3.14 Agricultural Lands

3.14.1 Introduction

This section describes the regulatory setting and affected environment for agricultural lands and identifies potential project impacts on these lands and associated mitigation measures. Because there are no forests between the cities of Merced and Fresno, this section does not discuss forestlands.

The Statewide Program EIR/EIS (Authority and FRA 2005) concluded that the project would have a significant impact on agricultural lands, and committed to mitigation strategies and design practices to reduce those effects. These mitigation strategies and design practices include avoiding farmland when selecting the HST alignment, situating the alignment adjacent to existing railway rights-of-way or USGS section lines that divide properties, and securing conservation easements to mitigate impacts. Additionally, to the extent possible, the project will avoid existing railway spurs that service agricultural businesses (e.g., by using overpasses).

Sections 3.4, Noise and Vibration; 3.8, Hydrology and Water Resources; 3.12, Socioeconomics, Communities, and Environmental Justice; 3.13, Station Planning, Land Use, and Development; and 3.18, Regional Growth, provide additional information about issues related to agricultural lands, including noise, irrigation, agricultural economics, rural housing, agricultural zoning, and the effects of future urban development on farmlands.

3.14.2 Laws, Regulations, and Orders

The following sections summarize key laws and regulations for agricultural lands relevant to the proposed project.

3.14.2.1 Federal

Farmland Protection Policy Act of 1981– 7 United States Code 4201-4209 and 7 CFR 658

The Farmland Protection Policy Act (FPPA, 7 U.S.C. Section 4201 et seq.) is intended to protect farmland and requires federal agencies to coordinate with the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), if their activities may irreversibly convert farmland to nonagricultural use, either directly or indirectly. The stated purpose of the FPPA is to "minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses." The FPPA requires federal agencies to examine potential direct and indirect effects to farmland of a proposed action and its alternatives before approving any activity that would convert farmland to nonagricultural use. USDA issues regulations to implement the FPPA (7 CFR, Chapter VI Part 658).

For the purpose of FPPA, important farmland includes prime farmland, unique farmland, and farmland of statewide or local importance, as defined by Section 1540(c)(1) of the FPPA. Classification standards differ from state to state; each state may set its own criteria for classification in each category. Federal farmland classification criteria may differ from those developed by the California Department of Conservation (DOC), which are described in Section 3.14.2.2, Regional and Local Regulatory Framework. Farmland subject to FPPA requirements can be forestland, pastureland, cropland, or other land, but not water or urban built-up land.

The FPPA exempts the following land types:

- Soil types not suitable for crops, such as rocky terrain or sand dunes.
- Sites where the project's right-of-way is entirely within a delineated urban area and the project requires no prime or unique farmland, nor any farmland of statewide or local importance.

- Farmland that has already been converted to industrial, residential, or commercial or is used for recreational activity.

The FPPA applies to projects and programs sponsored or financed in whole or in part by the federal government. FPPA implementing regulations spell out requirements to ensure that federal programs, to the extent practical, are compatible with state, local, and private programs and policies to protect farmland. The FPPA requires a rating of farmland conversion impacts based on land evaluation and site assessment criteria identified in 7 CFR Part 658.5. These criteria are addressed through completion of a Farmland Conversion Impact Rating for Corridor Type Projects (NRCS-CPA-106) form, which requires input from both the federal agency involved and from the NRCS.

3.14.2.2 State

California Land Conservation Act of 1965 (California Government Code S.51200-51295) (also known as the Williamson Act)

The California Land Conservation Act of 1965 (Government Code §51200 et seq.), commonly known as the Williamson Act, provides a tax incentive for the voluntary enrollment of agricultural and open space lands in contracts between local government and landowners. The contract restricts the land to agricultural and open space uses and compatible uses defined in state law and local ordinances. Local government establishes an agricultural preserve defining the boundary within which a city or county will enter into contracts with landowners. Local governments calculate the property tax assessment based on the actual land use instead of the potential land value assuming full development.

Williamson Act contracts are for 10 years and longer. The contract renews automatically each year, maintaining a constant, 10-year contract, unless the landowner or local government files to initiate nonrenewal. Should that occur, the Williamson Act would terminate 9 years after the filing of a notice of nonrenewal. Only a landowner can petition for a contract cancellation. Tentative contract cancellations can be approved only after a local government approves, but the landowner pays the cancellation fee.

California has the following policies regarding public acquisition of and locating public improvements on lands in agricultural preserves and on lands under Williamson Act contracts (Government Code §51290–51295):

- State policy is to avoid locating federal, state, or local public improvements and improvements of public utilities, and the acquisition of land, in agricultural preserves.

- State policy is to locate public improvements that are in agricultural preserves on land other than land under Williamson Act contract.

- State policy is that any agency or entity proposing to locate such an improvement, in considering the relative costs of parcels of land and the development of improvements, give consideration to the value to the public of land, particularly prime agricultural land, in an agricultural preserve.

Since 1998, another option in the Williamson Act Program is a Farmland Security Zone (FSZ) contract. An FSZ is an area created within an agricultural preserve by a board of supervisors upon the request of a landowner or group of landowners. FSZ contracts offer landowners greater property tax reductions and have a minimum initial term of 20 years. Like Williamson Act contracts, FSZ contracts renew annually unless an owner files a notice of nonrenewal.

Farmland Mapping and Monitoring Program

The Farmland Mapping and Monitoring Program (FMMP) is the only statewide land use inventory conducted on a regular basis. DOC administers the FMMP, under which it maintains an automated map and database system to record changes in agricultural land use. “Important Farmland” under the FMMP is listed by category, as described below. The categories are defined according to USDA land inventory and monitoring criteria, as modified for California:

- **Prime Farmland** – Prime Farmland is land with the best combination of physical and chemical features to sustain long-term agricultural crop production. These lands have the soil quality, growing season, and moisture supply necessary to produce sustained high yields. Soil must meet the physical and chemical criteria determined by the NCRS. Prime Farmland must have been used for production of irrigated crops at some time during the 4 years prior to the FMMP's mapping date.

- **Farmland of Statewide Importance** – Farmland of Statewide Importance is similar to Prime Farmland but with minor differences, such as having greater slopes or soils with a lesser ability to store moisture. Farmland of Statewide Importance must have been used for production of irrigated crops at some time during the 4 years prior to the mapping date.

- **Unique Farmland** – Unique Farmland has lesser quality soils than Prime Farmland or Farmland of Statewide Importance. Unique Farmland is used for producing the state's leading agricultural crops. These lands usually are irrigated, but may include non-irrigated orchards or vineyards found in some climatic zones. Unique Farmland must have been used for crops at some time during the 4 years prior to the mapping date.

- **Farmland of Local Importance** – Farmland of Local Importance is farmland that is important to the local agricultural community as determined by each county's board of supervisors and local advisory committees.

California Farmland Conservancy Program Act (Public Resources Code Sections 10200 to 10277)

This act provides a mechanism for the DOC to establish agricultural conservation easements on farmland. Agricultural conservation easement, or easement, means an interest in land, less than fee simple, which represents the right to prevent the development or improvement of the land for any purpose other than agricultural production. The easement is granted for the California Farmland Conservancy Program by the owner of a fee simple interest in land to a local government, nonprofit organization, resource conservation district, or to a regional park or open-space district or regional park or open-space authority that has the conservation of farmland among its stated purposes or as expressed in the entity's locally adopted policies. It shall be granted in perpetuity as the equivalent of covenants running with the land. The landowner may make a request to the DOC that the easement be reviewed for possible termination 25 or more years from the date of sale of the agricultural conservation easement.

3.14.2.3 Regional and Local

Table 3.14-1 summarizes the regional and local plans and policies addressing preservation and protection of farmlands that were identified and considered in the preparation of this analysis.

Table 3.14-1
Regional and Local Plans and Policies

Policy Title	Summary
Regional	
San Joaquin Valley Blueprint (2009)	The San Joaquin Valley Blueprint planning process resulted in a regional plan – the B+ Scenario – that includes development of the HST with stations in Merced and Fresno. The B+ Scenario promote concentration of growth in existing urban centers. By 2050, implementation of the B+ Scenario would reduce the conversion of farmland in the San Joaquin Valley relative to current land use trends ("Scenario A") by 118,000 acres (San Joaquin Valley Blue Print Planning Process 2009). On behalf of the eight councils of government that participated in the blueprint process (including the Merced, Madera, and Fresno councils), the Council of Fresno County Governments initiated preparation of the Valley Blueprint Roadmap in early 2010. This roadmap will provide a guidance framework and tools to guide local planning decisions to realize the values

Policy Title	Summary
	expressed in the B+ Scenario.
Merced County	
Merced County General Plan (Merced County 1990)	Contains policies for the use of agricultural lands within the county: • Conversion of agricultural and other rural lands into urban uses only allowed where a clear and immediate need can be demonstrated based on anticipated growth and availability of public services and facilities (Land Use, Goal 7, Objective 7A, Policy 1). • Conversion of agricultural lands into urban uses only allowed where a clear and immediate need can be demonstrated, based on population projections and lack of land availability for nonagricultural uses (Agriculture, Goal 2, Objective 2A, Policy 1). • Proper location of land uses that potentially are disruptive to the agricultural economy (Agriculture, Goal 3).
Merced County Code (Title 18)	Designates agricultural zones to preserve, develop, and grow agriculture in the county (Chapter 18.02 A-1, A-1-40, and A-2). Chapter 18.48 details regulations pertaining to animal confinement facilities and operations in the county.
City of Merced Vision 2030 General Plan (Draft) (City of Merced 2010)	Contains urban expansion policies consistent with the goal "preservation of agriculturally significant areas." • Designate areas for new urban development that recognize the physical characteristics and environmental constraints of the planning area (Policy UE-1-1). Contains open space policies consistent with the goal "protection of regional agricultural resources." • Protect agricultural areas outside the City's urban expansion area from urban impacts (Policy OS-2.1). • Relieve pressures on converting areas containing large concentrations of "prime" agricultural soils to urban uses by providing adequate urban development land within the urban expansion area (Policy OS-2.2).
Madera County	
Madera County General Plan (Madera County 1995)	Contains policies for the use of agricultural lands in the county. Goals and policies include the following: • Maintain agriculturally designated areas for agricultural uses (Agriculture, Goal 5A, Policy 5.A.1). • Ensure new development and public works projects do not encourage further expansion of urban uses into designated agricultural areas (Agriculture, Goal 5A, Policy 5.A.3). • Allow conversion of existing agricultural lands to urban uses within designated urban and rural residential areas, new growth areas, and city spheres of influence (Agriculture, Goal 5A, Policy 5.A.5). • Encourage continued and, where possible, increased agricultural activity on lands designated for agricultural use (Agriculture, Goal 5A, Policy 5.A.6). • Require development within or adjacent to designated agricultural areas to incorporate design, construction, and maintenance techniques to protect agriculture and minimize conflicts with adjacent agricultural uses (Agriculture, Goal 5A, Policy 5.A.13). Dairy Element: Includes dairy standards for compliance with the Dairy Element and associated requirements of the Madera County Zoning Ordinance.

Policy Title	Summary
County Code, Title 18	Designates agricultural zones to preserve, develop, and grow agriculture in the county. It also includes dairy operations' standards and regulatory standards that identify procedures and management practices for implementation that provide pollution protection for surface and groundwater resources.
City of Chowchilla General Plan (Draft) (City of Chowchilla 2009)	Contains objectives that support agriculture (each with multiple policies and implementation measures). • Coordinate with Madera County to maintain viable agricultural land on the periphery of the City of Chowchilla Sphere of Influence boundary for purposes of resource and view protection (Policy OS 1.3). • Support preservation of existing agricultural lands at the periphery of the City of Chowchilla Sphere of Influence (Policy OS 1.4). • The City shall work with the County to preserve lands dedicated as "Agriculture" within and adjacent to the City Sphere of Influence boundaries.
City of Madera General Plan (City of Madera 2009)	Policies for open space for managed resource protection. • Productive agricultural acreage should be developed under a phasing program that will retain agricultural production for as long as possible. • The protection of agricultural lands from premature conversion to urban use should be reinforced by firm policies of the City not to permit the extension of sewer and water lines to such lands. • Exclusive agricultural zoning should be continued by the County on agricultural lands outside the urban development boundary. • A right-to-farm ordinance should be adopted by the City.
Fresno County	
Fresno County General Plan (Goal LU-A) (Fresno County 2000)	Contains the following goals and policies for the use of agricultural land in the county: • Maintain agriculturally designated areas for agriculture use and direct urban growth away from valuable agricultural lands to cities, unincorporated communities, and other areas planned for development where public facilities and infrastructure are available (Agriculture, Goal LU-A, Policy LU-A.1). • Protect agricultural activities from encroachment of incompatible land uses (Agriculture, Goal LU-A, Policy LU-A.12). • Protect agricultural operations from conflicts with nonagricultural uses by requiring buffers between nonagricultural uses and agricultural operations (Agriculture, Goal LU-A, Policy LU-A.13). • Include an assessment of the conversion of productive agricultural lands and mitigation, where appropriate, in review of discretionary permits (Agriculture, Goal LU-A, Policy LU-A.14). • Accept California Land Conservation contracts on designated agricultural lands subject to the location, acreage, and use limitations of the county (Agriculture, Goal LU-A, Policy LU-A.17).
Fresno County Zoning Ordinance	Designates agricultural land use districts (Sections 816, 817, and 819) to preserve, develop, and grow the agricultural community in the county.
City of Fresno	
City of Fresno General Plan (City of Fresno 2002)	Focuses on the relationship between the city and farmlands outside the city limits, protecting existing uses from "untimely" conversion (Objective G-6). Objective: Support existing farming operations and protect them from untimely urbanization. G-6-a. Policy: Allow for continued agricultural use of vacant land in the city consistent with standards for the protection of the environment; public safety and well-being;

Policy Title	Summary
	and the planned, orderly, and efficient development of the urban area. G-6-b. Policy: Fresno will continue to recognize its agricultural preserve contracts (i.e., Williamson Act contracts) and promote the enrollment of prime farmland that remains outside of its anticipated urban growth area. Scenic or resource conservation easements should be explored as another means for protecting farmland. G-6-c. Policy: Where possible, major streets will be used as boundaries between areas designated for urban development and agriculture. G-6-d. Policy: When land proposed for urban development directly abuts active farmed land under an agricultural preservation contract, which has not had an application for cancellation or a Notice of Nonrenewal filed, appropriate design features need to be incorporated into the development project to buffer the agriculture/urban interface. Design features should include the following, or equivalent measures, to create an adequate buffer: • Wider building setbacks with fencing. • Designated open space (including but not limited to: densely landscaped strips, full-width multiuse trails or bikeways, onsite flood control, drainage or recharge facilities) and/or boundary streets.

3.14.3 Methods for Evaluating Impacts

The methods for evaluating project impacts include using geographic information system (GIS) tools. Recently available FMMP spatial data for Merced, Madera, and Fresno counties (DOC 2008a) identify Important Farmland (i.e., Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance) and Grazing Land. The DOC also provided spatial data for agricultural lands protected under Williamson Act and FSZ contracts. Together, this information provided the basis for calculating land use changes. Several conservation organizations (e.g., land trusts) provided information about agricultural conservation easements.

To calculate the permanent conversion of Important Farmlands to nonagricultural use, the acreage for the project footprint for each alternative was quantified and identified as being permanently converted to HST use. In addition, analysts examined farmland severance on a parcel-by-parcel basis for each alternative to identify where severance would create two parcels, and result in remainder parcel(s) that would be too small to be farmed economically. The quantity of the non-economic remainder parcels was then added to the footprint quantity to identify total Important Farmland converted to nonagricultural use for each alternative.

In addition to evaluating changes to Important Farmland by using FMMP data, NRCS staff and project analysts evaluated farmland conversion impacts on agricultural land and resources through completion of Form NRCS-CPA-106, in accordance with FPPA criteria. NRCS completed the land evaluation portion of Form NRCS-CPA-106, considering the extent of converted farmland (as defined by the FPPA). Project analysts prepared the site assessment by using FPPA criteria (e.g., area of nonurban use, percentage of the HST corridor being farmed, protected farmland, size of farm, creation of nonfarmable farmland, availability of farm support services, on-farm investments, and compatibility with existing agricultural uses). Project staff combined the scores for both the land evaluation and site assessment portions of Form NRCS-CPA-106 to arrive at a total score for each HST alternative. The maximum possible score is 260 points. If the score is less than 160 points, no further evaluation is necessary under the FPPA. If the score is greater than 160, the FPPA requires consideration of alternatives that avoid or minimize farmland impacts.

In addition to the GIS analysis and Form NRCS-CPA-106 calculations, public and agency input (e.g., during the Project EIR/EIS scoping process) also informed the analysis. For example, the directors of the Merced County Farm Bureau and Madera County Farm Bureau organized an agricultural tour, with input from University of California Cooperative Extension farm advisors. The tour on June 28, 2010,

provided insight into farmland operations and functions of agricultural lands in Merced and Madera counties, which helped focus the impact analysis on important resources of concern and inform the selection of avoidance and minimization measures (CH2M HILL 2010). Similarly, scoping comments also helped define a range of possible indirect impacts to consider in the Project EIR/EIS, including disruption of adjacent agricultural operations (e.g., orchards and dairies) from dust, noise, and wind. These comments helped the Lead Agencies consider a broader range of potential impacts than expected prior to the scoping process.

In evaluating the potential effects on farming and animal husbandry, the impacts analysis methods also included noise modeling and measured wind velocity to assess predicted noise effects on animal operations during project construction and operation.

3.14.3.1 Methods for Evaluating Effects Under NEPA

Pursuant to NEPA regulations (40 CFR 1500-1508), project effects are evaluated based on the criteria of context and intensity. Context means the affected environment in which a proposed project occurs. Intensity refers to the severity of the effect, which is examined in terms of the type, quality, and sensitivity of the resource involved, location and extent of the effect, duration of the effect (short- or long-term), and other consideration of context. Beneficial effects are identified and described. When there is no measurable effect, impact is found not to occur. Intensity of adverse effects is summarized as the degree or magnitude of a potential adverse effect where the adverse effect is thus determined to be negligible, moderate, or substantial. It is possible that a significant adverse effect may still exist when on balance the impact is negligible or even beneficial. For agricultural lands, the terms are defined as follows:

A *negligible* impact would be an impact that would not be measurable by FMMP, which uses a minimum land use mapping unit of 10 acres. A *substantial* impact would be a large conversion of agricultural land resources. Agricultural lands are not replaceable, and therefore any farmland conversion is a permanent depletion of the resource. Within the context of the highly productive Central Valley farmland in the project area, a large depletion is defined as more than 50 acres. A *moderate* impact would be a depletion of agricultural land that is measurable by FMMP (i.e., greater than 10 acres) but not a substantial impact (i.e., less than 50 acres).

3.14.3.2 CEQA Significance Criteria

According to CEQA guidelines Appendix G, the project would result in a significant impact on agricultural lands if it would result in any of the following:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared for FMMP, to a nonagricultural use.
- Conflict with existing zoning for agricultural use or a Williamson Act contract.
- Involve other changes in the existing environment that would result in conversion of farmland to nonagricultural use because of their location or nature.

3.14.3.3 Study Area

The study area for effects on agricultural lands encompasses the entire potential area of disturbance associated with the project construction footprint (for direct effects), plus an additional 100 feet around the construction footprint based on federal standards for evaluating livestock noise impacts. As described in Section 3.1, Introduction, the construction footprint includes the proposed HST right-of-way and associated facilities, (including traction power substations, switching and paralleling stations, wye junctions, and areas associated with modifying or relocating roadways for those facilities, such as overcrossings and interchanges), heavy maintenance facility (HMF) sites, and other areas temporarily disturbed by construction activity. Parcels that the HST alignments could sever were part of the study area for direct effects (i.e., the project construction footprint).

The urbanized areas around the proposed Merced and Fresno HST stations are within the study area. Because these urban areas do not include agricultural lands, this section excludes the HST station areas from further analysis in this section.

3.14.4 Affected Environment

This section describes the existing agricultural lands and provides information about regional agricultural operations and those in the project vicinity. This section also discusses confined animal agriculture facilities, which only includes dairies in the study area.

3.14.4.1 Regional Agriculture

In 2007, California had approximately 25.4 million acres of farmland, with an estimated 81,000 farms (USDA 2009). According to the California Department of Food and Agriculture (2009), the state produces more than 400 different types of agricultural products. In 2007, the state generated $36.6 billion in direct farm sales. California's agricultural production represents 12.8% of the nation's total agricultural value (in dollars). California is also a major global supplier of food and agricultural commodities, with exports reaching a high of $10.9 billion in 2007. This represents an 11% increase over the 2006 export totals.

The Central Valley is the state's largest agricultural area. Many of the state's most agriculturally productive counties, including Merced and Madera counties, are in the Central Valley. Crops produced in Merced, Madera, and Fresno counties include almonds, grapes, tomatoes, sweet potatoes, and several types of stone fruit (such as nectarines and peaches) (Merced County 2009, Madera County 2009, Fresno County 2009). Almonds are a key regional crop; 80% of the world's almonds come from California, primarily from the San Joaquin Valley. Approximately 1.2 million bee colonies pollinate the almonds during the 2- to 4-week pollination period (Almond Board of California 2007).

In addition to farmlands, California currently has 1,600 to 1,800 dairies; 80% of the dairies are in the Central Valley. Dairy properties include areas for forage crop production (e.g., corn). California does not produce sufficient forage to support the dairy industry, and dairy farmers import forage, primarily from Nevada and Idaho (Norton 2010). The forage crop areas associated with dairies receive dairy waste in accordance with a nutrient management plan, and the requirements include manure containment, application of manure at the agronomic rate, and nutrient balance. To comply with the plan, dairies might need to reduce herd size, increase acreage, or haul manure offsite. Dairies require large-scale operations to allow for the increasing cost of environmental compliance (Castillo 2010).

According to the most recent Census of Agriculture profile information for Merced County (USDA 2007), in 2007, a total of 2,607 farms occupied more than 1 million acres, with an average farm size of 399 acres. More than 51% of farmland was devoted to crops and about 44% was pasture (other uses accounted for about 4.5% of total farmland). In 2007, the county's agricultural product market value was more than $2 billion: 38% from crop sales and 62% from livestock sales. The largest crop acreages were devoted to forage, almonds, corn (for silage), vegetable crops, and cotton. In order of sales value, the most important agricultural commodities in Merced County are milk and other dairy products; fruits, tree nuts, and berries; poultry and eggs; vegetables, melons, and potatoes; and cattle.

In 2007, Madera County had 1,708 farms occupying nearly 700,000 acres, with an average farm size of 398 acres. Nearly 43% of farmland was devoted to crops and about 51% was pasture (other uses accounted for about 6% of total farmland). In 2007, the county's agricultural market value was more than $990 million: 63% from crop sales and 37% from livestock sales. The largest crop acreages included forage, almonds, grapes, pistachios, and feed corn. In order of sales value, the most important agricultural commodities in Madera County are fruits, tree nuts, and berries; milk and other dairy products; cattle; poultry and eggs; and nursery, greenhouse, floriculture, and sod.

In 2007, Fresno County had 6,081 farms occupying more than 1.6 million acres of land, with an average farm size of 269 acres. More than 67% of farmland was devoted to crops and about 29% was pasture (other uses accounted for about 4% of total farmland). In 2007, the county's agricultural market value

was more than $3 billion: 67% from crop sales and 33% from livestock sales. The largest crop acreages were devoted to grapes, vegetable crops, cotton, almonds, and tomatoes. In order of sales value, the most important agricultural commodities in Fresno County are fruits, tree nuts, and berries; vegetables, melons, and potatoes; milk and other dairy products; cattle; poultry and eggs; and cotton and cottonseed.

3.14.4.2 Important and Protected Farmlands

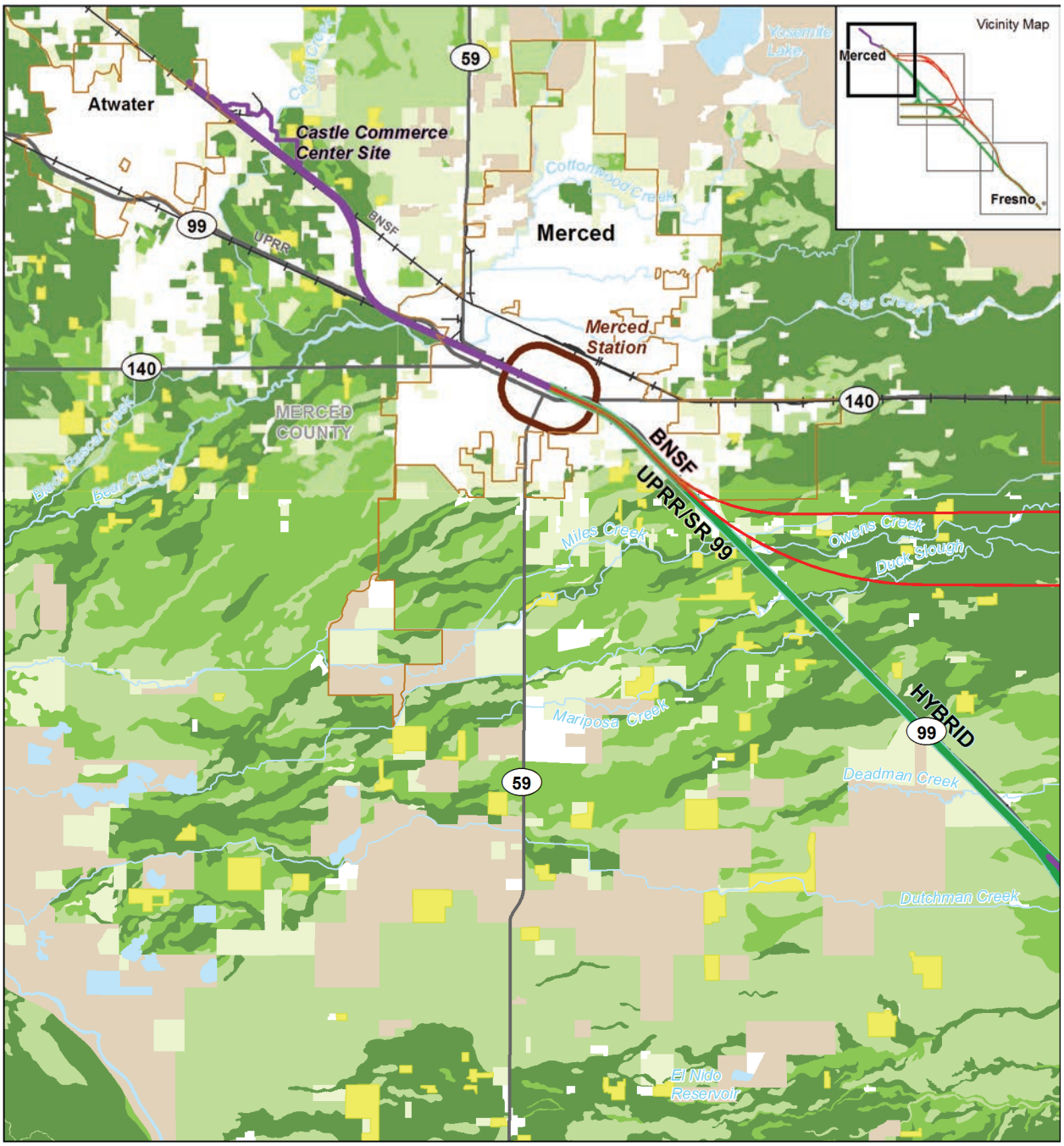
According to the FMMP data, there are more than 2.3 million acres of Important Farmland in Merced, Madera, and Fresno counties combined (refer to Table 3.14-2). In addition, there are nearly 1.8 million acres of Grazing Land in the three counties. The FMMP defines Grazing Land as land that has existing vegetation that is suitable for livestock grazing (DOC 2004). In the northern portion of the City of Fresno, crops include deciduous fruit and nut trees; there is no Grazing Land in the city. In Merced and Madera counties, the practice is to fence grazing areas to prevent livestock from crossing major transportation corridors, such as the BNSF, UPRR, and SR 99. Table 3.14-2 presents the total acreage of each category of Important Farmland and Grazing Land within Merced, Madera, and Fresno counties. Figures 3.14-1 through 3.14-4 show the distribution of Important Farmland and Grazing Land in the Merced, Chowchilla, Madera, and Fresno project vicinities, respectively. Figures 3.14-5 through 3.14-8 show the distribution of crop cover.

Table 3.14-2
Important Farmland and Grazing Land in Merced, Madera, and Fresno Counties

Type of Agricultural Lands	Merced County (acres[a])	Madera County (acres[a])	Fresno County (acres[a])
Prime Farmland	272,100	97,500	693,200
Farmland of Statewide Importance	153,200	85,100	439,000
Unique Farmland	104,400	164,000	94,200
Farmland of Local Importance	59,900	16,100	149,900
Total Important Farmland	589,600	362,700	1,376,300
Grazing Land	569,800	399,500	827,000
Total Agricultural Land	**1,159,400**	**762,200**	**2,203,200**

[a]Rounded to the nearest 100 acres.
Source: DOC (2008a).

Although each county in the project study area has policies to protect agricultural lands, according to the DOC farmland conversion reports, conversions of Important Farmland continue to occur. Table 3.14-3 presents the change in acreages of Important Farmland and Grazing Land between 2000 and 2008. In Merced County, there was a net increase in Important Farmland acreage between 2000 and 2008; however, in 2008, county boundaries were redrawn between Fresno and Merced counties, which might have increased the Important Farmland acreage in Merced County. Madera and Fresno counties reported a reduction in Important Farmland acreage of 3% and 2%, respectively, during this period. Population growth and the associated urban development pressure primarily drive the loss of Important Farmland; however, losses also can occur if land goes into habitat conservation or confined animal facilities. Gains in Important Farmland also can occur, for example, when grazing land goes into crop production (e.g., increased area planted to almonds). Nevertheless, one of the leading regions in the state that is losing Important Farmland to urban uses is the San Joaquin Valley (DOC 2008b).



Source: DOC (2008)

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N

0 2.5

Miles

- UPRR/SR 99 Alternative
- BNSF Alternative
- Hybrid Alternative
- Potential Heavy Maintenance Facility
- Station Study Area
- City Limit
- County Boundary
- Railroad

- Prime Farmland
- Farmland of Statewide Importance
- Unique Farmland
- Farmland of Local Importance
- Grazing Land

Figure 3.14-1
Important Farmland and Grazing Land in the Merced Project Vicinity

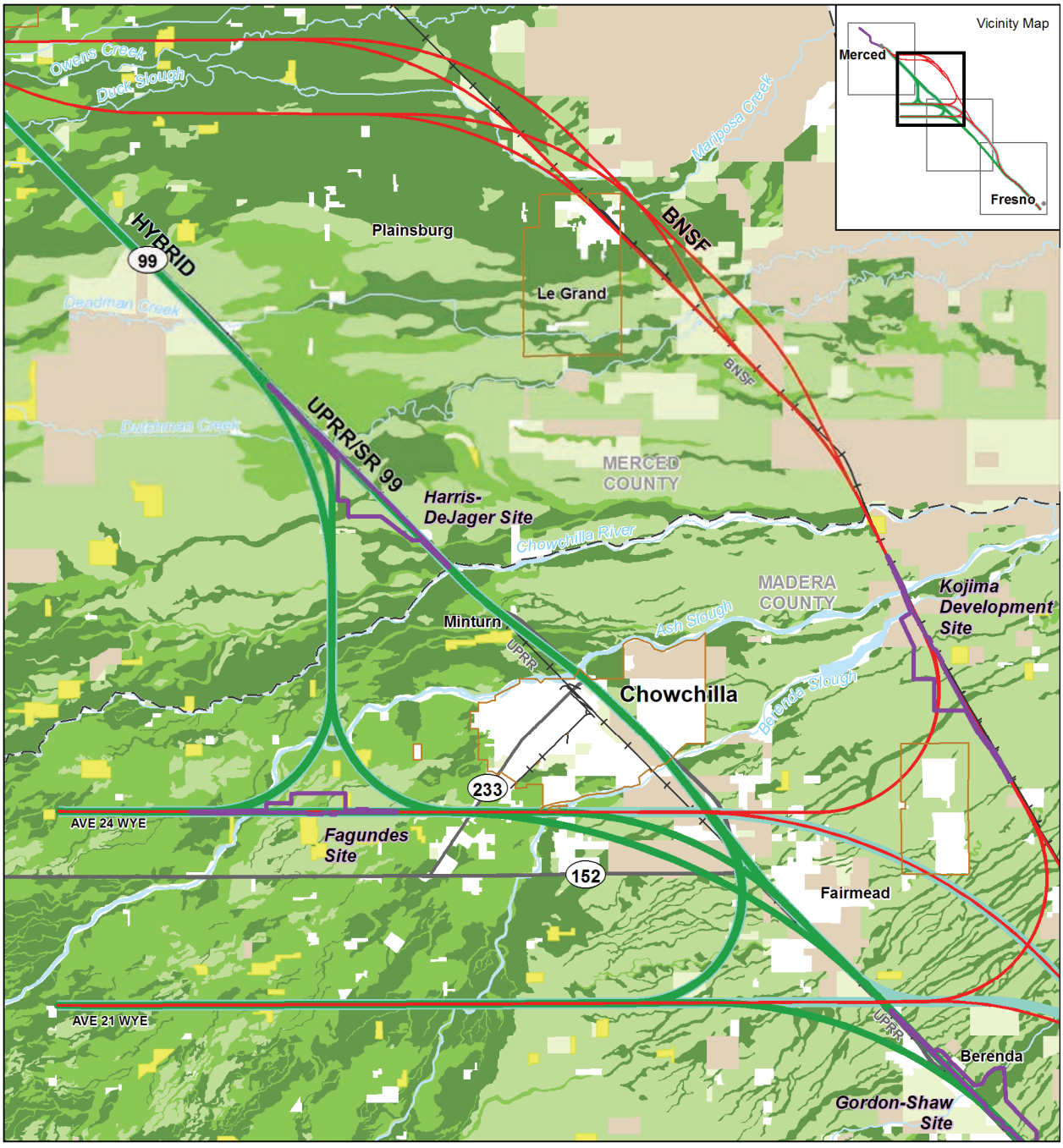


Figure 3.14-2
Important Farmland and Grazing Land in the Chowchilla Project Vicinity

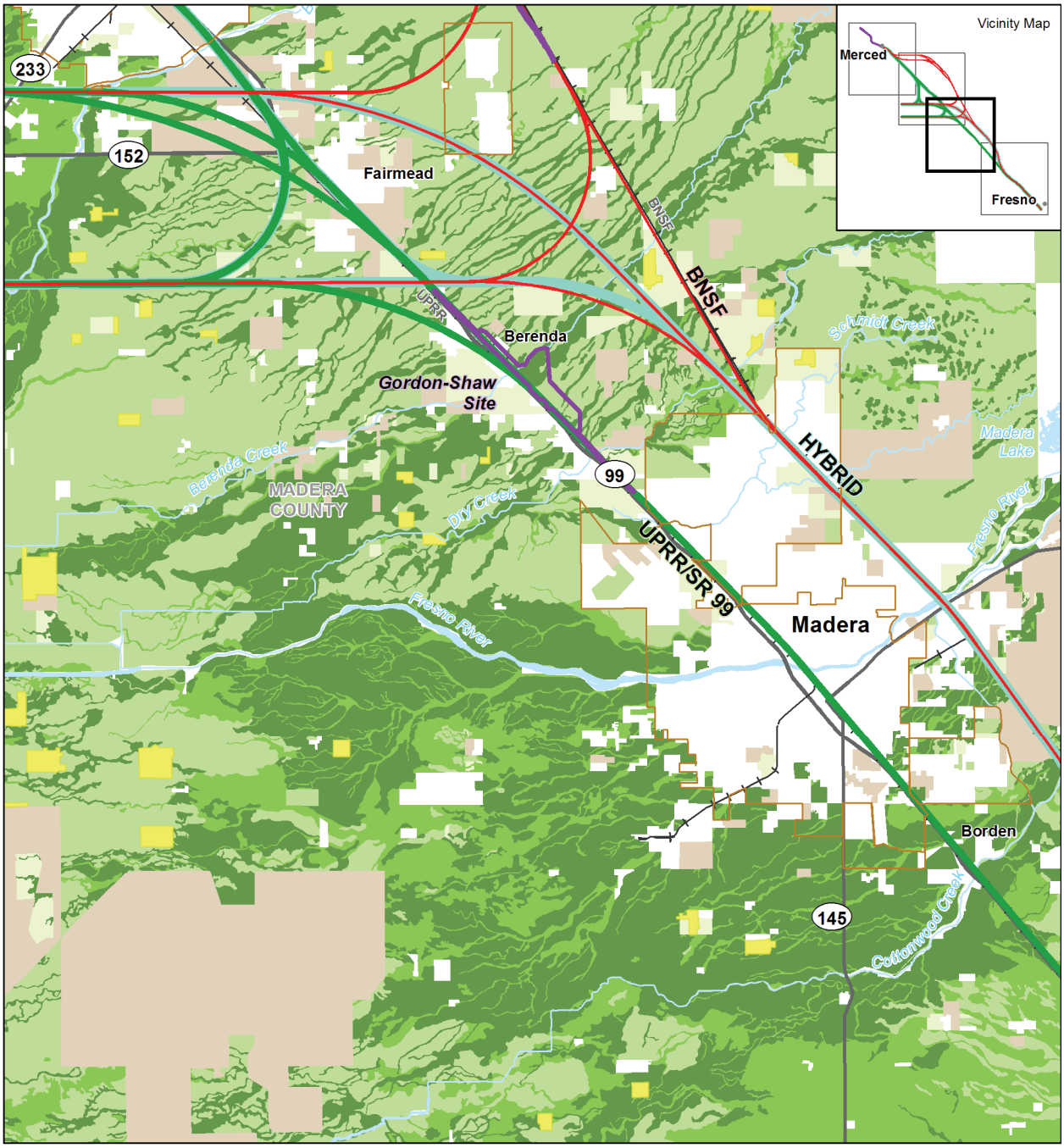


Figure 3.14-3
Important Farmland and Grazing Land in the Madera Project Vicinity

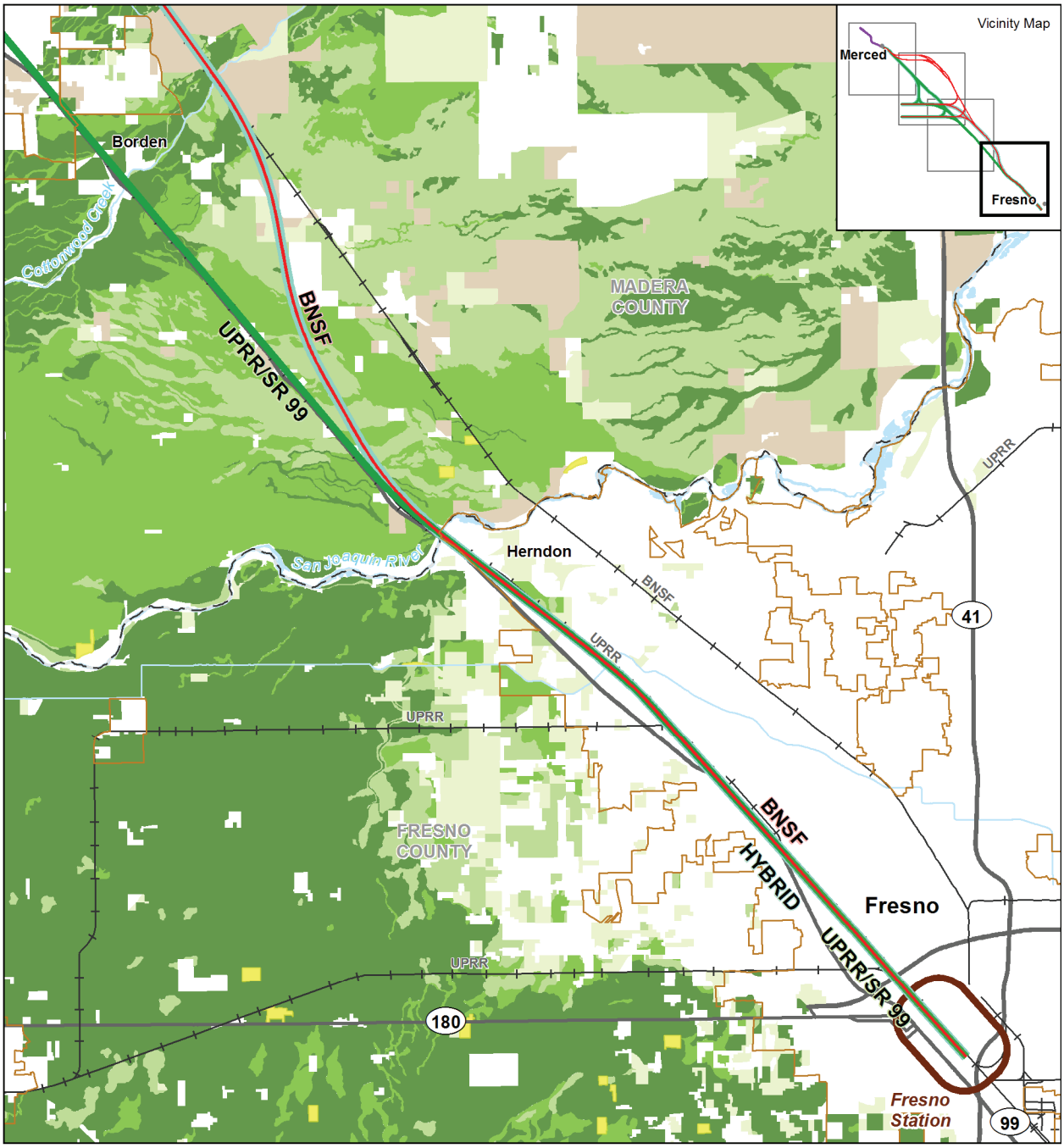
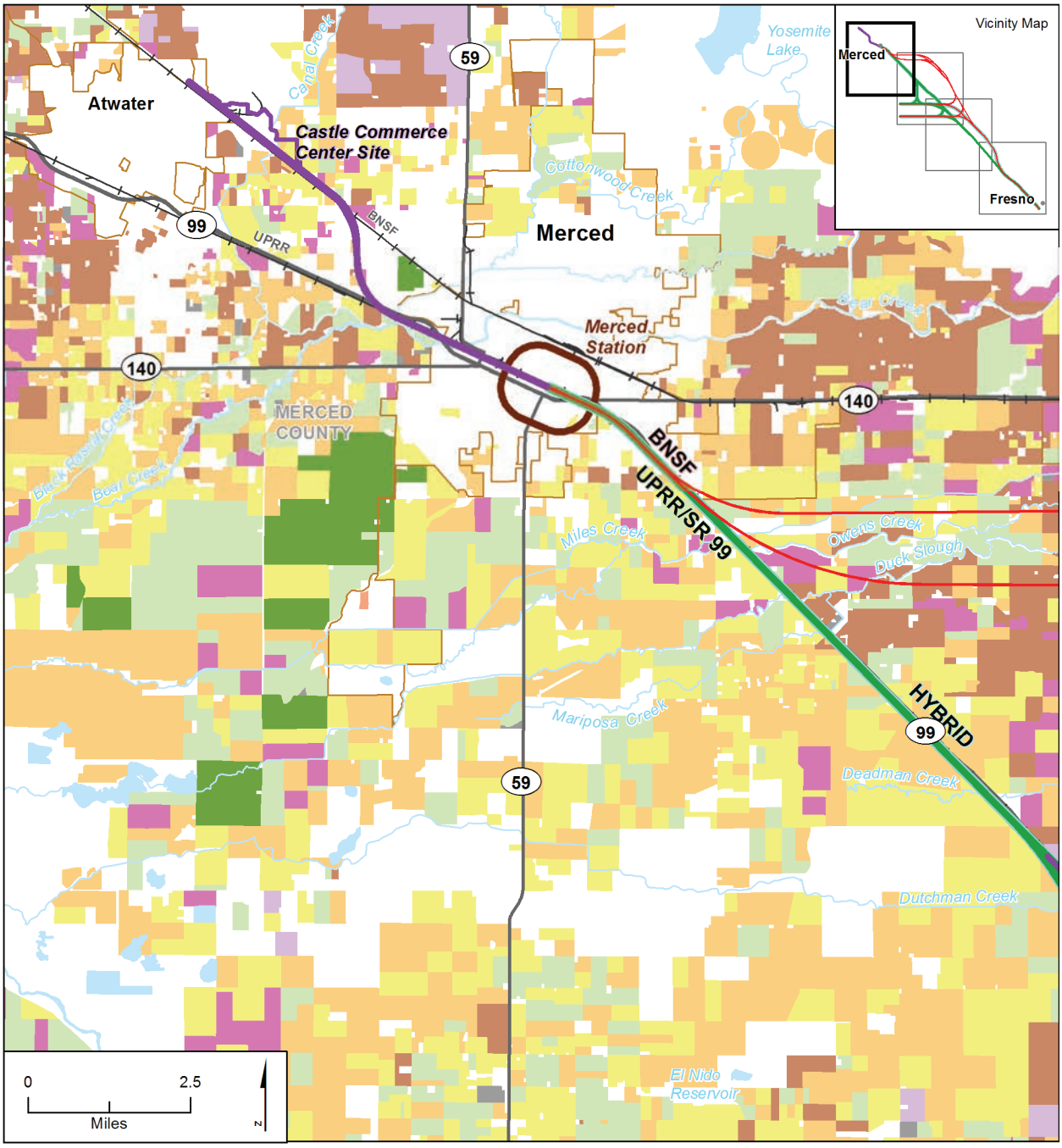


Figure 3.14-4
Important Farmland and Grazing Land in the Fresno Project Vicinity



Source: DWR (2003, 2004ab).

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- UPRR/SR 99 Alternative
- BNSF Alternative
- Hybrid Alternative
- Potential Heavy Maintenance Facility
- Citrus and Subtropical
- Deciduous Fruit and Nut Trees
- Field Crop
- Grain and Hay Crop
- Idle
- Pasture
- Rice
- Truck, Nursery and Berry Crop
- Vineyard

Figure 3.14-5
Distribution of Crop Cover
in the Merced Project Vicinity

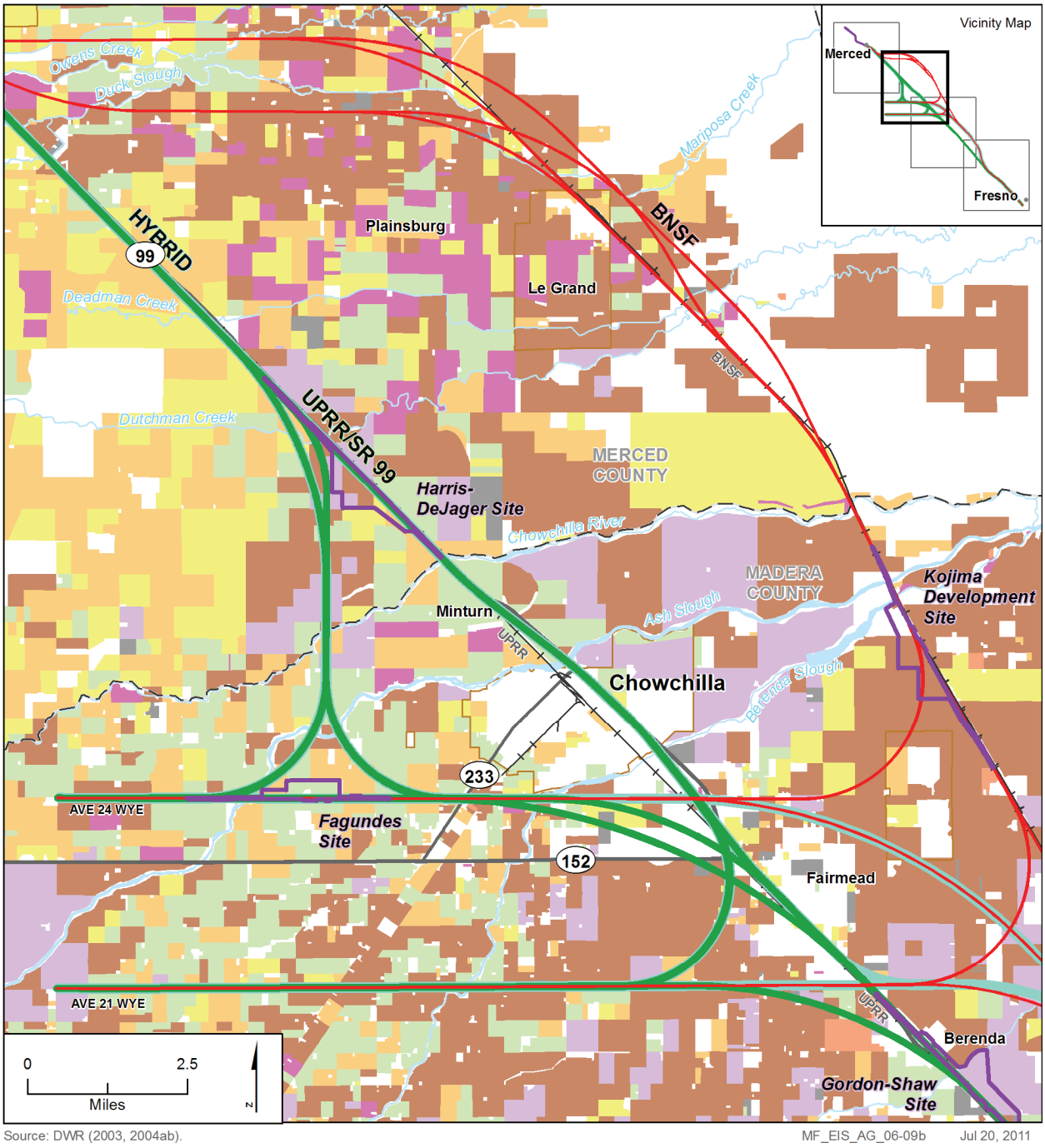
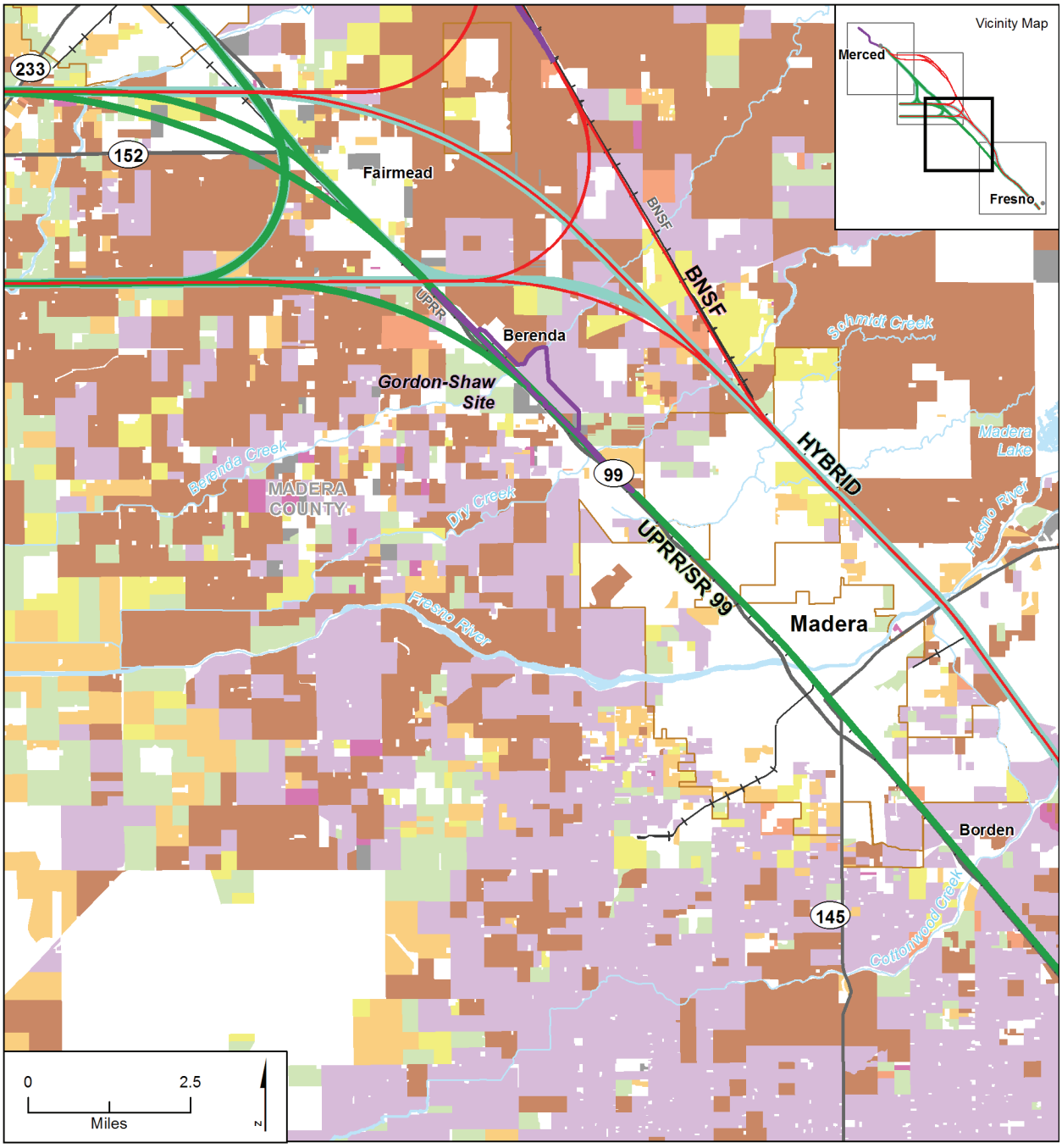


Figure 3.14-6
Distribution of Crop Cover
in the Chowchilla Project Vicinity



Source: DWR (2003, 2004ab).

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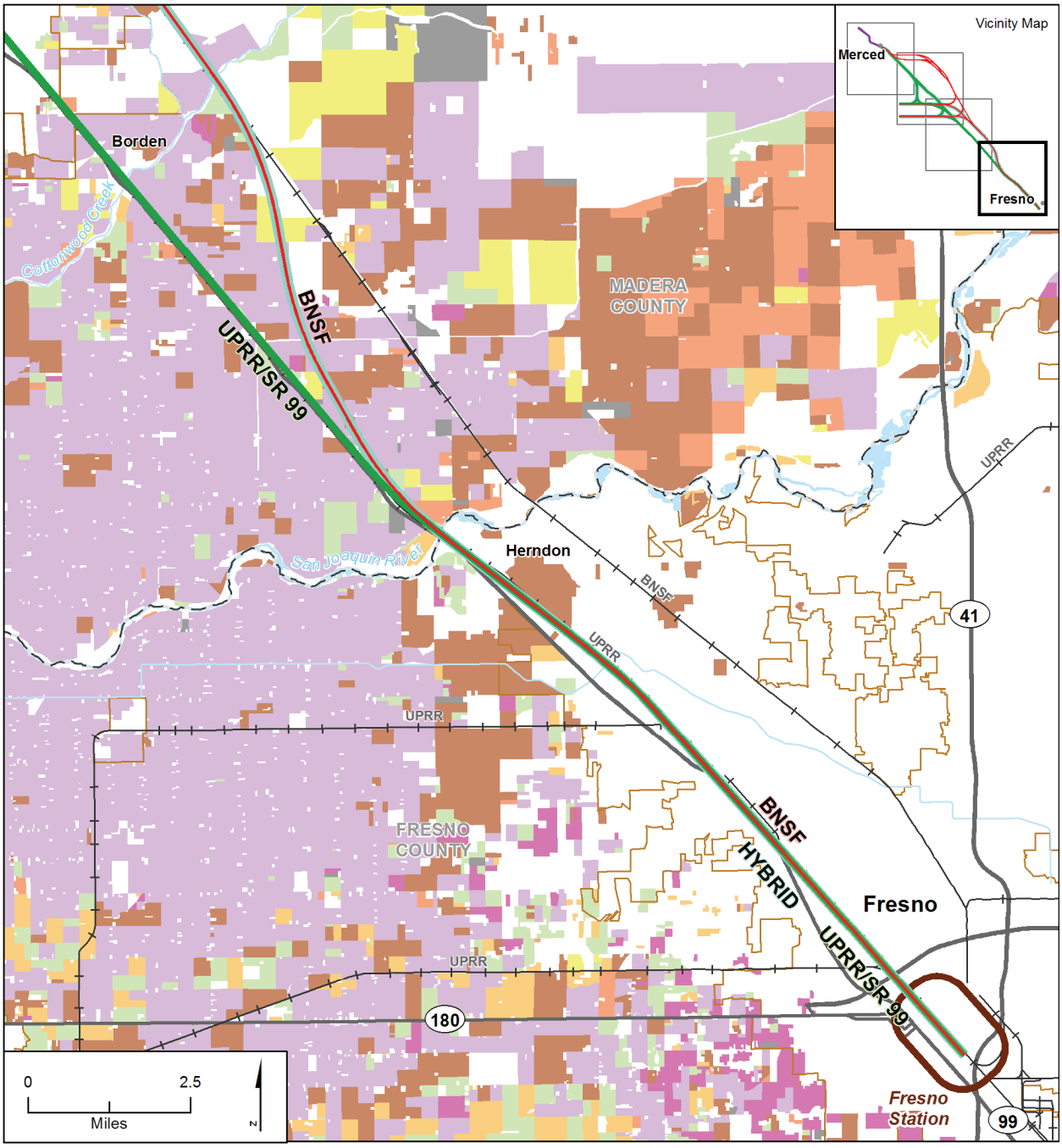
- UPRR/SR 99 Alternative
- BNSF Alternative
- Hybrid Alternative
- Potential Heavy Maintenance Facility
- Citrus and Subtropical
- Deciduous Fruit and Nut Trees
- Field Crop
- Grain and Hay Crop
- Idle
- Pasture
- Rice
- Truck, Nursery and Berry Crop
- Vineyard

Figure 3.14-7
Distribution of Crop Cover
in the Madera Project Vicinity



Source: DWR (2003, 2004ab).

MF_EIS_AG_06-09d Jul 20, 2011

- UPRR/SR 99 Alternative
- BNSF Alternative
- Hybrid Alternative
- Potential Heavy Maintenance Facility
- Citrus and Subtropical
- Deciduous Fruit and Nut Trees
- Field Crop
- Grain and Hay Crop
- Idle
- Pasture
- Rice
- Truck, Nursery and Berry Crop
- Vineyard

Figure 3.14-8
Distribution of Crop Cover
in the Fresno Project Vicinity

Table 3.14-3
Farmland Conversions in Merced, Madera, and Fresno Counties 2000–2008

County and Farmland Category	Net Change in Acreage
Merced County	
Prime Farmland	-16,516
Farmland of Statewide Importance	-7,062
Unique Farmland	7,637
Farmland of Local Importance	20,363
Total Change in Important Farmland (acres)	4,422
Grazing Land	-14,338
Total Change in Agricultural Land (acres)	**-9,916**
Madera County	
Prime Farmland	-4,561
Farmland of Statewide Importance	58
Unique Farmland	383
Farmland of Local Importance	-7,900
Total Change in Important Farmland (acres)	-12,020
Grazing Land	-2,092
Total Change in Agricultural Land (acres)	**-14,112**
Fresno County	
Prime Farmland	-40,876
Farmland of Statewide Importance	-52,550
Unique Farmland	-8,589
Farmland of Local Importance	77,755
Total Change in Important Farmland (acres)	-24,260
Grazing Land	-8,918
Total Change in Agricultural Land	**-33,178**
Source: DOC (2008a).	

Table 3.14-4 presents the acreage of farmland protected under Williamson Act and FSZ contracts in Merced, Madera, and Fresno counties. Merced County does not participate in the FSZ program. Figure 3.14-9 shows the protected farmland in the project vicinity.

Table 3.14-4
Protected Farmland in Merced, Madera, and Fresno Counties

Protected Farmland	Merced County (acres)	Madera County (acres)	Fresno County (acres)
Williamson Act Contract	455,650	476,143	1,465,383
Farmland Security Zone	0[a]	62,798	29,114
Total	**455,650**	**539,941**	**1,494,497**

[a]Merced County does not participate in the FSZ program.

Source: DOC (2010).

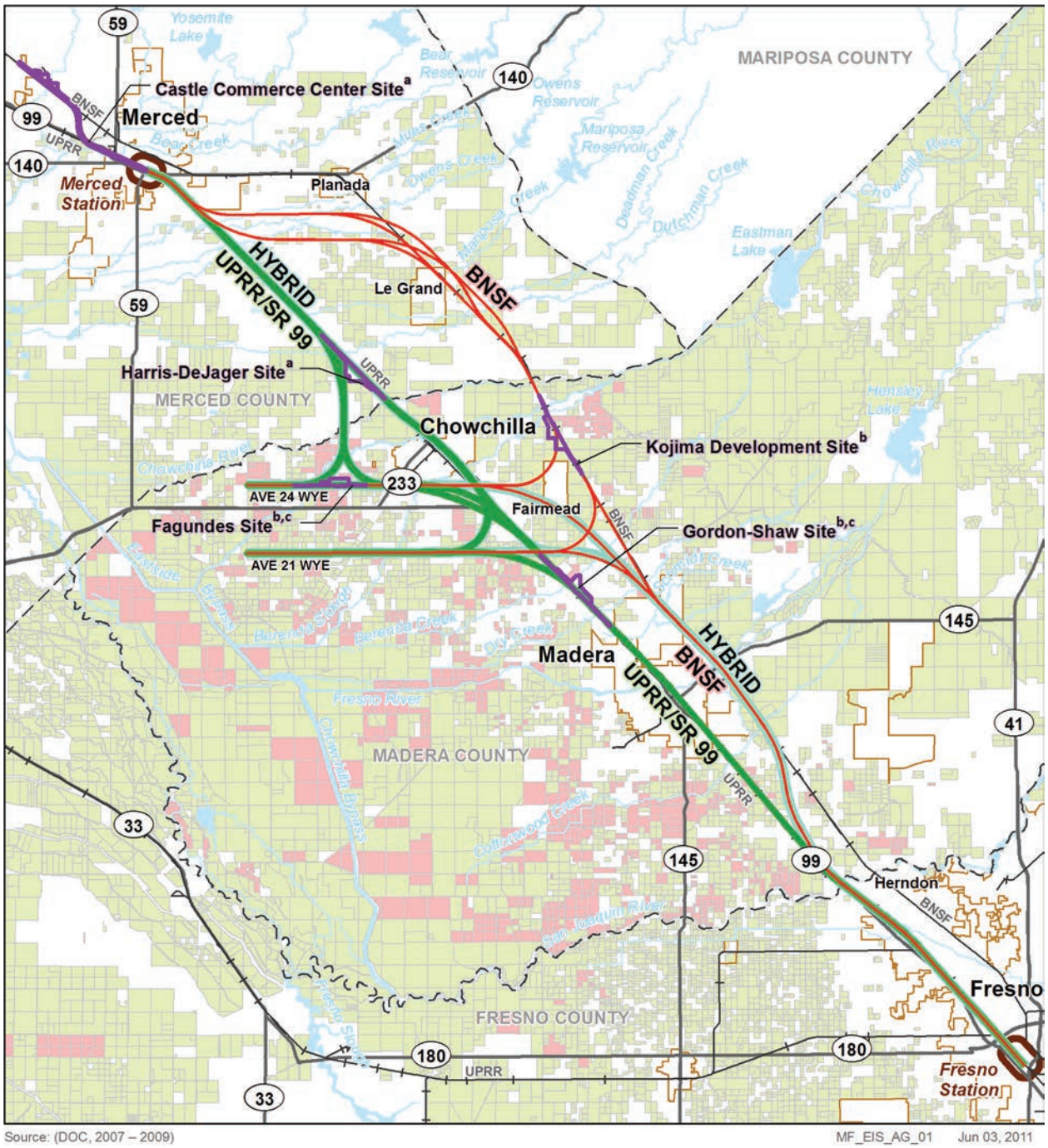
Either the Williamson Act or FSZ contracts in Merced, Madera, and Fresno counties protect Farmland and Grazing Land (refer to Table 3.14-1). A higher proportion of protected land exists in Madera County than in Merced County, and no protected farmland exists in the northern portion of the City of Fresno. Protected farmlands also include lands zoned for agricultural use and lands with agricultural conservation easements. Most of the Important Farmland in the area is zoned for agriculture (refer to Section 3.13, Station Planning, Land Use, and Development), but the project would not affect any agricultural conservation easements.

Figure 3.14-9 illustrates that the protected farmlands are not concentrated along the UPRR/SR 99 transportation corridor in Merced County. In Madera County, protected lands are adjacent to the transportation corridor, except in urbanized areas, with the Ave 24 and 21 wyes nearly surrounded by protected farmlands.

When originally established, farms in the project vicinity were rectangular parcels that followed township and range survey patterns, with many similarly shaped parcels. Over time, construction of railroads, state highways, and local roads divided some farms, creating irregularly shaped parcels.

The majority of farms are family-owned and range from several hundred to several thousand acres. Often, large farm owners only farm a portion of the land themselves; others farm none. Large farm owners hire agricultural management and specialized service firms (e.g., for pesticide application, bee pollination, or harvesting). Farm infrastructure typically includes irrigation and drainage systems, field access roads, storage structures (e.g., silos and barns) power distribution systems, and residences.

Weather conditions, such as temperature and wind, affect crop production. Careful timing and scheduling of agricultural operations help maximize yields. For example, farmers apply chemicals to extend blooms of bee-pollinated trees to increase the pollination potential. Spray rigs apply most pesticides. In accordance with Federal Aviation Regulations 137, Agricultural Aircraft Operations, and the California Code of Regulations, Division 6, Pesticides and Pest Control Operations, aircraft can apply pesticides when the wind speed and direction are favorable and do not disperse chemicals beyond the target area. Aerial applications occur near existing railroad tracks (Gage 2010a) and also can occur at night (Norton 2010). A 100-acre field may take less than 1 hour to spray by aircraft, compared to 1 to 2 days by ground equipment.



[a] The study area for the track between Castle Commerce Center and Merced Station includes land under Williamson Act contracts.
[b] Includes land under Farmland Security Zone contracts.
[c] Includes land under Williamson Act contracts.

Figure 3.14-9
Protected Lands in the Project Vicinity

3.14.4.3 Agricultural Lands along the Proposed HST Alternatives

The following subsections describe the agricultural lands that are associated with the HST Alternatives.

UPRR/SR 99 Alternative

The UPRR/SR 99 Alternative north-south alignment includes Important Farmland, Grazing Land, portions of parcels with Williamson Act and FSZ contracts, and land zoned for agriculture. Important Farmland predominates in this corridor. No dairies exist in this north-south alignment. Agricultural land along the alignments within the City of Fresno is designated as Important Farmland and lies adjacent to urban development areas. No agricultural area within the City of Fresno is under a Williamson Act or FSZ contract, and no Grazing Land exists along the HST alignment within the City of Fresno. No dairies exist in the northern portion of the City of Fresno.

Along the Ave 24 and Ave 21 wyes, agricultural resources include Important Farmland, (primarily Farmland of Statewide Importance) and Grazing Land near Chowchilla and Fairmead. Williamson Act and FSZ contracts protect most of this farmland. Parts of five dairy operations exist within the 200-foot-wide corridor along the Ave 24 Wye, part of one dairy is within the Ave 21 Wye corridor, and parts of two dairies are within the West Chowchilla design option. No agricultural conservation easements are located within the UPRR/SR 99 Alternative alignment.

BNSF Alternative

Important Farmland exists along the north-south alignment of the BNSF Alternative, along with Grazing Lands, portions of parcels with Williamson Act and FSZ contracts, and lands zoned for agriculture. Each design option between Merced and Le Grand (i.e., Mission Ave, Mission Ave East of Le Grand, Mariposa Way, and Mariposa Way East of Le Grand) traverses primarily Prime Farmland west of the BNSF corridor and a mix of Prime Farmland and Grazing Land east and south of Le Grand. More lands protected under Williamson Act contracts occur along the Mariposa Way design option than the Mission Ave design option; however, no land under FSZ contracts occurs along either of these design options. City of Fresno impacts under the BNSF Alternative are the same as those for the UPRR/SR 99 Alternative. One dairy operation lies along the Mission Ave design option; there are no dairies along the Mariposa Way design option.

The western portions of the wyes are the same as under the UPRR/SR 99 Alternative. The areas farther east along the Ave 24 and Ave 21 wyes are primarily Unique Farmland and Grazing Land. Although there are several farmlands protected under Williamson Act and FSZ contracts in this area, fewer farmlands are protected than in the area west of SR 99. Parts of four dairy operations are within the 200-foot corridor along the Ave 24 Wye, and part of one operation is within the Ave 21 Wye corridor. No agricultural conservation easements are located within the BNSF Alternative.

Hybrid Alternative

Along the Hybrid Alternative north-south alignment are Important Farmland, Grazing Land, portions of parcels with Williamson Act and FSZ contracts, and lands zoned for agriculture. No protected farmlands are within the area between Merced and the Chowchilla River. West of Chowchilla there is mostly Prime Farmland. Continuing east, the land is Unique Farmland and Grazing Land. The Ave 24 and Ave 21 wyes include Important Farmland and farmland protected under Williamson Act and FSZ contracts. Parts of five dairies are within the Ave 24 Wye corridor, part of one dairy is within the Ave 21 Wye corridor, and parts of two dairies are along the north-south alignment. No agricultural conservation easements are located within the Hybrid Alternative alignment.

Heavy Maintenance Facility

Figures 3.14-1 through 3.14-9 show the proposed sites for the HMF. None of the sites includes agricultural conservation easements. The Castle Commerce Center HMF site and the access guideway connecting the HMF with the Downtown Merced Station contain Important Farmland and portions of parcels with Williamson Act contracts. FSZ contracts do not protect any of this land. The primary

agricultural use on the site is pasture. Four dairies are adjacent to the site. No dairy properties are located within the 200-foot-wide right-of-way for the access guideway.

Agricultural resources within the proposed Harris-DeJager HMF site include Important Farmland, including portions of parcels with Williamson Act contracts, but no Grazing Land or dairies exist there. The site is primarily orchards, vineyards, and field crops. The proposed site for the Fagundes HMF contains Important Farmland, with portions of the site protected under active Williamson Act and FSZ contracts, but no Grazing Land exists there. The site is primarily cultivated in field crops. A dairy is located along the southern edge of the site and part of another dairy occupies a portion of the eastern end of the site.

Agricultural resources within the proposed Gordon-Shaw HMF site include Important Farmland, some of which is under Williamson Act and FSZ contracts. A small amount of Grazing Land exists. The site is primarily vineyards. The proposed Kojima Development HMF site contains Important Farmland and Grazing Land; the Williamson Act protects most farmland on the site. FSZ contracts do not protect any of this land. The site is primarily orchards. No agricultural conservation easements are located within any of the proposed sites for the HMF.

3.14.5 Environmental Consequences

This section describes the potential effects of the HST alternatives on agricultural lands. Section 3.14.6, Mitigation Measures, summarizes the mitigation measures for agricultural resources.

3.14.5.1 Overview

The No Project Alternative would result in substantial farmland conversion to accommodate anticipated growth in the region that would occur without the proposed project. In comparison, the HST alternatives would convert farmland for construction of the project, but would also provide opportunities for focusing future development on land that is already urbanized. This could reduce the amount of farmland converted to urban uses to accommodate projected future growth.

Table 3.14-5 shows the potential conversion of Important Farmland (by category) for the HST, and Table 3.14-6 lists the total acres of protected farmlands (Williamson Act/FSZ) that would be affected. The UPRR/SR 99 Alternative would affect between 1,037 and 1,158 acres of Important Farmland, the BNSF Alternative would affect 1,411 to 1,481 acres, and the Hybrid Alternative would affect 1,291 to 1,420 acres. The variations in design options and wye connections account for differences among the three alternatives. All three alternatives also would convert Grazing Land and lands zoned for agricultural use.

The BNSF Alternative would require crossing and potentially severing more farmlands than would the other HST alternatives because it traverses large areas that do not parallel transportation corridors. The UPRR/SR 99 Alternative would require nearly as much Important Farmland because more of the adjacent infrastructure would need to be modified. The West Chowchilla design option would reduce the modifications to SR 99 infrastructure, and it represents the lower range of agricultural land conversion under the UPRR/SR 99 Alternative. The Hybrid Alternative would avoid most of the modifications to the SR 99 infrastructure associated with the UPRR/SR 99 Alternative. Although the Hybrid Alternative would not be as long as the BNSF Alternative, it would be longer than the UPRR/SR 99 Alternative. The Harris-DeJager and Gordon-Shaw HMF alternatives would affect the most agricultural land while the Castle Commerce Center alternative would affect the least. None of the HST or HMF alternatives would affect agricultural conservation easements.

Alternatives that do not follow an existing transportation corridor would sever more farmlands than alternatives that closely follow existing transportation corridors. Severance would be greatest at the northern and southern ends of the BNSF Alternative, the southern end of the Hybrid Alternative, all wye transitions, and the UPRR/SR 99 Alternative with the West Chowchilla design option.

Wind effects on bees, including pollination by bees, and adjacent cropland would be negligible and would not affect agricultural productivity. Noise from HST operations would be unlikely to affect confined farm animals.

Table 3.14-5
Important Farmland Potentially Affected by Each HST Alternative

HST Alternative	Important Farmland				
	Prime Farmland (acres)[a]	Farmland of Statewide Importance (acres)[a]	Unique Farmland (acres)[a]	Farmland of Local Importance (acres)[a]	Total (acres)[a]
UPRR/SR 99 Alternative	262 to 314	260 to 424	288 to 449	102 to 134	1,037 to 1,158
BNSF Alternative	317 to 470	247 to 351	555 to 636	127 to 196	1,411 to 1,481
Hybrid Alternative	283 to 299	282 to 467	526	145 to 183	1,291 to 1,420
Heavy Maintenance Facility					
Castle Commerce Center	64	15	0	35	114
Harris-DeJager	47	4	262	0	313
Fagundes	12	58	97	0	168
Gordon-Shaw	149	0	163	1	313
Kojima Development	20	0	226	0	246

[a]Acreage rounded to the nearest whole number.
Source: DOC (2008a).

Table 3.14-6
Protected Farmland Potentially Affected by HST Alternatives

Alternative	Williamson Act Land (acres)[a]	Williamson Act Land Parcels	FSZ Land (acres)[a]	FSZ Land Parcels
UPRR/SR 99 Alternative	130 to 261	46 to 82	61 to 106	19 to 28
BNSF Alternative	396 to 538	117 to 156	28 to 33	21
Hybrid Alternative	275 to 320	83 to 101	33 to 114	17 to 29

[a]Acreage rounded to the nearest whole number.
Source: DOC (2007, 2008c, and 2009).

3.14.5.2 No Project Alternative

As discussed in Chapter 1, Purpose, Need, and Project Objectives, and Section 3.18, Regional Growth, the San Joaquin Valley population continues to grow. To accommodate this growth, conversion of

farmland to other uses such as residential developments and transportation infrastructure continues. Section 3.19, Cumulative Impacts, discusses foreseeable future projects, which include shopping centers, large residential developments, quarries, and expansion of SR 99 between the cities of Merced and Fresno by 2020. The City of Fresno General Plan (City of Fresno 2002) designates the remaining agricultural areas in northern Fresno for industrial and other urban uses. These projects are planned or approved, and future development pursuant to local land use plans would result in conversion of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance.

Under the No Project Alternative, population growth would be commensurate with regional growth forecasts (refer to Section 2.4.1, No Project Alternative). The eight San Joaquin Valley counties that participated in the San Joaquin Valley Blueprint planning process developed a forecast of farmland conversion by 2050 based on current development patterns. Given continuation of these patterns, 327,000 acres of farmland would be converted by 2050.

Using the methods in Section 2.4.1 for converting population growth to land conversion, regional growth forecasts for 2035 indicate that approximately 93,000 acres will be developed in Merced, Madera, and Fresno counties. Because of the extent and quality of farmland in these counties, most of this development is likely to occur on Important Farmland. Pursuant to the San Joaquin Valley Blueprint, land use plans would encourage infill and higher-density development in urban areas and concentration of uses around transit corridors, which would help reduce the conversion of Important Farmland. These higher-density land use scenarios include the HST project as a critical element in meeting land use goals. Under the No Project Alternative, cities would have more difficultly reducing low-density sprawl and encouraging high-density development.

Indirectly, urbanized area encroachment affects agricultural operations by constraining activities such as spraying fertilizers and pesticides or reducing operating hours for farm equipment. Where residential development is adjacent to farms, residents complain of odor and noise from agricultural equipment.

The *Merced County Year 2000 General Plan* (Merced County 1990) and the *Madera County General Plan* (Madera County 1995) include provisions to protect agricultural lands (refer to Table 3.14-1). Most lands under Williamson Act and FSZ contracts are distant from urban boundaries (refer to Figure 3.14-9); therefore, the effects of urban growth on protected farmlands may not be substantial.

3.14.5.3 High-Speed Train Alternatives

This section evaluates direct and indirect impacts that would result from each HST alternative. Construction impacts, such as construction staging, are temporary and cease when construction is completed. Project impacts, such as conversion of agricultural lands for the HST guideway and associated facilities, are permanent because these lands would remain in nonagricultural use. For a discussion of property acquisition, including the Uniform Relocation Assistance and Real Properties Acquisition Policy Act and the California Relocation Assistance Act, refer to Section 3.12, Socioeconomics, Communities, and Environmental Justice. The project would compensate property owners and tenants in accordance with statutory requirements, which apply to all real property including the acquisition of farmland for conversion to other uses or because of severance.

Construction Period Impacts

Project implementation would include purchasing rights-of-way, constructing the project, and testing the HSTs. Heavy construction (e.g., grading, excavation, constructing the HST railbed, and laying the guideway) would occur within a shorter period. Chapter 2, Alternatives, describes the expected construction schedule.

Common Agricultural Land Impacts

The construction of any of the three HST alternatives would result in temporary use of agricultural lands outside the permanent right-of-way and would result in disruption of some utilities and infrastructure and

temporary disturbance of dairies. The following sections discuss the potential effects under each HST alternative.

Temporary Use of Agricultural Land

Some agricultural land outside of the permanent right-of-way would be used for construction activities, such as staging and material laydown areas (refer to Table 3.14-7). This land would be leased from the landowner and used for approximately 1 to 3 years during construction. After construction, the land would be restored and returned to the owner. These impacts are negligible under NEPA and less than significant under CEQA because the land would be used temporarily and restored; the land would not be permanently converted to a nonagricultural use.

Table 3.14-7
Important Farmland Temporarily Used for Project Construction

HST Alternative	Important Farmland				
	Prime Farmland (acres)	Farmland of Statewide Importance (acres)	Unique Farmland (acres)	Farmland of Local Importance (acres)	Total (acres)
UPRR/SR 99 Alternative	38.39 to 62.96	48.30 to 76.13	60.36 to 74.96	28.35 to 31.98	194.20 to 246.03
BNSF Alternative	23.51 to 46.43	16.83 to 42.00	67.20 to 115.73	27.36 to 54.04	145.59 to 248.75
Hybrid Alternative	35.00 to 53.02	36.99 to 64.70	68.50 to 80.91	35.23 to 38.01	208.94 to 326.49
Heavy Maintenance Facility					
Castle Commerce Center	9.18	0.77	0.10	6.81	51.44
Harris-DeJager	0.00	0.00	0.00	0.00	0.00
Fagundes	0.06	0.18	2.77	0.00	3.01
Gordon-Shaw	0.27	0.00	0.27	0.00	0.54
Kojima Development	0.65	0.00	5.97	0.00	6.62

Source: DOC (2008a).

Temporary Utility and Infrastructure Interruption

Construction of the alignment alternatives and related improvements (e.g., road realignments) would affect productive farmland. Each farm maintains a system of onsite utilities needed for operations, such as irrigation systems (e.g., ditches, drains, pipelines, and wells), access roads, and power supplies disrupted by the project during construction. Utility disruptions could jeopardize farm productivity and place some farmland at risk for conversion to nonagricultural use.

Section 3.12, Socioeconomics, Communities, and Environmental Justice, describes the expected process for right-of-way acquisition. As part of this process, Authority right-of-way agents would work with each affected property owner to address issues of concern. The required property appraisal would identify affected utilities, and the agents would attempt to resolve conflicts. For example, the acquisition agreements could require that the contractor relocate the affected utilities prior to construction, maintain service during construction, or time disruptions to avoid active periods (e.g., during the winter idle period

for annual crops). In some cases, the agents may not be able to resolve the conflict. When construction activities cannot avoid a utility, the agent would negotiate a fair compensation for the temporary loss of production. Because utility disruptions would likely be resolved during the right-of-way acquisition process, it is unlikely that it would result in the conversion of farmland to nonagricultural use; therefore, the impact would be negligible under NEPA, and less than significant under CEQA.

For additional information on large regional utilities, see Section 3.6, Public Utilities and Energy. The analysis of project impacts below addresses potential hardships associated with severing parcels (i.e., not just disrupting utilities during construction).

Temporary Noise and Vibration Effects on Farm Animals

Construction of the project would generate noise and vibration from construction equipment and vehicles (e.g., clearing, grading, track installation). Noise levels from project construction are estimated to be 89 dBA L_{eq} at 50 feet for an 8-hour workday (refer to Section 3.4, Noise and Vibration). Some construction activities (e.g., clearing and grading) would occur to the edge of the alignment. Noise generated during construction could temporarily disturb livestock (such as dairy cows) near the HST alignment.

As described below under project impacts, FRA (2005) has developed noise criteria for impacts of high-speed trains on farm animals. However, there are no construction-specific guidelines with regard to livestock. The general threshold for construction noise impacts on commercial land uses (such as dairies) is 85 dBA 8-hour L_{eq} (day or night). At a distance of 100 feet from the alignment, the 8-hour L_{eq} for project construction at the dairies would be 83 dBA. As described below under project impacts, no livestock areas would be located within 100 feet of the HST tracks, either because the dairies would be acquired or because livestock holding areas would be located more than 100 feet away from the tracks. In most cases, livestock holding areas also would be located more than 100 feet from the edge of the alignment, where construction activities could occur. For these facilities, there would be no impact under NEPA and CEQA from project construction noise effects on these facilities. Three dairies along the Ave 24 Wye have livestock holding areas within 100 feet of the edge of the alignment, and therefore livestock could experience noise levels in excess of 85 dBA 8-hour L_{eq}. In all three cases, however, aerial photo interpretation shows that livestock within these holding areas would be able to move at least 100 feet away from the alignment if necessary. For these three facilities, construction noise impacts would be negligible under NEPA and less than significant under CEQA.

There are no criteria established for vibration effects on domestic animals; however, the FRA has established a 75-VdB criterion for ground-borne vibration impacts to institutional land uses (Category 3). Institutional land uses include schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for vibration to cause activity interference. This level of sensitivity to vibration is judged to be appropriate for animal husbandry operations. Project construction would generate vibration levels of 75 VdB at up to 70 feet from the construction site (refer to Section 3.4, Noise and Vibration). For the same reasons as discussed above for construction noise effects, impacts would be negligible under NEPA and less than significant under CEQA for three dairies along the Ave 21 Wye, and there would be no impacts under NEPA and CEQA for all other dairies.

UPRR/SR 99 Alternative

Potential noise and vibration effects exist at three dairies along the Ave 24 Wye, but the impact would be negligible under NEPA and less than significant under CEQA for the reasons discussed above. There would be no impact under NEPA and CEQA for all other dairies.

BNSF Alternative

Potential noise and vibration effects exist three dairies along the Ave 24 Wye, but the impact would be negligible under NEPA and less than significant under CEQA for the reasons discussed above. There would be no impact under NEPA and CEQA for all other dairies.

Hybrid Alternative

Potential noise and vibration effects exist at three dairies along the Ave 24 Wye, but the impact would be negligible under NEPA and less than significant under CEQA for the reasons discussed above. There would be no impact under NEPA and CEQA for all other dairies.

Project Impacts

Common Agricultural Land Impacts

All of the HST alternatives would result in permanent conversion of agricultural land to nonagricultural use (including potential conversion from parcel severance), permanent access severance, conflicts with farmland protection contracts (e.g., Williamson Act), and indirect effects on dairies. None of the HST alternatives would cause adverse wind effects on adjacent agricultural lands nor would they interfere with aerial spraying of the crops.

Permanent Conversion of Agricultural Land to Nonagricultural Use

The project involves construction of the HST guideway and associated structures and facilities (e.g., paralleling stations and HMF access guideway) through areas with Important Farmland, permanently displace agricultural uses on these lands. In addition, the HST alternatives would sever large agricultural properties, especially where the alternatives are not directly alongside existing transportation facilities. In many cases, severing the parcels would create two farmable parcels, and the only loss of Important Farmland would be caused by the HST facilities. In some cases, severing the parcels would create small remainder parcels. Depending on several factors such as adjacency to neighboring farms, access, and utilities (e.g., irrigation and power systems), these small remainder parcels might be farmable. For example, the parcels might be farmable if neighboring farms acquire them or the utilities are reconfigured. Where this is not possible, however, it is unlikely that farming would continue. In cases where farming is unlikely to continue, these small remainder parcels are identified in this section as a farmland conversion. For this document, analysts reviewed each affected parcel by alternative and associated design option, considered usable and unusable remainders, and made preliminary recommendations for full or partial property acquisitions. The farmland conversion reported in the Project EIR/EIS reflects a 15% design level.

Conversion of agricultural lands would occur along each of the HST alternative alignments. Table 3.14-5 summarizes the impacts (acres converted), and Tables 3.14-8 through 3.14-11 present more details (by alternative and HMF). The following discussion of alternatives presents the results of the NRCS-CPA-106 farmland conversion evaluation.

The project also would affect Grazing Land, as described in detail under each HST alternative below. Grazing Land is not Important Farmland; therefore, impacts on Grazing Land would be negligible under NEPA and less than significant under CEQA.

As discussed in Chapter 1, Project Purpose, Need, and Objectives, and in Section 3.18, Regional Growth, the HST System would ease the pressure on the state's agricultural land base by reducing the need for expanding airports and freeways. By offering a new transportation option, it provides an opportunity to create transit centers in the central business districts, where mixed land uses (residential, commercial, and business uses) and urban densities are best suited. If the communities zone to take advantage of this increase in land values, the growth can be redirected to limit low density development, which has been consuming large amounts of land area. There is an opportunity to encourage walkable, more concentrated development patterns to meet new growth demands and reduce the rate and occurrence of low density, which erodes the valuable land resources. Providing opportunities for focusing future development on land that is already in nonagricultural uses would reduce the amount of farmland converted to uses other than agriculture. Consistent with the preferred B+ (Blueprint) Scenario, which incorporates the HST system, farmland conversion would be reduced from 327,000 acres (the business-as-usual, or "A" Scenario) to 209,000 acres, a reduction of 118,000 acres. The project's expected contribution to this reduction would be a potential beneficial effect under each HST alternative.

UPRR/SR 99 Alternative

Table 3.14-8 presents estimates of the permanent conversion of Important Farmland under the UPRR/SR 99 Alternative. This would be a substantial impact under NEPA and a significant impact under CEQA. The conversions are ranges that reflect the various design options. NRCS-CPA-106 forms show farmland conversion scores in excess of 160 for Madera County and less than 160 for Merced and Fresno counties. The UPRR/SR 99 Alternative also would affect Grazing Land, ranging from 66 acres with the West Chowchilla design option to 131 acres with the East Chowchilla design option (Ave 24 Wye).

Table 3.14-8
Farmland Types Potentially Affected by the UPRR/SR 99 Alternative

UPRR/SR 99 Alternative	Important Farmland				
	Prime Farmland (acres)[a]	Farmland of Statewide Importance (acres)[a]	Unique Farmland (acres)[a]	Farmland of Local Importance (acres)[a]	Total (acres)[a]
Impact of Components Combined					
UPRR/SR 99 Alternative North-South Alignment, West Chowchilla design option, with Ave 24 Wye	262	424	329	102	1,116
UPRR/SR 99 Alternative North-South Alignment, East Chowchilla design option, with Ave 24 Wye	286	359	288	103	1,037
UPRR/SR 99 Alternative, East Chowchilla design option, Ave 21 Wye	314	260	449	134	1,158
Total UPRR/SR 99 Alternative	**262 to 314**	**260 to 424**	**288 to 449**	**102 to 134**	**1,037 to 1,158**

[a]Acreage rounded to the nearest whole number.

Source: DOC (2008a).

BNSF Alternative

Table 3.14-9 presents estimates of the permanent conversion of Important Farmland that would result from the BNSF Alternative, including the potential effects of severing parcels into fragments. This would be a substantial impact under NEPA and a significant impact under CEQA. NRCS-CPA-106 forms show farmland conversion scores in excess of 160 for Merced and Madera counties and less than 160 for Fresno County. The BNSF Alternative also would affect between 139 acres and 185 acres of Grazing Land, differentiated primarily by the wye options (the Ave 24 Wye would have the greatest impact).

Table 3.14-9
Farmland Types Potentially Affected by the BNSF Alternative

BNSF Alternative	Important Farmland				
	Prime Farmland (acres)[a]	Farmland of Statewide Importance (acres)[a]	Unique Farmland (acres)[a]	Farmland of Local Importance (acres)[a]	Total (acres)[a]
Impacts of North-South Alignments with Wye Options[b]					
BNSF Alternative North-South Alignment with Ave 24 Wye	168	280	586	109	1,143
BNSF Alternative North-South Alignment with Ave 21 Wye	253	225	521	120	1,118
Le Grand Design Options					
Mission Ave	149	71	42	76	338
Mission Ave East of Le Grand	194	64	47	18	324
Mariposa Way	177	31	34	51	293
Mariposa Way East of Le Grand	217	22	50	27	317
Impact of Components Combined					
Total BNSF Alternative	**317 to 470**	**247 to 351**	**555 to 636**	**127 to 196**	**1,411 to 1,481**

[a]Acreage rounded to the nearest whole number.

Source: DOC (2008a).

Hybrid Alternative

Table 3.14-10 presents estimates of the permanent conversion of Important Farmland under the Hybrid Alternative. This would be a substantial impact under NEPA and a significant impact under CEQA. NRCS-CPA-106 forms show farmland conversion scores in excess of 160 for Merced and Madera counties and less than 160 for Fresno County. The Hybrid Alternative also would affect between 80 acres 119 acres of Grazing Land.

Table 3.14-10
Farmland Types Potentially Affected by the Hybrid Alternative

HST Alternative (acres[a])	Important Farmland				
	Prime Farmland (acres)[a]	Farmland of Statewide Importance (acres)[a]	Unique Farmland (acres)[a]	Farmland of Local Importance (acres)[a]	Total (acres)[a]
Hybrid Alternative North-South Alignment with Ave 24 Wye	283	467	526	145	1,420
Hybrid Alternative North-South Alignment with Ave 21 Wye	299	282	526	183	1,291
Total Hybrid Alternative	**283 to 299**	**282 to 467**	**526**	**145 to 183**	**1,291 to 1,420**

[a]Acreage rounded to the nearest whole number.

Source: DOC (2008a).

Heavy Maintenance Facility

Table 3.14-11 presents estimates of the permanent conversion of Important Farmland for each proposed HMF. This would be a substantial impact under NEPA and a significant impact under CEQA. The Castle Commerce Center and Harris-DeJager HMF sites are in Merced County, and all other HMF sites are within Madera County. Most of the Castle Commerce Center HMF site is located on the former Castle Air Force Base, which does not have agricultural land. However, the southern portion of the Castle Commerce Center HMF site and the access guideway between the Merced HST station and the HMF site would convert agricultural land to a nonagricultural use. Both the Castle Commerce Center and Harris-DeJager HMF sites would convert Important Farmland in addition to the conversions associated with the HST alternative alignments. All of the alternatives would result in a substantial adverse effect in Merced County, and an HMF in Merced County would increase this effect. The conversion of Important Farmland for any HMF site in Madera County would be in addition to the conversion associated with the HST alternative alignments. All of the HST alternatives would result in a substantial adverse effect in Madera County, and an HMF in Madera County would increase this effect. The Kojima Development HMF site would affect 84 acres of Grazing Land. An HMF at the Gordon-Shaw site would affect 1 acre of Grazing Land; an HMF at the other remaining sites would not affect any Grazing Land. Farmland conversion scores are greater than 160 for each of the HMF sites except the Castle Commerce Center site.

Table 3.14-11
Farmland Types Potentially Affected by the HMF Alternatives

HST Alternative	Important Farmland				
	Prime Farmland (acres)[a]	Farmland of Statewide Importance (acres)[a]	Unique Farmland (acres)[a]	Farmland of Local Importance (acres)[a]	Total (acres)[a]
Castle Commerce Center	64	15	0	35	114
Harris-DeJager	47	4	262	0	313
Fagundes	12	58	97	0	168
Gordon-Shaw	149	0	163	1	313
Kojima Development	20	0	226	0	246

[a]Acreage rounded to the nearest whole number.
Source: DOC (2008a).

Parcel Severance

As previously discussed, the HST alternative alignments would convert farmland to a nonagricultural use. The alignments follow existing transportation corridors (i.e., SR 99, UPRR, and BNSF) as much as possible, but in some cases, the alignments deviate from those corridors and bisect agricultural parcels. The reasons for these deviations include crossing from the north-south alignments to the Ave 21 or Ave 24 Wye, and accessing the BNSF alignment from the UPRR/SR 99 alignment (both HST stations are on the UPRR/SR 99 alignment). Diagonal alignments would bisect parcels, potentially creating remainder parcels that are too small to maintain economic activity. The analysis of impacts on Important Farmland already assumes that the Authority would acquire the smallest property remainders. Because the farmland conversion analysis includes these non-economic remnants, they are not discussed further. This analysis assumes that other remainder parcels are of sufficient size to maintain economic activity and are not at risk for conversion.

Although larger remainder parcels would not be at risk based on size alone, diagonal alignments could cause hardships in maintaining economic activity on otherwise viable parcels. For example, a remainder parcel may become isolated from the farm activity center, requiring farm workers (and farm equipment) to take long detours on public roads. The project design reduces these hardships by providing alignment crossings on public roads. As described in Chapter 2, Alternatives (refer to Figures 2-29 through 2-32 for the UPRR/SR 99 Alternative), grade-separated crossings (usually overpasses) would occur at intervals of approximately 1 to 2 miles. The right-of-way acquisition process provides additional opportunities to reduce hardships caused by access severance. As part of this process, the Authority's right-of-way agents would work with each affected property owner to address issues of concern. Agents would attempt to resolve conflicts, for example by arranging additional property transfers to consolidate ownership. For large properties, agents may be able to arrange for additional grade-separated crossings (e.g., underpasses or small overpasses). The agents may not be able to resolve all issues, and may offer compensation to landowners that demonstrate a hardship from parcel severance. Because these issues would likely be resolved during the right-of-way acquisition process, it is unlikely that parcel severance would result in the additional conversion of farmland to nonagricultural use; therefore, this would be a negligible impact under NEPA and a less than significant impact under CEQA. For additional information on the right-of-way process, see Section 3.12, Socioeconomics, Communities, and Environmental Justice.

UPRR/SR 99 Alternative

Parcel severance and related impacts would be highest in the curves of the wye. The alignment in these areas potentially would sever approximately 52 large farm parcels along the Ave 24 Wye (East Chowchilla design option), 34 large farm parcels along the Ave 24 Wye (West Chowchilla design option), and

32 large farm parcels along the Ave 21 Wye. The UPRR/SR 99 Alternative would permanently close 20 to 29 roads, mostly along the wyes. Large farm equipment that is not street-legal might not be able to use the detours, overpasses, or underpasses along public roadways. This would be a negligible impact under NEPA and a less than significant impact under CEQA.

BNSF Alternative

Generally, where the BNSF Alternative includes a curved guideway there is a greater potential for parcel severance and related impacts. The Mission Ave and Mariposa Way design options, which generally are straight portions of HST, would result in parcel severance because these design options are not adjacent to roadways. The Mission Ave design option is 1,200 feet away from Mission Avenue, and the Mariposa Way design option is 1,100 feet away from Mariposa Way. The BNSF Alternative would cause less roadway disruption at the intersections, but might sever 80 to 120 large farm parcels with the two Mission Ave design options and between 90 and 124 large farm parcels with the two Mariposa Way design options. The design options east of the Community of Le Grand would result in more parcel severances than the design options adjacent to the BNSF railway through Le Grand. South of Le Grand, the north-south alignment of the BNSF Alternative would result in few parcel severances until it veers from the BNSF to parallel the UPRR.

The BNSF Alternative would result in permanently closing 27 to 42 roadways, mostly along the wyes, the Mission Ave and Mariposa Way design options, and in the area where the BNSF Alternative reconnects with the UPRR, south of Madera Acres. Large farm equipment that is not street-legal might not be able to use the detours, overpasses, or underpasses on public roadways. This would be a negligible impact under NEPA and a less than significant impact under CEQA.

Hybrid Alternative

The Hybrid Alternative north-south alignment would result in the same number of parcel severances as the UPRR/SR 99 and BNSF alternatives. Generally, the Hybrid Alternative includes long portions of the north-south alignment that do not follow existing major transportation corridors and would sever utilities and infrastructure serving the farmlands. The north-south alignment of the Hybrid Alternative would likely sever approximately 80 large farm parcels in areas that are not adjacent to existing transportation corridors.

The Hybrid Alternative would result in permanently closing 30 to 37 roadways west of Chowchilla, the connection to the BNSF corridor, and the right-of-way returning to the UPRR, north of the San Joaquin River. Large farm equipment that is not street-legal might not be able to use the detours, overpasses, or underpasses on public roadways. This would be a negligible impact under NEPA and a less than significant impact under CEQA.

Heavy Maintenance Facility

The Castle Commerce Center HMF access guideway would sever up to four large farm parcels. The only HMF that would result in closing roadways is the Castle Commerce Center HMF. Two roadway closures would occur along the access guideway north of the Downtown Merced Station. This would be a negligible impact under NEPA and a less than significant impact under CEQA.

Effects on Land under Williamson Act or FSZ Contracts, Local Zoning, or Conservation Easement Lands

Parcels required for the project that are under Williamson Act or FSZ contracts would be subject to property acquisition in accordance with the applicable provisions of these programs. Williamson Act and FSZ contracts provide tax incentives for parcels to remain in agricultural production. Partial acquisitions of Williamson Act or FSZ properties might result in remaining portions of the parcels staying under contract if minimum acreage requirements established by the local jurisdiction are met. These requirements vary by county, parcel size, and land quality. However, a partial acquisition of land protected by Williamson Act or FSZ contracts could constrain the potential continued use of that land for farming. This is because (1) the remaining land acreage might be too small to meet the minimum requirements under these programs and (2) the resulting increase in property taxes on the land might affect the financial feasibility

of continued farming. Although it would be possible to combine adjacent farmlands, this approach might not be feasible because of variations in topography and soil between adjacent farms. As previously discussed, farmland conversion would be a significant impact for each of the HST alternatives. The potential for the project to cause removal of land from Williamson Act or FSZ contracts is not expected to result in additional farmland conversion beyond that previously identified. There would be no impact under NEPA or CEQA.

Agricultural conservation easements provide permanent protection for high-quality farmland. Available information indicates that none of the HST alternatives would affect land protected under agricultural conservation easements. There would be no impact under NEPA or CEQA associated with the potential for additional agricultural land conversion due to impacts on land protected by an agricultural conservation easement. Moreover, the analysis of farmland conversion is based on physical characteristics (e.g., soil type), and the level of conversion discussed above would not change even if it is determined that agricultural conservation easements exist.

Local zoning codes and general plan policies also protect most of the Important Farmlands discussed above for agricultural use. Section 3.13, Station Planning, Land Use, and Development, addresses the project's consistency with local zoning and general plan policies, including those for protection and preservation of agricultural land.

UPRR/SR 99 Alternative

Table 3.14-12 summarizes potentially affected Williamson Act and FSZ lands under the UPRR/SR 99 Alternative. Parcels in nonrenewal status (i.e., the landowners are not continuing their Williamson Act or FSZ contracts) are not counted. There would be no impact under NEPA or CEQA.

Table 3.14-12
Protected Farmland Potentially Affected under the UPRR/SR 99 Alternative

Alternative	Williamson Act Land (acres)[a]	Number of Williamson Act Parcels	FSZ Land (acres)[a]	Number of FSZ Parcels
Impact of Components Combined				
UPRR/SR 99 Alternative North-South Alignment, West Chowchilla design option, with Ave 24 Wye	171	59	106	28
UPRR/SR 99 Alternative North-South Alignment, East Chowchilla design option, with Ave 24 Wye	130	46	65	19
UPRR/SR 99 Alternative, East Chowchilla design option, with Ave 21 Wye	261	82	61	27
Total UPRR/SR 99 Alternative	**130 to 261**	**46 to 82**	**61 to 106**	**19 to 28**

[a]Acreage rounded to the nearest whole number.

Source: DOC (2007, 2008c, and 2009).

BNSF Alternative

Table 3.14-13 summarizes potentially affected Williamson Act and FSZ lands under the BNSF Alternative. Parcels in nonrenewal status are not counted. There would be no impact under NEPA or CEQA.

Table 3.14-13
Protected Farmland Potentially Affected by the BNSF Alternative

Alternative	Williamson Act Land (acres)[a]	Number of Williamson Act Parcels	FSZ Land (acres)[a]	Number of FSZ Parcels
Impacts of North-South Alignment with Wye Options				
BNSF Alternative North-South Alignment with Ave 24 Wye	369	98	33	21
BNSF Alternative North-South Alignment with Ave 21 Wye	411	114	28	21
Le Grand Design Options				
Mission Ave	27	19	0	0
Mission Ave East of Le Grand	52	29	0	0
Mariposa Way	59	29	0	0
Mariposa Way East of Le Grand	127	42	0	0
Impact of Components Combined				
Total BNSF Alternative	396 to 538	117 to 156	28 to 33	21

[a]Acreage rounded to the nearest whole number.

Source: DOC (2007, 2008c, and 2009).

Hybrid Alternative

Table 3.14-14 summarizes the Williamson Act and FSZ lands that would potentially be affected under the Hybrid Alternative. Parcels in nonrenewal status are not counted. There would be no impact under NEPA or CEQA.

Table 3.14-14
Protected Farmland Potentially Affected by the Hybrid Alternative

Alternative	Williamson Act Land (acres)[a]	Number of Williamson Act Parcels	FSZ Land (acres)[a]	Number of FSZ Parcels
Hybrid Alternative North-South Alignment with Ave 24 Wye	275	83	114	29
Hybrid Alternative North-South Alignment with Ave 21 Wye	320	101	33	17
Total Hybrid Alternative	**275 to 320**	**83 to 101**	**33 to 114**	**17 to 29**

[a]Acreage rounded to the nearest whole number.

Source: DOC (2007, 2008c, and 2009).

Heavy Maintenance Facility

Table 3.14-15 summarizes potentially affected Williamson Act and FSZ lands at each proposed HMF site. Parcels in nonrenewal status are not counted. There would be no impact under NEPA or CEQA.

Table 3.14-15
Protected Farmland Potentially Affected by the Heavy Maintenance Facility

Potential HMF Site	Williamson Act Land (acres)[a]	Number of Williamson Act Parcels	FSZ Land (acres)[a]	Number of FSZ Land Parcels
Castle Commerce Center[b]	0	0	0	0
Harris-DeJager	76	3	0	0
Fagundes	70	1	0	0
Gordon-Shaw	0	0	15	4
Kojima Development	197	10	0	0

[a]Acreage rounded to the nearest whole number.
[b]At the Castle Commerce Center HMF, the effect is caused by the access guideway only.
Source: DOC (2007, 2008c, and 2009).

Effects on Confined Animal Agriculture

Conversion of land with dairy operations would include the loss of structures and facilities, as well as removal of associated land from growing forage crops or receiving waste. The conversions of partial property would result in secondary impacts. For example, changes to land areas that receive dairy waste would require modification of the dairy waste management and nutrient management plans, and would result in the need to increase offsite waste disposal or reduce the number of cattle. Relocation or a substantial change in dairy operations would result in the need to obtain a new or modified conditional use permit from the local jurisdiction or new air and water quality permits from regulatory agencies.

As described below, the project could result in the closure of several dairies, and acquisition of property from several other dairies. As part of the right-of-way acquisition process, the Authority's right-of-way agents would work with each affected dairy to address issues of concern. Agents would attempt to resolve conflicts, for example by reconfiguring facilities so that there is no net loss of operational capacity. The agents may not be able to resolve all issues, and may offer compensation to landowners that demonstrate a hardship from loss of facilities. Dairies are not classified as Important Farmland, and therefore the impact would not result in farmland conversion; therefore, loss of dairy facilities would be a negligible impact under NEPA and a less than significant impact under CEQA. For additional information on the right-of-way process and potential economic impacts, see Section 3.12, Socioeconomics, Communities, and Environmental Justice.

Additionally, when the HST right-of-way removes a portion of the dairy site or would otherwise be in close proximity to confined animal facilities, the HST operation might cause noise that would disturb livestock. Based on existing research, the FRA has established a threshold for high-speed train noise effects on livestock of 100 dBA SEL (FRA 2005). As discussed in Section 3.4, Noise and Vibration, SEL describes the noise from a single event such as a train passing a given point. At a distance of 100 feet from the tracks, the SEL for project operations at all dairies along the alignment would be less than 100 dBA SEL. As described below, livestock holding areas would not be located within 100 feet of any of the proposed HST tracks. The impact would not preclude agricultural use and would not result in farmland conversion. Therefore, there would be no HST noise effects on confined animals under NEPA or CEQA.

UPRR/SR 99 Alternative

The project would result in the conversion of land used for dairy operations. Based on an overlay of the alignments onto existing dairy facilities, land conversion would impact the operations at three dairies along the Ave 24 Wye, one along the Ave 21 Wye, and two along the West Chowchilla design option. Severe impacts would occur to the two dairies along the West Chowchilla design option such that continued operation would not be possible. Each of these dairies would be bisected by road improvements.

Some property acquisition would occur at the three dairies along the Ave 24 Wye and the dairy along the Ave 21 Wye, but the loss of facilities is not anticipated to preclude continued operation. The remaining facilities at these dairies would be located more than 100 feet away from the tracks, and therefore noise levels would not exceed the 100-dBA SEL threshold.

In addition, two other dairies would be close to the alignment but no acquisition would be required. At these dairies, noise levels would not exceed the 100-dBA SEL threshold because facilities would be more than 100 feet away from the tracks.

BNSF Alternative

The project would result in the conversion of land used for dairy operations. Based on an overlay of the alignments onto existing dairy facilities, land conversion would impact the operations at one dairy along the Mission Ave Design Option, three dairies along the Ave 24 Wye, and one dairy along the Ave 21 Wye. Severe impacts would occur at the dairy along the Mission Ave design option such that continued operation would not be possible. The dairy would be bisected by the HST alignment.

Some property acquisition would occur at the three dairies along the Ave 24 Wye and the dairy along the Ave 21 Wye, but the loss of facilities is not anticipated to preclude continued operation. The remaining facilities at these dairies would be located more than 100 feet away from the tracks, and therefore noise levels would not exceed the 100-dBA SEL threshold.

In addition, two other dairies would be close to the alignment but no acquisition would be required. At these dairies, noise levels would not exceed the 100-dBA SEL threshold because facilities would be more than 100 feet away from the tracks.

Hybrid Alternative

The project would result in the conversion of land used for dairy operations. Based on an overlay of the alignments onto existing dairy facilities, land conversion would impact the operations at two dairies along the north-south alignment (west of Chowchilla) and three dairies along the Ave 24 Wye. Severe impacts would occur to the two dairies west of Chowchilla such that continued operation would not be possible. Each of these dairies would be bisected by road improvements.

Some property acquisition would occur at the three dairies along the Ave 24 Wye, but the loss of facilities is not anticipated to preclude continued operation. The remaining facilities at these dairies would be located more than 100 feet away from the tracks, and therefore noise levels would not exceed the 100-dBA SEL threshold.

In addition, two other dairies would be close to the alignment but no acquisition would be required. At these dairies, noise levels would not exceed the 100-dBA SEL threshold because facilities would be more than 100 feet away from the tracks.

Heavy Maintenance Facility

The Fagundes HMF site would result in severe impacts to one dairy such that continued operation would not be possible. Approximately one half of this facility would be acquired as part of the Fagundes HMF site. Some property acquisition would occur at another dairy, but the loss of approximately 10 percent of this facility is not anticipated to preclude continued operation. The remaining facilities at this dairy would be located more than 100 feet away from the tracks, and therefore noise levels would not exceed the 100-dBA SEL threshold.

The Castle Commerce Center HMF site is adjacent to four dairies, but facilities would be located more than 100 feet away from the site, and therefore noise levels would not exceed the 100-dBA SEL threshold. The other HMF sites would not require removal of, or be located adjacent to, dairies.

Wind-Induced Effects

During operation, HSTs induce airflow (i.e., generate wind) along the sides and at the end of the train (known as *wake*). Studies summarized by FRA in 1999 show that the strength of the airflow depends on the distance from the train, the train's geometry (i.e., the shape of the nose and end of the HST), and the operating speed of the HST. FRA found that the airflow dissipates in less than 1 second (FRA 1999). Other studies found that wind generated by the train has a velocity of approximately 10% of the train velocity at a distance of approximately 10 feet from the train (Neppert and Sanderson 1977; Sterling and Baker 2010). An extrapolation of these studies for an HST traveling at 220 mph indicates that the wind gust would last less than 1 second at a distance of approximately 10 feet from the guideway. The guideway would be a minimum of 21 feet from the edge of the right-of-way (refer to Section 2.1.4, Infrastructure Components), and in many cases the guideway would be farther away, particularly in agricultural areas. Therefore, the HST would not cause adverse wind effects on adjacent farmland and indirect effects (e.g., interference with insect pollination, additional pesticide drift, on application restrictions) are not expected to result in additional farmland conversions. There would be no impact under NEPA or CEQA.

Aerial Spraying

The height of vertical HST structures, such as poles and elevated guideways, could interfere with aerial spraying of agricultural lands adjacent to the alignment. Currently, no restrictions on the distances an aircraft must maintain from utility lines or towers exist (Gage 2010b). Agricultural aircraft currently spray fields where there are utility lines of varying heights (e.g., telephone poles and electrical transmission towers). The distance that aircraft maintain from power lines and poles depends on the cropping pattern, orientation of the field, and operator-determined safety factors. Because vertical HST structures are similar to existing utility structures in and near agricultural fields, changes in spraying patterns are unlikely to cause conversions of agricultural land, and no impact under NEPA or CEQA would occur.

3.14.6 Mitigation Measures

The following mitigation measures are based on the Statewide Program EIR/EIS mitigation strategies. The project would implement these measures to reduce substantial adverse environmental impacts resulting from the project.

Ag-MM#1: Preserve the Total Amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland. Coordinate with DOC to identify suitable land for mitigation and purchase agricultural conservation easements from willing sellers at a ratio of no less than 1:1, to preserve Important Farmland in an amount commensurate with the quantity and quality converted farmlands. Work directly or through donation of mitigation fees to a local, regional, or statewide organization or agency whose purpose includes the acquisition and stewardship of agricultural conservation easements (e.g., Central Valley Farmland Trust, American Farmland Trust, and resource conservation districts). Establish easements in the same agricultural regions as the impacts occur.

Ag-MM # 2: Consolidate Non-Economic Remnants. Create a farmland consolidation program to sell non-economic remnant parcels to neighboring landowners for consolidation with adjacent property with the goal of providing for continued agricultural use on the maximum feasible amount of non-economic remnant parcels.

3.14.7 NEPA Impacts Summary

The No Project Alternative would have adverse impacts on the ability of Important Farmland to accommodate projected future growth in Merced, Madera, and Fresno counties.

- Temporary use of Important Farmland during construction would be negligible because the land would not be permanently converted to a nonagricultural use.
- Temporary utility and infrastructure interruption would be negligible because it would not result in a permanent conversion of farmland to a nonagricultural use.
- The indirect noise and vibration effects of construction would have no impact on livestock because there would be sufficient distance between construction noise sources and livestock areas.
- Each of the HST alternatives would have substantial direct adverse effects on Important Farmland; as shown in Table 3.14-5, farmland losses would range from 1,037to 1,481 acres. Impact would remain significant after mitigation. Mitigation measures AG-MM#1 and AG-MM#2 would ensure that land is preserved for agriculture and that non-economic remnant parcels are consolidated so that they would remain in agricultural production.
- Each of the HST alternatives would have negligible effects from severing large farm parcels because severance of large parcels would not result in a permanent conversion of farmland to a nonagricultural use.
- Each of the HST alternatives would affect lands that are subject to Williamson Act or FSZ contracts. There would be no impact because additional farmland conversion would not occur.
- Each of the HST alternatives would result in the closure of several dairies and the acquisition of property from several other dairies. Because dairies are not classified as Important Farmland, there would be no loss of Important Farmland and therefore no impacts would occur.
- HST operations would result in negligible noise and vibration impacts on farm animals at three dairies and no impacts at other dairies. caused by HST operations
- The HST-generated wind would not render agricultural land unusable for farming under any of the HST alternatives. Therefore, it would not result in an effect. Similarly, the HST vertical structures would not interfere with aerial application of pesticides and would not render agricultural lands unusable for farming. As a result, there would be no adverse impact from HST-generated wind.

3.14.8 CEQA Significance Conclusions

Table 3.14-16 summarizes significant construction and project impacts, associated mitigation measures, and levels of significance after mitigation.

Table 3.14-16
Summary of Significant Agricultural Land Impacts and Mitigation Measures

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Construction Period Impacts			
None required.	NA	NA	NA
Project Impacts			
Ag#1: Permanent Conversion of Agricultural Land to Nonagricultural Use. The UPRR/SR 99 Alternative would affect 1,037 to 1,158 acres of Important Farmland, compared to 1,411 to 1,481 acres under the BNSF Alternative and 1,291 to 1,420 acres under the Hybrid Alternative. Castle Commerce Center HMF – 114 acres Harris-DeJager – 313 acres Fagundes – 168 acres Gordon-Shaw – 313 acres Kojima Development – 246 acres	Significant	**Ag-MM#1:** Preserve the total amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland;	Significant
Ag#2: Permanent Conversion of Agricultural Land from Parcel Splits	Significant	**Ag-MM# 2:** Consolidate Non-Economic Remnants. Create a farmland consolidation program.	Significant
NA = not applicable			