

# CALIFORNIA HIGH-SPEED TRAIN

Project Environmental Impact Report /  
Environmental Impact Statement

DRAFT

## Checkpoint B Summary Report

Merced to Fresno Section  
Draft Project EIR/EIS

April 2011





**DRAFT  
REPORT**

Merced to Fresno Section  
**Checkpoint B Summary Report**

April 22, 2011



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This report summarizes technical data and analysis for the Merced to Fresno Section (see Figure 1) as specified at Checkpoint B of the National Environmental Policy Act (NEPA)/Section 404/408 Integration Process Memorandum of Understanding (MOU) (Authority et al. 2010). Supporting documents, including planning studies and information on environmental resources and constraints, are presented as appendices. Much of the supporting information can be found in the *Preliminary Alternatives Analysis Report* and the *Supplemental Alternatives Analysis Report* for the Merced to Fresno Section, both of which are available on the California High-Speed Rail Authority's website at [http://www.cahighspeedrail.ca.gov/lib\\_Merced\\_Fresno.aspx](http://www.cahighspeedrail.ca.gov/lib_Merced_Fresno.aspx).

## 1.0 Background

The California High-Speed Rail Authority (Authority) and the Federal Railroad Administration (FRA) prepared two Program Environmental Impact Reports/Environmental Impact Statements (EIR/EIS) for the California High-Speed Train (HST) System as the first programmatic phase (Tier 1) of a tiered environmental review process. These documents are the 2005 Statewide *Final Program EIR/EIS for the Proposed California High-Speed Train System* (Authority and FRA 2005), the 2008 *Bay Area to Central Valley HST Final Program EIR/EIS* (Authority and FRA 2008), and the *Bay Area to Central Valley Revised Final Program EIR* (Authority and FRA 2010a), collectively referred to as "programmatic documents" in this report. The Authority is now preparing project-level environmental documents for several HST sections, including the Merced to Fresno Section, which will tier from the programmatic documents.

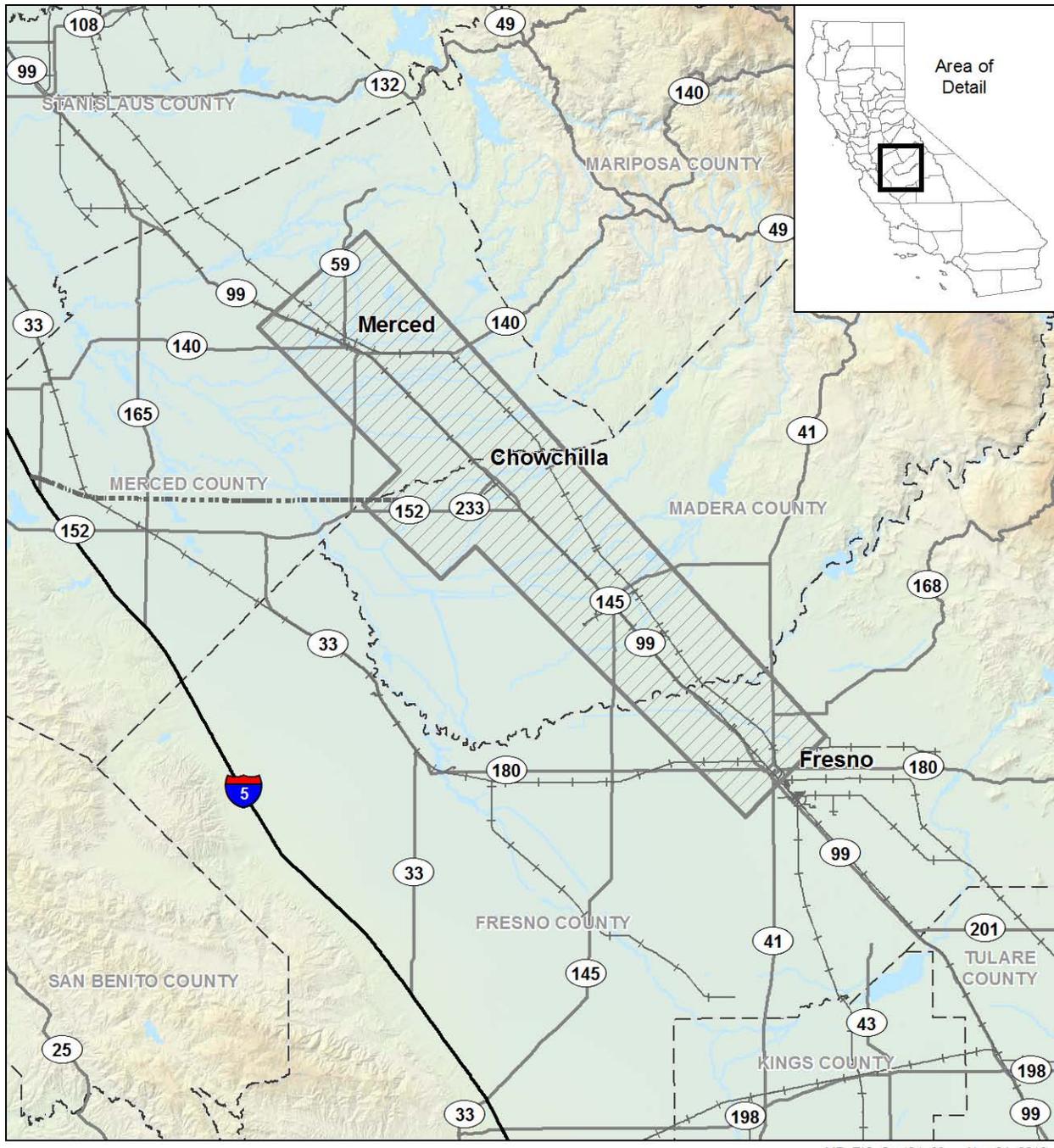
As part of the Statewide Program EIR/EIS concluded in 2005, the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE), in letters dated July 22, 2005, concurred with the alternative most likely to contain the Least Environmentally Damaging Practicable Alternative (LEDPA) for the California HST project. In addition, EPA and USACE, in separate letters dated April 30 and May 8, 2008, respectively, concurred that the program alternative likely to contain the LEDPA for the HST System from the Bay Area to the Central Valley is the Pacheco Pass, San Francisco, and San Jose termini. These decisions were based on corridor-level environmental analysis.

While the Statewide Program EIR/EIS concluded in 2005 that the preferred alternative through the Central Valley would be the BNSF railroad alignment, the subsequent Bay Area to Central Valley HST Program EIR/EIS concluded that the UPRR railroad alignment through the portion of the Central Valley from north of Madera to south of Stockton would be the preferred alternative. The Merced to Fresno Project EIR/EIS will evaluate the BNSF railroad alignment in this part of the Central Valley because of the uncertainty of negotiating with the UPRR for some of their right-of-way and will continue investigation of alignments and linkages to a potential maintenance facility at Castle Commerce Center.

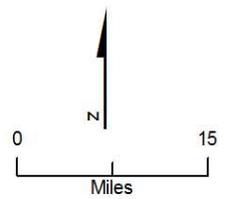
The preferred station locations selected by the Authority and FRA through the Statewide Program EIR/EIS and the Bay Area to Central Valley HST Program EIR/EIS in Merced will be evaluated in the Merced to Fresno HST Project EIR/EIS. The station in Fresno will be analyzed in the EIR/EIS for the Fresno-Bakersfield section of the HST System and, therefore, this memo will not address the Fresno station alternatives analysis (that the Fresno to Bakersfield Section provides). Alternative Merced station sites are identified and evaluated.

The construction of the HST project will require authorizations from several federal agencies. To facilitate compliance with the NEPA, the Clean Water Act (CWA) Section 404 (Section 404), and the Rivers and Harbors Act (33 U.S.C. Section 408), the Authority, FRA, EPA, and USACE developed the Tier 2 MOU (Authority et al. 2010). The MOU pertains to project-level (Tier 2) actions and establishes several checkpoints at which agreement must be reached by the signatory parties (see the EPA and USACE Involvement in HST Planning section below).

On December 22, 2010, the Authority and FRA submitted Tier 2 MOU Checkpoint A materials to EPA and USACE for final review and concurrence. Those materials pertain to the project purpose and need. On January 20, 2011, EPA concurred in the purpose and need. On February 2, 2011, USACE concurred in the



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-  General HST Corridor
-  Railroad
-  County Boundary
-  San Jose to Merced Section Via Pacheco Pass

**Figure 1**  
 Merced to Fresno HST Project Corridor

purpose and need. This report is submitted to comply with Checkpoint B data and analysis requirements. The purpose of Checkpoint B is to identify project alternatives that will be evaluated in the Draft EIS.

The project team developed and considered numerous potential alternatives and screened them against standardized evaluation criteria pursuant to Section 404(b)(1). The screening criteria included the following:

- Consistency with the project purpose
- Logistics and technology
- Impacts on aquatic resources
- Environmental effects
- Agency, stakeholder, and public positions
- Benefits of the alternatives

The qualitative and quantitative screening results are documented in alternative analyses reports and summarized in this report and attachments. Attachments to this report include the following:

1. Correspondence from EPA and USACE concurring that the corridor “Pacheco Pass, San Francisco and San Jose Termini” is most likely to contain the LEDPA (Attachment 1)
2. A PowerPoint presentation that summarizes environmental resources and constraints using data gathered and evaluated (Attachment 2)
3. Section 404(b)(1) alternatives analysis evaluation tables that compare data collected for each of the screened alignments, stations, and heavy maintenance facility (HMF) sites (Attachment 3)
4. The Preliminary Alternatives Analysis Report (Authority and FRA 2010b), which screens alignment and station alternatives against the criteria (Attachment 4)
5. The Supplemental Alternatives Analysis Report (Authority and FRA 2010c), which evaluates design options near Le Grand and for the wye connection to the San Jose to Merced Section as well as alternatives sites for the HMF (Attachment 5)

These materials were developed over the last two years and naming conventions reflect the development of alternatives. Names denoting identical alignment alternatives are listed below in Table 1.

**Table 1**  
 Alignment Alternatives Naming Conventions

404 Application	Alternatives Analysis
BNSF	A1 - BNSF
UPRR/SR 99	A2 – UPRR/SR99
Western Madera	A3 – Western Madera
UPRR/BNSF Crossover	A4 - BNSF/UPRR Hybrid
Hybrid	New Hybrid

Throughout development of the project, the Authority has worked closely with all the communities in the corridor, including Merced, Planada, Le Grand, Chowchilla, Madera, and Fresno. For Merced and Fresno where rail stations are to be located in this HST section, the Authority and FRA considered crossing these two communities at-grade or on an elevated structure. Construction of the HST at-grade through Merced and Fresno was initially eliminated during the analysis of alignment alternatives due to multiple and significant infrastructure conflicts and traffic impacts caused by disruption of the local roadway network.

Preliminary engineering for the project resulted in a 5-mile-long elevated structure through Merced and a nearly 11.5-mile-long elevated structure to the Fresno station. Due to their height and mass, the structures would visually dominate the city landscape. At this elevation, potential noise from the train could extend out as much as 3,300 feet from the alignment. For example, in Merced with SR 99 being elevated at both ends of the city, the HST alignment had to be over 60 feet above grade to clear the highway

To address the visual and noise impacts of the elevated HST guideway, working together, the two cities and the Authority have developed a plan for an at-grade alignment that would minimize disruption of the cities' existing roadways and substantially reduce project construction costs. As a result, the design of the HST through Merced and Fresno was modified to be at-grade. A significant benefit to the cities is the resulting elimination of some freight railroad at-grade crossings, such as G Street in Merced, and Carnegie Street in Fresno. Through this collaborative effort, a new at-grade station site was also identified in Merced that helps reduce environmental impacts and disruption to the downtown commercial core. With the HST alignment adjacent to the UPRR, the necessary road modifications pass over both the HST and UPRR and the existing UPRR grade crossing is eliminated. In addition, there are several other smaller areas along the alignments that are also at-grade more than they were previously, but these did not involve major infrastructure adjustments. Illustrations showing the previous aerial alignments and the new at-grade stations proposed in Merced and Fresno are shown in Appendix A of this document.

## 2.0 EPA and USACE Involvement in HST Planning

EPA and USACE have been actively involved in HST planning activities since 2003, when they—along with the Authority, FRA, Federal Highway Administration, Federal Transit Administration, and U.S. Fish and Wildlife Service—signed the Interagency Memorandum of Understanding (Tier 1 MOU) that established procedures to integrate NEPA and Section 404 actions relating to HST program-level (Tier 1) planning (Authority et al. 2003). The NEPA/404 integration process facilitated compliance with the NEPA, the CWA, and the Rivers and Harbors Act. In signing the MOU in July 2003, the federal agencies also agreed to be cooperating agencies during the NEPA review process.

On August 31, 2004, EPA and USACE provided written comments on the HST Statewide Program Draft EIR/EIS. Their comments identified general and specific concerns that pertained to many of the HST planning sections. In the Central Valley, EPA specifically requested that the project minimize impacts on farmland, local communities, waters of the United States, and associated biological resources by minimizing the use of bypasses and total miles of track. USACE's comments emphasized the need for avoidance and complete mitigation, requested more detailed descriptions of aquatic resources, and recommended a suite of data needs to be addressed during Tier 2, or project-level, environmental impact evaluation.

On July 22, 2005, in compliance with the Tier 1 MOU process, EPA and USACE provided written comments to the FRA. Those comments indicated concurrence with the preferred alignments and station options that were most likely to contain the LEDPA.

On November 18, 2005, the FRA issued its Record of Decision (ROD) on the Statewide Program Final EIR/EIS. With respect to compliance with Section 404, the ROD stated, "The USEPA and USACE have participated in the development of both the Draft and Final Program EIR/EIS and, in accordance with the MOU among Federal agencies for their environmental review, were consulted concerning the selection of the preferred corridor and route most likely to yield the least environmentally damaging practicable alternative (LEDPA) and as identified as preferred in the Final Program EIR/EIS. The USEPA and USACE have concurred that the preferred HST alignment and station options are most likely to contain the LEDPA. Future project-level environmental review will include further consultation with USEPA and USACE regarding the Clean Water Act leading to USACE permit application."

On April 30, 2008, in compliance with the Tier 1 MOU process, EPA provided concurrence that the corridor "Pacheco Pass, San Francisco and San Jose Termini" is most likely to contain the LEDPA. Concurrence from USACE followed on May 8, 2008 (see Attachment 1).

In December 2010, the Authority, FRA, EPA, and USACE signed the Tier 2 MOU for integrating the NEPA, CWA, and Rivers and Harbors Act processes. The MOU requires implementation of three milestones:

- Checkpoint A - Purpose & Need – anticipated to be completed in January 2011
- Checkpoint B - Alternatives – being implemented with this report
- Checkpoint C - Least Environmentally Damaging Practicable Alternative – to occur after the public comment period of the Draft EIR/EIS closes

## 3.0 Checkpoint B Summary

This section summarizes the materials for the Checkpoint B alternatives following the Section 404 (b)(1) criteria. The alternatives that were considered are shown in Figure 2a, with vicinity maps of Merced and Fresno in Figure 2a and 2b respectively. These alternatives range from stations, to HST track alignments, and to possible sites for the HMF within the Merced to Fresno Section study area. This section describes the practicability review, the environmental resources and constraints, and the community support of each alternative considered.

### 3.1 Practicability Analysis

As part of its effort to determine which alternatives to carry forward, FRA and the Authority analyzed the practicability of the station, HST track alignments, and HMF alternatives. The term practicable means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. This analysis was conducted using evaluation criteria established pursuant to the Section 404(b)(1) Guidelines.

All the station, alignments and HMF alternatives, with one exception, meet the project purpose. The exception is the Sierra Foothills Alternative, as suggested during the public scoping meeting. This alternative does not meet the project purpose because it does not connect to the Merced and Fresno major metropolitan areas. This alignment was proposed as an alignment to avoid all developed areas, but in doing so, it defeats the project purpose. As a result, this alignment is no longer discussed in the following sections.

### 3.2 Alternatives Considered

#### 3.2.1 Stations

Stations were preliminarily selected during the Program EIR/EIS process based on balancing project ridership viability to meet the statewide project purpose and need. The Merced to Fresno Section only addresses the alternatives analysis for the Merced area station, whereas the Fresno to Bakersfield Section addresses the Fresno Station alternatives. Stations that were not within the urban centers as approved in the Program EIR/EIS were not considered in this analysis. Among the station locations initially reviewed, the Castle Commerce Center site, Merced Amtrak Depot site, and Merced Intermodal Transit Center (which is now referred to as the Merced Downtown Station) site fulfilled the most station location criteria and were carried forward for further consideration (Figure 3).

Of the three stations considered, all are practicable. However, the Castle Commerce Center would not maximize the purpose for connecting efficiently with the Merced metropolitan area. It does not offer the central location of high-density mixed uses that Downtown Merced offers. The Merced Amtrak Station also does not offer the transit-oriented development land uses, nor does it offer convenient intermodal

connectivity or convenient regional accessibility. Finally, it would disrupt a potential historic neighborhood. In addition, the City of Merced expressed strong support for the Merced Intermodal Station alternatives for the following reason: it is adjacent to the railroad and the existing multimodal transit center that is within the old Southern Pacific Union Station. As stated in the Background section of this Summary Report, the Authority has worked with the City of Merced to reduce impacts and, therefore, the Intermodal Station that was analyzed during the AA as being between West 16th Street and West 15th Street and between M Street and O Street has shifted to the south as described below.

### **Castle Commerce Center Station**

Castle Commerce Center occupies a land associated with a former Air Force base along the northeast side of Santa Fe Drive and the UPRR corridor in Atwater, north of Merced. A station located here would likely be in the vicinity of or on the grounds of the Castle Airport. The station would be located approximately 7 miles from downtown Merced and approximately 2 miles from SR 99. The station would be compatible with all alignment alternatives, except as stated above, it does not offer optimum transit oriented development to maximize the intermodal opportunities.

### **Merced Downtown Station (previously, the Merced Intermodal Transit Center)**

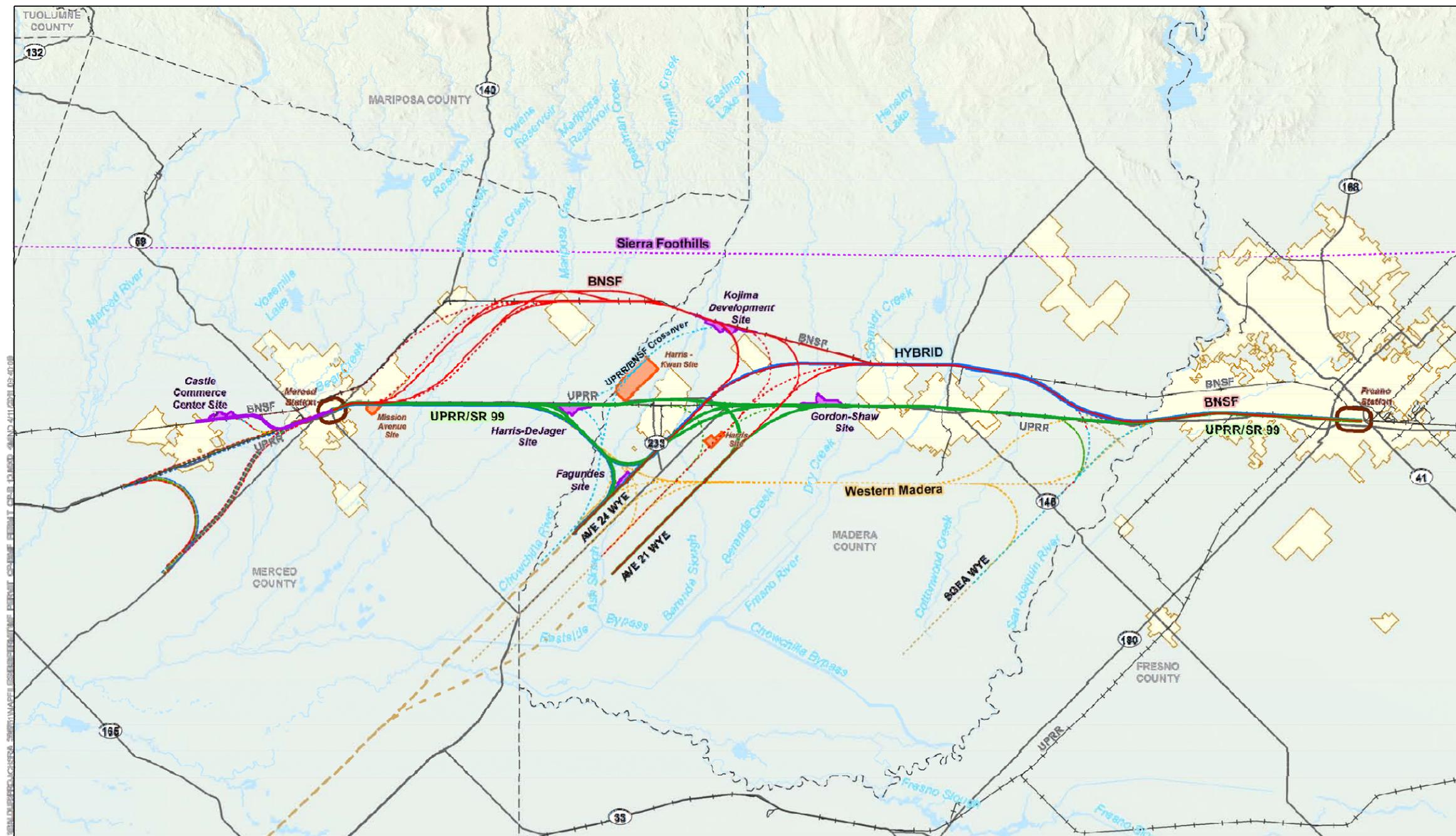
The Merced Downtown Station would be located between at Martin Luther King, Jr. Way to the northwest and G Street to the southeast and 16th Street (to the northeast), 14th Street (to the southwest), Martin Canal Street (to the northwest), and G Street (to the southeast). The station would be compatible with all alignment alternatives. This station is central to the core of Downtown Merced and offers present and future transit-oriented development connectivity and convenient access from SR 99.

### **Merced Amtrak Depot Station**

This station would be located at the existing Amtrak Depot in Merced, which is currently bounded on the north and south by West 24th Street and West 25th Street and to the east and west by K Street and G Street. The future HST station would occupy a much larger area, possibly extending to M Street to the west and 5th Avenue to the east. The station would only be compatible with the BNSF alternative. This area is surrounded by residential development.

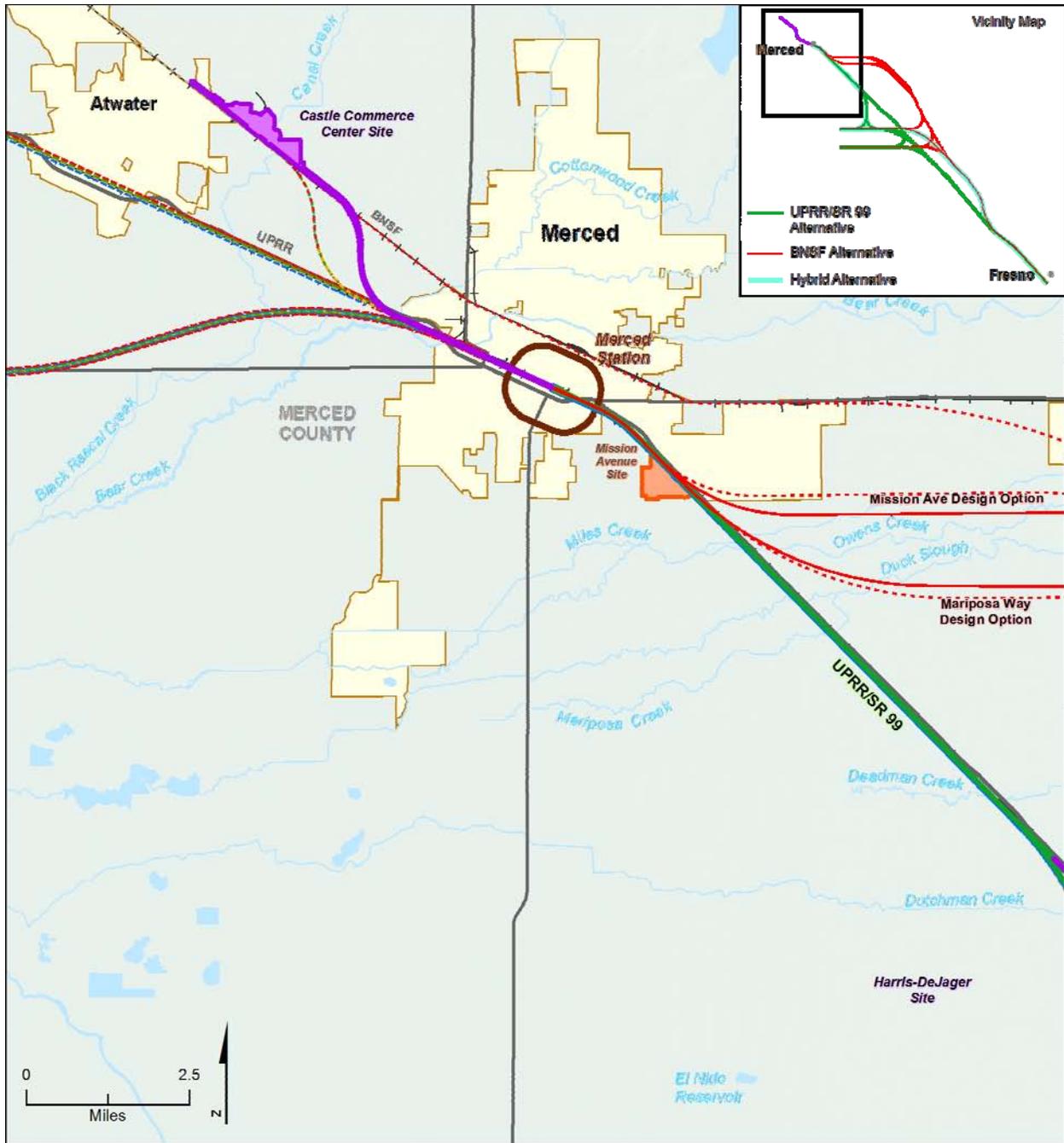
## **3.2.2 North-South Alignment Alternatives**

The Program EIR/EIS processes in 2005, 2008, and 2010 resulted in selection of the BNSF and UPRR north-south alignment alternatives for further study. As a result of the agency and public consultation process, additional north-south alignment alternatives were explored in an effort to minimize community impacts and impacts on agricultural lands, while still meeting the project purpose and need and project objectives. Of the five north-south alignment alternatives, three are considered practicable (BNSF, UPRR/SR 99, and Hybrid) and are recommended for inclusion in the Draft EIR/EIS. Two are considered not practicable (Western Madera and UPRR/BNSF Crossover) and, therefore, are not recommended to be carried forward (see Figure 2). The information collected in this summary report can be found in the *Preliminary Alternatives Analysis Report* and the *Supplemental Alternatives Analysis Report* found at [http://www.cahighspeedrail.ca.gov/lib\\_Merced\\_Fresno.aspx](http://www.cahighspeedrail.ca.gov/lib_Merced_Fresno.aspx)



**Figure 2A**  
 Range of Alternatives Considered

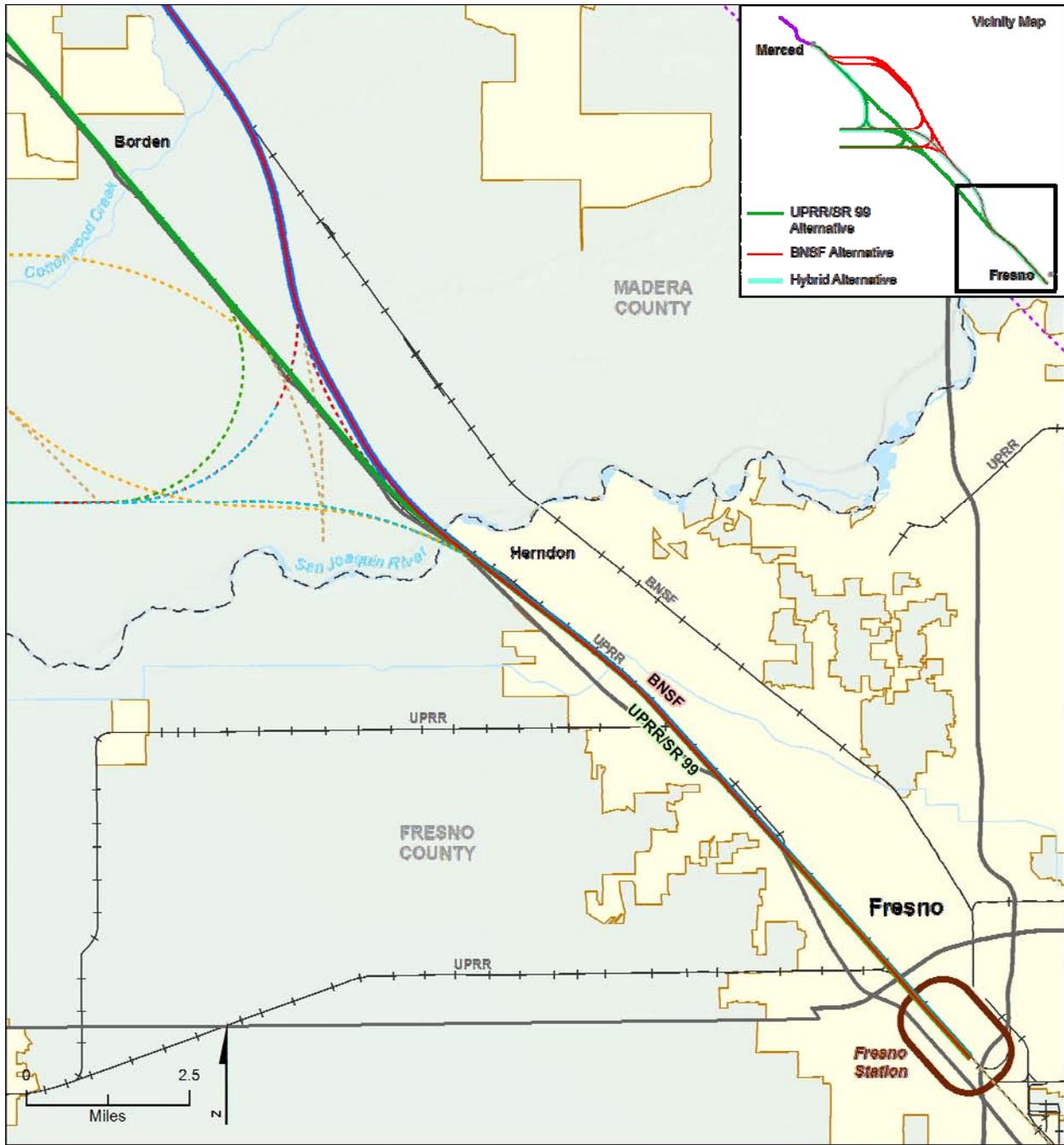




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- |                                      |   |                    |
|--------------------------------------|---|--------------------|
| <b>Alternatives Carried Forward</b>  | <b>Alternatives Not Carried Forward</b> | <b>City Limit</b>  |
| BNSF Alternative                     | BNSF Alternative                        | County Boundary    |
| UPRR/SR 99 Alternative               | UPRR/SR 99 Alternative                  | Railroad           |
| Hybrid Alternative                   | UPRR/BNSF Hybrid Alternative            | State / US Highway |
| Connection to Other Section          | Western Madera Alternative              |                    |
| Station Study Area                   | Sierra Foothills                        |                    |
| Potential Heavy Maintenance Facility | Connection to Other Section             |                    |
|                                      | Heavy Maintenance Facility              |                    |

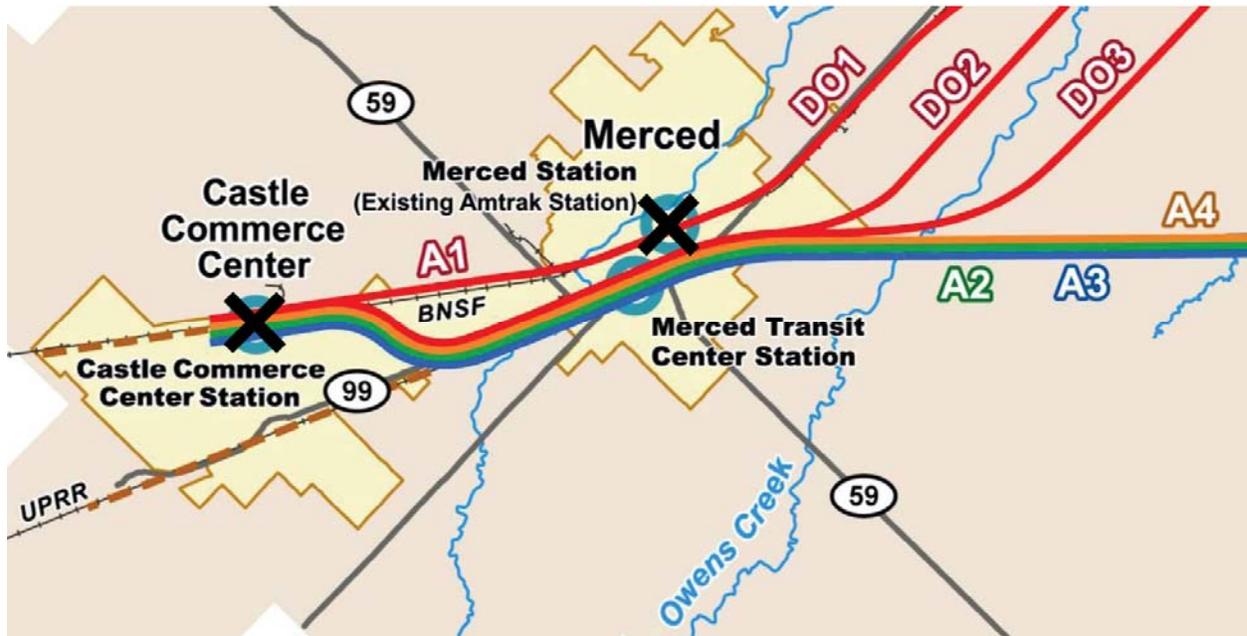
**Figure 2A**  
 Range of Alternatives  
 Considered – Merced Vicinity



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- |  |  |  |
|--|--|--|
| <b>Alternatives Carried Forward</b>  | <b>Alternatives Not Carried Forward</b>                              | <b>City Limit</b>  |
| <span style="color: red;">—</span> BNSF Alternative                        | <span style="color: red;">- - -</span> BNSF Alternative              | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> City Limit                    |
| <span style="color: green;">—</span> UPRR/SR 99 Alternative                | <span style="color: green;">- - -</span> UPRR/SR 99 Alternative      | <span style="border-bottom: 1px dashed black; width: 20px; display: inline-block;"></span> County Boundary                     |
| <span style="color: blue;">—</span> Hybrid Alternative                     | <span style="color: blue;">- - -</span> UPRR/BNSF Hybrid Alternative | <span style="border-bottom: 1px solid black; width: 20px; display: inline-block; margin-left: 5px;"></span> Railroad           |
| <span style="color: orange;">—</span> Connection to Other Section          | <span style="color: orange;">- - -</span> Western Madera Alternative | <span style="border-bottom: 1px solid black; width: 20px; display: inline-block; margin-left: 5px;"></span> State / US Highway |
| <span style="color: brown;">●</span> Station Study Area                    | <span style="color: purple;">- - -</span> Sierra Foothills           |  |
| <span style="color: purple;">■</span> Potential Heavy Maintenance Facility | <span style="color: brown;">- - -</span> Connection to Other Section |  |
|  | <span style="color: orange;">■</span> Heavy Maintenance Facility     |  |

**Figure 2B**  
 Range of Alternatives  
 Considered – Fresno Vicinity



**Figure 3**  
 Range of Stations under Consideration within the Merced and Merced to Fresno Sections

**A. BNSF ALTERNATIVE (A1) - ADJACENT TO BNSF ROUTE**

The BNSF Alternative (A1) is consistent with the 2005 Statewide Program EIR/EIS Preferred Alternative (Authority and FRA 2005). This alternative would generally remain west of the BNSF in Merced and Madera, and would then join to the east side of the UPRR near the San Joaquin River. Several design options were suggested—three on the north end of the Merced to Fresno Section and three on the south end.

On the north end, the original alignment followed the BNSF into the Downtown Merced Amtrak station. This alignment was not developed because it would result in severe community impacts and inefficient design. Additionally, the City of Merced preferred a downtown station near the UPRR and asked that the alignment of the BNSF Alternative be shifted to the UPRR corridor for the station before reconnecting to the BNSF. The remaining two design options would link to the station in Downtown Merced (transit station). The first option would follow Mission Avenue from the UPRR to the BNSF. Because of residential impacts and constraints at the SR 99/Mission Avenue interchange related to the Mission Ave design option, another design option was developed farther south that would follow Mariposa Way to the BNSF.

In response to Merced County and the community of Le Grand, the Mission Ave and Mariposa Way design options were expanded to include avoiding the small town of Le Grand, resulting in the Mission Ave East of Le Grand and Mariposa Way East of Le Grand design options. Each of these design options would travel approximately 1 mile east of the Le Grand town limits. These design options and the north-south alignments are generally practicable (i.e., follows existing transportation corridors).

Generally, the BNSF Alternative can remain at-grade until it has to cross major transportation corridors where it transitions to elevated guideway, such as SR 99 south of Merced, over the BNSF corridor both east and then south of Le Grand. Again, when it converges to the westside of the UPRR, it becomes elevated over the San Joaquin River and the UPRR, and then returns to at-grade until it reaches the Fresno station. Originally, the BNSF Alternative was elevated through the cities of Merced and Fresno to avoid conflict with existing infrastructure. Due in part to cost constraints, the project team worked with

the local jurisdictions to resolve conflicts and still maintain an at-grade profile of the alternative through these communities.

### **B. UPRR/SR 99 ALTERNATIVE (A2) - ADJACENT TO UPRR AND SR 99**

The UPRR/SR 99 Alternative is consistent with the 2008 Bay Area to Central Valley Program EIR/EIS Preferred Alternative (Authority and FRA 2008). This alternative would generally remain parallel to, but outside of the UPRR right-of-way on the opposite side to SR 99. There are two design options being considered on this route—the West Chowchilla design option would follow the Ave 24 Wye connection (see the East-West Alignment Connections discussion below) to travel west around Chowchilla, and the East Chowchilla design option would follow the UPRR/SR 99 transportation corridor, traveling near and to the east of Downtown Chowchilla. This alternative involves crossing over SR 99 and the UPRR railroad, but it has generally practicable logistics (follows existing transportation corridors).

The UPRR/SR 99 Alternative fluctuates between at-grade and elevated. It begins at-grade at Merced Station and remains so along the West of Chowchilla design option, until it must be elevated to cross over SR 152. Shortly thereafter it crosses over SR 99 to be on the east side of UPRR. The East of Chowchilla design option requires a much longer distance of elevated profile to cross over the UPRR, remain west of and parallel to SR 99, and crosses over several interchanges. It then crosses over SR 99 to remain east of the UPRR. From this point, it continues elevated through the city of Madera and returns down to grade south of Madera at Ave 12. Finally, it becomes elevated again to span the San Joaquin River and the UPRR when it returns to at-grade until it reaches the Fresno station.

### **C. WESTERN MADERA ALTERNATIVE (A3)**

This alternative followed the UPRR/SR 99 Alternative (A2) but diverged to the west before reaching Chowchilla. It moved west to a location approximately 3.75 miles west of UPRR/SR 99, remaining parallel to the UPRR/SR 99 for approximately 20 miles through agricultural lands, and then returned to be adjacent to SR 99 and UPRR south of Madera, crossing over the San Joaquin River adjacent to the UPRR and SR 99. This alternative did not meet the project objective to remain adjacent to transportation corridors, and therefore had considerably greater impacts on agricultural lands than alignments that adhered closely to existing transportation corridors. While, this alternative is not prohibitive in terms of cost or technological limitations, the logistics of diagonally traversing farmlands and county roads for over 40 miles with an at-grade railroad trackway would result in cumbersome overcrossings, ineffective circulation, and inefficient use of adjacent lands. If this alternative were designed as an elevated alternative, it would offer no efficiency advantages over other less environmentally damaging alternatives and, therefore, would not be as practicable from a cost efficiency perspective. In the north-south direction, the alignment added some length and travel time beyond the UPRR/SR 99 (A2) Alternative, but was still shorter than the BNSF (A1) Alternative.

The Western Madera Alternative can remain at-grade until it becomes elevated to cross over SR 152 east of Chowchilla and returns to at-grade. Then again, when it converges to west side of the UPRR, it becomes elevated over the San Joaquin River, then crosses over SR99 is at-grade until Clinton Avenue, where the alternative then returns to at-grade to the Fresno station.

### **D. UPRR/BNSF CROSSOVER ALTERNATIVE (A4)**

Similar to the Western Madera Alternative (A3), this alternative deviated from the UPRR before Chowchilla, but then moved east to connect with the BNSF route north of the City of Chowchilla. The alternative would continue along the BNSF corridor before connecting back with the UPRR south of Madera. There were no design options suggested for this route. Similar to the Western Madera Alternative, the north-south alignment diverged from transportation corridors, adding track length and inefficient track alignment and higher cost.

The UPRR/BNSF Crossover Alternative can remain at-grade until it has to cross over SR99, north of Chowchilla. It returns to at-grade and merges with the BNSF Alternative and follows the profile and alignment for that alternative. As this summary will later show, the A4 alternative is not practical because

of the amount of deviation from existing transportation corridors resulting in severing farmlands and causing indirect impacts.

## E. HYBRID ALTERNATIVE

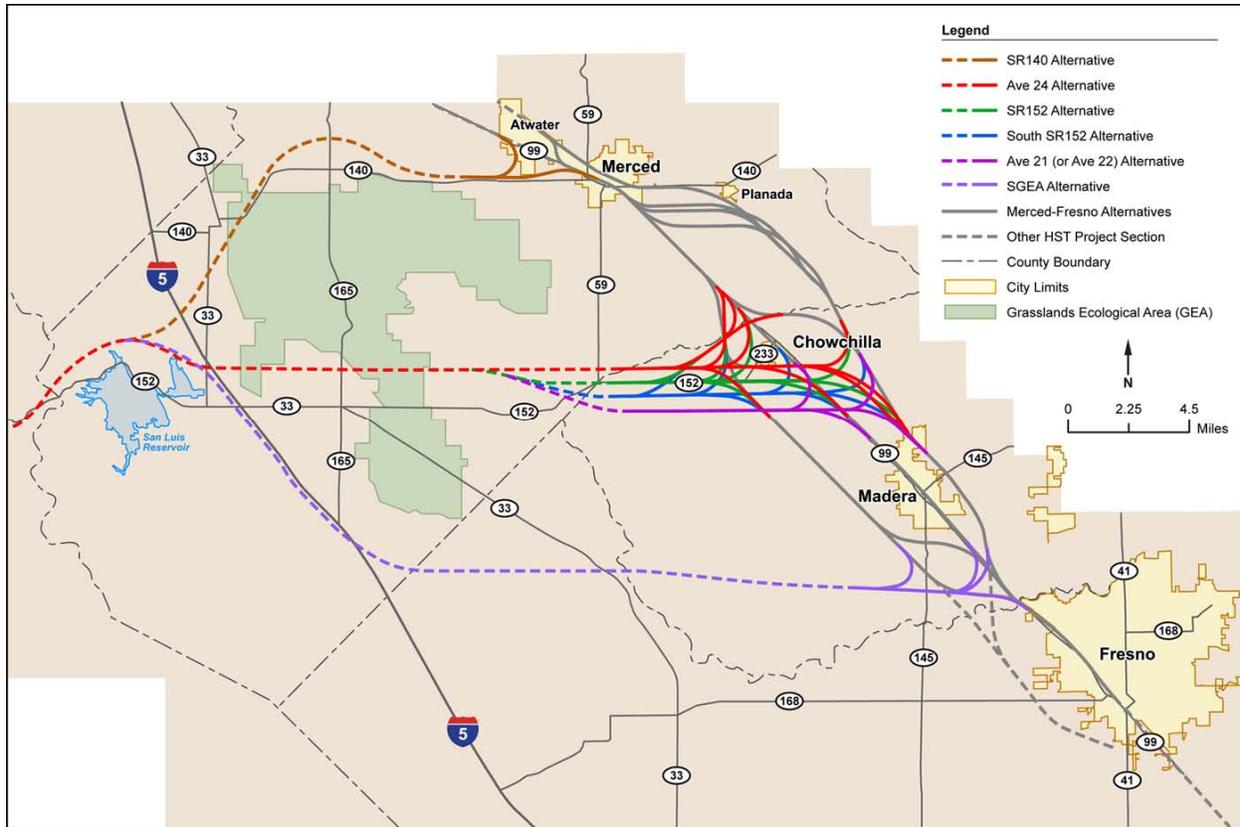
During the continued working relationship with Chowchilla, local farm bureaus, and Madera on beneficial features of the A4 UPRR/BNSF Crossover Alternative, a Hybrid Alternative emerged that would use portions of the same rail alignments as the UPRR/SR 99 and BNSF alternatives as well as major portions of the Ave 24 Wye; it became a practicable alternative for further consideration. The difference in this Hybrid Alternative compared to the original A4 Crossover Alternative as described above is that it incorporates the Ave 24 Wye connection of the San Jose to Merced section to the BNSF Alternative. This alternative is practicable because it travels along existing rail corridors and minimizes linear miles of track in combination with Ave 24 Wye (discussed below). Also, while it travels around Chowchilla, this does not reduce speeds in this area. The mandatory turnout from a main line to a secondary rail line is 150 miles per hour maximum design criteria. The mainline is the San Jose to Fresno southbound route. The eastbound to northbound and south to northbound portions toward Merced require a turnout from the mainline, which is why this alternative remains a practicable alternative. The Hybrid Alternative can remain at-grade until it crosses SR152, west of Chowchilla and then SR99, south of Chowchilla. Then, it follows the BNSF alternative in alignment and profile.

### 3.2.3 East-West Alignment Connections

Figure 4 demonstrates the range of wye connections from the San Jose to Merced Section to the Merced to Fresno Section from the common point of departure at the San Luis Reservoir. The east-west alignments are named based on their orientation to the Grassland Ecological Area (GEA) or their adjacency to state routes. The wye connections have been studied in concert with the San Jose to Merced Section project team. Their alternatives analysis can be found on the Authority's website at [http://www.cahighspeedrail.ca.gov/Lib\\_San\\_Jose\\_Merced.aspx](http://www.cahighspeedrail.ca.gov/Lib_San_Jose_Merced.aspx). Originally, through the Program EIR/EIS, Henry Miller Road/Ave 24 was selected as the preferred east-west route from San Jose to the Central Valley.

In summary, the analysis found the SR 140/North GEA, SR 152, and South GEA east-west wye connection alternatives to be impracticable based on considerations of logistics and cost as outlined further below. Both the Henry Miller/Ave 24 Wye and the south of SR152 Wye (blue and purple lines) connection alternatives are practicable because they follow existing roadways with minimal disruption to existing services, and they minimize cost. The South SR 152 Wye connections, through community and engineering input refinements, became one alignment following Ave 21 to avoid major impacts on a local museum, an airport runway, and community conflicts. It is important to note that the east-west connections must consider factors beyond the Merced to Fresno Section. The wye connection has system-wide implications on cost, travel time, and potential redundant rail track. These factors greatly influenced the practicability of the east-west connection.

All wyes are primarily at-grade upon approaching the Merced to Fresno north-south alignments. The transition to a wye would require splitting two tracks into four tracks crossing over one another before the wye legs can diverge in opposite directions to allow bidirectional travel. Based on HST design criteria, this transition would require approximately 2 miles, with an estimated 120-foot-wide right-of-way for the transition before the tracks have fully diverged from each other. This occurs at each point of the triangle, where the tracks flow from west to north or west to south, etc. Because of the extensive infrastructure, the wyes may result in substantial barriers for other transportation infrastructure development.



**Figure 4**  
 Range of Wye Connections between San Jose to Merced and Merced to Fresno Sections

**A. AVE 24 WYE CONNECTION**

This wye connects to the Ave 24 alignment, which is the closest to the Preferred Alternative as recorded in the 2008 Record of Decision for the California High-Speed Rail (HSR) Programmatic Environmental Impact Report/Environmental Impact Statement (EIR/EIS). This wye is named for its position generally following Avenue 24, which is located just north of SR 152 heading east to Chowchilla. The southbound leg converges with the UPRR Alternative just south of the SR 152 and SR 99 interchange, south of Chowchilla, while the northbound leg travels west and north of Chowchilla to connect with the UPRR Alternative.

**B. SOUTH SR 152 WYE CONNECTION**

The South SR152 alignment results in formation of this wye, located south of SR 152 along Avenue 22. Both wye legs of the South SR152 Wye connect to the UPRR Alternative south of Chowchilla. In collaboration with the City of Chowchilla and property owners, this wye was developed to connect to the South SR 152 Alternative, which approximately followed Avenue 22 or Avenue 21 alignments south of SR 152. Both the north and south wye legs would converge with the Merced to Fresno Section alternatives south of Chowchilla. After further study, it was determined that using the Avenue 21 alignment would minimize many impacts that would occur with Avenue 22, including conflicts with the Chowchilla Airport, the existing SR 99 interchange, paleontological findings in the area, and impacts on the community of Fairmead.

**C. SR 140/NORTH GEA WYE CONNECTION**

This wye would connect to the San Jose to Merced SR 140 Alternative located north of the GEA, which lies west of the Merced to Fresno Section study area. The alignment would approach the Merced to Fresno Section following SR 140 from the west, and would align with the Merced to Fresno Section alternatives near the City of Atwater. This wye was found to be impracticable because it would add as much as 5 minutes to the San Francisco to Los Angeles express route, be more expensive, and would result in approximately 8 miles of redundant rail track system-wide.

**D. SR 152 WYE CONNECTION**

This wye would connect to the San Jose to Merced Henry Miller/SR 152 Alternative, located in the median of SR 152, and would align with the Merced to Fresno Section alternatives near Chowchilla. Two scenarios were considered, one that uses the median of SR 152 for the HST alignment, and one that aligns the HST adjacent (to the north or south) to SR 152. The median of SR 152 is not consistently wide enough to provide for a median alignment, particularly near the City of Chowchilla where the divergence of the two tracks from the main alignments would require a four-track right-of-way for the HST. In addition, in all cases, the HST alignment would conflict with SR 152, the existing interchange with SR 99, and the north-south connection of the local roads to SR 152, all of which would lead to the complete reconstruction of a new SR152 or the addition of several highly complex interchanges, none of which currently exist.

**E. SOUTH GEA WYE CONNECTION**

This wye would nearly avoid the GEA by traveling south and along Avenue 10, which is between Madera and Fresno and generally north of and parallel to the Madera-Fresno county line and the San Joaquin River. This connection would add travel time to the San Jose to Sacramento route, and would add long out-of-direction travel to destinations in north San Joaquin Valley from the Bay Area. In addition, the alignment included nearly 20 additional miles of north-south HST tracks along I-5, resulting in more acres impacted, affecting sensitive ecosystems and agricultural lands.

**3.2.4 HMF Alternatives**

Figure 2 illustrates the location of the eight HMF alternatives originally analyzed in the Merced to Fresno Section. Most of the proposed HMF sites contain Prime, Unique, or Important farmlands except the Mission and Castle Commerce Center sites, which are characterized by predominantly industrial development.

**A. CASTLE COMMERCE CENTER**

The site is located 6 miles northwest of Merced, at the former Castle Air Force Base in northern unincorporated Merced County. The site would require 272 acres of 178 available acres for proposed site footprint requiring additional land. The site is adjacent to and on the east side of the BNSF mainline, 1.75 miles south of the UPRR mainline, off of Santa Fe Drive and Shuttle Road, 2.75 miles from existing SR 99 interchange. The site would require a spur track from the Merced Station and would not be central to the existing main line but would be central to the system-wide HST plan. Feasible alternative connections include UPRR/SR 99, BNSF, Western Madera, and the UPRR/BNSF Crossover and Hybrid Alternatives

**B. HARRIS-DEJAGER SITE**

The site is located north of Chowchilla adjacent to and on west side of the UPRR corridor, along S Vista Road, near SR 99 interchange under construction. HMF would require approximately 383 acres of the 1,243 acres available for the proposed site footprint. Feasible alternative connections include UPRR/SR 99 with Ave 21 Wye, and UPRR/BNSF Crossover Alternatives.

**C. FAGUNDES SITE**

The site is located 3 miles southwest of Chowchilla on north side of SR 152, between Road 11 and Road 12 and the site would require approximately 222 acres of 1,064 available acres for proposed site footprint. However, the site would require adjacent land beyond the proposal site due to the HMF site configuration needs. Feasible alternative connections include UPRR/SR 99 and BNSF with Ave 24 Wye, Hybrid, Western Madera, and UPRR/BNSF Crossover Alternatives.

**D. GORDON-SHAW SITE**

The site is adjacent to and on east side of the UPRR corridor from north of Berenda Blvd to Avenue 19. The site would require 306 acres of 472 available acres for proposed site footprint. The only feasible alternative connection is the UPRR/SR 99 Alternative with the Ave 24 Wye.

**E. KOJIMA DEVELOPMENT SITE**

The site is on the BNSF corridor east of Chowchilla, along Santa Fe Drive and Robertson Blvd (Avenue 26), on the west side of the BNSF corridor. The site would require 343 acres of 665 available acres for proposed site footprint. Feasible alternative connections include the BNSF and UPRR/BNSF Crossover alternatives.

**F. MISSION AVENUE SITE**

The site is located 3 miles southeast of Merced on the west side of SR-99 between East Gerard Avenue and East Mission Avenue and would be located on the west side of the UPRR mainline. Feasible alternative connections include UPRR/SR 99, BNSF, Hybrid, Western Madera, and the UPRR/BNSF Crossover Alternatives. The site would require 222 acres, but was not considered suitable due to access connections. For at grade track, the HMF access spur would extend into the city of Merced.

**G. HARRIS-KWAN SITE**

The site is located 1 mile northeast of Chowchilla, east of SR 99 and north of Avenue 27. The site would require 155 acres, but was not considered for further analysis. The site is only directly accessible from the UPRR/BNSF Crossover alternative and would require spur tracks of 5-miles for the other alternatives.

**H. HARRIS FARMS SITE**

The site is located 2 miles south of Chowchilla on north side of Avenue 22, between Road 16 and Road 17 ½. The site would require 155 acres but was not considered for further analysis because of the 5 mile spur track that would be required to allow access for all of the alternatives.

**3.3 Environmental Resources and Constraints**

A major purpose of Checkpoint B is to identify environmental resources and constraints that must be considered during the planning phases for the Merced to Fresno Section. Of particular importance are the environmental resources within the purview of USACE's Section 404 regulatory program. Natural and agricultural resources do not occur within the study areas for the stations. Attachment 2 (Summary Presentation of Environmental Resources and Constraints) provides detailed information regarding environmental resources and constraints that occur within the alignment and HMF alternatives. These data are summarized in Table 1 under Decision Rule #3 (Impacts on Aquatic Resources) and Decision Rule #4 (Environmental Effects) (see Attachment 3). At this stage of the evaluation, which uses existing available data and not preliminary field-verified data, these resources do not greatly differentiate among the alternatives. Key environmental differentiators are summarized below.

### 3.3.1 Three Station Location Alternatives

The primary difference among the stations is the degree of community impacts. The Castle Commerce Center could result in unplanned growth and unnecessary travel between the station and the Downtown Merced destination, resulting in indirect effects on community and natural resources. Also the station would require track farther north than the Merced station alternatives. The Merced Amtrak Station alternative would result in high disturbance of a potential historic neighborhood because of added traffic along residential streets due to the distance from major SR 99 access points, and does not include supportive land use. The Merced Transit station alternative is positioned closest to mixed use destinations, only affects underdeveloped industrial zones, and has few community impacts (senior housing center), which are easily relocated.

### 3.3.2 Five North- South Alignment Alternatives

Please refer to Attachment 2: the Annotated Slide Presentation that presents the Alternatives Analysis Processes. There are 3 primary themes that influence the alternatives to be carried forward:

1. Best representing the Project Purpose and Need and Project Objectives—Throughout its Tier 1 EIR/EIS processes, the Authority and FRA have identified as a key project objective to locate HST tracks adjacent to existing transportation corridors to the maximum extent feasible, as a way of minimizing environmental impacts. The Authority determined that the Western Madera Alternative least followed this commitment.
2. Design Criteria – Travel time, length of the new trackway to be built, number and degree of curvatures which require slower travel and higher long term maintenance. The UPRR/BNSF Crossover Alternative requires long distances of curvilinear out of direction travel (north of Chowchilla), resulting in additional travel time along the primary San Francisco to Los Angeles main line.
3. Environmental Impacts – While some design options were eliminated early based upon high residential impacts and community severance, the strongest determining factor was severance<sup>1</sup> of agricultural lands in areas where Prime agricultural lands are concentrated. Table 2 evaluates the alternatives for the north-south portion of the project, and provides an overview of the number of parcels that would be split by the alternative considered [also available in Attachment 4, the Section 404(b)(1) Alternatives Analysis Evaluation Tables. The table presents a range for some alternatives because they work with either the Ave 24 or Ave 21 Wye. There are other differences in environmental impacts for the various alternatives; however, they were not discriminating factors in the analysis of the alternatives. The BNSF Alternative (A1) with the Ave 24 Wye would result in a similar number of severed acres as the Western Madera (A3) Alternative, which would sever the greatest number of parcels. The UPRR/SR99 Crossover Alternative (A4) would result in the greatest acreage of severed parcels.

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<sup>1</sup> Farmland Severance: The HST alignment traverses agricultural land resulting in the severance of parcels. Some parcels are split into pieces that remain large enough to farm, while splitting of other parcels renders one or both of the pieces too small for continued farming.

**Table 2**  
 Agricultural Severance by Alternative

Alternative Considered	Number of Severed Parcels	Severed Parcel Acreage	Discussion
BNSF Alternative (A1)	57 to 85	5,456 to 7,523	This alignment was designed to follow a transportation corridor. Where this was not possible, USGS section lines were followed that best reflect the agricultural layout; therefore, the parcels can maintain the same irrigation drainage pattern and fewer oddly shaped parcels would result. The high range is due to the design options that travel around Le Grand, upon this community's request.
UPRR/SR 99 Alternative (A2)	8 to 27	463 to 2,942	The higher range is due to the design option traveling west around Chowchilla.
Western Madera Alternative (A3)	106	8,530	These parcels would be diagonally split where no existing infrastructure currently exists. The potential for indirect effects of additional transportation and utilities is great, resulting in large impacts on agricultural lands beyond the HST. Please note that this alternative severs the most individual agricultural parcels.
UPRR/BNSF Crossover Alternative (A4)	42	7,805	The crossover alignment includes large curvatures, which is poor for track maintenance, but also results in a high degree of awkwardly shaped parcels.
Hybrid Alternative	73	8,166	Like the BNSF, this alignment is designed to follow a transportation corridor. Where this was not possible, USGS section lines were followed that best reflect the agricultural layout. Also, 1,821 acres of the impacted parcels are due to the wye junction, which would also be needed by any of the other alternatives. Because this alternative uses the wye as its north-south alignment, it actually results in fewer total acres of impact than the other alternatives.

The actual acreages of impacts on aquatic resources do not appear to result in substantial differences among the north-south alignments. Refer to Attachment 3, the Aquatic Sites and Waters of the U.S. Potentially Affected by Merced to Fresno Section Alternatives Considered Technical Memorandum for more information. However, in discussion with regulatory agencies and trends in development, there appear to be qualitative differences that are noted briefly below.

- BNSF Alternative (A1) – This alternative follows a more rural alignment that contains one established and one planned mitigation bank (i.e., the Great Valley Conservation Bank and the proposed Lazy K Ranch Mitigation Bank, respectively). These are valuable for their vernal pool and grassland habitats. This alignment, if combined with the Ave 24 Wye, would include longest linear feet of stream crossings and highest impacts on acres of residential land uses.

- UPRR/SR 99 (A2) – This alternative, in combination with the wyes, would have the most stream crossings, but otherwise would generally lower impacts on aquatic resources (with the exception of the Hybrid Alternative). It does impact the highest acreage of industrial land uses and highest potential cultural sites because it travels through more community centers (Madera) than the other north-south alignments.
- Western Madera Alternative (A3) – This alternative appears to have low impacts on aquatic and other environmental factors; however, qualitatively it is not adjacent to existing transportation corridors and, therefore, results in high severance of farmlands in diagonal orientation and fragmentation of important wildlife movement corridors.
- UPRR/BNSF Crossover Alternative (A4) – Similar to the Western Madera Alternative, this alternative results in nonlinear severance and fragmentation of resources, including severance of agricultural lands.
- Hybrid Alternative – This alternative combines the benefits of the UPRR/SR 99 and the BNSF alternatives. It travels along existing transportation corridors to avoid fragmentation, but also avoids Le Grand, Chowchilla, and Madera community impacts.

### 3.3.3 East-West Wye Connections

#### A. HENRY MILLER/AVE 24 WYE CONNECTION

This wye connection has been refined to reduce the amount of curvatures to minimize the disturbance of agricultural lands. Although it does travel within the general boundary of the GEA, it would travel along Henry Miller Road. Lands adjacent to Henry Miller Road are primarily agricultural and, therefore, the impacts would result in almost no ecological effects.

#### B. SOUTH SR152 WYE CONNECTION

The wye travels along the same east-west alignment as the Henry Miller/Ave 24 wye, but shifts south upon exiting the general boundary of the GEA to follow along Avenue 21. As described above, the Avenue 21 alignment would minimize many impacts that would occur with Avenue 22, including conflicts with the Chowchilla Airport, the existing SR 99 interchange, paleontological findings in the area, and impacts on the community of Fairmead. Although this wye connection does travel within the general boundary of the GEA, it would follow an existing roadway to minimize further fragmenting the ecosystem. Additionally, the County of Madera is considering vacating Avenue 21 to further minimize the impacts on adjacent farmlands.

#### C. SR 140/NORTH GEA WYE CONNECTION

While this wye connection attempts to avoid traveling within the general boundary of the GEA, by doing so it would result in large community impacts primarily in the City of Atwater and biological impacts that resemble the same ecological values that the GEA is trying to protect. The extra miles of rail track would result in a high number of acres of impact on biologically sensitive resources, grasslands and wetlands, in addition to important farmlands.

#### D. SR152 Wye Connection

This wye would result in high impacts on farmlands and extraordinary costs for widening SR 152.

#### E. SOUTH GEA WYE CONNECTION

This alternative would cause significant impacts on wildlife resources. The extra miles of rail track would result in a high number of acres of impact on biologically sensitive resources, grasslands and wetlands, in addition to important farmlands.

### 3.3.4 Heavy Maintenance Facility Proposed Sites

For the HMF proposed sites, design criteria, environmental characteristics, and economic incentives were evaluated. Environmental data did not distinguish between the sites. Several of the properties are near streams, but the position of the facilities would, in all cases, be over 100-feet away.

Based on considerations of logistics and cost, three of the eight proposed HMF sites in the Merced to Fresno Section were found to be impracticable, the reasons for which are outlined below. The remaining alternative HMF sites (Castle Commerce Center, Harris-DeJager, Fagundes, Gordon-Shaw, and Kojima Development) are proposed adjacent to one of the proposed north-south or east-west alignments and do not have logistical or cost issues that would render them impracticable. Although the Castle Commerce Center Cite site would require a spur track from the Merced Station and would not be central to the existing main line it would be central within the systemwide HST plan. As result, it is considered practicable.

- Merced Mission – Located 3 miles southeast of Merced on the west side of SR 99 between East Gerard Avenue and East Mission Avenue. This site is not suitable for yard-track turnouts because the access requirements of an at-grade alignment would require access tracks that would encroach into downtown Merced where there is inadequate right of way available. the site is also located entirely within a 100-year floodplain and includes residential lands and a church.
- Harris-Kwan – Located 1 mile northeast of Chowchilla, east of SR 99 and north of Avenue 27. This site would not be directly accessible from any HST alignment. Access would require constructing as much as 5 miles of extra rail for a spur track for all of the alternatives except the UPRR/BNSF Crossover alternative. This site also contains emergent wetlands.
- Harris Farms – Located 2 miles south of Chowchilla on the north side of Avenue 22 between Road 16 and Road 17½. This site would not be directly accessible from any HST alignment. Access would require constructing as much as 5 miles of extra rail for a spur track.

## 3.4 Community Support

The analysis began with the corridors selected at the conclusion of the 2005 Statewide Program EIR/EIS process (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008). Four primary alternatives were considered in the initial review of alternatives for the Merced to Fresno Section. These included the two preferred alternatives identified in the Program EIR/EIS documents—a route parallel to the BNSF and a route parallel to the UPRR. In addition, the analysis included consideration of two alternatives suggested during the scoping process described above—the Sierra Foothills Alternative parallel to SR 99 and the Western Madera Alternative that would avoid Chowchilla and Madera. The alternatives analysis process also included the study of wye alternatives connecting the Merced to Fresno Section to the Bay Area suggested by the City of Chowchilla and Madera County—one north of SR 152 and a new alternative wye south of SR 152. Based on public and agency comments during scoping, various design options to the main north-south alternatives and three station options were considered.

Public and agency comments received during the Merced to Fresno Project EIR/EIS scoping period and during ongoing interagency coordination meetings helped to identify the initial alternatives to carry forward for detailed evaluation. After initial project alternatives were identified, alignment plans, preliminary profile concepts, and cross-sections were developed and used for this detailed evaluation of the alternatives.

Public and agency input on issues to be studied, city and county land use and planning information, and input on the range of alternatives provided valuable information to assist in evaluating the alternatives. After the initial review of these alternatives, a series of Technical Working Group (TWG) meetings was held to review results and gather input. An additional alternative suggested by the City of Chowchilla and Merced County through the TWG meeting process described below was included. This alternative would

travel along the UPRR and SR 99 corridors and diverge to the east north of the City of Chowchilla, joining the alternative along the BNSF near Le Grand and continuing along the BNSF Alternative to the proposed Downtown Fresno Station. Other agency comments resulted in adjustments to alignments and profiles of the alternatives to avoid and minimize environmental and community impacts.

### **3.4.1 Public Information Meetings and Materials during the Alternatives Analysis Process**

Public information meetings were held during EIR/EIS development to inform the public about the Merced to Fresno Section alternatives analysis recommendations. The *Preliminary Alternatives Analysis Report, Merced to Fresno Section High-Speed Train Project EIR/EIS* (Authority and FRA 2010b) (see Attachment 4) was prepared to provide information to the public and stakeholders regarding the alternatives analysis process, the initial range of alternatives considered, and the criteria for evaluating those alternatives. Detailed information boards about the alternatives analysis process were also displayed at public meetings and scoping meetings. In addition to the TWG and public information meetings, another element of the outreach has been to provide updates and presentations to clubs, organizations, farm bureaus, and business owners, as well as to the cities and counties of Merced and Madera, to facilitate an inclusive and transparent process. Common comments included concern about impacts on agricultural fields, effects on community resources, and desires for changes in alignments. Coordination with the San Jose to Merced HST Section led to a review of additional wye connections to that section's alternatives and resulted in preparation of the *Supplemental Alternatives Analysis Report, Merced to Fresno Section High-Speed Train Project EIR/EIS* (Authority and FRA 2010c) (see Attachment 5).

### **3.4.2 Technical Working Group Meetings during the Alternatives Analysis Process**

Beginning before project scoping, in 2008, the Authority formed an agency TWG composed of senior staff from county and city public works and planning departments, redevelopment agencies, and economic development agencies. The purpose of these groups is to facilitate the exchange of information and ideas during the course of the study. The Authority has met with the TWGs at quarterly and/or at major project milestones throughout project development and analysis for approximately six sets of meeting. Other individual city and county meetings are held to provide project develop input.

After the scoping period ended, the initial range of alternatives was developed. In June 2009, the Merced to Fresno HST Section alternatives were presented to the TWG in Merced, Madera, and Fresno. The TWG provided input on the alternatives and information about city and county land use and transportation and other planning projects, as well as providing updates to their boards or councils.

Following the initial review of alternatives, the project team met with the TWG in Merced and Madera to review the initial range of alternatives and receive more detailed information about transportation and land use development patterns that could be affected by the alternatives. The meeting included additional representatives from the Madera Irrigation District and Chowchilla Water District. The TWG members offered insights about important community features, proposed and additional infrastructure plans, and existing utilities. These insights resulted in adjustments in the position of the alignments and the profile of the alternatives to avoid and minimize impacts on community resources.

Once the preliminary alternatives analysis findings were available, the results and findings were communicated to the TWG, the public, and the Authority board members in December 2009.

### **3.4.3 Environmental Resource Agency Meetings during the Alternatives Analysis Process**

Six sets of meetings in Merced and Madera were held with the Environmental Agency TWG for the Merced to Fresno Section and the San Jose to Merced Section to provide an overview and review of the

alternatives analysis process and to present recommendations. Primary feedback included information about subsequent environmental permitting processes, site-specific knowledge, and interest in carrying more than one HST alternative through the EIR/EIS.

## **A. SUMMARY OF SUPPORT FROM INPUT**

### **Stations**

The Merced Transit Center has the strongest support from City of Merced. Other stations are not well supported.

### **North-South Alignments Combined with East-West Wye Connections**

The BNSF Alternative also has generally strong support from Merced and Madera City and County entities. For the wye connections, there is more support for the Ave 21 Wye connection over the Ave 24 from the farming community.

The UPRR/SR 99 Alternative generally has strong support from stakeholders. The cities of Chowchilla and Madera, however, have expressed concerns about the UPRR/SR 99 Alternative, particularly because the alignment would travel through the cities and would have impacts on community cohesion and land uses. Chowchilla also has expressed resistance to the wye connection to this alternative because the north-south alignment and the wye would surround Chowchilla with HST track. The West Chowchilla design option was developed to address this concern. If the north-south alignment were to follow the wye legs, it would eliminate track through Chowchilla and the alternative would no longer surround Chowchilla on all sides. Chowchilla has not responded to this design option, but the farming community has expressed strong concerns over the Ave 24 Wye.

The Western Madera Alternative met with considerable resistance from the City and County of Merced, the County of Madera, and members of the agricultural community in the Central Valley. The alternative's deviation from existing transportation corridors in Madera County would result in significant impacts on private properties, agricultural properties, and important farmlands. The significant level of impacts is a result of the orientation of the HST and UPRR/SR 99 alignment in relation to the surrounding transportation network. The Western Madera Alternative parallels the diagonal direction of the UPRR/SR 99 corridor in order to provide a more direct route between the Downtown Merced and Downtown Fresno HST stations. The alternative affects a large amount of prime, unique, and important farmlands, which are oriented north-south. The alignment would also bifurcate farmlands, severing numerous farm operations in the area.

The early UPRR/BNSF Crossover Alternative did not meet with as much community and political resistance as did the Western Madera Alternative, but it did not have strong support either. Unlike the Hybrid Alternative recommended to be carried forward into the EIR/EIS, the UPRR/BNSF Crossover Alternative does not take advantage of a required wye connection. Instead, it deviates from existing transportation corridors requiring the wye connection to follow a large northward curve around Chowchilla to link up to the BNSF in a southbound direction. The northward curve severs agricultural lands.

The Hybrid Alternative was developed to take advantage of the West Chowchilla design option and the Ave 24 Wye connection to the BNSF Alternative. By following the wye legs connecting the UPRR/SR 99 Alternative to the San Jose to Merced Section, and then continuing to follow the wye leg to the BNSF Alternative, the Hybrid Alternative takes advantage of necessary wye connections and also avoids four communities that are adjacent to the other alternatives, including Le Grand, Chowchilla, Fairmead, and Madera. Community and political support for the Hybrid Alternative is mixed, with continued concern about impacts on farmlands.

## 4.0 Conclusions

After considering all the information in this Checkpoint B package, several conclusions may be drawn for the Merced to Fresno Section:

- The Merced Transit Station alternative best meets the project purpose for connecting with the metropolitan areas with least community impacts.
- The Sierra Foothills Alternative does not meet the project purpose. The BNSF Alternative (A1), Western Madera (A3), and BNSF/UPRR Crossover (A4) alternatives would result in the greatest number of acres of severed farmlands.
- The BNSF Alternative (A1) would maximize use of existing transportation corridors, although there are areas of deviation in order to minimize community impacts in Merced County. This alternative was identified as the “preferred alternative” by the Authority and the FRA in the 2005 Final Statewide Program EIR/EIS. However, it would not perform as well as the UPRR/SR 99 Alternative (A2) or Hybrid Alternative in terms of travel-time and impacts on the biological resources and agricultural lands (both in terms of numbers and acres of severed parcels).
- The UPRR/SR 99 Alternative (A2) would meet the objective of staying adjacent to existing transportation corridors, while optimizing travel time and minimizing environmental impacts. The Ave 24 Wye option could be used in combination with the West of Chowchilla design option to avoid community impacts on Chowchilla without adding too much travel time and to eliminate 10 miles of track.
- The Hybrid Alternative would take advantage of track necessary to fulfill either the UPRR/SR 99 or BNSF alternatives (via the Ave 24 Wye) and would reduce community impacts on Chowchilla, Madera, along the UPRR/SR 99 Alternative, and Le Grand along the BNSF Alternative, while also minimizing impacts on sensitive habitats. It follows the transportation corridors at least as well as the other alternatives, while minimizing impacts on known environmental resources. It is shorter than the BNSF Alternative and slightly longer than the UPRR/SR 99 Alternative, but it also has a larger proportion of at-grade profile than more costly elevated profile (near Le Grand and through Chowchilla). With respect to agricultural impacts, it performs better than the BNSF Alternative (A1) and not as well as the UPRR/SR99 Alternative (A2) for both number and acres of severed parcels.
- The North GEA, South GEA, and SR 152 wye connections are not as practicable or present significantly greater effects on environmental factors over the Ave 24 Wye and Ave 21 Wye alternatives east-west alignments.
- The Castle Commerce Center, Harris-DeJager, Fagundes, Gordon-Shaw, and Kojima Development HMF sites are proposed to be adjacent to one of the proposed north-south or east-west alignments, do not have logistical or costly constraints, and also do not pose other substantial environmental impacts on aquatic or other environmental factors outside of converting farmlands to industrial use.
- The Merced Mission, Harris, and Harris-Kwan HMF sites are either impracticable or contain environmental factors that do not make them viable alternative sites.

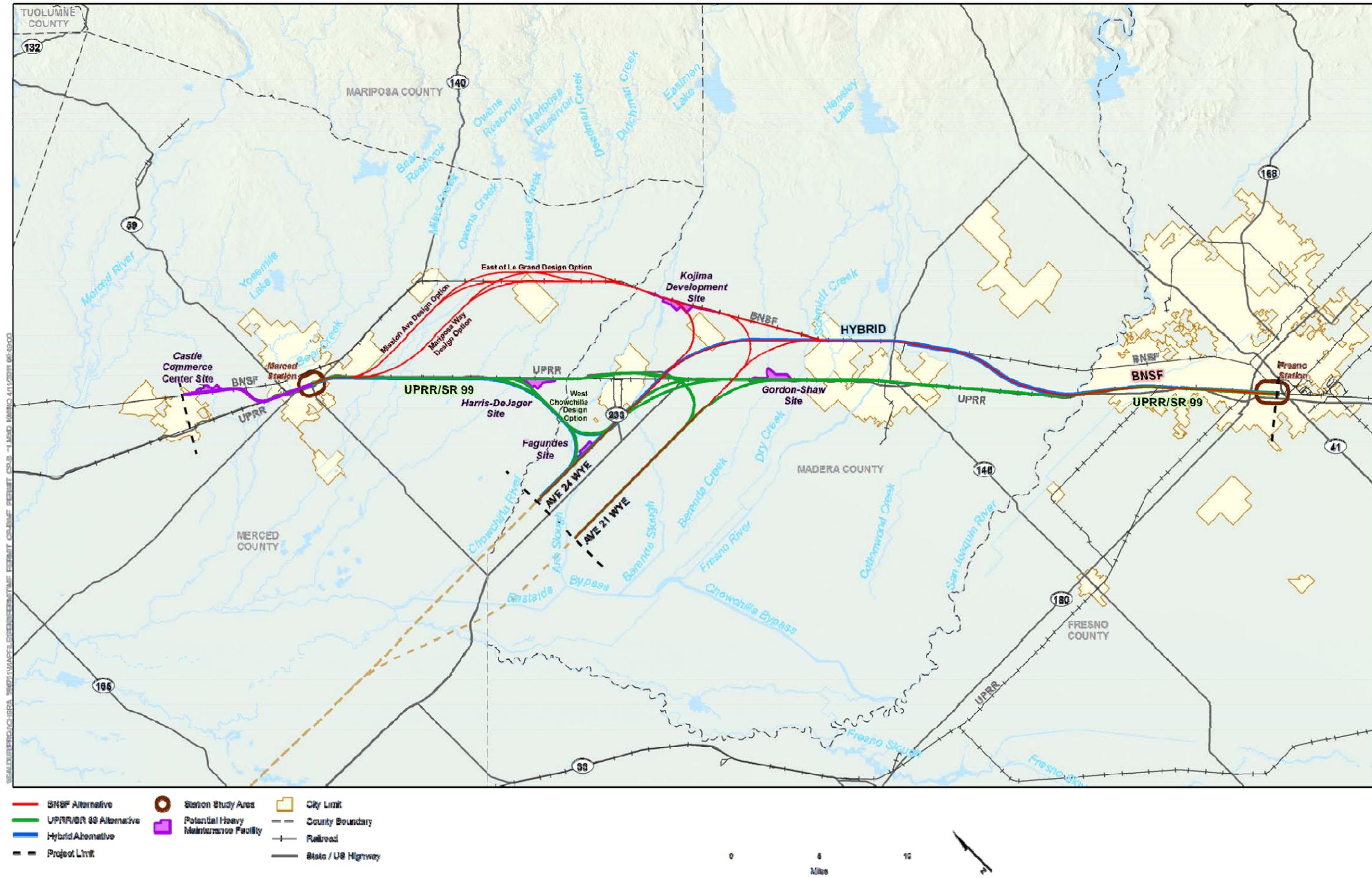
## 5.0 Selection of Alternatives to be Carried Forward

Based on planning efforts to date, the Authority and FRA propose to carry forward the following alternatives for further study in the Merced to Fresno Section HST Project EIR/EIS (see Figure 5):

- Merced Station: Merced Transit Center

- Three alignment alternatives:
  - ✓ UPRR/SR 99 Alternative with design options east and west of Chowchilla and with design options for the wye (Ave 24 Wye or Ave 21 Wye)
  - ✓ BNSF Alternative with design options between Merced and Le Grand and with design options for the wye (Ave 24 Wye or Ave 21 Wye)
  - ✓ Hybrid Alternative
- Five alternative sites for the HMF:
  - ✓ Castle Commerce Center
  - ✓ Harris-DeJager
  - ✓ Fagundes
  - ✓ Gordon-Shaw
  - ✓ Kojima Development





**Figure 5**  
 HST Alternatives and HMF Sites Recommended to be Carried Forward



## 6.0 References

California High-Speed Rail Authority (Authority), Federal Rail Authority (FRA), Federal Highway Administration, Federal Transit Administration, U.S. Army Corps of Engineers (USACE), and U.S. Environmental Protection Agency (EPA). 2003. *Federal Agency Memorandum of Understanding for the California High-Speed Train Program EIR/EIS – Tier 1*. April 2003.

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California High-Speed Rail Authority (Authority), Federal Rail Authority (FRA), U.S. Army Corps of Engineers (USACE), and U.S. Environmental Protection Agency (EPA). 2010. *Memorandum of Understanding for the Integration Process for the California High-Speed Train Program – Tier 2*. November 2003.



APPENDIX A

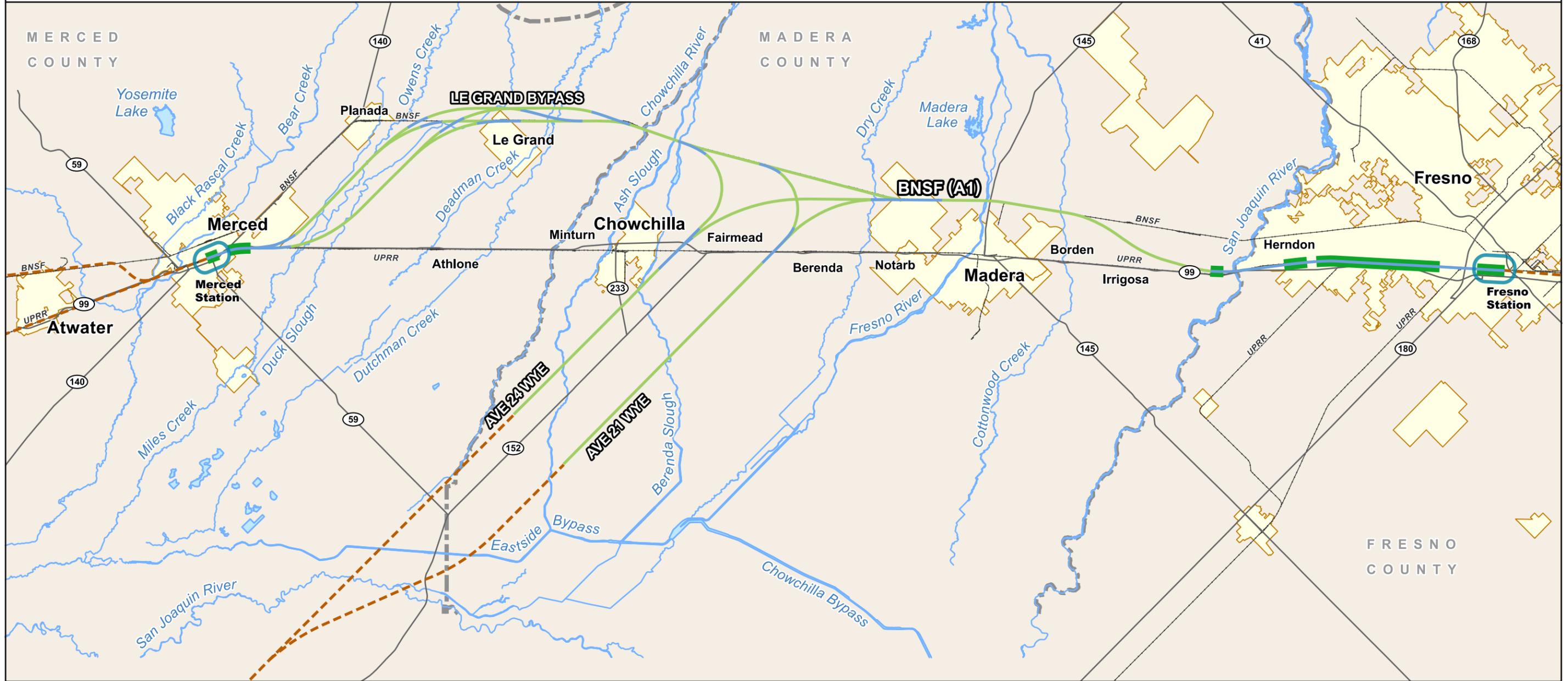
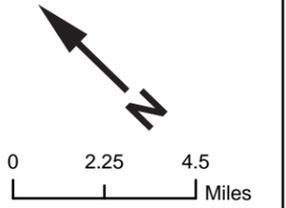
# **Merced and Fresno Section - Profile Changes from Elevated to At-grade**

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As discussed in the Summary Report, the Authority worked with the communities of Merced and Fresno to reduce HST impacts by changing the profile from elevated to at-grade. The following maps show the locations where the elevated profile has become an at-grade profile in areas within Merced and Fresno and other areas outside the city limits for each of the three alternatives: BNSF (A1), UPRR/SR 99 (A2), and the Hybrid alternatives. Not only does this reduce the impacts of noise and visual intrusion, but these changes result in benefits to the city by grade separating some existing at-grade roadway crossings over the UPRR tracks.

**Legend**

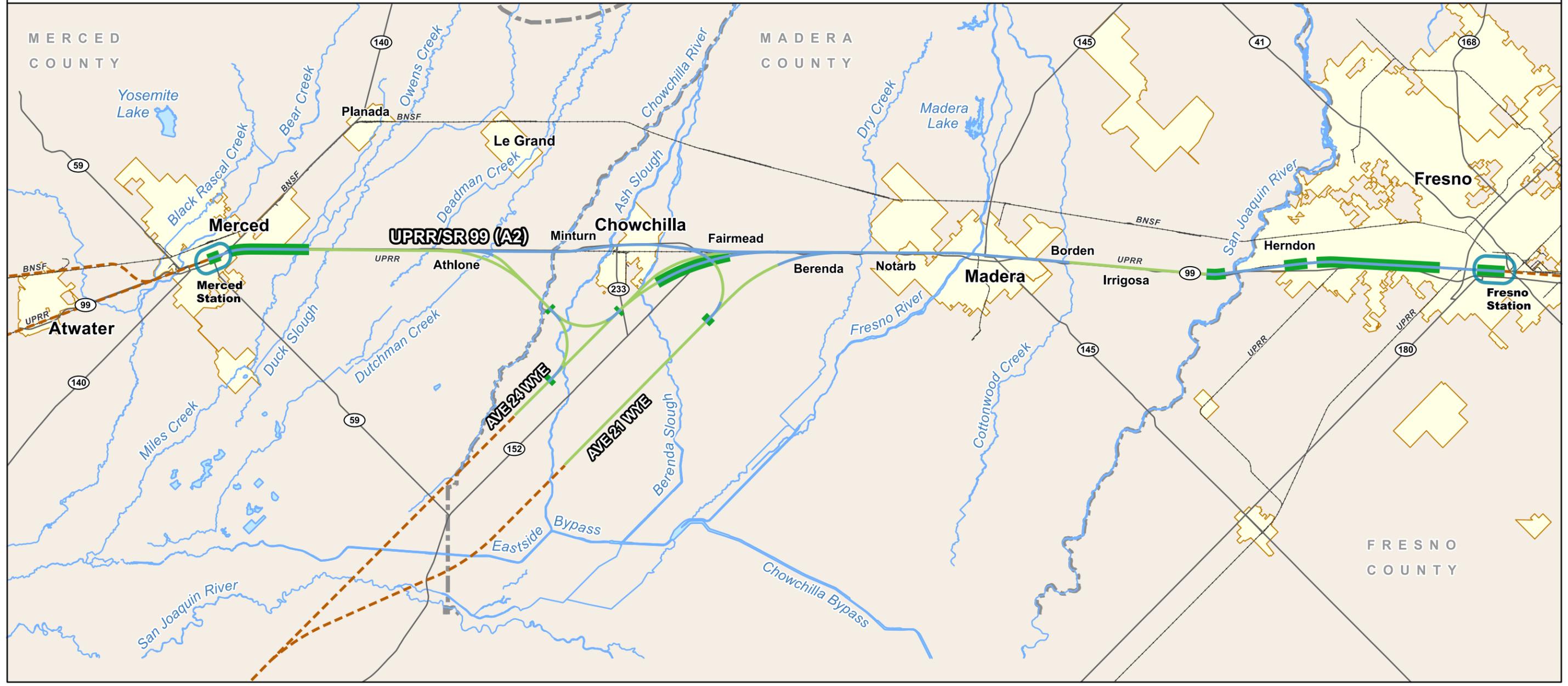
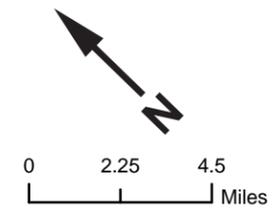
- Previous At-Grade
- Previous Elevated
- Revised Elevated to At-Grade
- Other HST Project Section
- Potential Station
- County Boundary
- City Limits





**Legend**

- Previous At-Grade
- Previous Elevated
- Revised Elevated to At-Grade
- Other HST Project Section
- Potential Station
- County Boundary
- City Limits





**Legend**

- Previous At-Grade
- Previous Elevated
- Revised Elevated to At-Grade
- Other HST Project Section
- Potential Station
- County Boundary
- City Limits

