, Fischer Creek, Llagas Creek, Upper Miller Slough, Soap Lake	3,872
Middle San Joaquin–Lower Chowchilla (18040001)	Los Banos Creek, Pacheco Creek, Mud Slough, San Luis Reservoir	38,019

Source: USGS 2016.

In the northern part of the study area (the southern Bay Area), extensive development has altered natural hydrology and drainage patterns. In this portion of the study area, streams generally flow from south to north, eventually discharging into the San Francisco Bay. When stream channels overflow, overland flooding tends to pond against linear barriers that are perpendicular to the direction of flow, such as road and railroad embankments and canal levees. If these facilities lack sufficient cross-drainage features, flows can be diverted long distances before overflowing the barrier and continuing north and east.

Watercourses that intersect the study area are typically intermittent or perennial. Historically, many streams in the northern portion of the study area had discontinuous surface flow. Today, flood control and drainage improvements have altered the course of many streams through widening, straightening, channelization, and undergrounding.

The Santa Clara Valley Water District operates a groundwater recharge system that includes reservoirs, in-stream and off-line percolation basins, and in-stream recharge. Operation of groundwater recharge systems influences the hydrology of many creek systems through releases from reservoirs, diversions to percolation basins, and importation of water for in-stream recharge.

Farther south and east in the study area there is less development, and valley floors support agriculture and scattered urban development. Streams in this area generally flow only during and briefly following heavy winter storms. In the eastern portion of the study area (the San Joaquin Valley), many of the ephemeral streams drain to the valley floor and into wetlands where the runoff infiltrates before reaching the San Joaquin River. Many of the watercourses throughout the study area are channelized or impounded, and diversions to percolation basins have been constructed.

4.1.3.2 Waters of the U.S.

Approximately 328 acres of waters of the U.S. occur in the study area: 90 acres of wetlands and 238 acres of non-wetland waters (this is an estimate based on the information described above. The Authority will submit a delineation to USACE for verification). The general characteristics of these resources, their extent, and their locations are described in the following subsections. Figure 4-2 depicts the location of waters of the U.S. (based on NWI data) relative to each

subsections design options. For this document, all waters are assumed to be both waters of the U.S. and waters of the state; subsequent jurisdictional determination will identify if any waters are isolated waters and therefore only waters of the state.

Wetlands

Wetlands are distributed throughout the study area. The highest concentration of wetlands occurs in the Pacheco Pass and San Joaquin Valley Subsections. No wetlands are present in the Monterey Corridor Subsection.

Freshwater Emergent Wetland

Approximately 69.3 acres of freshwater emergent wetland were identified in the study area, primarily in the Pacheco Pass and San Joaquin Valley Subsections. Freshwater emergent wetlands are characterized by emergent plants (i.e., erect, rooted, herbaceous, and typically perennial hydrophytes) with at least 30 percent areal coverage. This vegetation is present for a majority of the growing season in most years. Emergent wetlands are known by many names, including marshes, meadows, and sloughs (FGDC 2013).

Vernal pools, which are limited to the San Joaquin Valley Subsection, are also classified as freshwater emergent wetlands in the NWI data (USFWS 2016a). Vernal pools are a type of seasonal wetland characterized by a low amphibious, herbaceous community dominated by annual forbs and grasses. Vernal pools are isolated, unstable ecosystems that respond markedly to seasonal precipitation patterns. These pools are associated with certain types of soils. Hardpan soil layers frequently form in the horizons of clay soils, leading to the formation of vernal pools with clay soils. California annual grasslands can occur on similar soils but are not exclusively associated with vernal pools. Once formed, these vernal pools have specific and often rare flora and fauna associated with their seasonal water cycle.

Freshwater Forested/Shrub Wetland

Approximately 20.3 acres of freshwater forested/shrub wetland were identified in the study area, primarily in the Morgan Hill and Gilroy and Pacheco Pass subsections. Freshwater forested/shrub wetlands are characterized by woody vegetation—woody plants less than 20 feet tall are dominant in shrub wetlands, whereas trees are dominant in forested wetlands. Freshwater forested/shrub wetlands exhibit at least 30 percent cover of woody vegetation. Shrub wetlands may include true shrubs, young trees, or trees that are stunted by adverse environmental conditions. Shrub wetlands may represent a successional stage prior to developing into forested wetlands (FGDC 2013). Based on interpretation of aerial imagery, NWI data on freshwater forested/shrub wetlands may include some riparian areas (e.g., Los Gatos Creek and Guadalupe River in the San Jose Diridon Station Approach Subsection).

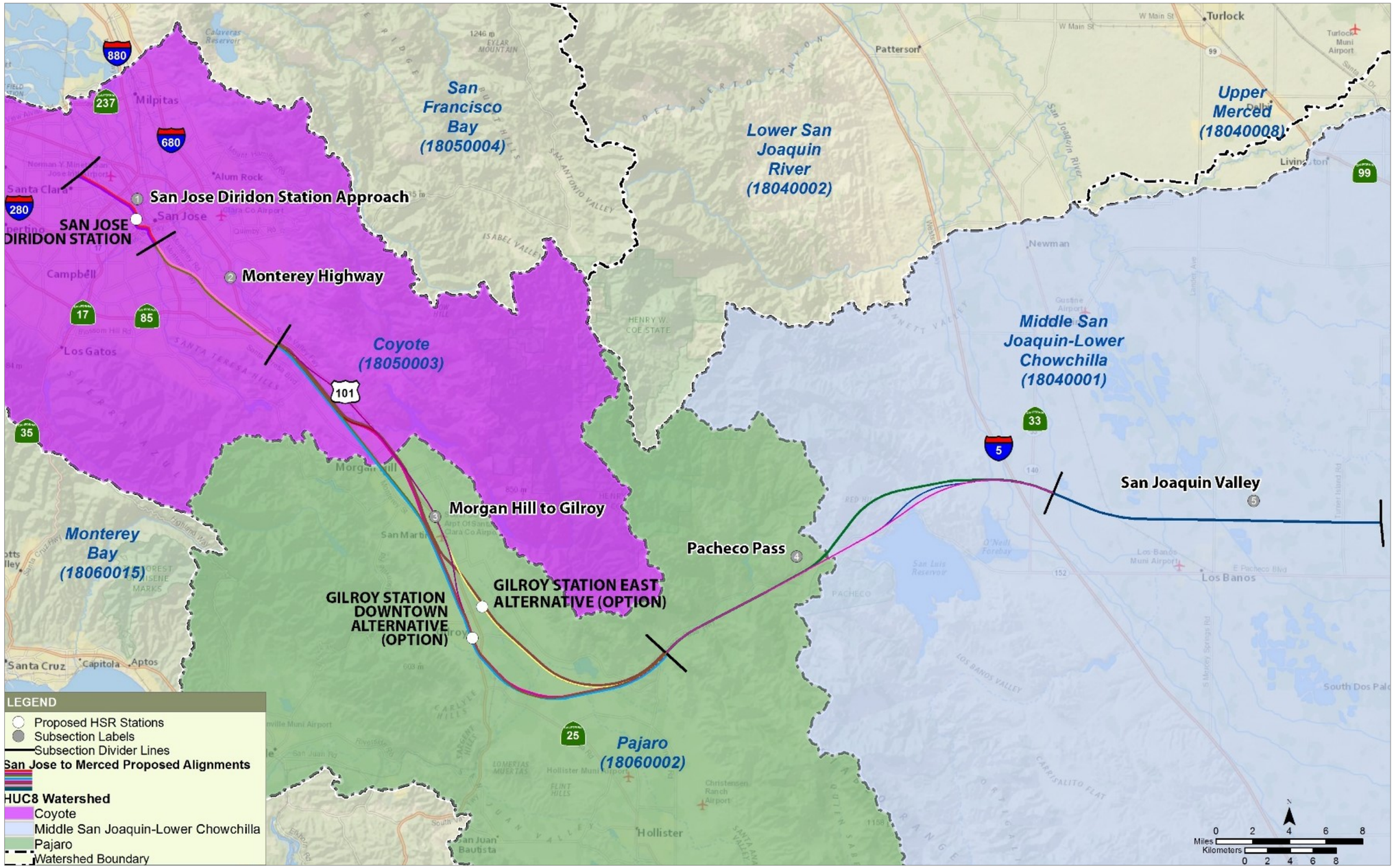
Non-Wetland Waters

Non-wetland waters are distributed throughout the Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections. No non-wetland waters occur in the San Jose Diridon Station Approach or Monterey Corridor Subsections.

Riverine/Channel

Approximately 117 acres of riverine/channel (in approximately 200 natural creeks and rivers, channelized creeks, and agricultural canals) were identified in the study area, of which all but 4 are in the Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections. Rivers and channels also include wetlands and deepwater habitats contained within a channel (not including wetlands dominated by trees). A channel is “an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water” (Langbein and Iseri 1960). Rivers and channels are bounded on the landward side by uplands, by the banks (including natural and constructed levees), or by adjacent wetlands. Rivers and channels may exhibit perennial, intermittent, or ephemeral hydrology (FGDC 2013). Based on interpretation of aerial imagery, NWI data on rivers and channels may include canals

and large agricultural ditches. Rivers and channels (as well as smaller ephemeral drainage features) are shown on Figure 4-2 (based on NWI data).



Source: HNTB 2016; ESRI/National Geographic 2016; USGS 2016.

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Figure 4-1 Watersheds in the Study Area

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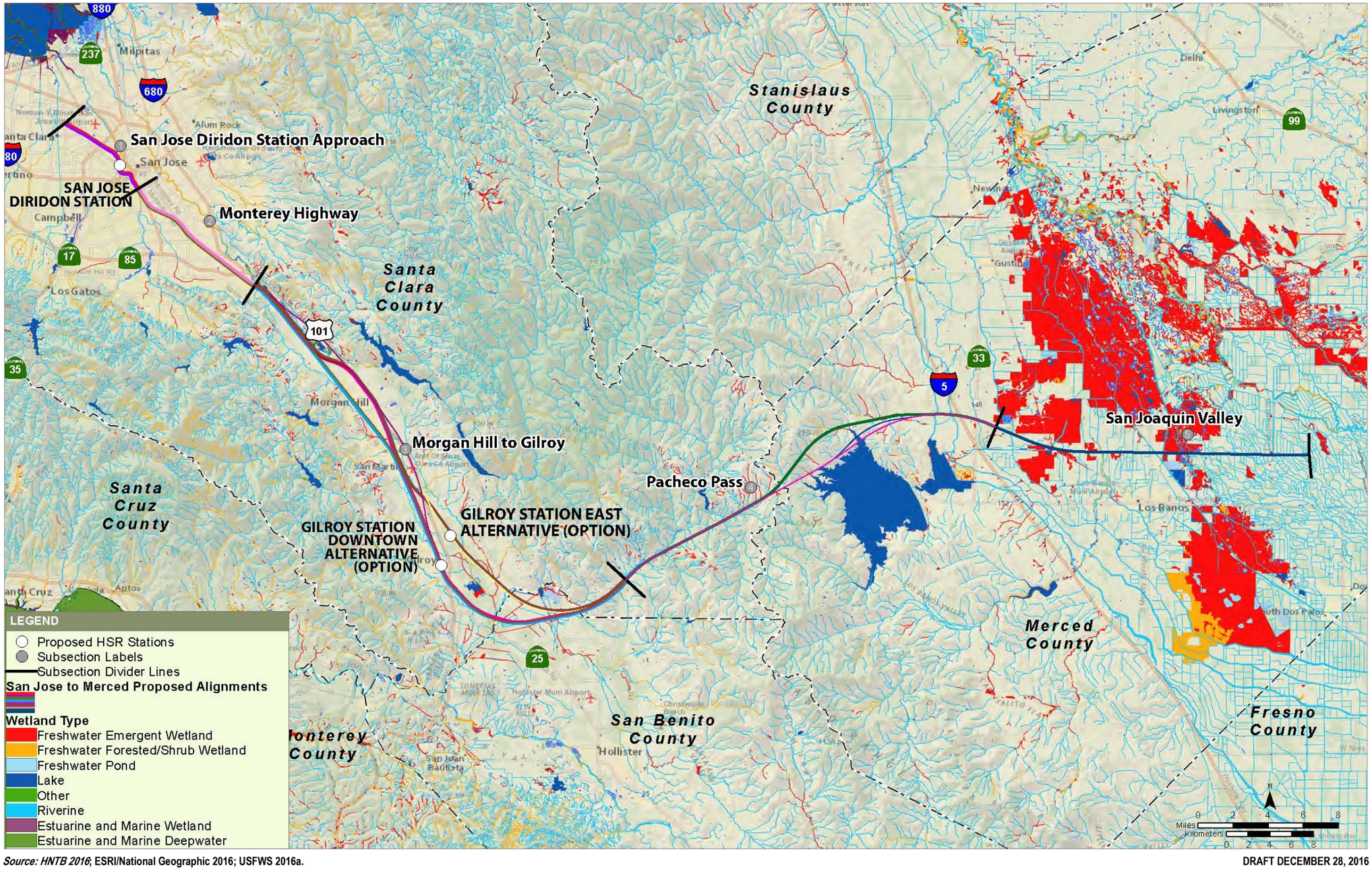

Source: HNTB 2016; ESRI/National Geographic 2016; USFWS 2016a.

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Figure 4-2 Aquatic Resources in the Study Area

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Freshwater Pond

Approximately 16.8 acres of freshwater ponds were identified in the study area in the Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections. Freshwater ponds are characterized as small, shallow, permanent or intermittent waterbodies (FGDC 2013). Ponds may support emergent wetland vegetation along their margins. Due to the resolution of the NWI data, these wetlands are sometimes grouped with ponds.

Lake/Reservoir

Approximately 104.4 acres of lakes/reservoirs were identified in the study area in the Morgan Hill and Gilroy and Pacheco Pass Subsections.[9] Lakes and reservoirs include permanently and intermittently flooded natural or artificial waterbodies, respectively. Typically, lakes and reservoirs contain extensive areas of deep water. Larger lakes and reservoirs may exhibit considerable wave action. Lakes and reservoirs may support emergent wetland vegetation along the waterbody margins, particularly where bays occur (FGDC 2013). Due to the resolution of the NWI data, these wetlands are sometimes grouped with lakes and reservoirs.

4.2 Impacts of Alternatives on Aquatic Resources

Direct impacts on aquatic resources resulting from construction of design options are summarized by subsection in Table 4-2 through Table 4-5.

4.2.1 San Jose Diridon Station Approach

There are no distinguishing factors relating to impacts on aquatic resources between the two design options in the San Jose Diridon Station Approach Subsection. Both design options result in approximately 0.3 acre of impact on freshwater forested/shrub wetland. Impacts on aquatic resources from each design option in the San Jose Diridon Station Approach Subsection are presented in Table 4-2.

Table 4-2 Impacts on Aquatic Resources in the San Jose Diridon Station Approach Subsection (acres)

Aquatic Resource	Aerial to Scott Blvd.	Aerial to I-880
Total of Aquatic Resource Impacts	*0.3*	*0.3*
Wetlands		
Freshwater Emergent Wetland	-	-
Freshwater Forested/Shrub Wetland	0.3	0.3
Non-wetland Waters		
Riverine/Channel	-	-
Freshwater Pond	-	-
Lake/Reservoir	-	-
Other	-	-

Source: HNTB 2016; USFWS 2016a.

[9] The wastewater percolation ponds located south of Southside Drive in Gilroy were not included as waters of the U.S. in this analysis per 40 C.F.R. §230.3(o)(2)(i), which states "waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act are not waters of the United States." Furthermore, these percolation ponds were not included as wetlands in the NWI data.

4.2.2 Monterey Highway

The Monterey Corridor Subsection design options would not result in impacts on aquatic resources because their footprints do not intersect any aquatic features.

4.2.3 Morgan Hill and Gilroy

All eight design options in the Morgan Hill and Gilroy Subsection would result in impacts on aquatic resources, ranging from 12.9 to 51.2 acres. Impacts on aquatic resources from each design option in the Morgan Hill and Gilroy Subsection are presented in Table 4-3.

Table 4-3 Impacts on Aquatic Resources in the Morgan Hill and Gilroy Subsection (acres)

Aquatic Resource	Embankment to Downtown Gilroy	Viaduct to Downtown Gilroy	Viaduct to East Gilroy	US 101 to Downtown Gilroy	West of Coyote Creek Parkway to Downtown Gilroy	US 101 to East Gilroy	West of Coyote Creek Parkway to East Gilroy	East of UPRR to East Gilroy
Total of Aquatic Resource Impacts	*16.2*	*15.1*	*12.9*	*51.2*	*40.1*	*38.0*	*27.1*	*14.1*
Wetlands								
Freshwater Emergent Wetland	1.8	1.6	5.0	5.2	3.3	6.2	4.3	4.5
Freshwater Forested/ Shrub Wetland	4.4	4.3	2.5	9.4	7.5	5.5	3.6	3.8
Non-wetland Waters								
Riverine/ Channel	8.2	7.2	4.9	28.9	25.3	22.2	18.9	5.5
Freshwater Pond	1.7	1.6	0.1	5.0	3.9	1.4	0.2	0.2
Lake/ Reservoir	0.1	0.4	0.4	2.3	0.1	2.3	0.1	0.1
Other[1]	-	-	-	0.4	-	0.4	-	-

Source: HNTB 2016; USFWS 2016a.
[1] NWI data do not indicate the specific type of aquatic feature. This category has been included as non-wetland water for purposes of this analysis.

4.2.4 Pacheco Pass

The North Pacheco Pass design option would result in substantially less impacts on aquatic resources than the other two design options. The additional impacts under the Refined Program Alignment and Close Proximity to SR 152 design options are largely the result of encroachment into the San Luis Reservoir. Impacts on aquatic resources in the Pacheco Pass Subsection are presented in Table 4-4.

Table 4-4 Impacts on Aquatic Resources in the Pacheco Pass Subsection (acres)

Aquatic Resource	North Pacheco Pass	Refined Program Alignment	Close Proximity to SR 152
Total of Aquatic Resource Impacts	*27.7*	*120.7*	*176.8*
Wetlands			
Freshwater Emergent Wetland	**5.8**	**9.3**	**10.2**
Freshwater Forested/Shrub Wetland	**2.0**	**5.1**	**5.0**
Non-wetland Waters			
Riverine/Channel	**19.9**	**56.0**	**53.2**
Freshwater Pond	**-**	**6.1**	**7.3**
Lake/Reservoir	**-**	**44.2**	**101.1**
Other	**-**	**-**	**-**

Source: HNTB 2016; USFWS 2016a.

4.2.5 San Joaquin Valley

The San Joaquin Valley Subsection consists of a single design option, the Henry Miller Road design option. This design option would result in 69.4 acres of impacts on aquatic resources, primarily on freshwater emergent wetlands and riverine/channel. Per review of the Holland data, many of the freshwater emergent wetlands affected may be considered vernal pools. Impacts on aquatic resources from the Henry Miller Road Design option are presented in Table 4-5.

Table 4-5 Impacts on Aquatic Resources in the San Joaquin Valley Subsection (acres)

Aquatic Resource	Henry Miller Road
Total of Aquatic Resource Impacts	*69.4*
Wetlands	
Freshwater Emergent Wetland	**43.3**
Freshwater Forested/Shrub Wetland	**2.4**
Non-wetland Waters	
Riverine/Channel	**21.3**
Freshwater Pond	**2.4**
Lake/Reservoir	**-**
Other	**-**

Source: HNTB 2016; USFWS 2016a.

5 BIOLOGICAL RESOURCES

Biological resources identified in the study area include vernal pool complexes (i.e., aquatic portions of vernal pools and adjacent uplands) and listed species habitat. This section defines the study area as it relates to biological resources, details the methods and data sources used in the analysis, briefly describes the existing conditions, and compares impacts on biological resources across each design option by subsection.

5.1 Scope of Analysis

5.1.1 Study Area

For the purposes of this analysis, the *study area* for biological resources is the combined project footprint of all design options in each subsection. The project footprint is the area needed to construct, operate, and maintain all permanent HSR features, roadway modifications, new or relocated utility features, access to new or relocated utility features, drainage facilities, any other physical changes within the area needed to construct and operate HSR, and HSR property rights or licenses to accommodate HSR construction, operation, and maintenance. The project footprint therefore reflects the maximum area of direct disturbance for each individual design option, as opposed to the study area, which reflects the aggregate footprint of all design options.

All vernal pool complexes and listed species habitat within the study area are reported. This report does not identify the exact locations where temporary or permanent conversion of habitat or take will occur; instead, it relies on the total acreage within each footprint as a measure of the relative effect on biological resources. This approach overestimates the acreage of biological impacts that may be affected by the project extent but provides a sound basis for comparison between design options.

5.1.2 Methods

This section describes the methods used to determine the extent of vernal pool complexes and listed species habitat in the study area. For the purposes of this analysis, analysts evaluated and reported all impacts on biological resources within the project footprint of each design option, assuming them to be direct and permanent. However, because there is no surface disturbance associated with tunneled sections (except for the disturbance areas at tunnel portals), the analysis assumes no impacts. The comparison of impacts between design options are strictly quantitative (total area), because information describing the relative quality of biological resources is not presently available.

5.1.2.1 *Vernal Pool Complexes*

Vernal pool complexes are defined as aquatic vernal pools (evaluated as freshwater emergent wetlands in Chapter 4, *Aquatic Resources*) considered together with the surrounding upland (typically grassland) habitat.

Data on the extent of vernal pool complexes in the study area were derived from Holland et al. (2014), as wetland delineation data are not presently available. As shown on Figure 5-1, the Holland data set typically identifies vernal pool complexes at the parcel scale, thereby overestimating the total amount of vernal pool complex habitat in the study area.

5.1.2.2 *Listed Species Habitat*

For the purposes of this analysis, only state- and federally listed species were considered. Listed species are defined as species that are federal or state listed as threatened or endangered, or are candidate species under CESA. There are no federal candidate species in the study area.

Potentially suitable habitat for listed species was identified through development of GIS habitat models. Habitat models bring together information about environmental attributes, species life history, and environmental requirements to create a spatially explicit model of suitable habitat at a regional scale. Habitat models collect a variety of information relating to habitat requirements to create hypotheses of species-habitat relationships rather than statements of proven cause-and-

effect relationships (Schamberger et al. 1982). The models are created and displayed using GIS software. Once in GIS, the habitat models can be intersected with the project footprint and resource layers to determine impacts.

Two primary types of species habitat models were developed in GIS to assess impacts: *statistically based* and *rule-based*. Statistically based models are created using GIS software that accepts habitat and occurrence data inputs and then selects potentially suitable habitat based on the most statistically significant correlations between model variables. Statistically based models require extensive habitat preference data and are thus created for very few species. San Joaquin kit fox is the only species for which a statistically based model was used in this analysis. The kit fox model was developed by the Endangered Species Recovery Program (Cypher et al. 2013) and applied to this project without modifications.

Rule-based models are created using an intersection of habitat parameters in GIS. Typically, this is done using Boolean "and/or" relationships to formulate the habitat distribution. For example, a species would be predicted to occur in an area that has the vegetation community *AND* the soil type *AND* the correct elevation range where the species is known to occur. To recognize a difference in model complexity between listed and nonlisted species, analysts defined two secondary types of rule-based models: *basic* and *specific. Basic habitat models* are created through an intersection of land cover and geographic range (including elevation range in some cases) datasets in GIS. Basic habitat models are created primarily for nonlisted species. *Specific habitat models* use land cover and range data as well as additional parameters such as geology, soil, and hydrological data as well as spatial measurements related to species movement and area use (e.g., buffer distances related to dispersal; habitat patch size and shape related to resource availability, territory size, or microhabitat characteristics) to identify potentially suitable habitat. These two model types recognize a greater understanding of habitat preferences and life history for listed species because such species are more frequently and intensely studied.

Rules for the habitat models were based on the scientific literature, listing and recovery documents published by resource agencies, first-hand species knowledge, and prior experience. The rules incorporate interpretations of species biology and life history requirements into model parameters. Where existing rule-based habitat models are available and appropriate, they were applied, or adapted, to the study area. It is preferable to use existing models when possible because these models have usually been through some level of agency and expert review.

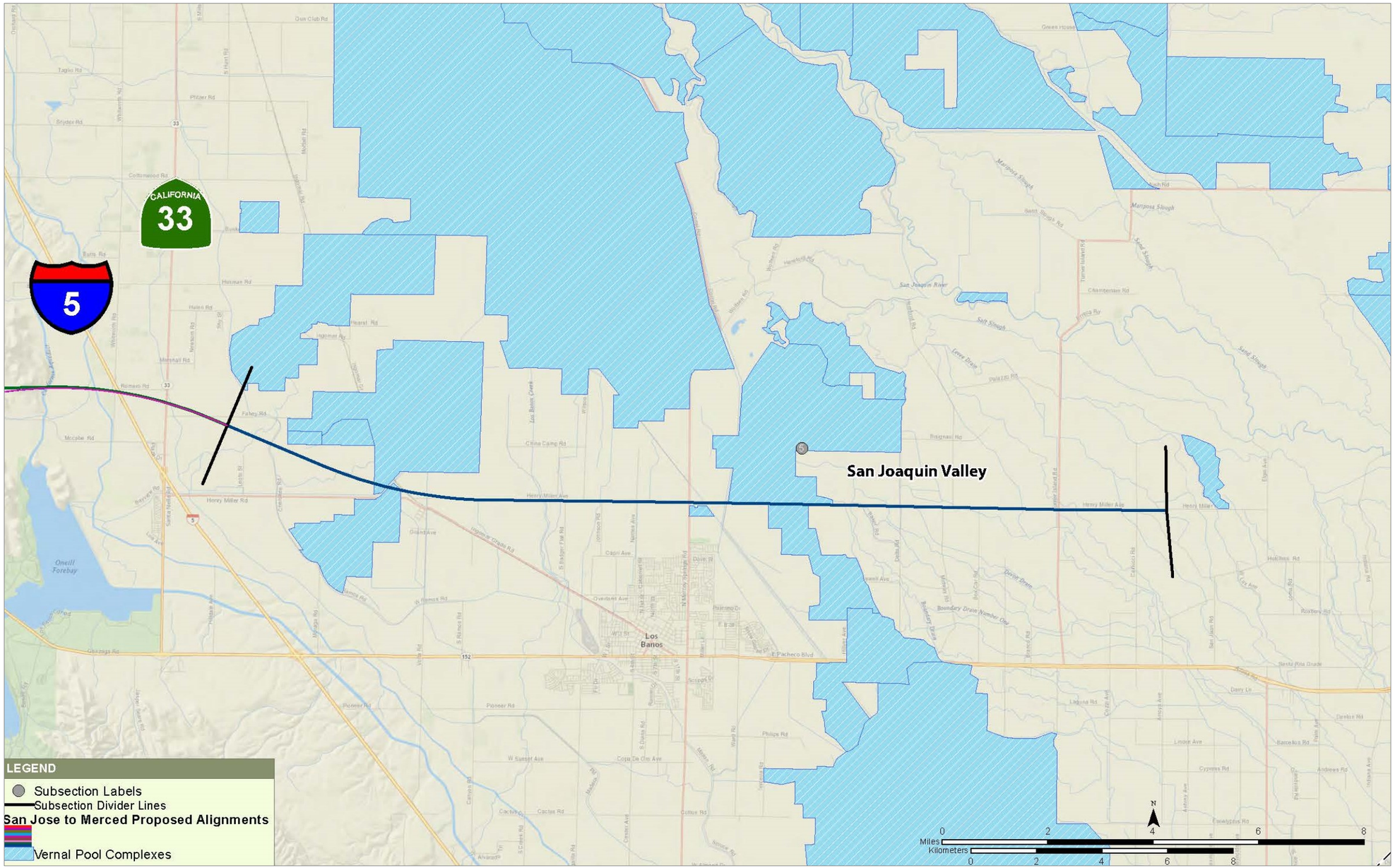
The models used in this report are considered to be in draft form. These models are expected to be reviewed, refined, and revised in coordination with agency and expert staff as the biological resource evaluation progresses. Appendix D provides an end-over-end depiction of special status species habitat, as required by the data needs articulated per the MOU.

5.1.3 Existing Conditions

5.1.3.1 *Characteristics of Subsections*

There is substantial variation in the relative quantity and characteristics of biological resources across the subsections.

- **San Jose Station Diridon Approach**—Due to the intensity of urban development, habitat for listed species in this subsection is generally confined to the narrow natural corridors at Los Gatos Creek and the Guadalupe River. These watercourses support species dependent on aquatic or riparian environments.
- **Monterey Corridor**—Due to the intensity of urban/suburban development, habitat for listed species in this subsection is generally limited to undeveloped land in the vicinity of Communications Hill in San Jose. Communications Hill is characterized by open grasslands with serpentine outcrops of rock and soil and may be inhabited by listed plants and wildlife. A pond is present at the base of Communications Hill, but it is outside the study area.



Source: HNTB 2016; ESRI/National Geographic 2016; Holland et al. 2014.

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Figure 5-1 Vernal Pool Complexes in the San Joaquin Valley Subsection

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- **Morgan Hill and Gilroy**—Although this subsection occurs in a largely agricultural and suburban setting, habitat for listed species occurs throughout much of the subsection, generally associated with the Coyote Creek riparian area, watercourses and associated wetlands, ponds (including Soap Lake), and pockets of undeveloped uplands, which may include serpentine grasslands (at Tulare Hill). While agricultural lands do not generally support pristine habitat for listed species, they provide opportunities for foraging as well as species movement and dispersal. Furthermore, the easternmost portion of the subsection (near its transition to the Pacheco Pass Subsection) consists of undeveloped grasslands in the foothills of the Diablo Range.
- **Pacheco Pass**—This subsection occurs in a largely rural and undeveloped grassland setting connected to vast areas of undeveloped land and intersected by numerous streams. Habitat for listed species occurs throughout this extensive area. The protected lands surrounding the San Luis Reservoir (including the Cottonwood Creek Wildlife Area, described in Section 6.1.1.4, Parks, Recreation, and Conservation Areas) also provide extensive habitat for listed species.
- **San Joaquin Valley**—This subsection supports listed species habitat, including vernal pool complexes (described in Section 5.2.2.1). The subsection occurs in a largely agricultural setting with numerous aqueducts, canals, and natural waterways intersecting the study area. There are a number of state and federally protected lands intersecting or adjacent to the study area that host large areas of undeveloped grasslands and wetlands (described in Section 6.1.2.3), particularly in the vicinity of Mud Slough. While some of these lands are privately used for grazing, many are managed to maximize the benefit to waterfowl. Furthermore, vernal pool complexes, which host a variety of rare and unique flora and fauna, occur throughout much of the subsection.

5.1.3.2 *Biological Resources in the Study Area*

Vernal Pool Complexes

A total of 34.9 acres of vernal pool complexes occur in the study area, only in the San Joaquin Valley Subsection. Vernal pool complexes intersect the study area in two general locations: west of the intersection of Henry Miller Road and Ingomar Grade in Los Banos, and north and south of Henry Miller Road where it intersects the Los Banos Waterfowl Management Area. Figure 5-1 shows the locations of vernal pool complexes in the San Joaquin Valley Subsection. Note that in the figures below areas depicted as vernal pool complexes are not entirely or mostly waters; instead they are areas that may contain both vernal pools and associated uplands.

Listed Plants

The study area contains habitat for five listed plants. Listed plant habitat occurs in the Monterey Corridor (two species), Morgan Hill and Gilroy (two species), and San Joaquin Valley (three species) Subsections. There is no listed plant habitat in the San Jose Diridon Station Approach or Pacheco Pass Subsections. The vast majority of the study area has low potential to harbor listed plants. Listed plant habitat in the study area is generally confined to certain sensitive habitats such as vernal pools, serpentine soils, and alkaline soils. Listed plants potentially occurring in the study area are summarized in Table 5-1.

Listed Wildlife

The study area contains habitat for 14 listed wildlife species. Listed wildlife habitat occurs in each of the subsections, with the greatest number of listed species and area of habitat in the Morgan Hill and Gilroy (9 species), Pacheco Pass (10 species), and San Joaquin Valley (10 species) subsections. The San Jose Diridon Station Approach and Monterey Corridor Subsections support substantially fewer listed species (four species each) and total habitat area. Unlike listed plants, habitat for listed wildlife species occurs in more common habitats (e.g., annual grasslands) as well as specialized environments (e.g., vernal pools). Listed wildlife species potentially occurring in the study area are summarized in Table 5-2.

Table 5-1 Listed Plants Potentially Occurring in the Study Area

Species	Status[1] Federal/State	Habitat Requirements	Potential Habitat in Study Area (acres)
Colusa grass (*Neostapfia colusana*)	FT / SE	Adobe soils of vernal pools	30.9
Hoover's spurge (*Chamaesyce hooveri*)	FT / -	Large northern hardpan and volcanic vernal pools	30.9
Metcalf Canyon jewelflower (*Streptanthus albidus* ssp. *albidus*)	FE / -	Valley and foothill grassland on serpentine soils	36.2
Palmate-bracted bird's-beak (*Chloropyron palmatum*)	FE / SE	Alkaline sites in grassland and chenopod scrub	2.8
Santa Clara Valley dudleya (*Dudleya abramsii* ssp. *setchellii*)	FE / -	Rocky serpentinite sites in cismontane woodland and valley and foothill grasslands	21.1

Source: ICF 2016a.
[1] Status explanations:
FE = listed as endangered under the FESA
FT = listed as threatened under the FESA
SE = Listed as endangered under the CESA

Table 5-2 Listed Wildlife Potentially Occurring in the Study Area

Species	Status[1] Federal/ State	Habitat Requirements	Potential Habitat in Study Area (acres)
California red-legged frog (*Rana draytonii*)	FT / -	Permanent and semipermanent aquatic habitats, such as creeks and cold-water ponds, with emergent and submerged vegetation; may aestivate in rodent burrows or cracks during dry periods	9,838
California tiger salamander (*Ambystoma californiense*)	FT / ST	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for breeding; rodent burrows, rock crevices, or fallen logs for upland cover during dry season	4,020
Least bell's vireo (*Vireo bellii pusilus*)	FE / SE	Riparian thickets either near water or in dry portions of river bottoms; nests along margins of bushes and forages low to the ground; may also be found using mesquite and arrow weed in desert canyons	68
Swainson's hawk (*Buteo swainsoni*)	- / ST	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	5,355

Species	Status[1] Federal/ State	Habitat Requirements	Potential Habitat in Study Area (acres)
Tricolored blackbird (*Agelaius tricolor*)	CT / SCET	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grainfields; habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony.	7,870
Steelhead—Central Valley DPS South-Central California Coast DPS (*Oncorhynchus mykiss*)	FT / -	Cold, clear water with clean gravel of appropriate size for spawning. Most spawning occurs in headwater streams. Steelhead migrate to the ocean to feed and grow until sexually mature.	216
Bay checkerspot butterfly (*Euphydryas editha bayensis*)	FT / -	Native grasslands on outcrops of serpentine soil; California plantain (Plantago erecta) and owl's clover (Castilleja densiflorus or C. exserta) are host plants	34
Conservancy fairy shrimp (*Branchinecta conservation*)	FE / -	Large, deep vernal pools in annual grasslands	31
Longhorn fairy shrimp (*Branchinecta longiantenna*)	FE / -	Small, clear pools in sandstone rock outcrops of clear to moderately turbid clay- or grass-bottomed pools	31
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT / -	Common in vernal pools; also found in sandstone rock outcrop pools	31
Vernal pool tadpole shrimp (*Lepidurus packardi*)	FE / -	Vernal pools and ephemeral stock ponds	54
San Joaquin kit fox (*Vulpies macrotis mutica*)	FE / ST	Saltbush scrub, grassland, oak, savanna, and freshwater scrub	6,648
Blunt-nosed leopard lizard (*Gambelia sila*)	FE / SE	Open habitats with scattered low bushes on alkali flats, low foothills, canyon floors, plains, washes, and arroyos; substrates may range from sandy or gravelly soils to hardpan	197

Species	Status[1] Federal/ State	Habitat Requirements	Potential Habitat in Study Area (acres)
Giant gartersnake (*Thamnophis gigas*)	FT / ST	Sloughs, canals, low gradient streams and freshwater marsh habitats where there is a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter	418

Source: ICF 2016a.
[1] Status explanations:
FE = listed as endangered under the FESA
FT = listed as threatened under the FESA
CT = candidate for listing as threatened under FESA
SE = Listed as endangered under the CESA
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SCET = State candidate for listing as endangered or threatened under the CESA

5.2 Impacts of Design Options on Biological Resources

In general, impacts on biological resources are most extensive in the Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections, though impacts would likely occur in all five subsections. The San Joaquin Valley Subsection is the only subsection that would result in impacts on vernal pool complexes; it would also result in impacts on the greatest number of species of any subsection. The San Jose Diridon Station Approach and Monterey Corridor Subsections would result in minimal impacts on biological resources.

Impacts on vernal pool complexes and listed species habitat are summarized by subsection in Table 5-3 through Table 5-7.

5.2.1 San Jose Diridon Station Approach

There are no distinguishing factors relating to impacts on biological resources between the two design options in the San Jose Diridon Station Approach Subsection. Impacts on biological resources associated with each element are presented in Table 5-3.

Table 5-3 Impacts on Biological Resources in the San Jose Diridon Station Approach Subsection (acres)

Biological Resource	Viaduct to Scott Blvd.	Viaduct to I-880
Vernal Pool Complex	-	-
Listed Wildlife Species[1]		
California red-legged frog (FT)	0.6	0.6
California tiger salamander (FT)	-	-
Least Bell's vireo (FE, SE)	4.2	4.2
Swainson's hawk (ST)	-	-
Tricolored blackbird (CT, SCET)	0.4	0.2
Steelhead—Central Valley DPS South-Central California Coast DPS (FT)	1.8	1.8
Bay checkerspot butterfly (FT)	-	-
Conservancy fairy shrimp (FE)	-	-
Longhorn fairy shrimp (FE)	-	-

Biological Resource	Viaduct to Scott Blvd.	Viaduct to I-880
Vernal pool fairy shrimp (FT)	-	-
Vernal pool tadpole shrimp (FE)	-	-
San Joaquin kit fox (FE, ST)	-	-
Blunt-nosed leopard lizard (FE, SE)	-	-
Giant gartersnake (FT, ST)	-	-
Listed Plant Species[1]		
Colusa grass (FT, SE)	-	-
Hoover's spurge (FT)	-	-
Metcalf Canyon jewelflower (FE)	-	-
Palmate-bracted bird's-beak (FE, SE)	-	-
Santa Clara Valley dudleya (FE)	-	-

Source: HNTB 2016; Holland et al. 2014; ICF 2016a.
[1] Status explanations:
FE = listed as endangered under the FESA
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5.2.2 Monterey Corridor

The impacts on biological resources for the two alternatives in the Monterey Corridor Subsection are similar. Impacts on biological resources associated with each design option in the subsection are presented in Table 5-4.

Table 5-4 Impacts on Biological Resources in the Monterey Corridor Subsection (acres)

Biological Resource	At-Grade	Viaduct
Vernal Pool Complex	-	-
Listed Wildlife Species[1]		
California red-legged frog (FT)	82.6	85.1
California tiger salamander (FT)	-	-
Least Bell's vireo (FE, SE)	-	-
Swainson's hawk (ST)	28.1	16.4
Tricolored blackbird (CT, SCET)	24.1	12.4
Steelhead—Central Valley DPS South-Central California Coast DPS (FT)	-	-
Bay checkerspot butterfly (FT)	4.9	4.9
Conservancy fairy shrimp (FE)	-	-
Longhorn fairy shrimp (FE)	-	-
Vernal pool fairy shrimp (FT)	-	-
Vernal pool tadpole shrimp (FE)	-	-
San Joaquin kit fox (FE, ST)	-	-
Blunt-nosed leopard lizard (FE, SE)	-	-

Biological Resource	At-Grade	Viaduct
Giant gartersnake (FT, ST)	-	-
Listed Plant Species[1]		
Colusa grass (FT, SE)	-	-
Hoover's spurge (FT)	-	-
Metcalf Canyon jewelflower (FE)	7.1	7.1
Palmate-bracted bird's-beak (FE, SE)	-	-
Santa Clara Valley dudleya (FE)	4.9	4.9

Source: Holland et al. 2014; HNTB 2016; ICF 2016a.
[1] Status explanations:
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5.2.3 Morgan Hill and Gilroy Subsection

With a few exceptions, the Embankment to Downtown Gilroy, Viaduct to Downtown Gilroy, and Viaduct to East Gilroy design options would generally result in fewer impacts on listed species than the other design options. Impacts on biological resources associated with each design option in the Morgan Hill and Gilroy Subsection are presented in Table 5-5.

Table 5-5 Impacts on Biological Resources in the Morgan Hill and Gilroy Subsection (acres)

Biological Resource	Embankment to Downtown Gilroy	Viaduct to Downtown Gilroy	Viaduct to East Gilroy	US 101 to Downtown Gilroy	West of Coyote Creek Parkway to Downtown Gilroy	US 101 to East Gilroy	West of Coyote Creek Parkway to East Gilroy	East of UPRR to East Gilroy
Vernal Pool Complex	-	-	-	-	-	-	-	-
Listed Wildlife Species[1]								
California red-legged frog (FT)	2,294.1	1,688.1	1,609.7	2,422.6	2,671.5	2,105.2	2,301.2	2,481.4
California tiger salamander (FT)	338.6	299.6	285.7	380.3	313.5	367.2	300.3	309.2
Least Bell's vireo (FE, SE)	18.3	17.7	11.3	29.9	22.5	28.8	21.4	22.7
Swainson's hawk (ST)	507.5	263.4	263.5	379.2	517.5	379.2	517.5	680.2
Tricolored blackbird (CT, SCET)	1,184.8	1,184.8	1,295.7	1,871.2	1,989.0	1,655.3	1,769.1	1,781.0
Steelhead—Central Valley DPS South-Central California Coast DPS (FT)	37.5	34.2	44.2	62.1	55.9	54.9	49.7	45.8
Bay checkerspot butterfly (FT)	12.4	4.2	4.2	20.0	14.1	20.0	14.1	14.1
Conservancy fairy shrimp (FE)	-	-	-	-	-	-	-	-
Longhorn fairy shrimp (FE)	-	-	-	-	-	-	-	-
Vernal pool fairy shrimp (FT)	-	-	-	-	-	-	-	-
Vernal pool tadpole shrimp (FE)	4.5	4.5	7.7	5.9	0.7	7.8	4.9	4.9
San Joaquin kit fox (FE, ST)	620.4	620.4	523.1	1,174.8	1,174.8	627.8	627.8	627.8
Blunt-nosed leopard lizard (FE, SE)	-	-	-	-	-	-	-	-
Giant gartersnake (FT, ST)	-	-	-	-	-	-	-	-
Listed Plant Species[1]								
Colusa grass (FT, SE)	-	-	-	-	-	-	-	-
Hoover's spurge (FT)	-	-	-	-	-	-	-	-
Metcalf Canyon jewelflower (FE)	12.4	6.1	6.1	20.0	14.1	20.0	14.1	14.1
Palmate-bracted bird's-beak (FE, SE)	-	-	-	-	-	-	-	-
Santa Clara Valley dudleya (FE)	12.4	6.1	6.1	7.1	14.1	7.1	14.1	14.1

Source: Holland et al. 2014; HNTB 2016; ICF 2016a.

[1] Status explanations:
FE = listed as endangered under the FESA
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SE = Listed as endangered under the CESA
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SCET = State candidate for listing as endangered or threatened under the CESA

5.2.4 Pacheco Pass Subsection

The North Pacheco Pass design option has the fewest impacts on biological resources with the exception of giant gartersnake, which is subject to marginally greater impacts than under the other two design options.

Impacts on biological resources associated with each design option in the Pacheco Pass Subsection are presented in Table 5-6.

Table 5-6 Impacts on Biological Resources in the Pacheco Pass Subsection (acres)

Biological Resource	North Pacheco Pass	Refined Program Alignment	Close Proximity to SR 152
Vernal Pool Complex	-	-	-
Listed Wildlife Species[1]			
California red-legged frog (FT)	973.7	2,889.3	2,760.6
California tiger salamander (FT)	917.0	2,666.7	2,554.1
Least Bell's vireo (FE, SE)	12.9	23.8	22.4
Swainson's hawk (ST)	2,820.5	2,473.5	2,377.6
Tricolored blackbird (CT, SCET)	899.4	2,283.3	2,325.0
Steelhead—Central Valley DPS South-Central California Coast DPS (FT)	33.0	101.8	99.9
Bay checkerspot butterfly (FT)	-	-	-
Conservancy fairy shrimp (FE)	-	-	-
Longhorn fairy shrimp (FE)	-	-	-
Vernal pool fairy shrimp (FT)	-	-	-
Vernal pool tadpole shrimp (FE)	3.0	7.7	7.4
San Joaquin kit fox (FE, ST)	1,298.2	3,344.8	3,240.6
Blunt-nosed leopard lizard (FE, SE)	72.9	141.8	129
Giant gartersnake (FT, ST)	34.0	33.8	31.2
Listed Plant Species[1]			
Colusa grass (FT, SE)	-	-	-
Hoover's spurge (FT)	-	-	-
Metcalf Canyon jewelflower (FE)	-	-	-
Palmate-bracted bird's-beak (FE, SE)	-	-	-
Santa Clara Valley dudleya (FE)	-	-	-

Source: Holland et al. 2014; HNTB 2016; ICF 2016a.
[1] Status explanations:
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SE = Listed as endangered under the CESA
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SCET = State candidate for listing as endangered or threatened under the CESA

5.2.5 San Joaquin Valley Subsection

The San Joaquin Valley Subsection consists of a single design option, the Henry Miller Road Design option. Impacts on biological resources from this design option are presented in Table 5-7.

Table 5-7 Impacts on Biological Resources in the San Joaquin Valley Subsection (acres)

Biological Resource	Henry Miller Road
Vernal Pool Complex	**34.9**
Listed Wildlife Species[1]	
California red-legged frog (FT)	-
California tiger salamander (FT)	57.3
Least Bell's vireo (FE, SE)	7.4
Swainson's hawk (ST)	701.2
Tricolored blackbird (CT)	696.6
Steelhead—Central Valley DPS South-Central California Coast DPS (FT)	-
Bay checkerspot butterfly (FT)	-
Conservancy fairy shrimp (FE)	30.9
Longhorn fairy shrimp (FE)	30.9
Vernal pool fairy shrimp (FT)	30.9
Vernal pool tadpole shrimp (FE)	30.9
San Joaquin kit fox (FE, ST)	827.9
Blunt-nosed leopard lizard (FE, SE)	-
Giant garter snake (FT, ST)	361.6
Listed Plant Species[1]	
Colusa grass (FT, SE)	30.9
Hoover's spurge (FT)	30.9
Metcalf Canyon jewelflower (FE)	-
Palmate-bracted bird's-beak (FE, SE)	2.8
Santa Clara Valley dudleya (FE)	-

Source: Holland et al. 2014; HNTB 2016; ICF 2016a.
[1] Status explanations:
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6 OTHER ENVIRONMENTAL AND COMMUNITY RESOURCES

Each design options' potential impact on environmental resources and community resources was evaluated using the MOU criteria. This evaluation included an assessment of the presence and proximity of low-income and minority populations; residential and business displacements; important farmland; cultural resources; parks, recreation, and conservation areas (including National Wildlife Refuges and conservation easements); and 100-year Flood Hazard Zones (FHZ). This analysis was based on preliminary information available at this conceptual stage of engineering design.

6.1 Other Environmental Resources

6.1.1 Scope of Analysis

6.1.1.1 Study Area

For the purposes of this analysis, the *study area* is the combined project footprint of all design options in each subsection. The project footprint is the area needed to construct, operate, and maintain all permanent HSR features, roadway modifications, new or relocated utility features, access to new or relocated utility features, drainage facilities, any other physical changes within the area needed to construct and operate HSR, and HSR property rights or licenses to accommodate HSR construction, operation, and maintenance. The project footprint therefore reflects the maximum area of direct disturbance for each individual design option, as opposed to the study area, which reflects the aggregate footprint of all design options.

6.1.1.2 Methods

Important Farmland

The agricultural resources along each of the design options were identified by reviewing the existing FMMP and Williamson Act GIS databases.

Cultural Resources

Historic properties and previously recorded archaeological resources in the study area were identified using information obtained through the NRHP, CHRI, and prior cultural resources studies. A background records search was conducted in May 2016 at the Northwest Information Center, based on a preliminary environmental footprint. All recorded cultural resources in the footprint (NRHP-listed and eligible) were tabulated for each design option.

Parks, Recreation, and Conservation Areas

Data collection for parks, recreation, and conservation areas consisted of a review of regional and local plans and policies and the use of GIS data sets. Parks and recreation areas were determined using CPAD (2016). Conservation areas—both wildlife refuges and conservation easements—were determined using the USFWS National Wildlife Refuge database (USFWS 2016) and CCED (2016), respectively.

For the purposes of this analysis, analysts evaluated and reported all impacts on parks, recreation, open space, and conservation areas within the footprint of each design option. These impacts are assumed to be direct and permanent. Consequently, the total impacts on parks, recreation, open space, and conservation areas analyzed in this report are likely to decrease as the project design advances.

FEMA 100-year Flood Hazard Zones

In response to increasing costs of disaster relief, Congress passed the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. The intent of these acts was to reduce the need for large, publicly funded, flood-control structures and disaster relief by restricting development on floodplains. The National Flood Insurance Program (NFIP) was created as a result of the passage of the National Flood Insurance Act of 1968. FEMA administers the NFIP to provide subsidized flood insurance to communities that comply with FEMA regulations limiting

development in floodplains. FEMA issues FIRMs for communities participating in the NFIP. These maps delineate FHZs in the community. A FIRM is the official map of a community prepared by FEMA to delineate both the special flood hazard areas and the flood risk premium zones applicable to the community.

Flood Insurance Rate Maps (FIRM) prepared by FEMA for Santa Clara, San Benito, and Merced Counties (FEMA 2016a) were reviewed to identify the locations of current 100-year floodplains in the study area. The FEMA 100-year FHZs analyzed in this report are as follows (FEMA 2016b):

- **Zone A**—Areas subject to inundation by the 1-percent-annual-chance flood event, generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFE) or flood depths are shown.
- **Zone AO**—Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are 1–3 feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone.
- **Zone AH**—Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are 1–3 feet. BFEs derived from detailed hydraulic analyses are shown in this zone.
- **Zone AE**—Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. BFEs are shown.

Moderate FHZ, or zones in 500-year Flood Hazard Areas including Zone X, were not included in this analysis. Similarly, Zone D, which is used for areas where there are possible but undetermined flood hazards, was also not included.

For the purposes of this analysis, analysts evaluated and reported all impacts within 100-year FHZs in the footprint of each design option. All impacts are assumed to be direct and permanent. Consequently, the total impacts within 100-year FHZs are likely to decrease as project design advances.

6.1.1.3 Existing Conditions

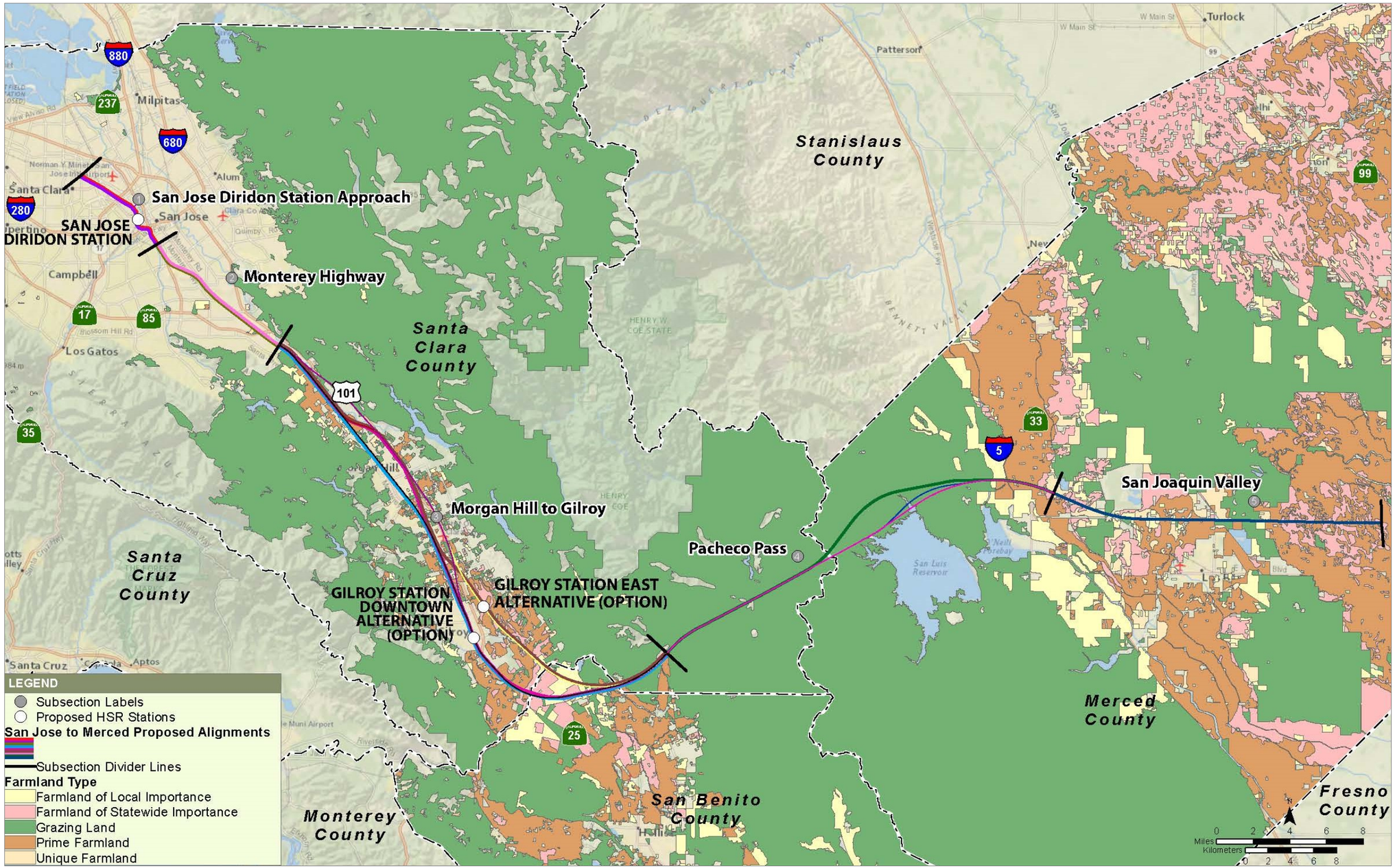
Important Farmland

Important farmland consists of four categories. The California Department of Conservation defines these as follows (CCEC 2016):

- **Prime Farmland** is farmland with the best combination of physical and chemical features able to sustain long-term agricultural production.
- **Farmland of Statewide Importance** is similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture.
- **Unique Farmland** is of lesser quality soils used for the production of the state's leading agricultural crops; this land is usually irrigated.
- **Farmland of Local Importance** is determined by the local agricultural economy.

This section also addresses grazing land, which sustains vegetation suitable for grazing. The design options in three of the five subsections are located in areas that contain Important Farmland. Important Farmlands and grazing lands in the region are shown on Figure 6-1.

The San Jose Diridon Station Approach and Monterey Corridor Subsections are largely urbanized and extensively developed; there are no Important Farmlands or grazing land in either subsection. The remainder of the project extent traverses more rural areas, with the exception of the more developed areas of Morgan Hill and Gilroy. In the Pacheco Pass Subsection, the alignment traverses predominantly grazing land, with areas of Important Farmland in the eastern portion. Prime Farmland and Farmland of Statewide Importance are the two predominant agricultural land types present in the Pacheco Pass and San Joaquin Valley Subsections.



Source: HNTB 2016; ESRI/National Geographic 2016; FMMP 2016.

Figure 6-1 Important Farmland and Grazing Lands

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Cultural Resources

Cultural resource conditions vary along the project extent. Because of the highly developed, urban character of the San Jose Diridon Station Approach and Monterey Corridor Subsections, most historic resources are degraded or have lost their integrity. Less extensive urbanization in the three other subsections contributes to higher quality built resources and untouched archaeological resources. The Morgan Hill and Gilroy Subsection is highly sensitive for archaeological deposits and contains numerous known archaeological sites.

- The San Jose Diridon Station Approach Subsection contains historic built resources related to historic railroad lines and to early 20th-century residential development and commercial activities in San Jose. Examples that have been listed in the NRHP include the ca. 1935 Southern Pacific Railroad Depot and the ca. 1904 Hayes Mansion, both in San Jose. A large number of historic-era built resources require further investigation to determine their eligibility. Archaeological sites have been recorded in the study area for this subsection, though most have been disturbed to some degree by the heavily developed nature of the area.
- The Monterey Corridor Subsection contains historic built resources related to the mid-twentieth century commercial and residential expansion from San Jose into southern Santa Clara County, with occasional remnants of the 19th-century agricultural and railroad heritage of the area. No built resources in this subsection have been listed in the NRHP; however, a large number of historic-era built resources may require further investigation to determine their eligibility. Archaeological sites have been recorded in the study area for this subsection, though most have been disturbed to some degree by the heavily developed nature of the area.
- The Morgan Hill and Gilroy Subsection contains pockets of late 19th- and early 20th- century commercial and residential built resources in the vicinity of Morgan Hill and Gilroy, with large areas of land between them that are either still in agricultural use or were subdivided for commercial or residential use in the late 20th century. Examples of built resources that have been listed in the NRHP include the ca. 1869 Malaguerra Winery and the ca. 1886 Villa Mira Monte, both in Morgan Hill; and the ca. 1908 Live Oak Creamery and ca. 1904 Old City Hall, both located in Gilroy. A large number of historic-era built resources require further investigation to determine their eligibility. Archaeological resources in this subsection are generally less disturbed due to the more open and undeveloped character of the area. The alignment elements crosse Coyote Creek in the northern portion of this subsection. Numerous sites are known in and around this drainage, some large and relatively intact. In the southern portion of this section, sites occur on the margins of wetlands associated with San Felipe Lake and regions to the south, known as the Soap Lake floodplain. This area is known to be an area of concern for Native American tribes.
- The Pacheco Pass Subsection contains relatively few historic built resources, consisting primarily of large 19th- and 20th-century farms or ranches and related agricultural properties, the San Luis Reservoir, and the California Aqueduct. No built resources in this subsection have been listed in the NRHP. A limited number of historic-era built resources require further investigation to determine their eligibility. Archaeological resources in this subsection include sites associated with the oak groves present in the pass uplands. Some sites are very small, but a few are extensive, encompassing midden and occupation debris. An NRHP district encompassing five sites is present in this subsection.
- The San Joaquin Valley subsection contains historic built resources related to late 19th and 20th century agricultural practices such as farms, ranches, and water conveyance systems. No built resources in this subsection have been listed in the NRHP. A moderate number of historic-era built resources require further investigation to determine their eligibility. Archaeologically, this subsection is very sparse, with few known sites, probably due to the depositional nature of the San Joaquin Valley setting, as well as to the lack of previous work undertaken in most of these ranchlands.

The design options in the five subsections are located in areas that contain known archaeological sites and or NRHP-listed or eligible properties. A total of 29 archaeological resources, listed in Table 6-1, were identified in the study area. One of these sites is listed in the NRHP, and one has been determined to be eligible for listing. A total of 44 known built historic resources were identified within the study area, listed in Table 6-2.

Table 6-1 Archaeological Resources within the Study Area

Archaeological Resources - P number or Trinomial	Type/Description	NRHP Eligibility Status
San Jose Diridon Station Approach		
P-43-002234	A historic refuse scatter including glass, ceramic, cut bone, and metal fragments.	Not formally evaluated
CA-SCL-000030	The third location of Mission Santa Clara de Asis, also known as the Murguiá Mission	Determined Eligible for listing in the NRHP
CA-SCL-00690	Prehistoric cemetery	Not formally evaluated
CA-SCL-00855	A historic refuse scatter including ceramics, tile, metal, glass, and cut bone	Not formally evaluated
Monterey Corridor		
CA-SCL-000191	Lithic concentration	Not formally evaluated
CA-SCL-00448	A surface scatter of oyster, abalone, and one Olivella shell	Not formally evaluated
Morgan Hill and Gilroy		
CA-SCL-000094	A reported (1973) burial (skeleton and some teeth)	Not formally evaluated
CA-SCL-000163	Midden dispersed and piled in mound in a grove of oak trees. Artifacts include lithics and groundstone fragments The midden deposit measures approximately 20 m in diameter.	Not formally evaluated
CA-SCL-000169	Lithic concentration	Not formally evaluated
CA-SCL-000170	A single pestle frament	Not formally evaluated
CA-SCL-000172	Lithic concentration	Not formally evaluated
CA-SCL-000412	A sparse scatter of groundstone	Not formally evaluated
CA-SCL-00571	A light lithic scatter with fire-cracked rock	Not formally evaluated
CA-SCL-00573	A habitation site including a lithic scatter, groundstone, and burial	Not formally evaluated
CA-SCL-00587	A habitation site including lithic scatter, groundstone, fire-cracked rock, shell, and human remains	Not formally evaluated
CA-SCL-00838	A prehistoric burial site with artifacts including groundstone and shell,	Recommended Eligible for the CRHR

Archaeological Resources - P number or Trinomial	Type/Description	NRHP Eligibility Status
Pacheco Pass		
CA-MER-0018	A small, rocky midden deposit, measuring approximately 50 by 40 ft. Artifacts include silicate flakes (3), one shell fragment, one possible human bone fragment	Not formally evaluated
CA-MER-0096	A midden deposit, measuring approximately 100 by 75 ft. Artifacts include chert flakes, one chert core, and one pestle fragment	Not formally evaluated
CA-MER-0130	A midden deposit on a small bench above a creek. The midden measures approximately 100 by 100 feet and include bedrock mortars and cupule petroglyphs	Not formally evaluated
P-24-000489	Five midden deposits: two major villages and three special-purpose sites	NRHP Listed
P-24-001640	One partially sodded-in fire ring and one rectangular stone alignment	Not formally evaluated
CA-SCL-000031	A shallow midden surrounding a rock outcrop with intact mortars. Artifacts include chert flakes and groundstone; a 1989 letter to the NWIC from Caltrans states that a field survey failed to identify any evidence of this site, which was likely destroyed during the construction of SR 152 in the early 1950s	Not formally evaluated
CA-SCL-000115	A dark ashy midden capping bench overlooking floodplain of Pacheco Creek; no artifacts observed	Not formally evaluated
CA-SCL-000116	A large terrace with variable colored midden; no artifacts observed	Not formally evaluated
CA-SCL-000123	Dark midden on several terraces on both sides of creek with bedrock mortars in rock outcrops. Midden deposit measures approximately 100 by 130 m.	Not formally evaluated
CA-SCL-000301	One bedrock mortar in flat rock outcrop; one pestle	Not formally evaluated
CA-SCL-000321	A light lithic scatter with fire-cracked rock on the first terrace above creek	Not formally evaluated
CA-SCL-00490	A lithic scatter with fire-cracked rock and groundstone	Not formally evaluated
San Joaquin Valley		
CA-MER-0322	A small village or large campsite with lithics, mortars, and debitage of various materials	Not formally evaluated

Source: ICF 2017.

Table 6-2 Built Resources within the Study Area

P Number	Trinomial	Common Name	Historic Name	City	Year Built
San Jose Diridon Station Approach					
				San Jose	1932
P-43-002272		Southern Pacific Depot	Diridon Station, Hiram Cahill Depot	San Jose	1935
P-43-001236		Walnut Factory Lofts	Walnut Growers Association	Santa Clara	
P-43-002653				San Jose	
P-43-002873		Santa Clara Depot	Santa Clara Railroad Historic Complex	Santa Clara	1877
P-43-003026		Santa Clara Control Tower		Santa Clara	1927
Monterey Corridor					
None					
Morgan Hill and Gilroy					
		White/Sturla Ranch	White/Sturla Ranch	Gilroy	c. 1850
		13000 Depot Street	San Martin Winery	San Martin	1933
		Live Oak Creamery	Live Oak Creamery	Gilroy	1908
		7341 Alexander Street	Wilson House	Gilroy	1904
			Gilroy City Hall	Gilroy	1905
		St. Stephen's school	St. Stephen's School	Gilroy	1870/c.1930
		290 Ioof Avenue	Ioof Orphanage Home	Gilroy	1921
		Holsclaw Road	Holsclaw Road	Gilroy	1866
			Miller Slough	Gilroy	1929
		655 Denio Avenue	655 Denio Avenue	Gilroy	1890
		9480 Murray Avenue	Hoenck House	Gilroy	1894
		Horace Willson House	Horace Willson House	Gilroy	1861
		Harrison/ Clifton/ Phegley House	Harrison/Clifton/Phegley House	Gilroy	1900
P-43-000404		Villa Mira Monte	Villa Mira Monte	Morgan Hill	1886

P Number	Trinomial	Common Name	Historic Name	City	Year Built
P-43-001217		Southern Pacific Train Station	Southern Pacific Train Station	Gilroy	1918
P-43-001740		Coyote Grange Hall No. 412	Coyote Hall	Coyote	1892
P-43-001747			Barnhart House	Morgan Hill	1909
P-43-001760			J. M. Owens House	Coyote	1874
P-43-001739		8215 Monterey Road	Coyote Depot Complex	Coyote	1869/1902
P-43-003039			Madrone Underpass	Morgan Hill	1933
P-43-000345	SCL-000338			Coyote	1900
P-43-000395	SCL-000389			Gilroy	
P-43-000455	SCL-000454			Gilroy	1900
P-43-000484	SCL-000483		Gilman Bridge	Gilroy	1911 replaced 1987
Pacheco Pass					
		California Aqueduct	California Aqueduct	Volta/Los Banos	1961
P-24-000434			Outside Canal	Los Banos	1896
P-24-001703			Delta-Mendota Canal	Los Banos	1942
San Joaquin Valley					
			Negra Ranch	Los Banos	1910
			San Luis Canal	Los Banos	1872
		San Luis Drain	San Luis Drain	Los Banos	1968
		23109 Henry Miller Road	Cottani Family Property	Los Banos	1908
		21391 Henry Miller Road	Cozzi Family Property	Los Banos	1906
P-24-000082			Main Canal	Los Banos	1871
P-24-000083		Same	Santa Fe Grade	Los Banos	1890
P-24-001848		San Luis Wasteway	San Luis Wasteway	Los Banos	1947
P-24-001893			Santa Fe Canal	Los Banos	1890
P-24-001905			Delta Canal	Los Banos	c. 1916
P-24-002104		Los Banos/ Miller&Lux Canal District		Los Banos	

Source: ICF 2017

Parks, Recreation, and Conservation Areas

Parks, recreation areas, and conservation areas in each of the San Jose to Merced alternatives elements were identified by taking an inventory of all public parks, recreation areas, open spaces, greenbelts, wildlife/waterfowl refuges, wildlife management areas, and conservation easements within the study area. Table 6-3 identifies by subsection such resources that are adjacent to any of the design options under consideration and that may be directly affected by project construction or operation. Parks, recreation areas, and conservation areas in the study area are shown on Figure 6-2.

Table 6-3 Parks, Recreation Areas, and Conservation Areas in the Study Area

Parks, Recreation Areas, and Conservation Areas	Description
San Jose Diridon Station Approach Subsection	
Reed Street Dog Park	Location: 888 Reed Street, Santa Clara Size: 1.5 acres Features: Picnic area, BBQs, play area Agency with Jurisdiction: City of Santa Clara Parks and Recreation
Larry J. Marsalli Park	Location: 1425 Lafayette Street, Santa Clara Size: 7 acres Features: Open space, restrooms, lighted softball field, children's playground Agency with Jurisdiction: City of Santa Clara Parks and Recreation
Guadalupe River Park	Location: 438 Coleman Avenue, San Jose Size: 120 acres Features: Guadalupe Community Garden, Columbus Park, Taylor Street Rock Garden, Heritage Rose Garden, Guadalupe gardens, Arena Green East visitor's center, playground, community garden Agency with Jurisdiction: Guadalupe River Park Conservancy/City of San Jose Department of Parks, Recreation and Neighborhood Services
Monterey Corridor Subsection	
None	None
Morgan Hill and Gilroy Subsection	
Coyote Creek Parkway	Location: Coyote Ranch Road, San Jose Size: 15 miles Features: Biking, equestrian, hiking, fishing, historic site, picnic areas, trails Agency with Jurisdiction: Santa Clara County Department of Parks and Recreation
Tulare Hill	Location: Santa Clara County Size: 155 acres Features: Property planned for future park use Agency with Jurisdiction: Santa Clara County Department of Parks and Recreation
Silveira Property	Location: Atherton Way, Morgan Hill Size: 53.4 acres Features: Open space area with fishing pond. Agency with Jurisdiction: Santa Clara County Department of Parks and Recreation

Parks, Recreation Areas, and Conservation Areas	Description
Morgan Hill Outdoor Sports Complex	Location: 16500 Condit Rd, Morgan Hill, CA Size: 35 acres Features: Outdoor sports complex featuring 10 natural grass sports fields, 2 fully equipped multiuse synthetic turf fields, landscaped plaza, bleachers, field and parking lighting, barbeque areas. Hosts numerous regional soccer, football, and cheer tournaments. Agency with Jurisdiction: City of Morgan Hill Recreation and Community Services Department
Wheeler Tot Lot	Location: Church Street and 6th Street, Gilroy Size: 0.2 acre Features: Small children's play area. Agency with Jurisdiction: Gilroy Department of Parks and Facilities
Forest Street Park	Location: Forest Street and E. 7th Street, Gilroy Size: 0.8 acre Features: 0.2 acre of turf and trees, picnic/BBQ area, children's play area. Agency with Jurisdiction: Gilroy Department of Parks and Facilities
Gonzales Farm Property	Location: Bloomfield Avenue, Gilroy Size: 170 acres Features: Protected open space Agency with Jurisdiction: Nature Conservancy (nongovernmental)
Pajaro River Mitigation Bank	Location: Lake Road, Gilroy Size: 301.9 acres Features: Wetland mitigation bank, protected land Agency with Jurisdiction: Wildlands Inc. (nongovernmental easement holder) and USACE
Silacci Property	Location: Bloomfield Avenue, Gilroy Size: 301 acres Features: Agricultural conservation easement in low-lying wetland area setting. Irrigated pasture, Prime Farmland and Farmland of Statewide Importance. Agency with Jurisdiction: Santa Clara County Open Space Authority
Pacheco Pass Subsection	
San Luis Reservoir State Recreation Area	Location: Approximately 13 miles west of Los Banos, south side of SR 152, Merced County Size: 12,700 acres Features: State park encompassing San Luis Reservoir, O'Neill Forebay, and Los Baños Creek Reservoir. Fishing, boating, swimming; four campgrounds; recreational bicycle, hiking, and motorcycle trails. Agency with Jurisdiction: California Department of Parks and Recreation
Romero Ranch Conservation Easement	Location: Approximately 22 miles east of Gilroy, north side of SR 152, Merced and Santa Clara Counties Size: 28,043 acres Features: Conservation easement covering steep hillsides along Pacheco Pass and Romero Creek. Private access only. Agency with Jurisdiction: The Nature Conservancy (nongovernmental)
Cottonwood Creek Wildlife Area	Location: Approximately 19 miles east of Gilroy, northwest of SR 152, Merced County Size: 6,300 acres

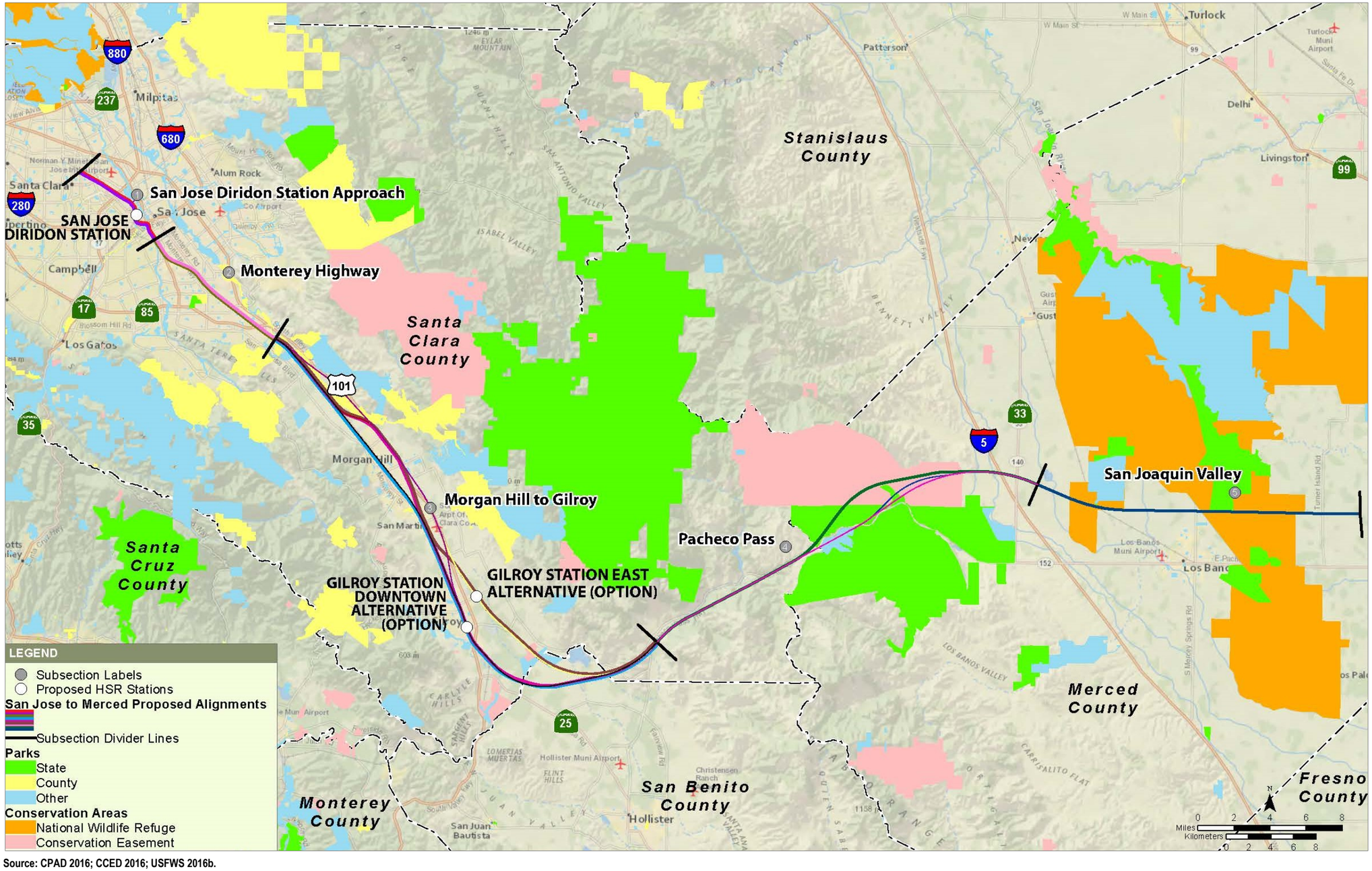
Parks, Recreation Areas, and Conservation Areas	Description
	Features: Wildlife management area; steep oak-grassland (upper unit) and steep hilly grassland (lower unit); hunting and wildlife viewing opportunities. Wild pig, black-tailed deer, gray fox, birds. Foot access only. Agency with Jurisdiction: California Department of Fish and Wildlife
San Joaquin Valley Subsection	
Grasslands Wildlife Management Area[1]	Location: San Joaquin Valley Size: 80,000 acres Features: National wildlife refuge comprised entirely of privately owned lands on which perpetual conservation easements have been purchased. Supports diverse habitats: seasonally flooded marshlands, semipermanent marshes, riparian habitats, wet meadows, vernal pools, native uplands, pastures, and native grasslands. Some agricultural lands are managed to maximize benefits to wildlife and waterfowl. Several listed plants and animals benefit from the habitat protection provided by the easement program (USFWS 2013). Agencies with Jurisdiction: USFWS, private landowners
Volta Wildlife Area	Location: 0.75 mile north of Volta, Ingomar Grade, Merced County Size: 3,800 acres Features: Wildlife refuge; managed marsh and valley alkali shrubland; permitted hunting during waterfowl season, wildlife viewing opportunities. Well-known waterfowl hunting area. Foot access only. Agency with Jurisdiction: CDFW
Los Baños Wildlife Area	Location: 4 miles northeast of Los Banos, Merced County Size: 6,200 acres Features: Wetland habitat: lakes, sloughs, and managed marsh; permitted hunting, wildlife viewing, boating, fishing; educational visitor's center. Agency with Jurisdiction: CDFW
Klamath Land/Cattle Wetlands Conservation Easement	Location: 4 miles northeast of Los Banos, Merced County Size: 235 acres Features: Wetland habitat: lakes, sloughs, and marsh. Private access only. Agency with Jurisdiction: CDFW

Source: CCED 2016; CPAD 2016; USFWS 2016b; USFWS 2013.
USFWS = U.S. Fish and Wildlife Service
CDFW = California Department of Fish and Wildlife
[1] The Grasslands Wildlife Management Area is a subset of the Grasslands Ecological Area. The Grasslands Ecological Area (GEA) is a 160,000-acre area in the historic floodplain of the San Joaquin River in Merced County. The GEA supports a vast network of grasslands, wetlands, and riparian areas protected through a combination of conservation agreements with duck clubs, California State Parks, CDFW (including the Volta and Los Baños Wildlife Areas), and USFWS (including the Grasslands Wildlife Management Area as well as the San Luis and Merced National Wildlife Refuges).

FEMA 100-year Flood Hazard Zones

The study area intersects a total of 2,989 acres of FEMA 100-year FHZs. As shown on Figure 6-3, multiple locations in the study area are subject to risk of flooding in a 100-year flood event. While these locations are distributed throughout the study area, a majority of FHZs are in the Morgan Hill and Gilroy Subsection—largely along major watercourses (typically with relatively wide floodplains) and in low-lying agricultural areas throughout all design options. The Pacheco Pass and San Joaquin Valley Subsections cross considerably fewer FHZs. FHZs in the Pacheco Pass Subsection are confined to areas near major watercourses in the western part of the subsection, while FHZs in the San Joaquin Valley Subsection are distributed throughout the subsection in low-lying agricultural areas. The San Jose Diridon Station Approach and Monterey Corridor Subsections have the fewest

locations within a 100-year FHZ. These locations are primarily adjacent to major watercourses—Los Gatos Creek, the Guadalupe River, and Coyote Creek.



Source: CPAD 2016; CCED 2016; USFWS 2016b.

Figure 6-2 Parks, Recreation Areas, and Conservation Areas in the Study Area

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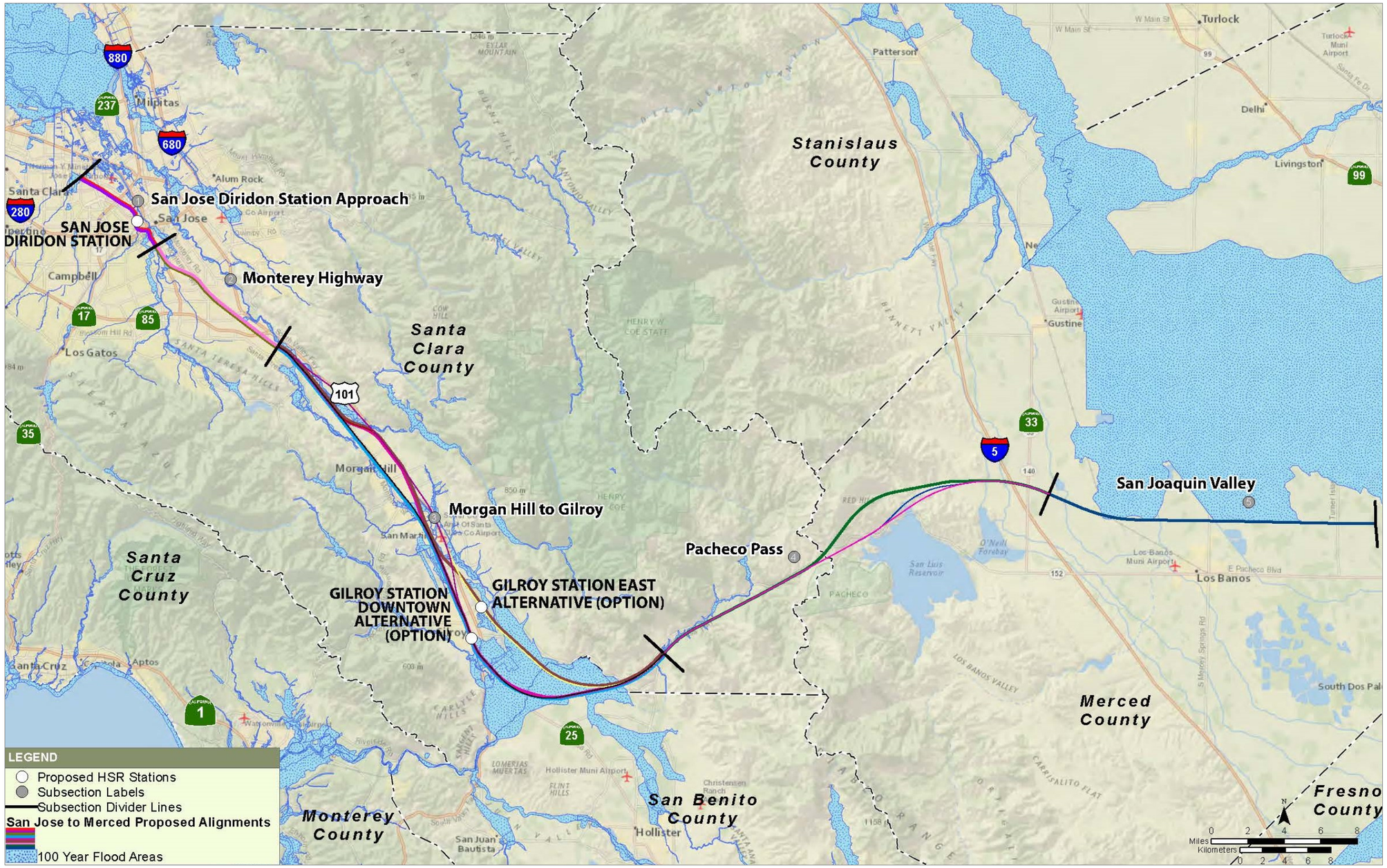

Source: FEMA 2016b

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Figure 6-3 FEMA 100-year Flood Hazard Zones in the Study Area

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6.1.2 Impacts of Design Options on Other Environmental Resources

6.1.2.1 Important Farmland

The Morgan Hill and Gilroy and San Joaquin Valley Subsections have the potential for the most extensive impacts on Important Farmland. None of the design options in the San Jose Diridon Station Approach and Monterey Corridor Subsections would affect any Important Farmland. Impacts on grazing lands are quantified in Appendix C.

San Jose Diridon Station Approach

There are no agricultural resources located within the San Jose Diridon Station Approach Subsection.

Monterey Corridor

Neither design option in the Monterey Corridor Subsection would result in impacts on Important Farmland.

Morgan Hill and Gilroy

All design options would affect Important Farmland (Table 6-4). The Embankment to Downtown Gilroy, Viaduct to Downtown Gilroy, and Viaduct to East Gilroy design options would result in the least extensive impacts on Important Farmland.

Table 6-4 Impacts on Important Farmlands in the Morgan Hill and Gilroy Subsection (acres)

Important Farmland	Embankment to Downtown Gilroy	Viaduct to Downtown Gilroy	Viaduct to East Gilroy	US 101 to Downtown Gilroy	West of Coyote Creek Parkway to Downtown Gilroy	US 101 to East Gilroy	West of Coyote Creek Parkway to East Gilroy	East of UPRR to East Gilroy
Total of Important Farmland Impacts	*968.7*	*793.5*	*912.3*	*1,203.7*	*1,397.5*	*1,027.7*	*1,219.7*	*1,314.7*
Prime Farmland	589.1	509.4	595.3	475.9	589.6	664.3	776.0	856.0
Farmland of Statewide Importance	133.9	101.8	140.8	446.6	446.6	166.3	166.3	167.3
Unique Farmland	17.2	11.3	3.6	28.6	30.2	6.3	8.0	7.5
Farmland of Local Importance	228.5	171.0	172.6	252.6	331.1	190.8	269.4	283.9

Source: FMMP 2016; HNTB 2016

Pacheco Pass

The North Pacheco Pass design option would result in the fewest impacts on Important Farmland (Table 6-5).

Table 6-5 Impacts on Important Farmland in the Pacheco Pass Subsection (acres)

Important Farmland	North Pacheco Pass	Refined Program Alignment	Close Proximity to SR 152
Total of Important Farmland Impacts	*240.0*	*263.7*	*260.7*
Prime Farmland	150.0	168.4	166.3
Farmland of Statewide Importance	17.0	17.6	17.6
Unique Farmland	22.0	20.9	20.5
Farmland of Local Importance	51.0	56.8	56.3

Source: FMMP 2016; HNTB 2016

San Joaquin Valley

This subsection has a single design option on the south side of Henry Miller Road. Impacts on Important Farmland are shown in Table 6-6.

Table 6-6 Impacts on Important Farmland in the San Joaquin Valley Subsection (acres)

Important Farmland	Henry Miller Road
Total of Important Farmland Impacts	*643.6*
Prime Farmland	285.6
Farmland of Statewide Importance	226.2
Unique Farmland	58.9
Farmland of Local Importance	72.9

Source: FMMP 2016; HNTB 2016

6.1.2.2 Cultural Resources

The Morgan Hill and Gilroy Subsection contains the greatest number of cultural resources (archaeological and built resources) with the potential to be affected by the project extent. The San Jose Diridon Station Approach, San Joaquin Valley, and Pacheco Pass Subsections have the potential to affect up to 10, 12, and 15 cultural resources, respectively, while the Monterey Corridor Subsection would affect the fewest cultural resources.

San Jose Diridon Station Approach

This subsection could potentially affect six built resources and four archaeological resources under either design option (Table 6-7).

Table 6-7 Impacts on Cultural Resources in the San Jose Diridon Station Approach Subsection

Cultural Resources	Viaduct to Scott Blvd.	Viaduct to I-880
Archaeological sites	4	4
Known built historic resources (NRHP-listed or eligible resources)	6	6

Source: ICF 2017

Monterey Corridor

This subsection has the potential to affect two archaeological resources under either design options (Table 6-8).

Table 6-8 Impacts on Cultural Resources in the Monterey Corridor Subsection

Cultural Resources	At-Grade	Viaduct
Archaeological sites	2	2
Known built historic resources (NRHP-listed or eligible resources)	-	-

Source: ICF 2017

Morgan Hill and Gilroy

The Morgan Hill and Gilroy Subsection traverses an area that is highly sensitive for NRHP-listed or eligible resources—especially built resources. The design options could affect up to 24 built resources and 10 archaeological sites (Table 6-9).

Table 6-9 Impacts on Cultural Resources in the Morgan Hill and Gilroy Subsection

Cultural Resources	Embankment to Downtown Gilroy	Viaduct to Downtown Gilroy	Viaduct to East Gilroy	US 101 to Downtown Gilroy	West of Coyote Creek Parkway to Downtown Gilroy	US 101 to East Gilroy	West of Coyote Creek Parkway to East Gilroy	East of UPRR to East Gilroy
Archaeological sites	3	1	3	5	2	7	4	4
Known built historic resources (NRHP-listed or eligible resources)	17	12	11	9	12	8	10	13

Source: ICF 2017

Pacheco Pass

This subsection would result in the same impact on built resources under all three design options; the North Pacheco Pass design option would affect less archaeological sites than the other design options in this subsection (Table 6-10).

Table 6-10 Impacts on Cultural Resources in the Pacheco Pass Subsection

Cultural Resources	North Pacheco Pass	Refined Program Alignment	Close Proximity to SR 152
Archaeological sites	4	11	8
Known built historic resources (NRHP-listed or eligible resources)	3	3	3

Source: ICF 2017

San Joaquin Valley

The single design option in this subsection could affect approximately 11 NRHP-listed and eligible built environment resources and one archaeological resource (Table 6-11).

Table 6-11 Impacts on Cultural Resources in the San Joaquin Valley Subsection

Cultural Resources	Henry Miller Road
Archaeological sites	1
Known built historic resources (NRHP-listed or eligible resources)	11

Source: ICF 2017

6.1.2.3 Parks, Recreation, and Conservation Areas

The Pacheco Pass and San Joaquin Valley Subsections would result in the most extensive impacts, largely as the result of impacts on conservation areas. Conversely, impacts in the Morgan Hill and Gilroy and San Jose Diridon Station Subsections would be of lesser extent and distributed more widely among parks and recreation facilities. There would be no impacts in the Monterey Corridor Subsection.

San Jose Diridon Station Approach

The Aerial to I-880 design option would result in fewer impacts than the Aerial to Scott design option (Table 6-12).

Table 6-12 Impacts on Parks, Recreation Areas, and Conservation Areas in the San Jose Diridon Station Approach Subsection (acres)

Parks, Recreation, and Conservation Areas	Aerial to Scott Blvd.	Aerial to I-880
Reed Street Dog Park	0.1	-
Larry J. Marsalli Park	0.7	-
Guadalupe River Park	3.1	3.0
Total (number of resources/acres of impact)	3/3.9	1/3.0

Source: HNTB 2016; CPAD 2016; CCED 2016; USFWS 2016b.

6.1.2.4 Monterey Corridor

There are no parks, recreation areas, or conservation areas within the project footprint of either design options in this subsection. Accordingly, there would be no impacts on parks, recreation, or conservation areas.

6.1.2.5 Morgan Hill and Gilroy

The extent of impacts in this subsection range from 9 to 200 acres, depending on the design option, and they are distributed among a variety of facilities as shown in Table 6-13.

Table 6-13 Impacts on Parks, Recreation, and Open Space Resources in the Morgan Hill and Gilroy Subsection (acres)

Parks, Recreation, and Conservation Areas	Embankment to Downtown Gilroy	Viaduct to Downtown Gilroy	Viaduct to East Gilroy	US 101 to Downtown Gilroy	West of Coyote Creek Parkway to Downtown Gilroy	US 101 to East Gilroy	West of Coyote Creek Parkway to East Gilroy	East of UPRR to East Gilroy
Coyote Creek Parkway	12.1	8.0	8.0	116.4	23.5	116.4	23.5	22.3
Tulare Hill	1.8	>0.1	>0.1	-	1.8	-	1.8	1.8
Morgan Hill Outdoor Sports Complex	-	-	-	18.0	18.0	18.0	18.0	-
Wheeler Tot Lot	-	-	-	>0.1	-	-	-	-
Forest Street Park	-	-	-	0.8	-	-	-	-
Gonzales Farm	-	-	5.6	-	-	6.1	6.1	6.1
Pajaro River Mitigation Bank	1.0	1.0	16.0	-	-	17.0	17.0	17.0
Silveira Property	2.9	-	-	-	-	-	-	2.7
Silacci Conservation Easement	-	-	40.8	-	-	42.6	42.6	42.6
Total (number of resources/acres of impact)	4/17.8	3/9.0	5/70.4	4/135.2	3/43.3	5/200.1	6/109.0	6/92.5

Source: CCED 2016; CPAD 2016; HNTB 2016; USFWS 2016b.

Pacheco Pass

In the Pacheco Pass subsection, the North Pacheco Pass design option would result in the least extensive impacts on parks, recreation, and conservation areas, in part because it avoids encroachment into the San Luis Reservoir State Recreation Area and surficial encroachment into the Cottonwood Creek Wildlife Area. Because most of the North Pacheco Pass impacts would occur on the Romero Ranch Conservation Easement, which affords no public access, the relative impact from the North Pacheco Pass design option is less severe than the other alignment elements. Table 6-14 summarizes this information.

Table 6-14 Impacts on Parks, Recreation, and Open Space Resources in the Pacheco Pass Subsection

Parks, Recreation, and Conservation Areas	North Pacheco Pass	Refined Program Alignment	Close Proximity to SR 152
San Luis Reservoir State Recreation Area	-	409.6	367.1
Cottonwood Creek Wildlife Area	-	399.8	402.0
Romero Ranch Conservation Easement	336.9	478.1	546.0
Total (number of resources/acres of impact)	1/336.9	3/1,287.5	3/1,315.1

Source: CCED 2016; CPAD 2016; HNTB 2016; USFWS 2016b.

San Joaquin Valley

The Henry Miller Road design option, the single design option in this subsection, would encroach on approximately 307 acres of the Grasslands Wildlife Management Area, an area managed by the USFWS under the National Wildlife Refuge system. The Grasslands Wildlife Management Area is noteworthy in that it is comprised entirely of privately owned parcels. Landowners of these privately owned parcels have agreed to manage their land (often using grazing) in a manner consistent with the goals of the broader National Wildlife Refuge system (e.g., maintaining waterfowl areas) (USFWS 2013). Because the Grasslands Wildlife Management Area occupies a vast area within the San Joaquin Valley, it is not feasible to avoid crossing some portion of it. The impacts associated with this subsection are shown in Table 6-15.

Table 6-15 Impacts on Parks, Recreation, and Conservation Areas in the San Joaquin Valley Subsection

Parks, Recreation, and Conservation Areas	Henry Miller Road
Grasslands Wildlife Management Area	307.3
Klamath Land/Cattle Wetland Conservation Easement	5.5
Volta Wildlife Area	>0.1
Park/Recreation/Wildlife Management Resources (number of resources/acres of impact)	3/312.8

Source: CCED 2016; CPAD 2016; HNTB 2016; USFWS 2016b.

6.1.2.6 FEMA 100-Year Flood Hazard Zones

Direct impacts on FEMA 100-year FHZs resulting from construction of each subsections design options are summarized in Table 6-7 through Table 6-11.

San Jose Diridon Station Approach

Both design options would result in impacts on FHZs in areas adjacent to major watercourses—Los Gatos Creek and the Guadalupe River—as well as discrete areas in the northern portion of the subsection. Impacts are presented in Table 6-16.

Table 6-16 Impacts on 100-year Flood Hazard Zones in the San Jose Diridon Station Approach Subsection (acres)

FEMA Flood Hazard Zone	Aerial to Scott Blvd.	Aerial to I-880
Total of Flood Hazard Zones	*56.4*	*55.0*
Zone A	3.6	3.6
Zone AE	-	-
Zone AH	36.4	35.0
Zone AO	16.4	16.4

Source: FEMA 2016a; HNTB 2016.

Monterey Corridor

Both design options in this subsection would result in relatively small encroachment into FHZs, primarily in the vicinity of Coyote Creek. Impacts are presented in Table 6-17.

Table 6-17 Impacts on 100-year Flood Hazard Zones in the Monterey Corridor Subsection

FEMA Flood Hazard Zone	At-Grade	Viaduct
Total of Flood Hazard Zones	*13.9*	*13.9*
Zone A	-	-
Zone AE	-	-
Zone AH	13.3	13.3
Zone AO	0.6	0.6

Source: FEMA 2016a; HNTB 2016.

Morgan Hill and Gilroy Subsection

Design options in the Morgan Hill and Gilroy Subsection would result in impacts on FHZs ranging from 680.5 to 1,370.5 acres. The wide floodplain of the Pajaro River in this subsection contributes to the relatively high impacts on FHZs across all design options. Impacts are presented in Table 6-18.

Table 6-18 Impacts on 100-year Flood Hazard Zones in the Morgan Hill and Gilroy Subsection

FEMA Flood Hazard Zone	Embankment to Downtown Gilroy	Viaduct to Downtown Gilroy	Viaduct to East Gilroy	US 101 to Downtown Gilroy	West of Coyote Creek Parkway to Downtown Gilroy	US 101 to East Gilroy	West of Coyote Creek Parkway to East Gilroy	East of UPRR to East Gilroy
Total of Flood Hazard Zones	*887.9*	*767.1*	*680.5*	*1,370.5*	*1,364.3*	*879.0*	*928.8*	*960.1*
Zone A	653.1	644.8	533.1	1,159.1	1,150.6	623.7	623.7	631.3
Zone AE	132.0	57.7	117.6	155.1	111.0	250.6	234.4	222.9
Zone AH	38.6	34.8	-	56.2	36.6	4.6	4.6	6.6
Zone AO	64.2	29.8	29.8	0.1	66.1	0.1	66.1	99.3

Source: FEMA 2016a; HNTB 2016.

Pacheco Pass Subsection

The North Pacheco Pass design option would result in the least extensive impacts on FHZs. The greater impacts under the other two design options are largely the result of encroachment in the vicinity of major watercourses in the western portion of the subsection. Impacts are presented in Table 6-19.

Table 6-19 Impacts on 100-year Flood Hazard Zones in the Pacheco Pass Subsection

FEMA Flood Hazard Zone	North Pacheco Pass	Refined Program Alignment	Close Proximity to SR 152
Total of Flood Hazard Zones	*48.7*	*106.7*	*101.5*
Zone A	48.7	106.7	101.5
Zone AE	-	-	-
Zone AH	-	-	-
Zone AO	-	-	-

Source: FEMA 2016a; HNTB 2016.

San Joaquin Valley Subsection

The impacts of the single design option in this subsection on FHZs would result primarily from encroachment in low-lying agricultural areas and vernal pool complexes. Impacts are presented in Table 6-20.

Table 6-20 Impacts on 100-year Flood Hazard Zones in the San Joaquin Valley Subsection

FEMA Flood Hazard Zone	Henry Miller Road
Total of Flood Hazard Zones	*68.8*
Zone A	68.8
Zone AE	-
Zone AH	-
Zone AO	-

Source: FEMA 2016a; HNTB 2016.

6.2 Community Resources

6.2.1 Scope of Analysis

6.2.1.1 Study Area

Low-Income and Minority Populations

The study area for low-income and minority populations is defined as the census tracts that fall partially or fully within the project footprint of each of the alternative alignments.

Residential and Business Displacements

The study area for residential and business displacements is the project footprint: the area needed to construct, operate, and maintain all permanent HSR features, roadway modifications, new or relocated utility features, access to new or relocated utility features, drainage facilities, any other physical changes within the area needed to construct and operate HSR, and HSR property rights or licenses to accommodate HSR construction, operation, and maintenance. Within the project footprint, residential, commercial, and industrial properties could be partially or fully acquired for project construction and operation.

6.2.1.2 Methods

Low-Income and Minority Populations

The analysis of potential impacts on low-income and minority populations identifies all minority and low-income populations within the census tracts intersected by the footprint of each of the design options. Analysts conducted a screening of such populations by obtaining poverty and minority data from the 2011–2015 American Community Survey (ACS) 5-Year Estimates for the census tracts and counties along the project extent.

For the purposes of this analysis, analysts determined the percent of low-income households in most of Santa Clara County based on the population below 200 percent of the federal poverty level, consistent with the thresholds set by the Metropolitan Transportation Commission, in view of the county's high cost of living. However, this standard was not applied to the Santa Clara County census tracts in the Pacheco Pass Subsection in view of the sparse population and lower cost of living in this portion of the project extent. For the Pacheco Pass Subsection and San Benito and Merced Counties, the threshold is based on the population below 100 percent of the federal poverty level rather than 200 percent.

Low-income and minority data were mapped using GIS software to determine the location and distribution of low-income and minority populations in relation to the project extent design options in the context of the broader region. The purpose of this analysis is to identify low-income and minority populations that are present in the study area and to compare them to the broader reference communities (e.g., Santa Clara, San Benito, and Merced Counties)..

Residential and Business Displacements

Affected properties were identified by reviewing aerial imagery in relation to the study area. Any residential or commercial/industrial buildings located partially or fully within permanent right-of-way of the environmental footprint were determined to be displaced for purposes of this analysis. Not all identified properties would be affected.

6.2.1.3 Existing Conditions

Low-Income and Minority Populations

Low-income, race and ethnicity characteristics of the counties crossed by the project extent are summarized in Table 6-21. *Racial minority* in the following tables refers to persons self-identifying as Black or African American, Asian or Pacific Islander, American Indian or Alaskan Native. Low-income, race and ethnicity characteristics of the study area relative to the region are shown on Figure 6-4 through Figure 6-6.

Table 6-21 Reference Community Low-Income, Race and Ethnicity Characteristics (2015 Estimates)

Geographic Area	Population	Low-Income (%)[1]	Racial Minority (%)	Hispanic/Latino (%)
Santa Clara County	1,868,149	22.3	51.7	26.6
San Benito County	57,557	10.8	15.5	57.9
Merced County	263,885	26.1	51.7	56.9
Region	2,189,591	22.4	49.2	31.1

Source: U.S. Census Bureau ACS 2011–2015.
[1] In Santa Clara County, the percent of low-income households is determined based on the population below 200% of the federal poverty level, consistent with the thresholds set by the Metropolitan Transportation Commission.

San Jose Diridon Station Approach

Because of the similarity between the two design options' project footprints, they exhibit comparable minority and low-income characteristics (Table 6-22). This subsection supports higher proportions of low-income and Hispanic populations and a lower proportion of racial minority populations than Santa Clara County as a whole.

Table 6-22 San Jose Station Approach Subsection Low-Income, Race, and Ethnicity Characteristics (2015 Estimates)

Design Option	Population	Low-Income (%)[1]	Racial Minority (%)	Hispanic/Latino (%)
Viaduct to Scott Blvd	71,786	32.9	46.0	39.5
Viaduct to I-880	67,635	32.6	46.9	40.7

Source: U.S. Census Bureau ACS 2011–2015.
[1] In Santa Clara County, the percent of low-income households is determined based on the population below 200% of the federal poverty level, consistent with the thresholds set by the Metropolitan Transportation Commission.

Monterey Corridor

Because the study area for the two design options is the same, their demographic compositions are also the same (Table 6-23). This subsection exhibits proportionately greater low-income and Hispanic/Latino populations proportionately smaller racial minority populations than Santa Clara County as a whole.

Table 6-23 Monterey Corridor Subsection Low-Income, Race and Ethnicity Characteristics (2015 Estimates)

Design Option	Population	Low-Income (%)[1]	Racial Minority (%)	Hispanic/Latino (%)
At-Grade	106,012	28.4	48.9	39.8
Viaduct	106,012	28.4	48.9	39.8

Source: U.S. Census Bureau ACS 2011–2015a.
[1] In Santa Clara County, the percent of low-income households is determined based on the population below 200% of the federal poverty level, consistent with the thresholds set by the Metropolitan Transportation Commission.

Morgan Hill and Gilroy

The Morgan Hill and Gilroy Subsection supports varying proportions of low-income and minority populations depending on the design option (Table 6-24). In general, the subsection study area supports proportionately greater Hispanic/Latino populations and proportionately smaller racial minority populations than Santa Clara County as a whole.

Table 6-24 Morgan Hill and Gilroy Subsection Low-Income, Race, and Ethnicity Characteristics (2015 Estimates)

Design Option	Population	Low-Income (%)[1]	Racial Minority (%)	Hispanic/Latino (%)
Embankment to Downtown Gilroy	79,702	30.0	32.0	48.1
Viaduct to Downtown Gilroy	66,519	29.6	32.5	49.4
Viaduct to East Gilroy	55,244	27.5	32.0	45.6
US 101 to Downtown Gilroy	76,048	29.3	31.1	49.1
West of Coyote Creek Parkway to Downtown Gilroy	67,629	27.9	31.9	47.7
US 101 to East Gilroy	47,174	19.3	30.8	35.6
West of Coyote Creek Parkway to East Gilroy	47,174	19.3	30.8	35.6
East of UPRR to East Gilroy	59,247	23.9	31.1	38.7

Source: U.S. Census Bureau ACS 2011–2015.
[1] In Santa Clara County, the percent of low-income households is determined based on the population below 200% of the federal poverty level, consistent with the thresholds set by the Metropolitan Transportation Commission.

Pacheco Pass

The Pacheco Pass subsection traverses the least populated area of any of the subsections and supports proportionately small racial minority populations. The low-income and Hispanic/Latino populations of the design options are generally consistent with those of Merced County as a whole. Table 6-25 summarizes this information.

Table 6-25 Pacheco Pass Subsection Low-Income, Race, and Ethnicity Characteristics (2015 Estimates)

Design Option	Population	Low-Income (%)[1]	Racial Minority (%)	Hispanic/Latino (%)
North Pacheco Pass Alignment	12,948	25.3	14.3	55.1
Refined Program Alignment	12,948	25.3	14.3	55.1
Close Proximity to SR 152	12,948	25.3	14.3	55.1

Source: U.S. Census Bureau ACS 2011–2015.
[1] In Santa Clara County, the percent of low-income households is determined based on the population below 200% of the federal poverty level, consistent with the thresholds set by the Metropolitan Transportation Commission.

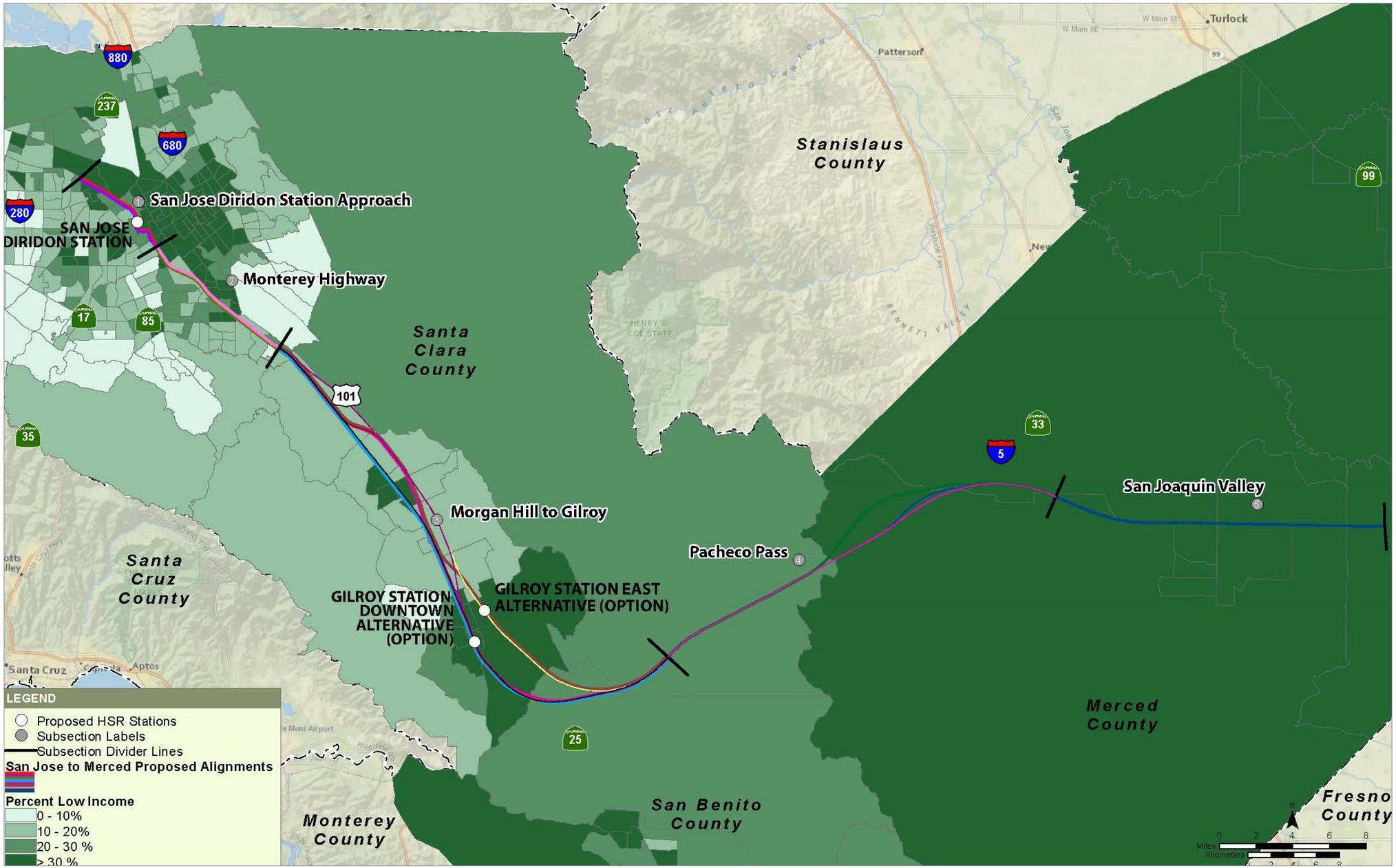
San Joaquin Valley

This subsection supports a proportionately smaller racial minority population and a substantially larger Hispanic/Latino population than Merced County as a whole. The low-income population generally is consistent with that of Merced County. The demographics of this subsection are presented in Table 6-26.

Table 6-26 San Joaquin Valley Subsection Low-Income, Race and Ethnicity Characteristics (2015 Estimates)

Design Option	Population	Low-Income (%)	Racial Minority (%)	Hispanic/Latino (%)
Henry Miller Road	38,368	25.2	21.4	68.1

Source: U.S. Census Bureau ACS 2011–2015.



Source: U.S. Census Bureau ACS 2011–2015.

Figure 6-4 Low-Income Populations in the Study Area Relative to the Surrounding Counties

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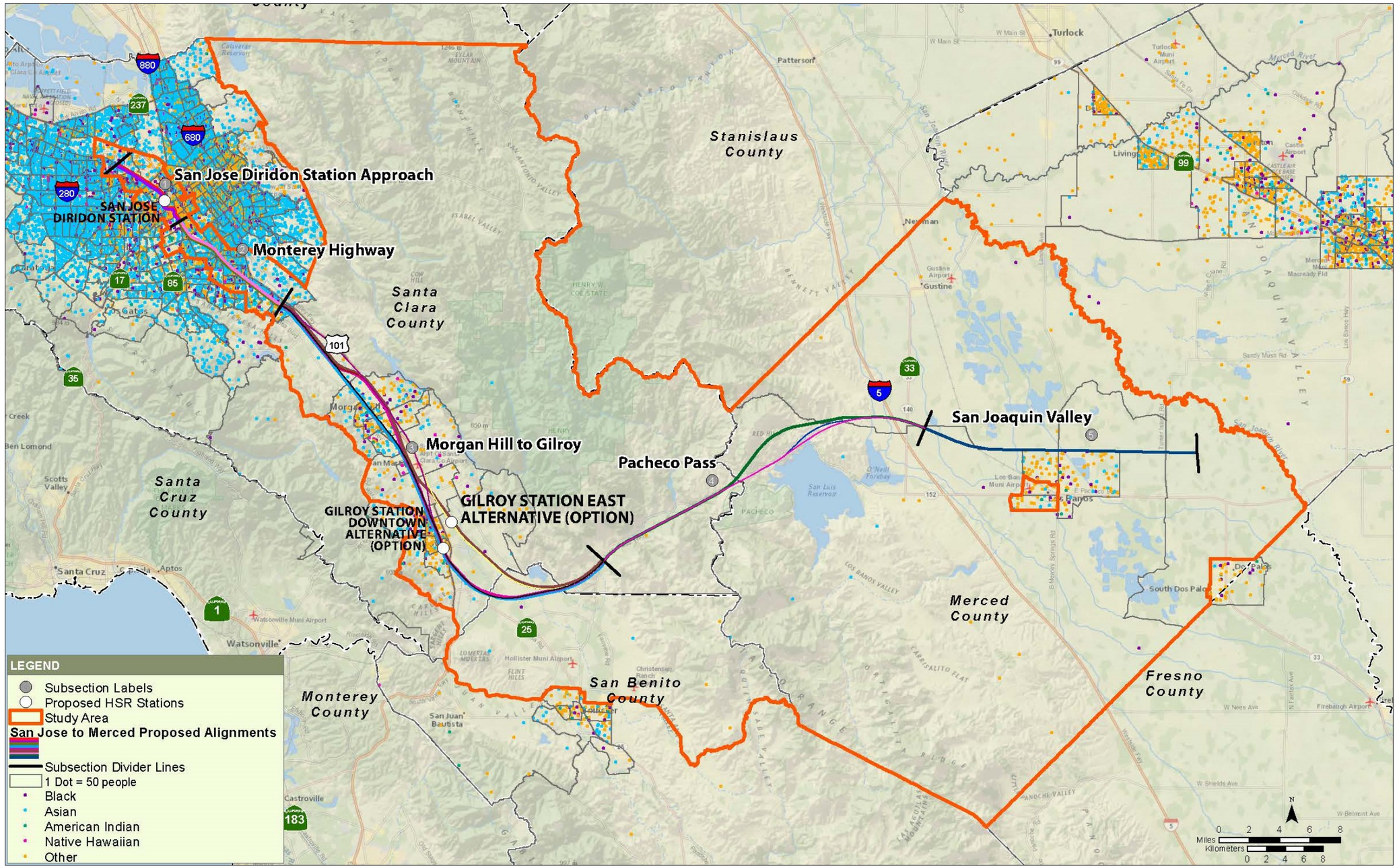

Source: U.S. Census Bureau ACS 2011–2015.

Figure 6-5 Racial Minority Populations in the Study Area relative to the Surrounding Counties

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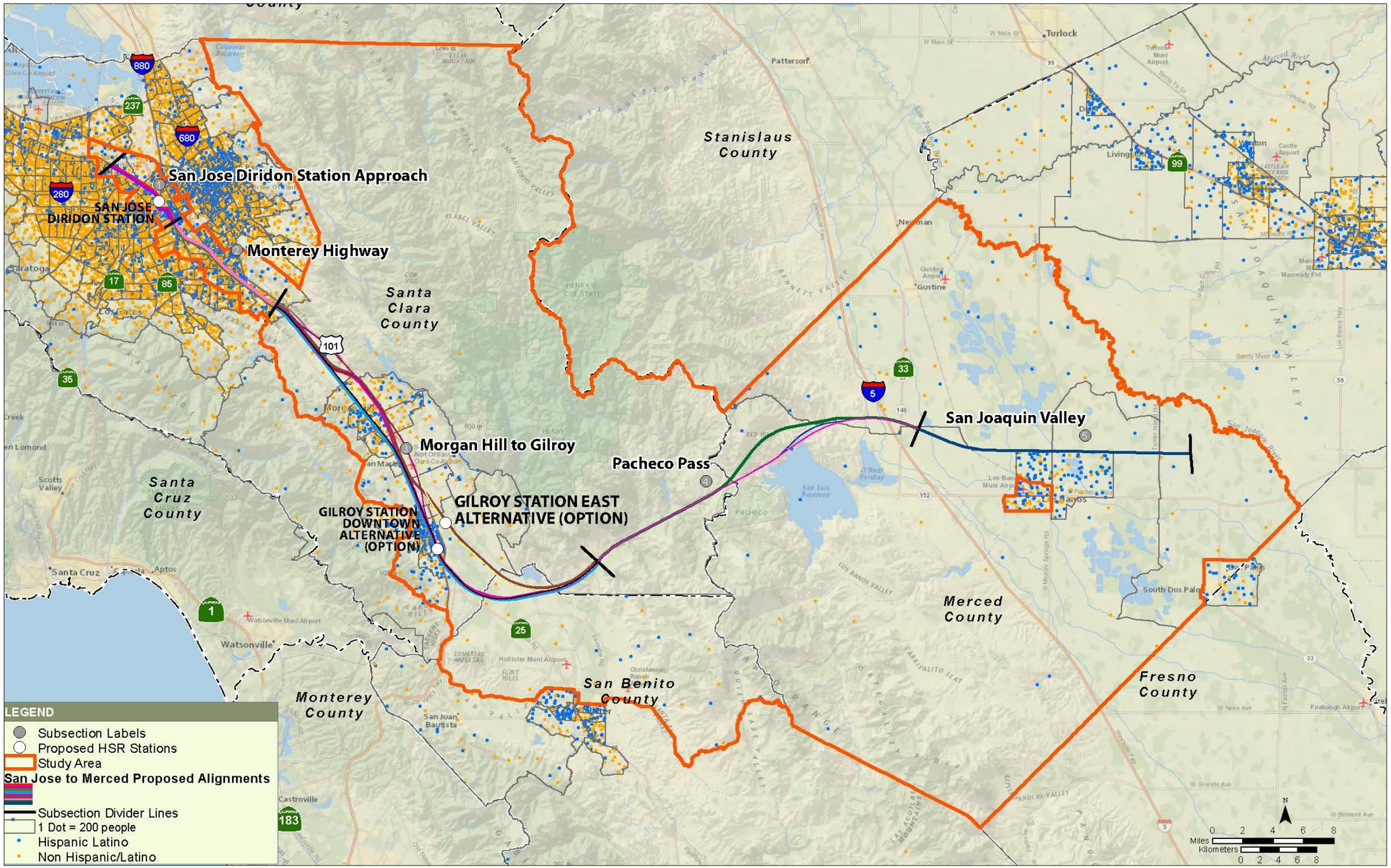

Source: U.S. Census Bureau ACS 2011–2015.

Figure 6-6 Hispanic and Non-Hispanic Populations in the Study Area relative to the Surrounding Counties

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Residential and Business Displacements

The more urbanized areas in San Jose, Morgan Hill, and Gilroy have more development and therefore more potential residential units and businesses to displace. The Pacheco Pass and San Joaquin Valley Subsections are generally more rural, characterized by ranches and homesteads, with much less development density.

6.2.2 Impacts of Design Options on Community Resources

6.2.2.1 *Low-Income and Minority Populations*

Construction and operation of the San Jose to Merced project extent has the potential to have adverse effects on low-income and minority populations resulting from traffic congestion, noise and vibration, and aesthetics and visual changes. Residential displacements would take place in communities with high percentages of minority and low-income populations.

However, long-term beneficial effects associated with HSR would also accrue to low-income and minority populations, including improved regional mobility, improved traffic conditions on freeways as people increasingly use HSR, improved safety of intersections due to improvements of at-grade intersections, and reductions in regional air pollutant emissions. Appendix C presents the population numbers and percentages for each subsection. Based on this preliminary analysis of the presence and proximity of low-income and minority populations along the San Jose to CVY project extent, analysts have determined that the potential for substantial adverse effects on low-income and minority populations is moderate.

San Jose Diridon Station Approach

The percent of the population that is low-income or minority within the study area for the San Jose Diridon Station Approach Subsection is similar for both design options.

Monterey Corridor

The percent of the population that is low-income or minority within the study area for the Monterey Corridor is similar for both design options.

Morgan Hill and Gilroy

Low-income and minority populations are present at comparable levels across the design options in this subsection.

Pacheco Pass

The percent of the population that is low-income or minority within the study area for the Pacheco Pass Subsection is similar for all design options.

San Joaquin Valley

Because there is a single alternative alignment in this subsection, no comparison for these purposes was appropriate.

6.2.2.2 Residential and Business Displacements

The San Jose to Merced design options would require the acquisition of residential, commercial, and industrial properties to obtain adequate right-of-way for project construction and operation. Affected properties were identified by reviewing aerial imagery in relation to the project footprints of the design options. Any residential or commercial/industrial buildings located partially or fully within the project footprints were determined to be displaced. This section describes the residential and business displacements that would result under each subsection.

San Jose Diridon Station Approach

Both design options in this subsection would displace residential properties and businesses. Table 6-27 shows the extent of displacement in units and square footage for the design options.

Table 6-27 San Jose Diridon Station Approach Subsection Summary of Displacement Impacts [units (square feet)]

Displacements	Aerial to Scott Blvd.	Aerial to I-880
Residential	119 (111,653 sf)	103 (92,785 sf)
Business	170 (1,966,697 sf)	113 (1,395,859 sf)

Source: ICF 2016b

Monterey Corridor

Both design options in this subsection would displace residential properties and businesses. Table 6-28 shows the extent of displacement in units and square footage for the design options.

Table 6-28 Monterey Corridor Subsection Summary of Displacement Impacts [units (square feet)]

Displacements	At-Grade	Viaduct
Displacements		
Residential	121 (209,933 sf)	28 (46,540 sf)
Business	88 (324,596 sf)	17 (214,842 sf)

Source: ICF 2016b

Morgan Hill and Gilroy

All design options in this subsection would displace residential properties and businesses. Table 6-29 shows the extent of displacement in units and square footage for the design options.

Table 6-29 Morgan Hill and Gilroy Subsection Summary of Displacement Impacts [units (square feet)]

Displacements	Embankment to Downtown Gilroy	Viaduct to Downtown Gilroy	Viaduct to East Gilroy	US 101 to Downtown Gilroy	West of Coyote Creek Parkway to Downtown Gilroy	US 101 to East Gilroy	West of Coyote Creek Parkway to East Gilroy	East of UPRR to East Gilroy
Residential	205 (744,455 sf)	77 (208,021 sf**)	70 (202,599 sf)	191 (658,637 sf)	225 (780,800 sf)	139 (321,404 sf)	209 (535,883 sf)	194 (913,366 sf)
Business	245 (2,995,482)	133 (1,705,735 sf)	28 (863,544 sf)	182 (2,299,503 sf)	148 (1,839,127 sf)	27 (974,455 sf)	94 (1,040156 sf)	42 (2,519,499 sf)

Source: ICF 2016b

Pacheco Pass

The North Pacheco Pass design option would result in a greater number of residential and business displacements than either of the other design options. Table 6-30 shows the extent of displacement in units and square footage (where available) for the design options.

Table 6-30 Pacheco Pass Subsection Summary of Displacement Impacts [units (square feet)]

Displacements	North Pacheco Pass	Refined Program Alignment	Close Proximity to SR 152
Residential	9 (11,860 sf)	6 (8,191 sf)	6 (8,604 sf)
Business Displacement	3 (17,279 sf)	2 (5,462 sf)	2 (6,352 sf)

Source: ICF 2016b

San Joaquin Valley

The San Joaquin Valley Subsection would displace 34 residential units and 1 business would be displaced. Table 6-31 shows the extent of displacement in units and square footage.

Table 6-31 San Joaquin Valley Subsection Summary of Displacement Impacts [units (square feet)]

Displacements	Henry Miller Road
Residential Displacement [units (square feet)]	34 (192,747 sf)
Business Displacement [units (square feet)]	1 (2,589 sf)

Source: ICF 2016b

7 SECTION 4(F) CONSIDERATIONS

This chapter evaluates the relative effect of each design option by subsection on resources regulated under Section 4(f) of the Department of Transportation Act.

7.1 Scope of Analysis

7.1.1 Study Area

For the purposes of this analysis, the study area is the combined project footprints of all design options of the project extent, as described in previous chapters. Because the project footprint represents all permanent and temporary right-of-way required for the project, the parks, recreation, and open space resources and cultural resource information presented represents an estimate of the relative effect of each design option on features regulated under Section 4(f). Not every resource that is identified would be affected.

7.1.2 Methods

Projects undertaken by an operating administration of the U.S. Department of Transportation (U.S. DOT) or that may receive federal funding or discretionary approvals from such an operating administration must comply with Section 4(f). Section 4(f) protects publicly owned land of parks, recreational areas, and wildlife refuges. Section 4(f) also protects historic sites of national, state, or local significance located on public or private land. The FRA's Procedures for Considering Environmental Impacts (64 C.F.R. Part 25445) contains FRA processes and protocols for analyzing the potential use of Section 4(f) resources. In addition, although not subject to the 23 C.F.R. Part 774 regulations regarding Section 4(f) for highways and transit projects, the FRA uses these regulations as additional guidance when applying the requirements established in Section 4(f).

The FRA may not approve the use of a Section 4(f) property, as described in 49 U.S.C. § 303, unless it determines that there is no feasible and prudent alternative to avoid the use of the property and the action includes all possible planning to minimize harm resulting from such use, or the project has a de minimis impact consistent with the requirements of 49 U.S.C. § 303(d).

7.1.3 Existing Conditions

The Section 4(f) resources in each of the design options were identified by taking an inventory of all public parks, recreation areas, NRHP-listed or potentially eligible historic properties, and wildlife/waterfowl refuges within the study area. A park or recreational area qualifies for protection under Section 4(f) if it: (1) is publicly owned at the time at which the "use" occurs, (2) is open to the general public, (3) is being used for recreation, and (4) is considered significant by the authority with jurisdiction. School playfields can be considered Section 4(f) resources if a joint use agreement for public recreational use of the school grounds/recreation facilities exists, or if recreation facilities are available for public use. Appendix C and Table 6-1 present the built environment and archaeological resources, respectively, in the study area that could be Section 4(f) resources if found to be listed or eligible for listing in the NRHP. Table 6-3 identifies the parks, recreation, or open space Section 4(f) resources that would be directly affected by design options within each subsection. Of the those resources listed in Table 6-3, the Silveira Property, Gonzalez Farm Property, and Pajaro River Mitigation Bank would not be considered protected under Section 4(f) because they do not meet any of four factors identified above. The remaining resources are considered Section 4(f) resources for this analysis and may incur a use as a result of one or more of the design options.

If the FRA determines there is both the use of a Section 4(f) property and that there is no prudent and feasible alternative to the use of a Section 4(f) resource, the FRA must ensure that the project includes all possible planning to minimize harm to the property, which includes all reasonable measures to minimize harm or mitigate impacts (49 U.S.C. § 303(c)(2)).

After making a Section 4(f) determination and identifying the reasonable measures to minimize harm, if there is more than one alternative that results in the use of a Section 4(f) property, the FRA must also compare the alternatives to determine which alternative has the potential to cause the least overall harm in light of the purpose of the statute.

7.2 Impacts of Design Options on Section 4(f) Resources

Based on the information available, with the exception of Monterey Corridor Subsection where there are no Section 4(f) protected parks, recreation, or wildlife/waterfowl refuge resources, each of the alternatives would affect at least one Section 4(f) resource.

- In the San Jose Diridon Station Approach Subsection, the Aerial to Scott Boulevard design option would affect three Section 4(f) protected parks (Guadalupe River Park, Reed Street Dog Park, and Larry J. Marsalli Park); the Aerial to I-880 design option would affect one of those parks (Guadalupe River Park).
- In the Morgan Hill and Gilroy Subsection, each of the design options would have potential effects on two Section 4(f) protected properties: Coyote Creek Parkway and Tulare Hill (a planned park not currently developed and without any protected facilities, attributes, or features). Both of these resources are located at the north end of the Subsection where all of the design options follow the same alignment along Monterey Highway. In addition, design options would have the following specific impacts:
  - The Embankment to Downtown Gilroy design option is likely to affect the most Section 4(f) protected resources of any of the design options in the subsection. This is because this design option has the largest number (up to 17 properties) of potentially affected historic sites. In addition to Coyote Creek Parkway and Tulare Hill, the design option is likelyto potentially affect the Silveira Property and the Pajaro River Mitigation Bank.
  - The US 101 and West of Coyote Creek Parkway design options are likely result in substantially higher use of the Coyote Creek Parkway than other elements because a portion of the alignment would cross through the parkway as opposed to taking land along the property line of the resource. In addition, these design options are likely result in use of the Morgan Hill Outdoor Sports Complex—a significant resource in Morgan Hill.
  - With exception to potential impacts on the Morgan Hill Outdoor Sports Complex and Coyote Creek Parkway posed by the US 101 and West of Coyote Creek Parkway design options, all other potential impacts on Section 4(f) resources posed by any of the design options would likely require acquisition of small portions of land from the other Park/Recreation Section 4(f) resources (i.e. Silveira Property, Wheeler Tot Lot, Forest Street park, Gonzalez Farm Property, and Pajaro Mitigation Bank) in the subsection.
- All three Pacheco Pass Subsection design options would cross the Cottonwood Creek Wildlife Area. The Close Proximity to SR 152 and Refined Program Alignment design options would likely affect the San Luis Reservoir State Recreation Area and surface of the Cottonwood Creek Wildlife Area, both significant Section 4(f) resources in the region. The North Pacheco Pass design option was developed to avoid use of the San Luis Reservoir State Recreation Area and avoid surficial use of the Cottonwood Creek Wildlife Area.
- In the San Joaquin Valley Subsection, the single design option would result in a small area of acquisition of the Volta Wildlife Area and approximately 307 acres of the Grasslands Wildlife Management Area (managed by the USFWS under the National Wildlife Refuge System and protected through conservation easements on private property). For the purposes of this analysis this land was assumed to be Section 4(f) protected; however, it is likely that, depending on the terms of the conservation easements on these lands, a majority of the affected land would not be considered Section 4(f) protected.

See Section 6.2.4 for more details on Cultural Resources. Each subsection contains NRHP-listed and eligible built resource sites that would be considered Section 4(f) resources. NRHP-eligible or likely eligible archaeological sites are valuable for what can be learned through data recovery,

with minimal value for preservation in place and are treated as exempt from Section 4(f) approval if it is determined in consultation with the State Historic Preservation Officer (SHPO) and the affected tribes that the value of the resource is in data recovery and data recovery is undertaken, or if the administration decides, with agreement of the official(s) with jurisdiction (California SHPO), not to recover the resource. The Authority would evaluate design modifications to avoid ground disturbance at the location of the sites. If the sites cannot be avoided, the Authority would conduct archaeological data recovery for the purposes of site identification and significance evaluation according to a plan prepared and approved by SHPO to determine if the sites are eligible for listing in the NRHP. If they are determined eligible, the Authority would mitigate impacts through archaeological data recovery. Any NRHP-eligible built environment resource would be considered a Section 4(f) resource. Impacts would be similar between the design options and mitigation to minimize and avoid impacts will be discussed with SHPO.

After making a Section 4(f) determination and identifying the reasonable measures to minimize harm, the FRA will compare the alternatives to determine which alternative has the potential to cause the least overall harm in light of the preservationist purpose of the statute.

8 FACILITIES REGULATED UNDER SECTION 14 OF THE RIVERS AND HARBORS ACT

Section 14 of the Rivers and Harbors Act of 1899 and codified in 33 U.S.C. 408 (commonly referred to as Section 408) authorizes the USACE to grant permission for the alteration, occupation, or use of a USACE civil works project (also known as 408 facilities) if it is determined that the activity will not be injurious to the public interest and will not impair the usefulness of the project. Documentation for the Section 408 component of the checkpoint integration process will be provided independently of this Checkpoint B Addendum as part of the Checkpoint C process.

The project extent crosses one waterway that is relevant to Section 408: the Guadalupe River. The bridge design for the Guadalupe River crossing does not place structures within the mean high-water mark of the channel, but the structures would be within the USACE improvement area. Prior coordination with the USACE conducted during preparation of the 2013 Checkpoint B Report indicated that authorization under Section 408 for minor, low-impact modifications will be required for the Guadalupe River crossing. Checkpoint C will contain Section 408 Determination documents for this crossing.

9 PRACTICABILITY

The 404(b)(1) Guidelines state that an alternative is *practicable* "if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purposes" (40 C.F.R. § 230.10(a)(2)). The Authority will conduct in the Checkpoint C Summary Report an analysis of alternatives pursuant to the Guidelines to determine the preliminary LEDPA, which will include an evaluation of the practicability of the alternatives. As part of the Checkpoint B addendum, a preliminary review was conducted regarding the potential practicability of the design options under consideration.

All the design options analyzed in this Checkpoint B Addendum are potentially practicable. While there are differences in capital cost and logistical and operational considerations associated with the various design options, none of these considerations warrant dismissal from project-level EIR/EIS evaluation.

10 PUBLIC OUTREACH AND COMMUNITY CONSIDERATIONS

The purpose of this chapter is to provide a summary of stakeholder, public, and community concerns identified during scoping that are relevant to the selection of design options and design within the project extent. The chapter provides a brief summary of previous environmental review, planning efforts, legislation that resulted in the selection of this corridor, and the requirement for blended service,[10] followed by a summary of scoping comments.

10.1 Public Comments Related to San Jose to Merced Design Options Received During NEPA and CEQA Scoping

10.1.1 Outreach to Agencies and the Public

The Authority has conducted early and continuing outreach with the general public and appropriate public agencies during the environmental and alternatives development processes. The Authority has held:

- Interagency Technical Working Group (TWG) meetings
- Public Information Meetings (PIM)
- Informal meetings with key community leaders, select members of the public, and local/resource agency staff
- Informal resource-specific agency meetings
- Informational open houses and informal presentations to community organizations and groups
- Letter, email, and phone requests for information and informal consultation
- Distribution of public notices, fact sheets, and a Frequently Asked Questions (FAQ) document with project information and updates on the ongoing studies

10.1.1.1 Early Outreach and Scoping (December 2008–May 2009)

The Authority initiated pre-scoping public outreach activities in December 2008, including the development of project information materials, establishment of a project information phone line, early engagement with interested parties, and media communications. On February 23, 2009, the Authority distributed a Notice of Preparation (NOP) announcing preparation of an EIR for the entire San Jose to Merced Project Section. The FRA published a Notice of Intent (NOI) in the *Federal Register* on March 16, 2009, announcing the preparation of an EIS for the Project Section.

The Authority and FRA initiated scoping in March 2009. The Authority held scoping meetings in Merced (March 18, 2009), San Jose (March 25, 2009), and Gilroy (March 26, 2009). More than 300 residents, property and business owners, agency representatives, elected officials, the media, and other interested parties participated in these meetings. The Authority provided information about the history of the HSR project to date, the 2005 Program EIR/EIS alternative, and the upcoming steps in the environmental review process, including alternatives development and analysis.

10.1.1.2 Alternatives Analysis Agency and Public Participation Activities (September 2009–May 2010)

The San Jose to Merced Project Section team (project team) conducted a number of meetings throughout the alternatives analysis effort with agencies, the general public, and small groups. These meetings included two sets (four in total) of TWG meetings in Gilroy and Merced, eight PIMs, a community workshop and panel discussion, and a Gilroy City Council study session, all held between September 2009 and May 2010. The purposes of these meetings were to explain

[10] A more detailed description of the project history is provided in Section 1.1 Overview of the San Jose to Merced Project Section.

the alternatives analysis process, share the results of preliminary studies with the public and agencies, and receive feedback.

10.1.1.3 Preliminary Alternatives Analysis Public Participation (June 2010–March 2011)

Following the release of the Preliminary Alternatives Analysis (PAA) Report on June 3, 2010, the project team held more than 80 meetings with elected officials and staff, other key stakeholders, and the public. These meetings included two sets (four in total) of TWG meetings in Gilroy and Merced; the meetings in Merced were held by the project team, with representation and participation from the Merced to Fresno Project Section team. More meetings were held following the release of the PAA. The Authority held five PIMs, a variety of stakeholder meetings, and two rounds of additional public outreach meetings in Gilroy and Morgan Hill between June 2010 and March 2011. Total attendance at these public meetings was more than 870 participants.

10.1.1.4 May 2011 Supplemental Alternatives Analysis Public Participation (May 2011–June 2011)

The project team presented a Supplemental Alternatives Analysis (SAA) Report to the Authority Board on May 5, 2011. This report documented additional and refined alignments and design options for the Morgan Hill and Gilroy, Pacheco Pass, and San Joaquin Valley Subsections developed in response to comments received on the PAA.

Following issuance of the May 2011 SAA, the team held two interagency TWG meetings in Merced (May 25, 2011) and Morgan Hill (June 16, 2011). This was the fourth round of TWG meetings. Three PIMs were also held along the Project Section corridor to review the content of the SAA report with the public. The meetings were held in Gilroy (May 19, 2011), Merced (May 25, 2011), and Los Banos (June 13, 2011).

10.1.2 Issues Raised during Public Outreach

The following is a description of issues consistently raised in these meetings (via verbal and written comments).

- **Consultation and Outreach**—Commenters wanted to know with which local agencies the Authority was consulting. Commenters were interested in how public and agency input will be elicited and incorporated, including what type of comments were being solicited at the current stage of the study and how public and agency comments will be incorporated. Some commenters expressed concern that the engagement effort in Gilroy (particularly east of US 101), Morgan Hill, and the surrounding unincorporated area needed to be more comprehensive.
- **Support or Opposition**—Commenters generally expressed support for HSR; however, some were concerned about the potential impact on homes. Some commenters expressed concern over the need for an HSR. Some commenters indicated the Altamont Pass alignment would be a shorter route, would destroy less existing infrastructure, and would be less expensive than the route over Pacheco Pass.
- **Business Plan (Funding, Ridership, and Schedule)**—Commenters expressed concerns about overall project funding, the decision-making timeline, and the age of the ridership figures. In addition, commenters wanted more information about the anticipated funding the project would receive from the federal government, and the cost differential of the various vertical profiles (tunnel, trench, at-grade, aerial) and horizontal profiles.
- **Right-of-Way**—Commenters wanted to know the anticipated right-of-way acquisition requirements and planned coordination for right-of-way acquisition for the project as a whole.
- **Project Operations**—Commenters asked for information about train operations, including hours of operation, frequency, and speed.

- **Alternatives**—In the San Jose area, commenters wanted to know the plan for coordinating the San Jose to Merced and San Francisco to San Jose Project Sections for planning and analysis of the San Jose Diridon Station. Commenters asked whether the Draft EIR/EIS would identify a preferred alignment alternative. Commenters questioned the feasibility of the Altamont Pass Crossing. Commenters requested consistency in the approach to addressing rail crossings in the San Jose to Merced Project Section and Merced to Fresno Project Section environmental documents.
- **Traffic Impacts**—Commenters requested information on traffic impacts and the magnitude of the access road and temporary construction easements that would be required.
- **Environmental Impacts and Impacts on Agricultural Lands**—Commenters wanted to ensure that impacts on agricultural lands and operations would be addressed in environmental review. They expressed further concerns about impacts on wildlife and the environment.
- **Noise and Vibration Impacts**—Meeting attendees expressed concerns about noise and vibration impacts from both construction and operation of the project. Commenters discussed impacts of sound and electromagnetic waves on the environment and on animals.

10.1.3 Specific Issues by Subsections

Concerns regarding alignments or other HSR facilities within specific subsections are described in more detail in the following sections. These concerns were expressed verbally at meetings and received through written comment cards, letters, and e-mails.

10.1.3.1 San Jose Diridon Station Approach

Commenters asked the Authority to consider a tunnel option in downtown San Jose, and expressed some support for the SR 87/I-280 design option.

Commenters expressed concerns regarding noise and vibration, along with concerns about visual impacts, eminent domain and impacts on property values.

10.1.3.2 Monterey Corridor

Commenters expressed concerns about impacts resulting from local road closures and the proposed narrowing of Monterey Highway. Other related concerns included impacts on local road connectivity, access, and right-of-way. Commenters indicated concern about eminent domain and impacts on property values.

10.1.3.3 Morgan Hill and Gilroy

Early in scoping, the City of Morgan Hill expressed concerns regarding the impacts of the East of UPRR aerial alignment through the City. The Authority included the US 101 design options (to Downtown Gilroy or to East of Gilroy) in the PAA in response to these concerns. Subsequent to the PAA, Morgan Hill requested that the Authority evaluate an at-grade alternative east of the UPRR from Cochrane Road to south of Morgan Hill. Morgan Hill also noted that, while it concurred with the decision to evaluate potential HSR station location options in Gilroy, the station location itself should not dictate the alignment through south Santa Clara County. If the two Gilroy station location options (downtown Gilroy and east Gilroy) proved infeasible due to right-of-way constraints or other insurmountable design constraints, then Morgan Hill would support consideration of other options.

The City of Gilroy expressed concerns regarding the impacts of the East of UPRR aerial alignment through the city and the impacts of an HSR station on its downtown and neighborhoods. Gilroy requested that an HSR trench through downtown be evaluated; this option was proposed in the PAA to be carried forward for further evaluation in the Draft EIR/EIS. Subsequent to the publication of the PAA, Gilroy requested that the Authority investigate the feasibility of partially covering the trench in downtown Gilroy and develop and evaluate an at-grade alternative option for the East of UPRR design option from Masten Avenue to south of Gilroy. The City also

requested that an aerial alignment be developed and evaluated near the East of Gilroy Station to provide for a grade-separation of the HSR and the existing and proposed future roadway.

The Planning and Development Department of Santa Clara County expressed concerns that the east Gilroy design options and station location option could significantly change the visual character and rural ambiance of that area and could have more impacts on agricultural land than the East of UPRR design option. The Planning and Development Department also stated concerns that the at-grade East of UPRR alignment through Coyote Valley could block wildlife passage and conflict with the Santa Clara Valley Habitat Conservation Plan.

The Roads and Airports Department of Santa Clara County requested that the HSR design team work jointly with Santa Clara County and its cities in determining proposed road modifications, reroutes, and new road connectors to support proposed road closures.

The Parks and Recreation Department of Santa Clara County requested additional evaluation of potential impacts on Santa Clara County parkland, including existing and proposed park facilities that may be displaced; easements and leaseholds; recreational, natural, and regional parkland resources; and the Santa Clara County Countywide Trails Master Plan.

The Local Agency Formation Commission (LAFCO) of Santa Clara County stated its concerns regarding areas of conflict between the proposed East Gilroy station location and LAFCO policies. LAFCO encouraged the Authority to consider alternative station location options more consistent with LAFCO policies, state law, and other local/regional interjurisdictional goals, plans, and policies.

Local residents in the East of Gilroy area expressed concerns regarding impacts on their homes and quality of life, impacts on agricultural lands, reduced access to properties, decreased property values, eminent domain, and the property acquisition process; noise mitigation; criteria for the selection of a final alignment; and the viability of project funding and projected ridership figures. Commenters also expressed concern regarding impacts on agriculture and on neighborhoods near alignments east of US 101.

Residents expressed concerns about impacts on local roads, connectivity, access, and right-of-way. Commenters indicated concern about impacts from the station location option near Leavesley Road. One commenter asked whether overpasses that are perpendicular to the proposed guideway are still proposed for Morgan Hill, San Martin, and Gilroy roads. Residents asked whether Depot Street would be closed for the proposed grade-separation between Dunne Avenue and Main Street in Morgan Hill.

The Transportation Agency for Monterey County (TAMC) stated its support for a downtown Gilroy station to facilitate connections with regional and local transit services.

10.1.3.4 Pacheco Pass

The California Department of Water Resources (DWR) and U.S. Bureau of Reclamation (USBR) expressed concerns regarding the displacement of storage capacity in the San Luis Reservoir, dam safety, water quality, and environmental and reservoir operational impacts related to construction of a large embankment in Cottonwood Bay. DWR also noted that all proposed alignments in the Cottonwood Creek area would affect that creek.

The California Department of Fish and Wildlife (DFW) expressed concerns about use of the Cottonwood Creek Wildlife Area under Section 4(f) and Section 6(f) of the Land and Water Conservation Act, and likely Section 4(f) use of the San Luis Reservoir State Recreation Area. The DFW requested consideration of project design changes to avoid or minimize use of these properties under Section 4(f) and Section 6(f).

Commenters expressed concerns about impacts on local roads, connectivity, access, and right-of-way. There were concerns related to eminent domain and impacts on property values. Commenters were also interested in potential mitigation related to Fringe Ranch.

10.1.3.5 San Joaquin Valley (PAA, SAA)

The majority of comments received in this subsection related to the Central Valley Wye alternatives and impacts. Questions regarding other subsections of the San Jose to Merced Project Section included Endangered Species Act consultation, such as the schedule for coordination and consultation for the various subsections, a request for coordination with kit fox experts regarding alignment profile (at-grade) and wildlife crossings at the Santa Nella kit fox "pinch point," and the need to consider California red-legged frog habitat and Bay checkerspot butterfly habitat and crossings. One commenter asked whether the Henry Miller Road to Avenue 24 alternative would bisect the Grasslands Ecological Area (GEA).

11 CONCLUSIONS AND REASONS FOR CHANGES TO THE RANGE OF DESIGN OPTIONS

As described in Chapter 1, the purpose of this addendum is to document the basis for changes and refinements to various design options for the San Jose to Merced project extent, including the reasons for withdrawal of certain design options from further consideration.[11] Specifically, the evaluation of the design options set out in this addendum takes into account a number of factors, including the effects on environmental and community resources and the feasibility of the different approaches.[12] This chapter summarizes the outcomes of the evaluation.

11.1 Revisions by Subsection

11.1.1 San Jose Diridon Station Approach

No changes have been made to the design options of this subsection.

11.1.2 Monterey Corridor

- **Design Option Added**
  - **Viaduct**—This design option was added because it reduces environmental and community impacts relative to the At-Grade design option in this subsection (previously called the East of UPRR alternative). This design option also reduces interaction with UPRR facilities, which reduces the need for intrusion barriers. This design option also reduces effects on Swainson's hawk, tricolored blackbird, and grazing land. The relatively smaller project footprint of the Viaduct also displaces fewer residential units, both in number of dwellings and total square feet, relative to the At-Grade design option.

11.1.3 Morgan Hill and Gilroy

- **Design Options Added**
  - **Viaduct to Downtown Gilroy**—This design option was added in response to input from the cities of Morgan Hill and Gilroy, and to reduce environmental impacts within the vicinity of Coyote Creek Regional Park. Greater use of a viaduct guideway rather than at-grade embankment increases permeability for wildlife movement in the Coyote Valley, which is an important geographic location for migration of various species including elk. The viaduct alignment west of US 101 would avoid residential and commercial displacements in downtown Morgan Hill, displacement of the Morgan Hill aquatic center and adjacent soccer fields, and reduce the structural complexity and expense of crossing over US 101. This design option avoids impacts to undeveloped land by siting the HSR station in downtown Gilroy, rather than utilizing an East Gilroy station option. This design option also reduces environmental effects for most resources, relative to the four design options the Authority proposes to withdraw.
  - **Viaduct to East Gilroy**—This design option was added in response to input from the City of Morgan Hill and to reduce environmental impacts within the vicinity of Coyote Creek Regional Park. Greater use of a viaduct guideway rather than at-grade embankment increases permeability for wildlife movement in the Coyote Valley, which is an important geographic location for migration of various species including elk. The viaduct alignment west of US 101 would avoid residential and commercial displacements in downtown

[11] The CEQA Guidelines state that alternatives may be withdrawn from detailed analysis in an EIR if they fail to meet most project objectives, are infeasible, or are unable to avoid significant environmental effects (14 Cal. Code of Regulations Section 15126.6(c)).

[12] Operations and maintenance activities will generally be similar across all alternatives. The primary driver of variation in operations and maintenance activities for different alternatives and alternative elements is the profile used because maintenance activities correspond to the nature of the profile constructed. However, because all operations and maintenance activity will occur within the permanent right-of-way operations and maintenance should not generate substantial effects on adjacent properties.

Morgan Hill, displacement of the Morgan Hill aquatic center and adjacent soccer fields, and reduce the structural complexity and expense of crossing over US 101. This design option reduces conversion of raw land relative to design options that follow US 101 for a longer extent. This option would avoid the land displacements of a guideway and station in downtown Gilroy and avoid acquisition of land owned by the UPRR for a downtown station site. This option also reduces environmental impacts on many resources relative to the design options the Authority proposes to withdraw in this subsection.

- **Design Options Withdrawn**
  - **East of UPRR to East Gilroy**— When compared to the alternatives the Authority proposes to carry forward, this design option has greater environmental effects on the following resources: California red-legged frog, least Bell's vireo, Swainson's hawk, tricolored blackbird, steelhead, Bay checkerspot butterfly, San Joaquin kit fox, Metcalf Canyon jewelflower, Santa Clara Valley dudleya, and built-environment resources. Similarly, the footprint for this design option would also require greater conversion of 100-year floodplain, important agricultural land, and residential housing. The East of UPRR to East Gilroy design option would also affect a greater acreage of land in conservation easements. These effects are associated with a relatively greater proportion of at-grade footprint. This design option would also create substantial disruption to local infrastructure use and land uses as it crosses over from east of the UPRR right-of-way to east of US 101 north of Gilroy.
  - **Maintenance Facility Coyote Valley A**—This maintenance facility option is withdrawn because it would use Coyote Creek Regional Park land, convert agricultural land, obstruct wildlife movement in the Coyote Valley, and is opposed by the community.
  - **Maintenance Facility Coyote Valley B**—This maintenance facility option is withdrawn because it is incompatible with a viaduct crossover between the Monterey corridor and US 101, it would use Coyote Creek Regional Park land, convert agricultural land, obstruct of wildlife movement in the Coyote Valley, and is opposed by the community.
  - **West of Coyote Creek Parkway to East Gilroy**—When compared to the three alternatives the Authority proposes to carry forward, this design option has greater environmental effects on the following resources: aquatic features, California red-legged frog, least Bell's vireo, tricolored blackbird, steelhead, Bay checkerspot butterfly, San Joaquin kit fox, Metcalf Canyon jewelflower, and Santa Clara Valley dudleya. The at-grade and embankment crossover between the Monterey corridor and US 101 would obstruct wildlife movement in the Coyote Valley. This design option would also convert a greater proportion of important agricultural land, 100-year floodplain, conservation easements, and parks (both number and acreage) than the design options proposed to be carried forward in this subsection, and displace portions of the Morgan Hill Aquatics Center and associated soccer fields. This design option would also require a combination of tunnel and trench to cross under US 101, with substantial disruption to local land uses and increased cost.
  - **US 101 to East Gilroy**—This design option is withdrawn because it has greater environmental effects than the design options carried forward in this subsection. This alignment has greater effects on the following resources: aquatic features, California red-legged frog, California tiger salamander, least Bell's vireo, tricolored blackbird, steelhead, Bay checkerspot butterfly, San Joaquin kit fox, Metcalf Canyon jewelflower, and Santa Clara Valley dudleya. The US 101 to East Gilroy design option would also convert a greater acreage of important agricultural land relative to the design options that are retained. This design option would also displace portions of the Morgan Hill Aquatics Center and associated soccer fields, and Coyote Creek Regional Park.
  - **West of Coyote Creek Parkway to Downtown Gilroy**—This design option is withdrawn because it has the greatest effects of all the design options on the following features: aquatic features, California red-legged frog, California tiger salamander, least Bell's vireo, Swainson's hawk, tricolored blackbird, steelhead, Bay checkerspot butterfly, San Joaquin kit fox, Metcalf

Canyon jewelflower, Santa Clara Valley dudleya, and built-environment cultural resources. This design option would also convert the largest proportion of 100-year floodplains and important agricultural land than the design options carried forward. The West of Coyote Creek Parkway to Downtown Gilroy design options would require demolition of the greatest number of residences and largest area of residential housing in square feet, than the design options carried forward. This design option would also displace portions of the Morgan Hill Aquatics Center and associated soccer fields, and Coyote Creek Regional Park. This design option would also require a combination of tunnel and trench to cross under US 101, with substantial disruption to local land uses and cost.

- **US 101 to Downtown Gilroy**—Relative to the design options that are carried forward, this alignment has greater environmental effects on the following resources: aquatic features, California red-legged frog, California tiger salamander, least Bell's vireo, tricolored blackbird, steelhead, San Joaquin kit fox, Bay checkerspot butterfly, and Metcalf Canyon jewelflower. This design option would also require conversion of a greater acreage of 100-year floodplains, parks, and agricultural land than the design options that are retained. This design option also would displace portions of the Morgan Hill Aquatic center and associated soccer fields in Morgan Hill. This design option would also require a tunnel and trench to cross US 101 with associated disruption of local land use and infrastructure.

11.1.4 Pacheco Pass

- **Design Options Added**
  - **North Pacheco Pass**—This design option was added because it avoids crossing the San Luis Reservoir and associated potential impacts on water storage capacity and recreational uses, and would avoid surficial use of the Cottonwood Creek Wildlife Area. The two design options that the Authority proposes to withdraw would affect the reservoir, which would require significant steps to ensure the ongoing safety of the reservoir and to avoid decreases in water storage capacity, and would alter the ground surface within the Cottonwood Creek Wildlife Area, a use which would impact recreation and wildlife resource values. The North Pacheco Pass Alignment also uses a large proportion of tunneling relative to at-grade or viaduct guideway, with an associated reduction of impacts on the surface landscape.
- **Design Options Withdrawn**
  - **Refined Program Alignment**—This design option is withdrawn because it crosses the San Luis Reservoir, with associated impacts on water storage capacity and recreational uses. The refined program alignment has greater impacts on aquatic resources, California red-legged frog, California tiger salamander, least Bell's vireo, Swainson's hawk, tricolored blackbird, steelhead, San Joaquin kit fox, and blunt-nosed leopard lizard. The Refined Program Alignment also would also convert greater acreage of 100-year floodplains and important agricultural land than the North Pacheco Pass alignment. The Refined Program Alignment would also impact a greater number and acreage of parkland than the North Pacheco Pass design option. In addition, this design option results in a greater acreage of impacts on the Cottonwood Creek Wildlife Area than the North Pacheco Pass design option, and also would affect the San Luis Reservoir State Recreation Area (which is avoided by the North Pacheco Pass design option). In addition this alternative would result in potential impacts to water storage capacity.
  - **Close Proximity to SR 152**—This design option is withdrawn because it crosses the San Luis reservoir, with associated impacts on water storage capacity. In addition this design option has greater environmental impacts than the North Pacheco Pass Alignment on aquatic resources, California red-legged frog, California tiger salamander, least Bell's vireo, Swainson's hawk, tricolored blackbird, steelhead, San Joaquin kit fox, blunt-nosed leopard lizard, and giant garter snake. The option would also generate greater effects on 100-year floodplains, important agricultural land, lands under conservation easement, and parkland (both in number of parks and total acreage). In addition, this design option

results in a greater acreage of impacts on the Cottonwood Creek Wildlife Area than the North Pacheco Pass design option, and also would affect the San Luis Reservoir State Recreation Area (which is avoided by the North Pacheco Pass design option). In addition this alternative would result in potential impacts to water storage capacity.

11.1.5 San Joaquin Valley

No changes.

11.2 Alternatives Identified for Analysis in the EIR/EIS

The subsection design options in this addendum have been assembled into three end-to-end alternatives for evaluation of the San Jose to CVY extent in the Project EIR/EIS. The alternatives identified in this section will connect to the alternatives the Authority and FRA are analyzing in the Supplemental EIR/EIS: Central Valley Wye.

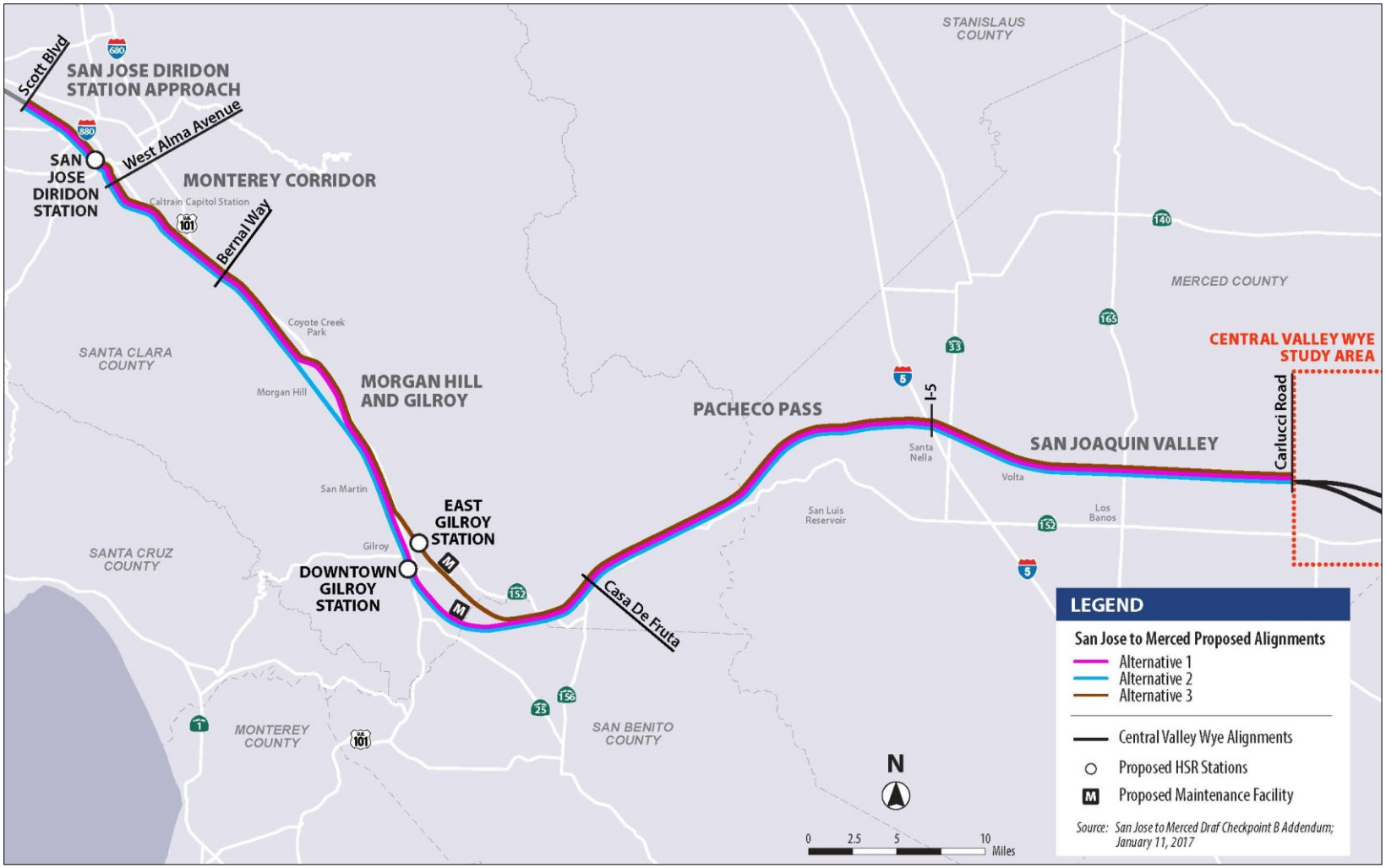
The range of end-to-end alternatives for the EIR/EIS are the result of three organizing themes that balance primary HSR project delivery and operating objectives with natural, community, and cultural resource considerations and stakeholder input.

- Alternative 1 combines design options that are most responsive to stakeholder input.
- Alternative 2 combines design options that most closely correspond to the preferred project of the program-level analysis: the Refined Program Alignment.
- Alternative 3 minimizes encroachment and acquisition of UPRR right-of-way.

Table 11-1 shows how the design options analyzed in this report will be assembled into three end-to-end alternatives for analysis in the EIR/EIS and other environmental documentation. Figure 11-1 depicts the end-to-end alternatives that result from this addendum.

Table 11-1 Alternatives Identified for Analysis in the EIR/EIS

Subsection/Elements	Alt. 1	Alt. 2	Alt. 3
San Jose Diridon Station Approach			
Viaduct to Scott Blvd		✓	✓
Viaduct to I-880	✓		
Monterey Corridor			
Viaduct	✓		✓
At-Grade		✓	
Morgan Hill and Gilroy			
East of UPRR through Downtown Gilroy (embankment)		✓	
Monterey Highway Median Viaduct and Morgan Hill – US 101 to Low Viaduct Downtown Gilroy Station (aerial)	✓		
Monterey Highway Median Viaduct and Morgan Hill – US 101 to East Gilroy Station (embankment)			✓
Pacheco Pass			
North Pacheco Pass Alignment	✓	✓	✓
San Joaquin Valley			
Henry Miller Road	✓	✓	✓
Maintenance Facilities			
East Gilroy "C"			✓
South Gilroy "D"	✓	✓	



Source: Authority 2017

Figure 11-1 End-to-end Alternatives to be Analyzed in the EIR/EIS

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Regulatory Specialist	Alex Hunt	6 years experience M.S., Environmental Management, University of San Francisco
Senior Biological Resources Reviewer	Rebecca Sloan	13 years experience M.S., Environmental Studies, San Jose State University, 2006 B.S., Marine Science, Eckerd College, St. Petersburg, Florida, 1995
Senior Cultural Resources Reviewer	Susan Lassell	23 years experience M.A., Historic Preservation Planning, Cornell University, 1994 B.S., Environmental Design, University of California, Davis, 1991
Senior Cultural Resources Reviewer	Mark Robinson	30 years experience M.S., Anthropology, University of Oregon, 1988 M.A., English, University of Oregon, 1990 B.A., History and Geology, University of Montana, 1981
Environmental Planner/Project Coordinator	Jamie Genevie	8 years experience MURP, Urban and Regional Planning, Virginia Polytechnic Institute and State University, Alexandria, Virginia, 2014 B.A., Global Change and Sociology, University of Michigan, Ann Arbor, 2009
Environmental Planner	Kristin Salamack	13 years experience M.S., Biology, University of Denver, Colorado, 2008 B.S., Wildlife Management, University of New Hampshire, Durham, New Hampshire, 2004
GIS Specialist	Bill Parker	14 years experience M.S., Geography, San Francisco State University

Project Role	Name, Credential	Qualifications
GIS Specialist	Mathew Sisneros	4 years experience B.S., Anthropology, Portland State University, Oregon, 2014
GIS Specialist	Greg Nichols	16 years experience M.A. Candidate, Geography, San Diego State University, 1994. B.A., Environmental Studies, California State University, San Bernardino, 1992.
GIS Specialist	Melissa Cascella	12 years experience M.A., Cultural Resources Management, Sonoma State University, 2006 B.S., Anthropology, University of California, Riverside, 2004 B.A., History, University of California, Riverside, 2004
Editor	Lawrence Goral	23 years experience
Publications Specialist	Corrine Ortega	29 years experience A.A., Communications, Cosumnes River College, 1996
Publications Specialist	Anthony Ha	11 years experience B.A., English, Saint Mary's College of California, 2006