

	Union Pacific Railroad (UPRR)			
	Colton Line	Riverside/Colton Line	Colton Line to San Bernardino	Riverside/Colton/San Bernardino
<p>Biological Resources Including Wetlands: Ac (ha) of wetland and ac (ha) of special-status species habitat within potential impact study areas</p>	<p>Wetlands: NA⁸⁷ Species:⁸⁸ 5 Habitat: 66 ac (27 ha) Traverses mostly developed urban areas. Due to existing development, there are few wetlands and wildlife resources present along the proposed alignment. Therefore, potential for impacts would be limited.</p>	<p>Wetlands: NA Species: 4 Habitat: 65 ac (26 ha) Traverses mostly developed urban areas. Due to existing development, there are few wetlands and wildlife resources present along the proposed alignment. Therefore, the potential for impacts would be limited.</p>	<p>Wetlands: NA Species: 4 Habitat: 119 ac (48 ha) Traverses mostly developed urban areas. Due to existing development, there are few wetlands and wildlife resources present along the proposed alignment. Therefore, the potential for impacts would be limited.</p>	<p>Wetlands: NA Species: 3 Habitat: 118 ac (48 ha) Traverses mostly developed urban areas. Due to existing development, there are few wetlands and wildlife resources present along the proposed alignment. Therefore the potential for impacts would be limited.</p>
<p>Section 4(f) and 6(f) Resources:⁸⁹ Number of resources rated high (potential direct effects)</p>	<p>Resources rated high: 7 Alignment would be along or adjacent to existing right-of-way and could potentially impact local parks.</p>	<p>Resources rated high: 9 Alignment would be along or adjacent to existing right-of-way and could potentially impact local parks.</p>	<p>Resources rated high: 9 Alignment would be along or adjacent to existing right-of-way and could potentially impact local parks.</p>	<p>Resources rated high: 11 Alignment would be along or adjacent to existing right-of-way and could potentially impact local parks.</p>

⁸⁷ The comparison of potential impacts to wetland resources is not relevant due to limited wetlands data in this region, particularly in the Soledad Canyon area. Hydrologic information regarding potential impacts to streams and lakes is used as a indication of the potential for impacts to wetland resources for this area.

⁸⁸ The study area is defined as a total of 50 feet (25 feet on each side of alignment centerline), per representative impact analysis.

⁸⁹ The 4(f) and 6(f) resources study area is defined as 900 ft (274m) on each side of the alignment centerline.

6.5.2 March Air Reserve Base to Mira Mesa Alignment Options

All information presented is for the area from March ARB to Mira Mesa. This segment is shown in Figure 6.5-2.

I-215/I-15	
Physical/Operational Characteristics	
Alignment Description	The I-215/I-15 alignment would begin at March ARB and follow the existing I-215 and then I-15 corridor to Mira Mesa. The majority of the alignment would follow or be adjacent to the existing transportation corridor. Station options considered in this segment include March ARB (cost not included), Temecula/Murrietta, and Escondido (I-15 or Escondido Transit Center).
Length in miles (km)	73 mi (117 km)
Cost (dollars)	\$3.97 billion (with I-15 Escondido station) \$4.89 billion (with Escondido Transit Center station)
Travel Time (min)	32 min
Ridership	This alignment would serve the I-15 corridor well, regardless of which Escondido station option were chosen.
Constructability	Substantial earthwork along this alignment could require additional right-of-way or extensive retaining walls. Existing traffic flow would need to be maintained during construction.
Operational Issues	Average speed: 153–215 mph (246–346 kph) Maximum speed: 186–217 mph (299–349 kph) This alignment is relatively straight and flat through undeveloped land and rural/suburban communities, thus allowing for operating speeds over 200 mph (322 kph).
Potential Environmental Impacts	
Travel Conditions	No rail corridor exists between March ARB and Mira Mesa. This alignment would provide options to increase accessibility, connectivity, and capacity to major suburban areas of Los Angeles and San Diego.
Noise and Vibration:⁹⁰ High, medium, and low potential impacts	Low to medium potential impacts. There would be low potential impacts between March ARB and Escondido, and medium potential impacts (from the Escondido Transit Center alignment and station option) between Escondido and Mira Mesa. This is largely due to the larger population south of Escondido compared to north of Escondido.

⁹⁰ Generally, vibration is not a significant impact. However, sensitive and specific areas, such as historical structures and special habitats, could be affected.

**Figure 6.5-2
March ARB to Mira Mesa Alignment and Potential Station Options**



I-215/I-15	
Land Use and Planning, Communities and Neighborhoods, Property, and Environmental Justice	<p>Compatible.</p> <p>Environmental Justice: Low potential minority population impacts.</p> <p>Community: Low potential impacts.</p> <p>Property: Low potential impacts.</p> <p>Since this area is largely undeveloped, this alignment would have few potential land use impacts.</p>
Cultural Resources and Paleontological Resources: ⁹¹ Potential presence of historical resources in area of potential effect	<p>High potential impacts. March ARB to Mira Mesa has high potential for archeological resources. The mountainous terrain just south of Temecula is considered to contain important traditional tribal cultural areas.</p>
Hydrology and Water Resources: Potential impacts and associated ac (ha) of floodplains, and linear ft (m) of streams within potential impact study areas, ac (ha) lakes/other water bodies within study areas.	<p>Floodplains:⁹² 112 ac (45 ha)</p> <p>Streams:⁹³ 650-1,050 linear ft (198-320 linear m)</p> <p>Lakes: 0.7-2.1 ac (0.3-0.8 ha)</p> <p>Most of the potential impacts on streams and floodplains could be mitigated through typical engineering solutions.</p>
Biological Resources Including Wetlands: Ac (ha) of wetlands, ac (ha) of special-status species habitat within potential impact study areas, and linear ft (m) of non-wetland waters (waters)	<p>Wetlands: 1.3-2.8 ac (0.5-1.1 ha)</p> <p>Species: 11</p> <p>Habitat: 104-106 ac (42-43 ha)</p> <p>Wildlife species potentially impacted include 15 sensitive species. March ARB to Escondido would result in potential impacts to jurisdictional waters.</p>

⁹¹ The archaeological area of potential effect is defined as 500 ft (152 m) on each side of the alignment centerline for new routes requiring additional right-of-way, and 100 ft (30 m) on each side of the centerline for routes along existing highways and railroads, where very little additional right-of-way would be required. The study area for paleontological resources is defined as 100 ft (30 m) on each side of alignment centerline.

⁹² The study area is defined as 100 ft (30 m) on each side of the alignment centerline.

⁹³ The study area is defined as a total of 50 feet (25 feet on each side of alignment centerline), per representative impact analysis.

I-215/I-15	
Section 4(f) and 6(f) Resources: ⁹⁴ Number of resources rated high (potential direct effects)	<p>Resources rated high: 15–16, depending on station option at Escondido</p> <p>The parks in this region are primarily unnamed local parks with recreational uses stretching the length of the corridor.</p>

⁹⁴ The 4(f) and 6(f) resources study area is defined as 900 ft (274m) on each side of the alignment centerline.

6.5.3 Mira Mesa to San Diego Alignment Options

All information presented is for the area from Mira Mesa to San Diego. This segment is shown in Figure 6.5-3.

Carroll Canyon		Miramar Road	I-15 to Qualcomm Stadium
Physical/Operational Characteristics			
Alignment Description	Undeveloped land and parkland comprise a considerable share of land use. The alignment follows an existing transportation corridor. The corridor traverses Carroll Canyon from Mira Mesa to the University City Station, connects to LOSSAN corridor, and terminates in downtown San Diego. The alignment is next to the north side of the Miramar Naval Air Station (NAS). Station options considered in this segment include University City, San Diego Airport, and downtown San Diego.	Undeveloped land and parkland comprise a considerable share of land use. The alignment follows an existing transportation corridor. The Miramar Road alignment would provide the most direct route from Mira Mesa along Miramar Road to University City Amtrak Station, connect to LOSSAN corridor, and terminate in downtown San Diego. The alignment is adjacent to the north side of the Miramar Naval Air Station (NAS). Station options considered in this segment include Mira Mesa, University City, and downtown San Diego.	Undeveloped land and parkland comprise a considerable share of land use. The alignment follows the I-15 alignment to Qualcomm Stadium. This alignment, along with the existing I-15 corridor, would bisect the Miramar NAS. Station options considered in this segment include Mira Mesa and Qualcomm.
Length in miles (km)	19 mi (31 km)	19 mi (31 km)	9 mi (14 km)
Cost (dollars)	\$1.42 billion	\$1.35 billion	\$1.28 billion
Travel Time (min)	14 min	14 min	7 min
Ridership	Would provide direct service to downtown San Diego and have higher potential for commute ridership than I-15 to Qualcomm option.	Would provide most direct service to downtown San Diego and have higher potential for commute ridership than I-15 to Qualcomm option.	Would provide highest potential for intercity ridership. The low-end ridership analysis estimates 350,000 more intercity passengers for this option than the downtown options by 2020. Would not provide direct service to downtown San Diego but would provide the shortest travel time to the greater San Diego area. The station location would be an 8-mi (13-km) drive or 10-mi (16-km) (20-min) ride on light-rail transit (LRT) to the city center.

**Figure 6.5-3
Mira Mesa to San Diego Alignment and Potential Station Options**



	Carroll Canyon	Miramar Road	I-15 to Qualcomm Stadium
Constructability	This alignment would require construction in a sensitive and remote area, and along the heavily constrained LOSSAN rail corridor as it enters San Diego from the north. Existing rail services would need to be maintained during construction.	This alignment would require construction in a densely suburban area, along an existing roadway, and along the heavily constrained LOSSAN rail corridor as it enters San Diego from the north. Existing traffic and rail services would need to be maintained during construction.	This alignment would require substantial earthwork and additional right-of-way or extensive retaining walls. Existing traffic flow would need to be maintained during construction. This alignment would be the shortest to be constructed relative to other alignment options.
Operational Issues	Average speed: 84 mph (135 kph) Maximum speed: 124–155 mph (200–249 kph)	Average speed: 84 mph (135 kph) Maximum speed: 124–155 (200–249 kph)	Average speed: 77 mph (124 kph) Maximum speed: 124–155 (200–249 kph)
Potential Environmental Impacts			
Travel Conditions	The Carroll Canyon alignment and the Miramar Road alignment would directly serve downtown San Diego. The Carroll Canyon alignment option provides an alternative to the potential Mira Mesa station at University City. The Carroll Canyon and Miramar Road alignment options would provide considerably shorter travel times to downtown San Diego than the I-15 to Qualcomm Stadium alignment (including alternative travel from Qualcomm to downtown).		The I-15 to Qualcomm alignment would have the shortest line-haul times (about 7 min less than the two options to downtown San Diego), but would not directly serve downtown San Diego. The in-train travel time for the light-rail between Qualcomm and the downtown San Diego Santa Fe Depot is more than 20 min.
Land Use and Planning, Communities and Neighborhoods, Property, and Environmental Justice	Moderately compatible (alignment would follow existing transportation corridor, therefore reducing potential impacts). Environmental Justice: Low potential minority population impacts. Community: Low potential impacts. Property: Medium potential impacts. Carroll Canyon option would pass well to the north of Miramar NAS, thereby avoiding potential impacts.	Moderately compatible (alignment would follow existing transportation corridor, therefore reducing potential impacts). Environmental Justice: Low potential minority population impacts. Community: Low potential impacts. Property: Low potential impacts. This alignment is directly adjacent to Miramar NAS on an aerial structure.	Moderately compatible (alignment would follow existing transportation corridor, therefore reducing potential impacts). Environmental Justice: Low potential minority population impacts. Community: Low potential impacts. Property: Low potential impacts. This alignment bisects Miramar NAS along the I-15 corridor, but it is assumed to be in tunnel throughout Miramar NAS.

	Carroll Canyon	Miramar Road	I-15 to Qualcomm Stadium
Aesthetics and Visual Resources	<p>High potential impacts.</p> <p>At-grade route would cut through a residential neighborhood and an open space area. Elevated structures would also pass through a city center area and directly in front of high-rise residences, adversely affecting views and creating the potential for impacts.</p>	<p>High potential impacts.</p> <p>Elevated structure would be visible from residential neighborhoods and Balboa Park, creating moderate to high levels of visual contrast. Elevated structures would also pass through a city center area and directly in front of high-rise residences, adversely affecting views and creating the potential for impacts.</p>	<p>Low potential impacts.</p> <p>There are few aesthetic and visual resources along the I-15 corridor.</p>
Cultural Resources and Paleontological Resources:⁹⁵ Potential presence of historical resources in area of potential effect	<p>High potential impacts.</p> <p>High potential for historical resources through downtown San Diego.</p>	<p>High potential impacts.</p> <p>High potential for historical resources through downtown San Diego.</p>	<p>Low potential impacts.</p> <p>Low potential for historical resources.</p>
Hydrology and Water Resources: Potential impacts and associated ac (ha) of floodplains, and linear ft (m) of streams within potential impact study areas, ac (ha) lakes/other water bodies within study areas.	<p>Floodplains:⁹⁶ 162 ac (66 ha) Streams:⁹⁷ 100 linear ft (30 m) Lakes: 0 ac (0 ha)</p> <p>Carroll Canyon would have the lowest potential impacts on streams, but the highest on floodplains. The Miramar corridor crosses several flood-prone areas and has several streams feeding the area.</p>	<p>Floodplains: 130 ac (53 ha) Streams: 600 linear ft (183 m) Lakes: 0 ac (0 ha)</p> <p>Miramar Road would have similar potential impacts as the Carroll Canyon alignment. The Miramar corridor runs within several flood-prone areas and has several streams feeding the area.</p>	<p>Floodplains: 40 ac (16 ha) Streams: 250 linear ft (76 m) Lakes: 0.3 ac (0.1 ha)</p> <p>The I-15 option would have potential impacts on streams. The I-15 corridor is considered a flood-prone area and has several streams feeding the area.</p>

⁹⁵ The archaeological area of potential effect is defined as 500 ft (152 m) on each side of the alignment centerline for new routes requiring additional right-of-way, and 100 ft (30 m) on each side of the centerline for routes along existing highways and railroads, where very little additional right-of-way would be required. The study area for paleontological resources is defined as 100 ft (30 m) on each side of alignment centerline.

⁹⁶ The study area is defined as 100 ft (30 m) on each side of the alignment centerline.

⁹⁷ The study area is defined as a total of 50 feet (25 feet on each side of alignment centerline), per representative impact analysis.

	Carroll Canyon	Miramar Road	I-15 to Qualcomm Stadium
<p>Biological Resources Including Wetlands: Ac (ha) of wetland and ac (ha) of special-status species habitat within potential impact study areas</p>	<p>Wetlands:⁹⁸ 2.5 ac (1 ha) Habitat: 40 ac (16 ha) Species: 10</p> <p>Characterized by a predominance of southern riparian scrub and potential encounters with more non-wetland waters (as a result of the canyon alignment) than the other two alignment options. Wetlands would be dominated by estuarine wetlands along the coast, with a greater amount of vernal pool wetlands than the Miramar Road alignment. This alignment would be expected to result in potential impacts on wildlife habitat and movement corridors, as well as to encounter threatened and endangered species and species of special concern.</p>	<p>Wetlands: 0.9 ac (0.4 ha) Habitat: 34 ac (14 ha) Species: 6</p> <p>Characterized by a predominance of mixed chaparral and southern riparian scrub and a potential encounter with a substantial amount of non-wetland waters. Wetlands would be dominated by estuarine areas along the coast, with some vernal pool wetlands in the interior portion of the segment. The Los Peñasquitos Canyon Preserve near Miramar NAS is a considerable regional wildlife and linkage corridor that might also be potentially impacted. This alignment would be expected to result in potential impacts on wildlife habitat and movement corridors, as well as to encounter threatened and endangered species and species of special concern.</p>	<p>Wetlands: 0.2 ac (0.1 ha) Habitat: 18 ac (7 ha) Species: 6</p> <p>Characterized by a predominance of mixed chaparral and a potential encounter with a substantial amount of non-wetland waters (similar in quantity to the Miramar Road alignment). Wetlands would be dominated by palustrine and vernal pool wetlands, with a quantity of vernal pool wetlands higher than either the Carroll Canyon or Miramar road alignment options⁹⁹. This alignment would be expected to result in potential impacts on wildlife habitat and movement corridors, as well as to encounter threatened and endangered species and species of special concern.</p>
<p>Section 4(f) and 6(f) Resources:¹⁰⁰ Number of resources rated high (potential direct effects)</p>	<p>Resources rated high: 5</p> <p>The Section 4(f) and 6(f) resources in this corridor are primarily local parks, including the Rose Canyon Open Space Preserve. There are more potential impacts on cultural and historical resources closer to downtown San Diego.</p>	<p>Resources rated high: 5</p> <p>Like the Carroll Canyon alignment, the Section 4(f) and 6(f) resources in this corridor are primarily local parks, including the Rose Canyon Open Space Preserve and the Miramar Memorial Golf Course. There are more potential impacts on cultural and historical resources closer to downtown San Diego.</p>	<p>Resources rated high: 9</p> <p>This alignment contains a higher number of unnamed local parks than the other two corridors, primarily because of the suburban development of the area.</p>

⁹⁸ The study area is defined as a total of 50 feet (25 feet on each side of alignment centerline), per representative impact analysis.

⁹⁹ Vernal Pools of Southern California Draft Recovery Plan, U.S. Fish and Wildlife Service, 1997.

¹⁰⁰ The 4(f) and 6(f) resources study area is defined as 900 ft (274m) on each side of the alignment centerline.

	Carroll Canyon	Miramar Road	I-15 to Qualcomm Stadium
Growth-Induced Impacts	<p>Low potential impacts.</p> <p>Growth is forecasted to be more concentrated in the urban (downtown) areas.</p>	<p>Low potential impacts.</p> <p>Growth is forecasted to be more concentrated in the urban (downtown) areas.</p>	<p>High potential impacts.</p> <p>Moving the terminal site from downtown San Diego to East Mission Valley is projected to increase the size of the urbanized area by about 11,500 ac (4,654 ha) (more than 2%) in 2035.</p>

6.5.4 Los Angeles to San Diego Station Options

Station Name (Alignment)	Discussion
East San Gabriel Valley	
<p>City of Industry Metrolink (UPRR Riverside/UPRR Colton)</p>	<p>The Metrolink station site at City of Industry would have a wide range of multimodal connections to local and regional bus services, and Metrolink commuter rail service. The City of Industry site would provide a central location between the potential stations at LAUS and Ontario Airport. This station site would also have good access to the freeway network. The City of Industry station site would be served by the UPRR Riverside/Colton alignment option. The forecasted ridership (boardings and alightings) would be between 4.8 and 10.2 million annual intercity passengers in 2020.</p> <p>The City of Industry station would be at grade, allowing for easier and less expensive construction of the facility. The station is estimated to cost \$28.7 million.</p> <p>There are few environmental issues with this site, except incompatibility with current land use. The surrounding area is primarily low density residential and would not be compatible with a train station.</p>
<p>Pomona Metrolink (UPRR Colton and UPRR Riverside/Colton)</p>	<p>The Metrolink station site at Pomona would have a wide range of multimodal connections to local and regional bus services, and Metrolink commuter rail service. This station site would also provide good access to the freeway network. The Pomona station site would be served by both the UPRR Colton and UPRR Riverside/Colton alignment options. The Pomona Metrolink station would have high potential ridership. The intercity ridership (boardings and alightings) would be similar to the City of Industry station option forecast.</p> <p>The station would be an aerial structure next to the existing at-grade Metrolink Station. Expected cost is \$165 million.</p> <p>The Pomona station has few environmental issues. However, there is one Section 4(f) and 6(f) resource within 150 ft (46 m) of the station. This unnamed park could be affected by station activities.</p>
<p>El Monte (UPRR Colton)</p>	<p>The El Monte station site would have good freeway access, but would only serve the UPRR Colton Line. The intercity ridership (boardings and alightings) would be similar to the City of Industry station forecasts.</p> <p>The El Monte station would be at grade, which would make construction easier and less expensive than if it were an aerial structure. The station is estimated to cost \$27.0 million.</p> <p>There are few environmental issues with this site. However, the surrounding area is primarily low density residential and would not be compatible with a train station.</p>
<p>South El Monte (UPRR Riverside/UPRR Colton)</p>	<p>The South El Monte station site would have good freeway access but would only serve the UPRR Riverside/UPRR Colton Line. The intercity ridership (boardings and alightings) would be similar to the City of Industry station option forecasts.</p> <p>Like the El Monte station, the South El Monte station would be at grade, which would make construction easier and less expensive than if it were an aerial structure. The station is estimated to cost \$27.0 million.</p> <p>Like the City of Industry station location, there are few environmental issues with this site, except incompatibility with current land use. The surrounding area is primarily low density residential and would not be compatible with a train station. The station would have a medium potential impact on streams, and would potentially affect 1,500 linear ft (457 linear m) of non-wetland waters.</p>

Station Name (Alignment)	Discussion
Ontario Airport	
<p>Ontario Airport (UPRR Colton and UPRR Riverside/UPRR Colton)</p>	<p>The Ontario airport station would provide a multi-modal connection to Ontario International Airport and link to regional bus transit services. The Ontario airport station would provide the fastest HST travel times and reduce access costs for passengers to Ontario International Airport. The forecasted intercity ridership (boardings and alightings) would be between 1.0 and 2.2 million annual intercity passengers in 2020.</p> <p>The station would be at grade, costing approximately \$ 27.0 million. Since it is next to a functioning airport, particular construction techniques may need to be employed to avoid interference with airport ground and airside operations, which could have cost implications.</p> <p>There are few environmental issues with this station location.</p>
East San Bernardino County/Riverside County	
<p>San Bernardino Santa Fe Depot (Riverside/Colton/San Bernardino)</p>	<p>The San Bernardino station site would have the widest range of multimodal connections to local and regional bus services, and Metrolink commuter rail service. The forecasted intercity ridership would be similar to the UC Riverside station option forecasts.</p> <p>The San Bernardino station would be an aerial station, which is more expensive than at-grade construction. The estimated cost of the station would be \$ 86.4 million.¹⁰¹</p> <p>There are several environmental issues with the San Bernardino station site. There would be high visual contrast in downtown San Bernardino because it would travel through primarily low density residential areas. It would also have high potential shadow impacts. This station would be incompatible with the surrounding residential area; however, the station is in a redevelopment area with future planned uses that would be consistent with the HST station. Minority populations are present in the vicinity of this station option.</p>
<p>UPRR Colton (UPRR Colton and UPRR Riverside/UPRR Colton)</p>	<p>The UPRR Colton station site would have the least connectivity to existing transit services, but it would have the most central location for serving both the San Bernardino and Riverside populations, and good accessibility to I-10. The intercity ridership would be similar to the UC Riverside station option forecasts.</p> <p>The station would be at grade, making it less expensive to build than the San Bernardino station. The estimated cost of this station is \$27.0 million.</p> <p>This station could affect 1,330 linear ft (405 m) of streams and 1,400 linear ft (427 m) of non-wetland waters.</p>
<p>University of California Riverside (UPRR Colton and UPRR Riverside/UPRR Colton)</p>	<p>The UC Riverside site is furthest away from the freeway network but provides for the most convenient access to Riverside. The forecasted ridership (boardings and alightings) would be between 2 and 4 million annual intercity passengers in 2020.</p> <p>The aerial station would cost \$86.4 million.¹⁰²</p> <p>This station could affect 690 linear ft (210 m) of streams and 1,500 linear ft (457 m) of non-wetland waters. There would be medium potential visual impacts in the residential areas near the station and along the corridor leading to the station.</p>

¹⁰¹ Costs are reduced due to lower design speed for station stopping tracks, requiring less infrastructure and right-of-way.

¹⁰² Costs are reduced due to lower design speed for station stopping tracks, requiring less infrastructure and right-of-way.

Station Name (Alignment)	Discussion
<p>March Air Reserve Base (UPRR Colton and UPRR Riverside/UPRR Colton)</p>	<p>The March ARB site would be adjacent to the air reserve base but would have the least connectivity, longest travel times, and highest access costs because it is farthest from the Riverside/San Bernardino populations, and the air reserve base does not serve commercial air passengers. The forecasted ridership (boardings and alightings) would be less than the other stations in this region in 2020.</p> <p>The station would be at grade, making it less expensive to build than the San Bernardino station. The estimated cost of this station is \$27.0 million.</p> <p>This station could affect 90 ac (36 ha) of costal sage scrub and one Section 4(f) and 6(f) resource.</p>
Temecula Valley	
<p>Murrieta (I-15)</p>	<p>A potential station at Murrieta would serve the fast-growing Temecula/Murrieta area. The Murrieta station site would have convenient freeway access to both I-15 and I-215. The forecasted ridership (boarding and alighting) would be between 1.2 and 2.0 million annual intercity passengers in 2020.</p> <p>This aerial station would cost \$165 million.</p> <p>This station could affect 3,319 linear ft (1,012 m) of non-wetland waters and 640 linear ft (195 m) of streams.</p>
Escondido	
<p>Escondido Transit Center (I-15)</p>	<p>The Escondido Transit Center would have somewhat higher connectivity than the Escondido I-15 station. The Transit Center station would be closer to the Escondido Transit Center (within 1/8-mi) and provide better connectivity with the proposed Escondido-to-Oceanside commuter rail service. The forecasted ridership (boardings and alightings) would be between 1.8 and 2.8 million annual intercity passengers in 2020.</p> <p>This station would be in a trench or tunnel, which is the most expensive and difficult station type to build, and would cost \$366 million. The alignment to serve this station would require 5.9 mi (9.5 km) of tunneling, raising the cost of the alignment between March ARB and Mira Mesa by nearly \$500 million. This alignment would also add considerable construction issues and right-of-way constraints.</p> <p>The corridor leading to the transit center is incompatible with the surrounding low density residential properties; however, the HST station is compatible with the use of the Transit Center. There are also minority populations present around the station.</p>
<p>Escondido at SR-78/I-15 (I-15)</p>	<p>The Escondido I-15 site is located in the City of Escondido southwest of the I-15/El Norte Parkway interchange. Access to the station is assumed to be from Hillery Drive, which has access to Westview Parkway and Black Mountain Road. The intercity ridership (boardings and alightings) would be similar to the Escondido Transit Center station option forecasts.</p> <p>This aerial station would most likely be less expensive than the Escondido Transit Center station. The station would cost \$164 million.</p> <p>The station and corridor are considered moderately compatible with the surrounding land use. There are few other environmental concerns.</p>

Station Name (Alignment)	Discussion
Mid-San Diego County	
Mira Mesa (I-15)	<p>The Mira Mesa location would provide convenient access to the freeway and serve northern San Diego County. Mira Mesa could serve both options to San Diego (I-15/Qualcomm and San Diego Downtown via Carroll Canyon or Miramar Road). The forecasted ridership (boardings and alightings) would be between 0.9 and 1.4 million annual intercity passengers in 2020.</p> <p>This aerial station would cost \$164 million.</p> <p>This stations could affect 50 ac (20 ha) of wetlands.</p>
University City (Carroll Canyon and Miramar Road)	<p>The University City site could be served by the Coaster commuter rail service. This 'at-grade' station would cost \$33.4 million.</p> <p>The University City site would be located within a minority population and would have low potential impacts on biological resources, visual resources, public utilities, and cultural resources. There would be moderate potential impacts on geology due to seismic hazards and difficulty in excavations, hydrology and water quality due to the potential for erosion, and Section 4(f) and 6(f) lands at Mandell Weiss Eastgate Park.</p>
San Diego	
Downtown San Diego Santa Fe Depot (Miramar Road and maybe I-15 to Qualcomm)	<p>For service to San Diego, the downtown San Diego Santa Fe Depot site would have the highest connectivity. This station is located in the city center where many potential HST passengers could walk to destinations. The Santa Fe Depot is the terminus for the Coaster commuter rail service and the Amtrak Surfliner intercity service. It provides direct connections to San Diego LRT network and is a bus transit hub for San Diego. The intercity ridership forecasts concluded that the downtown San Diego Santa Fe terminus would have about 350,000 fewer passengers annually than the Qualcomm Stadium station option by 2020. The downtown station site would have considerably higher potential for serving long distance commuters than the Qualcomm site.</p> <p>The station would be an aerial structure with several stub-end tracks. It would be over the existing station tracks and would be difficult to construct while continuing operations of the other rail services below. The station is expected to cost \$115 million.</p> <p>There would be medium to high potential property impacts for stations in the downtown areas. There would be high potential visual impacts on the downtown area. There are approximately 18 ac (7 ha) of estuarine wetlands that would be affected.</p>
San Diego Airport (Miramar Road)	<p>San Diego International Airport is a unique airport because it is located adjacent to downtown San Diego and is 2 mi (3 km) from the city center. The San Diego airport station location would provide a convenient connection to the airport and directly connect with the regional bus network and a San Diego LRT station. Although the location would not have as good connectivity to the city center as the Santa Fe Depot site, it would have a better connection to I-5 and is expected to have similar intercity ridership potential as the downtown San Diego Santa Fe station site.</p> <p>The station would be an aerial structure with several stub-end tracks. It would be next to the airport and, similar to the Ontario airport station, might require special construction considerations for the ongoing operation of the airport. This could increase the cost of the station, which is expected to be \$115 million.</p> <p>There are few potential environmental impacts for this station area.</p>

Station Name (Alignment)	Discussion
<p>Qualcomm Stadium (I-15)</p>	<p>Qualcomm Stadium would provide a direct connection to the San Diego LRT network and good freeway access, but it would not have the same level of connectivity to the San Diego city center. The low-end ridership analysis estimates 350,000 more intercity passengers than the downtown option by 2020. The Qualcomm station would not provide direct service to downtown San Diego, but it would provide the shortest travel time to the greater San Diego area. The station location would be an 8-mi (13 km) drive or 10-mi (16 km) (20-min) ride on LRT to the city center. The forecasted ridership (boarding and alightings) would be between 5.4 and 11.4 million annual intercity passengers in 2020.</p> <p>The station would be an aerial structure with several stub-end tracks. The station is expected to cost \$115 million.</p> <p>There would be medium potential property impacts, and the station would affect 1,430 linear ft (436 m) of non-wetland waters.</p>

6.6 LOS ANGELES TO ORANGE COUNTY

This region includes the western portion of the Los Angeles basin between downtown Los Angeles and Los Angeles International Airport (LAX) and the coastal areas of southern California between Los Angeles and Orange County, generally following the existing LOSSAN rail corridor.

6.6.1 Los Angeles to Los Angeles International Airport Alignment Options

All information presented is for the area from Los Angeles to LAX. This segment is shown in Figure 6.6-1.

MTA Harbor Subdivision Alignment	
Physical/Operational Characteristics	
Alignment Description	The LAUS to LAX alignment would follow an existing rail corridor for the majority of the distance from LAUS to LAX. Station options considered in this segment include LAX Station.
Length in miles (km)	15.4 mi (24.8 km)
Cost (dollars)	\$1.93 billion
Travel Time (min)	13 min
Ridership	This alignment would provide a direct route to LAX.
Constructability	This alignment would require construction of at-grade and aerial structure segments. It would be on an aerial structure from LAUS to the MTA harbor subdivision, at grade to I-405, and then on aerial to the airport.
Operational Issues	Average speed: 69 mph (111 kph) Maximum speed: 93–124 mph (150–200 kph)
Potential Environmental Impacts	
Travel Conditions	If service to LAX is selected, frequencies to each station along the Los Angeles-Inland Empire-San Diego corridor could be less than if a single line south of Los Angeles were selected. If both LAX and the direct link to Orange County were selected in addition to the Los Angeles-Inland Empire-San Diego corridor, the potential frequency of service for each of these three corridors could be considerably reduced. However, if LAX is directly served by HST, the number of intermodal connections would be increased, the travel times and access costs to these markets would be decreased, and the competitiveness of the new mode for the southwest portions of Los Angeles County intercity transportation markets would be increased. If the airport is not directly served, local transportation (shuttle, regional transit, or the automobile) will be needed between LAUS and the airport, or to western Los Angeles County.
Noise/Vibration: ¹⁰³ High, medium, and low potential impacts	High potential impacts. Dense urban area surrounding land uses. Speeds would be restricted under 100 mph (161 kph) for the majority of the alignment.

¹⁰³ Generally, vibration is not a significant impact. However, sensitive and specific areas, such as historical structures and special habitats, could be affected.

**Figure 6.6-1
Los Angeles to LAX Alignment and Potential Station Options**



MTA Harbor Subdivision Alignment	
Land Use and Planning, Communities and Neighborhoods, Property, and Environmental Justice	<p>Compatible.</p> <p>Environmental Justice: Low potential minority population impacts along alignment.</p> <p>Community: Low potential impacts.</p> <p>Property: Low potential impacts along alignment. Potential impacts at the LAX station location.</p> <p>Although there are minority populations in the corridor, the alignment is largely within an existing right-of-way, therefore reducing the potential impacts. The final location and type of station at LAX could influence the ultimate impact of the station on the surrounding community.</p>
Aesthetics and Visual Resources: Potential high contrast/impact areas and possible shadow areas	<p>Medium potential impacts.</p> <p>Elevated track would be visible in urban corridor and would create shadows.</p>
Hydrology and Water Resources: ¹⁰⁴ Potential impacts and associated ac (ha) of floodplains, and linear ft (m) of streams within potential impact study areas	<p>Floodplains: 5 ac (2 ha)</p> <p>Streams: 1,300 linear ft (396 linear m)</p> <p>Potential impacts would be limited due to the use of existing rail corridors in which few resources are found.</p>
Biological Resources Including Wetlands: ¹⁰⁵ Linear ft of non-wetland waters (waters) and number of special-status species (species)	<p>Waters: 2,960 linear ft (902 linear m)</p> <p>Species: 8</p> <p>Potential impacts would be limited due to the use of existing rail corridors in which few resources are found.</p>
Section 4(f) and 6(f) Resources: ¹⁰⁶ Number of resources rated high (potential direct effects)	<p>Resources rated high: 2</p> <p>Potential impacts would be limited due to the use of existing rail corridors in which few resources are found.</p>

¹⁰⁴ The hydrology and water resources study area is defined as 100 ft (30 m) on each side of the alignment centerline.

¹⁰⁵ The biological resources and wetlands study area is defined as 1,000 ft (305 m) for urban areas, 0.25 mi (0.40 km) for undeveloped areas, and 0.5 mi (0.80 km) for sensitive areas on each side of alignment centerline.

¹⁰⁶ The 4(f) and 6(f) resources study area is defined as 900 ft (274m) on each side of the alignment centerline.

6.6.2 Los Angeles Union Station to Orange County Alignment Options

All information presented is for the area from Los Angeles to Anaheim/Irvine. This segment is shown in Figure 6.6-2.

	HST Options		
	Union Pacific Santa Ana–HST (to Anaheim)	LOSSAN Corridor–HST (to Anaheim)	LOSSAN Corridor–HST (to Irvine)
Alignment Description	This alignment would provide dedicated ¹⁰⁷ HST service using an existing UPRR right-of-way. Station options considered in this segment include Norwalk and Anaheim Transportation Center.	This shared-use ¹⁰⁸ alignment would provide HST service along the existing LOSSAN corridor, terminating at Anaheim Transportation Center. The segment from Union Station to Fullerton would have a total of four tracks. Station options considered in this segment include Norwalk, Fullerton Transportation Center, and Anaheim Transportation Center.	This shared-use ¹⁰⁹ alignment would provide HST service along the existing LOSSAN corridor, terminating at Irvine Transportation Center. The segment from Union Station to Fullerton would have a total of four tracks. Station options considered in this segment include Norwalk, Fullerton Transportation Center, Anaheim Transportation Center, Santa Ana Regional Transportation Center, and Irvine Transportation Center.
Length miles (km)	28.8 mi (46.3 km)	30.1 mi (48.4 km)	43.9 mi (70.7 km)
Cost (dollars)	\$3.45 billion	\$1.20 billion	\$2.31 billion
Travel Time (min)	16 min	27 min	37 min
Ridership	Dedicated HST route provides fastest through-service with no capacity constraints from competing rail traffic.	Provides HST service to central Orange County but is frequency-constrained because of shared-use operations.	Extends HST services to south central Orange County but is frequency-constrained because of shared-use operations.
Constructability	Within existing rail right-of-way. Would require construction of at-grade, aerial structure, trenched and tunnel segments.	Within existing rail right-of-way. Would require additional right-of-way and construction of extensive grade separations while maintaining existing service.	Within existing rail right-of-way. Would require additional right-of-way and construction of extensive grade separations while maintaining existing service. Would require construction of trenched segments.

¹⁰⁷ *Dedicated HST* means only HST will operate on the alignment.

¹⁰⁸ *Shared-use* means that HST and other passenger rail service will operate on the same alignment.

¹⁰⁹ *Shared-use* means that HST and other passenger rail service will operate on the same alignment.

**Figure 6.6-2
Los Angeles to Anaheim/Irvine Alignment and Potential Station Options**



	HST Options	
	Union Pacific Santa Ana–HST (to Anaheim)	LOSSAN Corridor–HST (to Anaheim) LOSSAN Corridor–HST (to Irvine)
Operational Issues	No dispatching conflicts with conventional freight or passenger trains due to the dedicated right-of-way for HST operations. Few sharp curves to limit speeds. Could support up to 20 trains per hour in each direction, depending on terminal station configuration.	Shared-use alignment with delays and capacity constraints due to other rail traffic. Operational analysis suggests range of between 18 and 45 HST trains a day in each direction, depending on schedule and the effectiveness of a joint operating plan that would have to be developed in partnership with Amtrak and Metrolink. These estimated HST service levels assumed 16 Amtrak and 29 Metrolink trains daily in each direction. Improvements also benefit existing freight, passenger, and commuter services. The addition of a fourth track between Los Angeles and Fullerton would allow for the segregation of freight and passenger services, assuming additional modifications to track configurations approaching Fullerton and LAUS.
Travel Conditions	This alignment is the most direct alternative and has fastest travel time. A new station in Norwalk would be located along the alignment. This alignment could also be extended to Irvine along the existing LOSSAN corridor. The fully grade-separated corridor would improve traffic flow and reduce air pollution at existing rail crossings.	This alignment would operate along the existing rail corridor, providing fast travel times and direct service. Infrastructure improvements would provide benefits to existing Amtrak and commuter rail services as well. The fully grade-separated corridor would improve traffic flow and reduce air pollution at existing rail crossings.
Noise and Vibration: ¹¹⁰ High, medium, and low potential impacts	High potential impacts. Introduces new potential impacts in partially residential area on what is currently a sparsely used freight line.	Medium potential impacts. There would be an increase in noise levels due to increased frequency of trains consisting of HST, Amtrak, Metrolink, and BNSF trains at conventional speeds. There would be a reduction in noise levels due to the elimination of horn noise and gate noise from existing services as a result of the grade separations at some existing grade crossings. The grade crossing noise reduction (elimination of horn noise and gate noise from existing services) as a result of the grade separations would offset the increase in train frequencies

¹¹⁰ Generally, vibration is not a significant impact. However, sensitive and specific areas, such as historical structures and special habitats, could be affected.

	HST Options		
	Union Pacific Santa Ana–HST (to Anaheim)	LOSSAN Corridor–HST (to Anaheim)	LOSSAN Corridor–HST (to Irvine)
Land Use and Planning, Communities and Neighborhoods, Property, and Environmental Justice	<p>Compatible.</p> <p>Environmental Justice: Minority populations are present at points along this alignment option.</p> <p>Community: Low potential impacts.</p> <p>Property: Low potential impacts.</p>	<p>Compatible.</p> <p>Environmental Justice: Minority populations are present at points along this alignment option.</p> <p>Community: Low potential impacts.</p> <p>Property: High potential impacts.</p>	
Aesthetics and Visual Resources: Number of viewing points and potential high contrast/impact areas	<p>Low potential impacts.</p> <p>No viewing points are located along this alignment. Potential impacts are medium to high contrast/ impact areas.</p>	<p>Low potential impacts.</p> <p>No viewing points are located along this alignment. Potential impacts are low to high contrast/impact areas.</p>	
Hydrology and Water Resources: Potential impacts and associated ac (ha) of floodplains, and linear ft (m) of streams within potential impact study areas, ac (ha) lakes/other water bodies within study areas.	<p>Floodplains:¹¹¹ 15 ac (6 ha)</p> <p>Streams:¹¹² 1450 linear ft (442 linear m)</p>	<p>Floodplains: 75 ac (30 ha)</p> <p>Streams: 1050 linear ft (320 linear m)</p>	<p>Floodplains: 75 ac (30 ha)</p> <p>Streams: 1050 linear ft (320 linear m)</p>

¹¹¹ The Floodplains study area is defined as 100 ft (30 m) on each side of the alignment centerline.

¹¹² The streams, habitat and species study area is defined as a total of 50 feet (25 feet on each side of alignment centerline), per representative impact analysis.

	HST Options		
	Union Pacific Santa Ana–HST (to Anaheim)	LOSSAN Corridor–HST (to Anaheim)	LOSSAN Corridor–HST (to Irvine)
Biological Resources, Including Wetlands Linear ft of non-wetland waters (waters), and ac (ha) of special-status species habitat within potential impact study areas	Habitat: 66 ac (27 ha) Species: 3 Trains would travel in existing right-of-way within an urban area.	Habitat: 65 ac (26 ha) Species: 2 Trains would travel in existing right-of-way within an urban area.	Habitat: 65 ac (26 ha) Species: 2 Trains would travel in existing right-of-way within an urban area.
Section 4(f) and 6(f) Resources: ¹¹³ Number of resources rated high (potential direct effects)	Resources rated high: 3 Potential impacts would be limited due to the use of existing rail corridors in which few resources are found.	Resources rated high: 2 Potential impacts would be limited due to the use of existing rail corridors in which few resources are found.	Resources rated high: 5 Potential impacts would be limited due to the use of existing rail corridors in which few resources are found.

¹¹³ The 4(f) and 6(f) resources study area is defined as 900 ft (274m) on each side of the alignment centerline.

6.6.3 Los Angeles to San Diego Station Options

Station Name (Alignment)	Discussion
High-Speed Rail Stations	
Los Angeles International Airport	
Los Angeles International Airport (MTA Subdivision)	<p>The LAX station would be a below-grade station, adjacent to airport terminals, and would permit easy access by a potential people mover or shuttle, or by walking. It would have direct connections to regional bus transit services and would be the only HST station directly serving western Los Angeles County. This underground terminal station would cost \$336 million.</p> <p>A station at LAX would have low potential impacts on biological resources, visual resources, cultural and paleontological resources, Section 4(f) and 6(f) lands, and public utilities; and low to moderate potential impacts on hydrology and water quality (mostly groundwater). It would be located within a minority population.</p>
Southern Los Angeles County (Gateway Cities)	
Norwalk (UPRR)	<p>The selection of the alignment between Los Angeles and Orange County would determine the preferred station location that would serve the 17 cities that comprise the Gateway Cities of south Los Angeles County, which include the Cities of Vernon, Commerce, Montebello, Pico Rivera, Santa Fe Springs, Norwalk, and La Mirada. The Norwalk UPRR site would be an elevated station located near the Imperial Highway. There is no existing passenger rail connection (about 1 mi [2 km] east of the Green Line LRT terminus). It has existing bus connections and good freeway access. The station would cost \$28.7 million.</p> <p>A station in Norwalk along the UPRR Santa Ana Branch Line would have low potential impacts on biological resources, paleontological resources, hydrology and water quality, public utilities, and Section 4(f) and 6(f) lands; low to moderate potential impacts on cultural resources; and moderate potential visual impacts since it would be an elevated station. It would be located within a minority population, in addition to requiring some non-residential displacements.</p>
Norwalk (LOSSAN)	<p>The selection of the alignment between Los Angeles and Orange County would determine the preferred station location that would serve the 17 cities that comprise the Gateway Cities of south Los Angeles County, which include the Cities of Vernon, Commerce, Montebello, Pico Rivera, Santa Fe Springs, Norwalk, and La Mirada. The Norwalk LOSSAN site would be at Norwalk Metrolink station with direct connectivity to the regional commuter rail service. It would be a bus transit hub for the area, and would be well served by I-5 and the Imperial Highway. An HST station would require considerable improvements to the existing station, including lengthening platforms to accommodate the longer trains. Station improvements would cost \$10.0 million.¹¹⁴</p> <p>An HST station in Norwalk at the existing Metrolink station would have low potential impacts on biological resources, visual resources, cultural and paleontological resources, hydrology and water quality, public utilities, Section 4(f) and 6(f) lands at Zimmerman Park, and would be located within a minority population.</p>

¹¹⁴ Shared-use station includes modification to existing platforms and passenger facilities only within existing right-of-way. Does not include full express and stopping track configuration assumed for HST stations on dedicated high-speed lines.

Station Name (Alignment)	Discussion
Central Orange County	
Anaheim Transportation Center (LOSSAN)	<p>The Anaheim Transportation Center is an existing transit hub with high connectivity for central Orange County. The station is a bus transit hub and serves existing Amtrak and Metrolink Commuter Rail services. Depending on the alignment selected between Los Angeles and Anaheim, there are several design options for the orientation of the HST station at the transportation center. An HST station along the existing LOSSAN corridor would require considerable improvements to the existing station, including lengthening platforms to accommodate the longer trains, and would cost \$10.0 million.¹¹⁵ For the dedicated UPRR Santa Ana Branch alignment option, a full HST terminal station would be required. The terminal station would be configured underground and would cost \$336 million.</p> <p>The station in Anaheim would have low potential impacts on biological resources, visual resources, cultural and paleontological resource, public utilities, cultural resources, and Section 4(f) and 6(f) lands; and moderate potential impacts on hydrology and water quality, potentially affecting 15 ac (6 ha) of floodplain. The site is located within a minority population.</p>
Southern Orange County	
Irvine Transportation Center (LOSSAN)	<p>The master site plan for the Irvine Transportation Center indicates that this station area will develop into a transit-oriented environment serving as a station stop for improved Pacific Surfliner service, Metrolink Commuter service, and a potential southern terminus to the proposed HST network in Orange County. The Irvine Transportation Center is an existing transit hub for bus routes with high connectivity for South Orange County. An HST station would require considerable improvements to the existing station, including lengthening platforms to accommodate the longer trains. In addition, certain amenities would be required, since this would be a potential terminus station. The station improvements would cost \$10.0 million.¹¹⁶</p> <p>The station in Irvine would have low potential impacts on biological resources, visual resources, cultural and paleontological resources, public utilities, hydrology and water quality (affecting 5 ac [2 ha] of floodplain), and Section 4(f) and 6(f) lands at the former El Toro Marine Corps Air Station. The site is located within a minority population.</p>

¹¹⁵ Shared-use station includes modification to existing platforms and passenger facilities only within existing right-of-way. Does not include full express and stopping track configuration assumed for HST stations on dedicated high-speed lines.

¹¹⁶ Shared-use station includes modification to existing platforms and passenger facilities only within existing right-of-way. Does not include full express and stopping track configuration assumed for HST stations on dedicated high-speed lines.

6A PREFERRED HST ALIGNMENT AND STATION OPTIONS

6A.1 INTRODUCTION

In the Summary of the Draft Program EIR/EIS, the Authority and the FRA concluded that the High-Speed Train (HST) alternative is the preferred system alternative, but did not identify a preference among the HST alignment and station options presented. The Summary also stated (Next Steps in the Environmental Process) that as part of the Final Program EIR/EIS, the Authority may identify one or more potential HST alignment options as preferred for the proposed high-speed train (HST) system and may also identify preferred station locations within an identified preferred corridor for the proposed HST system. In order to facilitate the selection of preferred alignment and station locations for the HST alternative in this Final Program EIR/EIS, the Authority staff presented recommendations to the Authority in two parts. Part 1 was presented at the September 22, 2004 board meeting in Los Angeles, and Part 2 was presented at the November 10, 2004 board meeting. Based upon input from the Board and the public, staff made minor revisions to Part 1 and Part 2, which were incorporated and consolidated into one recommendation document.

On January 26, 2005 the Authority approved staff recommendations and directed that an additional study of an alignment option between Fresno and Bakersfield to serve a potential Visalia station, or variations thereof, located in an existing and/or planned urbanized area, is to be conducted prior to the commencement of project-level environmental documents for this segment and submitted to the Authority for any appropriate action.

The FRA has concurred in the preferred alignments and stations and has consulted with USEPA and USACE regarding their concurrence for compliance with the requirements of Section 404 of the Clean Water Act. Although no permit is being requested at this time under the Clean Water Act, FRA has committed to obtaining USEPA and USACE concurrence that the selection of the preferred corridor and route (alignment) is most likely to contain the "least environmentally damaging practicable alternative," consistent with the USACE's permit program (33 CFR Part 320 – 331) and USEPA's Section 404(b)(1) Guidelines (40 CFR 230 – 233). The FRA, FHWA, EPA, USACE, and FTA executed a memorandum of understanding (MOU) outlining roles and responsibilities for preparation of the Program EIR/EIS and the integration of Section 404 of the Clean Water Act (July 2003 Federal Agency MOU for the California HST Program EIR/EIS). The Authority and FRA intend to focus future project specific analysis on alignment and station options selected in this program environmental process. Site-specific location and design alternatives of the preferred alignment and station options including avoidance and minimization alternatives would be fully investigated and considered during project level environmental review.

The HST alignment and station locations preferences are based upon the data presented in this Final Program EIR/EIS and supporting technical reports, and the comments received on the Draft Program EIR/EIS (the comment period concluded on August 31, 2004). The Authority and FRA do not intend to further investigate in future project specific analysis alignment and station options that have not been identified as preferred.

Chapter 6 of this Final Program EIR/EIS summarizes and compares the physical and operational characteristics and potential environmental consequences associated with the HST alignment and station options where relative differences were identified including:

- Physical/operational characteristics:
 - Alignment
 - Length
 - Capital Cost

- Travel Time
 - Ridership
 - Constructability
 - Operational Issues
- Potential environmental impacts:
 - Transportation related topics (air quality, noise and vibration, and energy)
 - Human environment (land use and community impacts, farmlands and agriculture, aesthetics and visual resources, socioeconomics, utilities and public services, hazardous materials and wastes)
 - Cultural resources (archaeological resources, historical properties) and paleontological resources
 - Natural environment (geology and seismic hazards, hydrology and water resources, and biological resources and wetlands).
 - Section 4(f) and 6(f) resources (certain types of publicly owned parklands, recreation areas, wildlife/waterfowl refuges, and historical sites).

In making decisions, the Authority was guided by the adopted objectives and criteria for selecting preferred alignments and station locations that were applied in the screening evaluation as documented in Section 2.6.9 of this Final Program EIR/EIS (see Table 2.6.5 below).

**Table 2.6-5
High-Speed Rail Alignment and Station Evaluation Objectives and Criteria**

Objective	Criteria
Maximize ridership/revenue potential	Travel time Length Population/employment catchment area
Maximize connectivity and accessibility	Intermodal connections
Minimize operating and capital costs	Length Operational issues Construction issues Capital cost Right-of-way issues/cost
Maximize compatibility with existing and planned development	Land use compatibility and conflicts Visual quality impacts
Minimize impacts on natural resources	Water resources impacts Floodplain impacts Wetland impacts Threatened and endangered species impacts
Minimize impacts on social and economic resources	Environmental justice impacts (demographics) Farmland impacts
Minimize impacts on cultural and parks/wildlife refuge resources	Cultural resources impacts Parks and recreation impacts Wildlife refuge impacts
Maximize avoidance of areas with geologic and soils constraints	Soils/slope constraints Seismic constraints
Maximize avoidance of areas with potential hazardous materials	Hazardous materials/waste constraints

Several factors were considered in identifying potential station stops, including speed, cost, local access times, potential connections with other modes of transportation, ridership potential, and the distribution of population and major destinations along the route. There is a critical tradeoff between the accessibility of the system to potential passengers, which is provided by multiple stations and stops, and the resulting HST travel times. Additional or more closely spaced stations (even with limited service) would lengthen travel times, reduce frequency of service, and the ability to operate both express and local services. The ultimate location and the configuration of stations cannot be determined at this time; this would occur during subsequent project-level environmental processes. Preferences for station options allow the Authority to pursue proposed station development at or near those locations in future studies. It is possible that some of the preferred stations described in this Final Program EIR/EIS will not be built.

The preferred station sites are all multi-modal transportation hubs that would provide links with local and regional transit, airports and highways. It is assumed that parking at the stations would be provided at market rates (no free parking). Each station site would have the potential to promote higher density, mixed-use, pedestrian oriented development around the station. Should the HST system proceed to more detailed study, local government would be expected to provide (through planning and zoning) for transit-oriented development around HST station locations, and to finance (e.g., through value capture or other financing techniques) and to maintain the public spaces needed to support the pedestrian traffic generated by hub stations if they are to have a HST station. For more details, please refer to Chapter 6B, "HST Station Area Development".

All the headings below indicate the preferred alignments and station locations for the HST Alternative. References to existing rail right-of-way as preferred alignments mean the proposed HST system would be located generally within or adjacent to the existing rail right-of-way, unless otherwise specified (e.g., shared use). "Constructability" issues refer to substantial engineering and construction complexity as well as excessive initial and/or recurring costs that present logistical constraints. "Connectivity" relates to how well a station site links with other modes of transportation (transit systems, aviation, and/or highways) and "accessibility" relates to how well the station site is located for serving the surrounding population. "Compatibility" relates to how well a station site fits within current or planned local land uses as defined in local plans.

The USEPA and USACE have participated in the development of both the Draft and Final Program EIR/EIS and in accordance with the memorandum of understanding among Federal agencies for this 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. The High-Speed Train Alternative represents the proposed action, was identified as the preferred system alternative in the Draft Program EIR/EIS, and is identified as the environmentally preferable under NEPA as well as the environmentally superior alternative under CEQA.

6A.2 BAY AREA - MERCED

The region from the Bay Area to Merced was divided into three segments: 1) San Francisco to San Jose; 2) Oakland to San Jose; and 3) San Jose to Merced.

The Authority, in consultation with the FRA, has identified a broad preferred corridor between the Bay Area and the Central Valley containing a number of feasible route options within which further study will permit the identification of a single preferred alignment option. This corridor is generally bounded by (and includes) the Pacheco Pass (SR-152) to the south, the Altamont Pass (I-580) to the north, the BNSF Corridor to the east, and the Caltrain Corridor to the west, but the Authority would not pursue alignment options through Henry Coe State Park and station options at Los Banos.¹ The future studies would focus on the identification of a preferred alignment between the Central Valley and the San Francisco Bay area.

Future studies would consider: (1) how and where the HST alignment from the Bay Area would connect with the HST alignment in the Central Valley; (2) how and where the HST alignment would enter the Bay Area and would connect to Bay Area termini; (3) the location of stations within these segments.

The following preferences for the San Francisco to San Jose and Oakland to San Jose segments are based upon current information. These recommendations are subject to change based upon the information provided in future studies.

6A.2.1 San Francisco to San Jose

The Authority, in consultation with the FRA, has identified a broad preferred corridor between the Central Valley and the Bay Area containing a number of feasible route options within which further study will permit the identification of a single preferred alignment option. Future studies would consider how much of the Caltrain alignment between San Francisco and San Jose would be included as part of the HST system.²

Preferred Alignment:

- Caltrain Corridor (Shared Use)

Analysis:

This Program EIR/EIS analyzes one alignment option between San Francisco and San Jose along the San Francisco Peninsula that would utilize the Caltrain rail right-of-way, and share tracks with express Caltrain commuter rail services (see Figure 6.2-1). The Caltrain Corridor (Shared Use) is the preferred alignment option for direct service to San Francisco and San Francisco International Airport (SFO).

The alignment between San Francisco and San Jose is assumed to have 4-tracks, with the two middle tracks being shared by Caltrain and HST. HST trains could operate at maximum speeds of 100-125 mph along the Peninsula providing 30-minute express travel times between San Francisco and San Jose. Environmental impacts would be minimized since this alignment utilizes the existing Caltrain right-of-way (see summary table Section 6.2.1A). This alignment would increase connectivity and accessibility to San Francisco, the Peninsula, and SFO, the hub international airport for northern California. The HST system would provide a safer, more reliable, energy efficient intercity mode along the San Francisco Peninsula

¹ Highway route numbers are provided only as a convenient reference for the reader, not as a limitation on the corridor to be considered.

² In the Authority's previous investigations a potential Altamont Pass alignment option included a new Bay crossing near the Dumbarton Bridge. With this previous concept involving the Altamont Pass the proposed HST service would use only that portion of the Caltrain alignment between Redwood City and San Francisco on the San Francisco Peninsula.

while improving the safety, reliability, and performance of the regional commuter service because of the fully grade separated tracks with fencing to prevent intrusion, additional tracks, and a state-of-the-art signaling and communications system. The HST alignment would greatly increase the capacity for intercity and commuter travel and reduce automobile traffic.

Many comments in favor of the proposed HST on the San Francisco Peninsula were received from agencies and the public, including MTC, the City of San Francisco, Caltrain JPB, Samtrans, BART, the Transbay Terminal JPB, the City of Los Altos Hills, the City of Milpitas, the City of Santa Clara, the County of Santa Clara, the City of Morgan Hill and the San Francisco Chamber of Commerce. There was also opposition to improvements on the Caltrain corridor raised by some members of the public. The City of Menlo Park supported investigating options to avoid the SF Peninsula area by integrating HST with existing systems, and the Town of Atherton supports options that would avoid HST service through the Town of Atherton as well as investigating trench concepts through the Town of Atherton at the project-specific level.

Preferred Station Locations:

- Downtown San Francisco Terminus: Transbay Terminal

Analysis:

The Transbay Terminal site is the preferred station option for the San Francisco Terminal. The Transbay Terminal would offer greater connectivity to San Francisco and the Bay Area than the 4th and King site (about a mile from the financial district) because of its location in the heart of downtown San Francisco and since it would serve as the regional transit hub for San Francisco. The Transbay Terminal is located in the financial district where many potential HST passengers could walk to the station. The Transbay Terminal is also expected to emerge as the transit hub for all major services to downtown San Francisco, with the advantage of direct connections to BART (1 block from the terminus), Muni, and regional bus transit (Samtrans, AC Transit, and Golden Gate District). Moreover, the Transbay Terminal is compatible with existing and planned development and is the focal point of the Transbay redevelopment plan that includes extensive high density residential, office, and commercial/retail development.

The rail component of the Transbay Terminal is estimated to cost about \$500 million more than the 4th and King option, however because the rail component would be shared with Caltrain services, the Transbay Joint Powers Authority funding plan assigns only a portion of the rail related Transbay Terminal costs to the HST system. The rail facilities planned for the Transbay Terminal are for 6 tracks and 3 platforms. The Authority's operational analysis indicated that to serve all of the HST trains proposed in the Authority's Business Plan, four tracks and two island platforms would have to be dedicated to HST service. Subsequent cooperative operations planning analysis of the Transbay terminal rail capacity available for HST and Caltrain commuter service would be needed to determine the most efficient mix and scheduling of services.

Public and agency comments have largely favored the Transbay Terminal site. The City of San Francisco, the Transbay Terminal JPB, Samtrans, the Caltrain JPB, the San Francisco Chamber of Commerce, and AC Transit all submitted comments in favor of the Transbay Terminal site.

- San Francisco Peninsula Airport Connector Station: Millbrae (SFO)

Analysis:

Two airport connector station options were considered for the San Francisco peninsula in the Draft Program EIR/EIS, Millbrae for San Francisco International Airport (SFO) and Santa Clara for San Jose International Airport. SFO serves as the "hub" airport for international travel in Northern California and is located about 12 miles south of downtown San Francisco. The conceptual design is to link to SFO at the Millbrae Caltrain/BART station location which is adjacent to SFO (but not directly at the airport). This multi-modal station would link to the airport by the existing BART connection and could possibly be reached in the future by the airport people mover system. The Millbrae (SFO) HST station supports the objectives of the HST project by providing an interface with the northern California hub airport for national and international flights. The Millbrae (SFO) is the preferred HST airport connector station on the San Francisco peninsula.

A potential link to San Jose International Airport would be at Santa Clara less than 3 miles north of the potential downtown San Jose station. Because the downtown San Jose (Diridon) station site would provide sufficient connectivity to San Jose airport for the foreseeable future the Authority has determined that the preferred HST alternative have no HST station at Santa Clara.

- Mid-Peninsula Station: continue study of potential sites at Palo Alto and Redwood City

Analysis:

The Authority, in consultation with the FRA, has identified a broad preferred corridor between the Central Valley and the Bay Area within which further study will permit the identification of a preferred alignment option. Future studies would consider how much of the Caltrain alignment between San Francisco and San Jose would be included as part of the HST system and whether a Mid-Peninsula station site should be recommended.³

6A.2.2 Oakland to San Jose

The provision of HST service to Oakland would increase connectivity and accessibility to the East Bay, including Oakland International Airport. The HST system would provide a safer, more reliable, energy efficient intercity mode directly to the East Bay while improving the safety, reliability and performance of the existing Capitol intercity service through grade separation improvements between Oakland and Union City. The HST alignment would greatly increase the capacity for intercity travel in the East Bay and reduce highway congestion. Direct service to Oakland and the East Bay is supported by MTC, the City of Oakland, BART, and the Alameda County Congestion Management Agency.

The Authority, in consultation with the FRA, has identified a broad preferred corridor between the Central Valley and the Bay Area containing a number of feasible route options within which further study will permit the identification of a single preferred alignment option. These recommendations for the Oakland to San Jose alignment and stations are based upon current information and are subject to change based upon the information provided in other future studies.

³ In the Authority's previous investigations a potential Altamont Pass alignment option included a new Bay crossing near the Dumbarton Bridge. With this previous concept involving the Altamont Pass the proposed HST service would use only that portion of the Caltrain alignment between Redwood City and San Francisco on the San Francisco Peninsula.

Preferred Alignment:

- Hayward Line to I-880

Analysis:

Two alignment options were considered between San Jose and Oakland, the Hayward Line/I-880 and the Hayward Branch/Niles/Mulford Line. Both options would use the Hayward Line freight railroad right-of-way (also used by the "Capitol" intercity Amtrak service) between Oakland and Union City. At Union City, the Hayward Line/I-880 option would diverge to the median of Interstate 880 (on an aerial structure) to bring the alignment to San Jose and a tunnel under a small lake in Fremont Central Park. This option is estimated to cost about \$140 million more than the Hayward Line/Niles/Mulford option (about 4% of the cost between Oakland and San Jose) but would have higher ridership potential and considerably less potential environmental impact. The Hayward Line/I-880 is the preferred alignment option between Oakland and San Jose (see Figure 6.2-2).

The Hayward Line/Niles/Mulford option would require tight curves that would greatly limit operational speeds between Union City and Newark – with express travel times at least 6 minutes longer than the Hayward Line/I-880 option. This alignment also goes through the Don Edwards National Wildlife Refuge, which would result in considerably higher potential for environmental impacts (hydrology and water resources, biology and wetlands, visual impacts, and Section 4(f) and 6(f) parkland impacts) than the Hayward Line/I-880 alignment option (see summary table Section 6.2.1B).

MTC and the City of Newark support the Hayward Line/I-880 alignment option. Caltrans District 4 commented that there would be significant construction stage impacts if the alignment encroaches onto the I-880 median between Fremont and San Jose, and there is a need for a detailed analysis of potential construction impacts during project level environmental review.

Preferred Station Locations:

- Downtown Oakland Terminus: continue investigation of both West Oakland and 12th Street/City Center sites

Analysis:

The West Oakland station option and the 12th Street/City Center station options would both provide good connectivity with BART and would have similar potential for environmental issues. Although the 12th Street/City Center option is in the heart of downtown Oakland, it would have more construction and right-of-way issues. The MTC favors the West Oakland option, but supports continuing to investigate both station sites, while the City of Oakland believes both should be further investigated. Both the West Oakland and the 12th Street/City Center sites are preferred for future study as potential locations for a terminus station in Oakland because there is not enough information to differentiate between these two remaining station options.

- Oakland Airport Connector Station: Coliseum BART Station

**Figure 6.2-2
Oakland to San Jose Alignment and Potential Station Options**



Analysis:

A multi-modal station (BART/Capitol/HST) at the Coliseum BART station, which is located about two miles from the Oakland Airport passenger facilities, could connect the proposed HST system to Oakland Airport. This potential station would be about 7-miles south of downtown Oakland. The Coliseum BART HST station is preferred in support of the HST project objective to connect to major airports.

- Southern Alameda County Station: Union City

Analysis:

The Union City station location is the preferred HST station to serve Southern Alameda County. The multi-modal Union City station site offers a high level of connectivity with connections to BART, the Capitol Corridor, and AC Transit and could connect to the Altamont Commuter Express service. It would have low potential for environmental impacts, whereas the Auto Mall Parkway site is adjacent to the Don Edwards Wildlife Refuge. The Union City station site is supported by the City of Union City. Comments received by Bay Area Rapid Transit (BART) recommend a potential HST station be considered at Warm Springs (while accurately considering the planned BART Warm Springs Extension). The Authority would coordinate future studies of this potential station with planned BART improvements at Warm Springs.

- Downtown San Jose Terminus: Diridon Station

Analysis:

Diridon Station is the preferred HST station for downtown San Jose and the Southern Bay Area, serving Caltrain, ACE Commuter Rail, the Capitol Corridor, Amtrak long distance services, VTA buses and light rail, and a possible future link to BART (from Fremont). Diridon station is a multi-modal hub that maximizes connectivity to downtown San Jose and the southern Bay Area, and would have high ridership potential. The Authority identifies the Diridon Station as the preferred HST station option for San Jose and the southern Bay Area. Diridon Station is favored by the City of San Jose and the Valley Transportation Authority (VTA).

6A.2.3 San Jose to Merced: Northern Mountain Crossing

Preferred Alignment (Corridor): A broad corridor is preferred containing a number of feasible route options. This broad corridor is generally bounded by (and includes) the Pacheco Pass (SR-152) Corridor to the south, the Altamont Pass (I-580) Corridor to the north, the BNSF Corridor to the east, and the Caltrain Corridor to the west. The Authority would not pursue alignment options through Henry Coe State Park, and station options at Los Banos in future studies.

Analysis:

The Authority and the FRA, have determined that the available information supports identifying a broad corridor containing multiple route options and providing for further study. The San Jose to Merced segment involves the crossing of the Diablo Range Mountains that separate the Central Valley from the San Francisco Bay Area. This is one of the most difficult geographic features encountered by the proposed HST system and is an area of controversy. Future studies, including a next-tier EIR/EIS, will be needed in order to identify a single preferred alignment option between the Central Valley and the San Francisco Bay Area. The FRA consulted with CEQ, and CEQ concurred that the proposed approach would be consistent with NEPA and would provide for compliance with Section 404 of the Clean Water Act.

Many comments have been received urging further evaluation of the Altamont Pass as a potential alignment option. Federal agency comments and others have noted the limitations of available environmental resource information regarding the Diablo Range mountain crossing. In addition, comments have been received indicating that other undeveloped areas in the northern mountain crossing outside the current boundaries of Henry Coe State Park contain sensitive environmental resources. The Authority identifies a broad corridor between the Bay Area to Merced as preferred, that would be bounded generally by (and include) the Pacheco Pass Corridor (SR-152) to the south, the Altamont Pass Corridor (I-580) to the north, the BNSF Corridor to the east, and the Caltrain Corridor to the west⁴ (see Figure 6.2-3a).⁵

Many comments have also been received opposing potential HST alignments through (or under) Henry Coe State Park (which includes the Orestimba State Wilderness Preserve). The Authority has determined that alignment options through Henry Coe State Park should not be pursued in any subsequent environmental analysis.

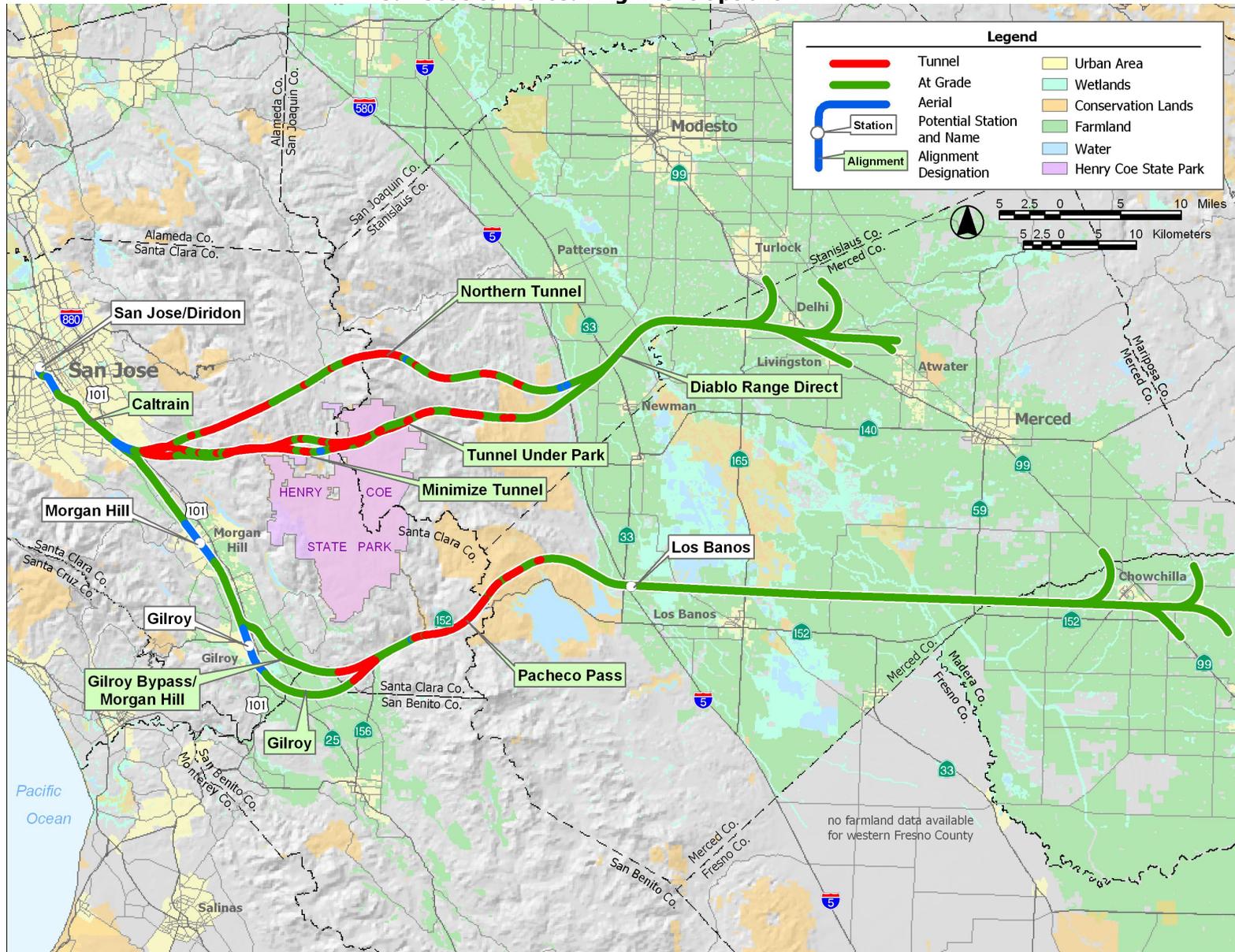
HST alignments through Henry Coe State Park would have greater potential environmental impacts than alignment options through the Diablo Range that would avoid the park to the north (see summary table Section 6.2.1C). Alignments through Henry Coe State Park would have the highest impacts to Section 4(f) and 6(f) Resources (both long-term and construction impacts). In addition, the considerable amount of public and agency input in regards to these alignment options has been overwhelmingly opposed to any construction through Henry Coe State Park.

The Authority also has determined that the Pacheco Pass alignment HST station at Los Banos (Western Merced County) should not be pursued in subsequent environmental reviews because of low intercity ridership projections for this site, limited connectivity and accessibility, and potential impacts to water resources and threatened and endangered species. Although the City of Los Banos supports the Pacheco Pass alignment with a potential station at Los Banos, considerable public and agency opposition has been expressed about a potential Los Banos HST station because of its perceived potential to result in growth related impacts. This station option (as well as the Visalia/Hanford option) has low ridership potential compared to other potential station locations investigated by the Authority. In 2020, this station is forecast to serve a population of only about 88,000 (forecast to only have between 155,000 and 190,000 annual total intercity boardings and alightings by 2020). Excluding this station is expected to slightly reduce the capital costs of the HST system and reduce potential environmental impacts at Los Banos.

4 The highways (SR 152 and I-580) are provided only as a point of reference for the convenience of the reader; the precise highway alignments are not limitations on the area to be considered in future studies.

5 The Altamont Pass alignment option was recommended to be eliminated from further investigation in the Authority's and FRA's Draft Program EIR/EIS (see Section 2.6.8). However, as a result of agency and public comments received on the Draft Program EIR/EIS, it was determined that the Altamont Pass should be included as part of the broad corridor identified as the preferred HST option for the Northern Mountain Crossing.

**Figure 6.2-3
San Jose to Merced Alignment Options**



6A.3 SACRAMENTO - BAKERSFIELD

The region from Sacramento to Bakersfield was divided into four segments for analysis: 1) Sacramento to Stockton; 2) Stockton to Merced; 3) Merced to Fresno; and 4) Fresno to Bakersfield.

The alignments considered in the Sacramento – Bakersfield corridor generally followed the two existing freight corridors of the UP and the BNSF. With that in mind, HST impacts throughout the Central Valley that have already been reduced and avoided could be further avoided and minimized by sharing the existing freight railroad right-of-way. If a decision were made to proceed with the HST system, the Authority would seek agreements with freight operators to utilize portions of the existing rail right-of-way to the greatest feasible extent.

In the Sacramento to Stockton segment, the use of the UP freight corridor would be more consistent with HST service needs and would have less of an effect on the present environmental setting than the use of the CCT corridor, which is currently out of service. In studying the two freight corridors between Stockton and Bakersfield both offer similar travel times and provide access to the Central Valley population centers, however it has become apparent that the BNSF alignment is more compatible with HST service and operations. Throughout the corridor the UP alignment passes through more urban areas and would require more aerial structures, thereby increasing adverse impacts to communities and construction costs. Both the UP and BNSF have freight activity; however, the UP serves more local industries adjacent to the corridor that the HST alignment would have to avoid. This would typically be accomplished by using aerial structures to fly over the local freight tracks, which would add cost and cause additional adverse community impacts. The BNSF alignment traverses a more rural setting, would require fewer aerial structures and would cause fewer impacts to Central Valley communities.

A great advantage of the BNSF alignment is that much of the HST system could be constructed at-grade such that the freight track would be grade separated along with the adjacent HST tracks. This would benefit freight services and communities by reducing noise (due to the elimination of horn noise and gate noise from existing services), providing improved safety, freeing automobile traffic and improving air quality through reduced congestion.

The Authority, in consultation with the FRA, has identified a broad preferred corridor between the Bay Area and the Central Valley containing a number of feasible route options within which further study will permit the identification of a single preferred alignment option. This corridor is bounded generally by (and includes) the Pacheco Pass (SR-152) to the south, the Altamont Pass (I-580) to the north, the BNSF Corridor to the east, and the Caltrain Corridor to the west, but would not include alignment options through Henry Coe State Park and station options at Los Banos.⁶ Future studies would focus on the identification of a preferred alignment between the Central Valley and the San Francisco Bay area.

Future studies would include consideration of: (1) how and where the HST alignment from the Bay Area would connect with the HST alignment in the Central Valley; (2) how and where the HST alignment would enter the Bay area and would connect to Bay Area termini; (3) the location of stations within these segments.

The preferences herein for portions of the Sacramento to Bakersfield alignment and stations, which are also in the broad corridor identified for further study between the Central Valley and the Bay Area (see above) are based upon current information. These preferences are subject to change based upon the information provided in other future studies.

⁶ Highway route numbers are provided only as a convenient reference for the reader, not as a limitation on the corridor to be considered.

6A.3.1 Sacramento to Stockton

Preferred Alignment:

- The UPRR alignment option is the CHSRA and FRA preferred option between Sacramento and Stockton. However, due to CWA Federal regulations, because the UPRR alignment option has more potential impacts to waters and biological resources, the CCT alignment option is included in the HST alternative to be further evaluated in project level environmental review.

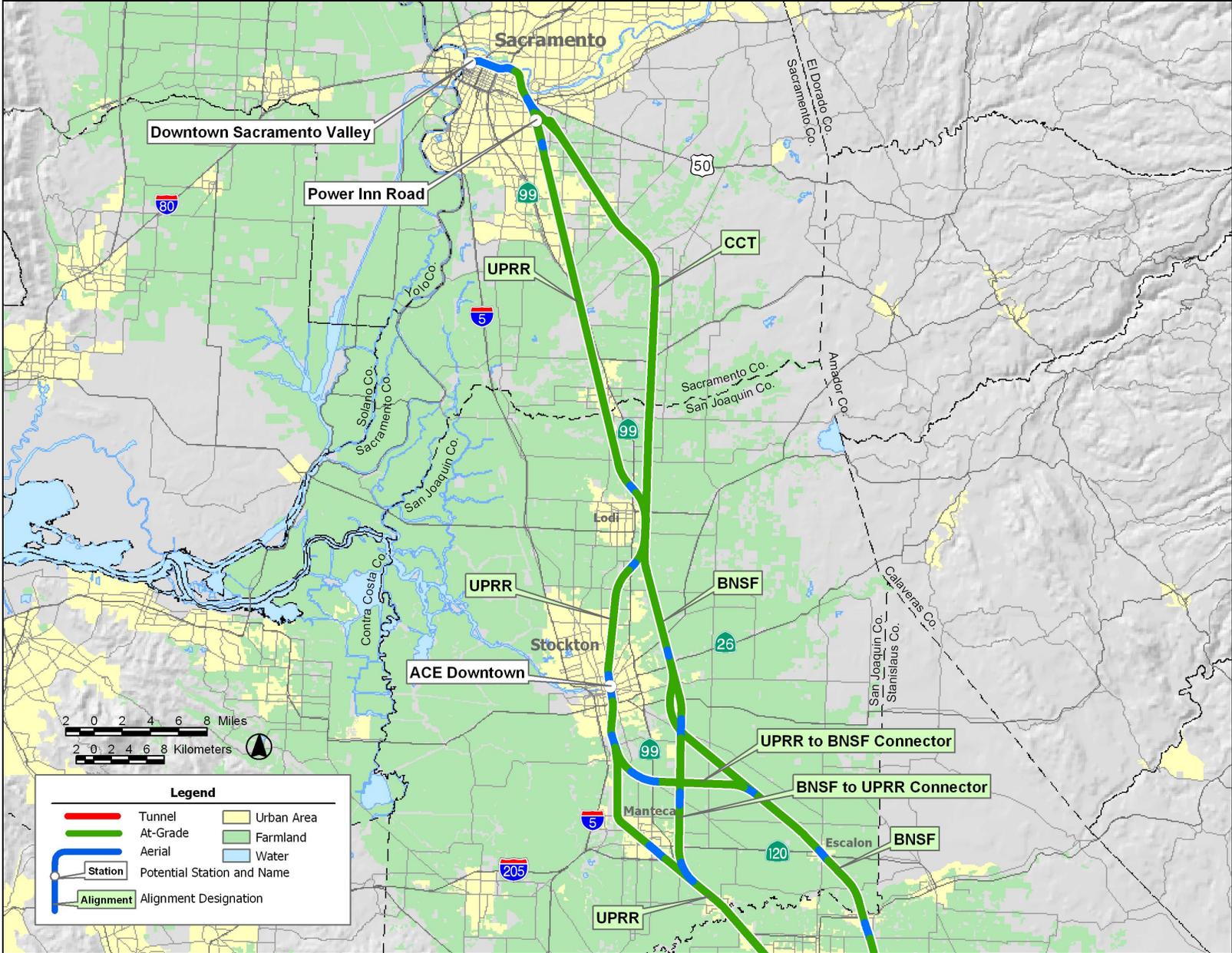
Analysis:

The UPRR alignment begins at the Sacramento Rail Depot in downtown Sacramento. North of Lodi, the alignment diverges from UPRR to CCT to bypass Lodi and reconnects to the UPRR to serve the proposed downtown Stockton station site. This alignment option includes a new alignment bypass of Stockton for express services (see Figure 6.3-1). In comparison to the out of service CCT alignment, using the existing freight corridor through most of this segment would minimize and avoid environmental impacts. The UPRR is a more direct route with slightly shorter travel times (1 minute less) and lower construction costs (an estimated \$150 million less) than the CCT alignment option.

At a program level of detail, the technical analysis of these options showed slightly higher potential impacts to biological and water resources for the UPRR alignment as compared to the CCT alignment. The technical analysis of these options showed generally higher potential impacts to biological and water resources for the UPRR alignment as compared to the CCT alignment. The UPRR option was determined to have 4.3 acres more potential impacts to wetlands, 25 acres more potential impacts to habitat, 20 more potential sensitive species, 800 linear feet more potential impacts to streams, and 0.56 acres more potential impacts to lakes than the UPRR alignment, but would have 34-88 acres less potential impacts to flood plains (see summary table Section 6.3.1A). Most of the stream crossings under the UP alignment are due to canal crossings, not river crossings, which are generally smaller and could be realigned if necessary. In addition, introduction of the HST service on the abandoned CCT right-of-way could result in greater interference of wildlife movement in comparison with the UPRR alignment, which is a heavily used freight corridor.

Although the program-level analysis utilizing the sightings reported in the California Natural Diversity Database (NDDB) indicates that the UPRR alignment has the potential to affect 25 acres more of wildlife habitat and 20 more sensitive species, this information was not confirmed by biological surveys. Recent field observations indicate more vegetation and higher habitat values along the out of service CCT alignment for habitat associated with both the aquatic ecosystem and upland resources than those observed along the UPRR alignment [Derek Jansen, Wildlife Biologist, Jones & Stokes; field observations June 21, 2005]. It was observed that the out of service CCT alignment currently has greater breeding and nesting areas, escape cover, travel corridors, and preferred food sources for resident and transient wildlife species associated with the aquatic ecosystem, as well as upland habitats. It is expected that introduction of the HST service on the CCT right-of-way would result in greater adverse environmental consequences related to interference of wildlife movement and would have more severe impacts to riparian vegetation and habitat values, in comparison with the UPRR alignment, which is a heavily used freight corridor. Adverse effects to non-biological resources within the human environment would also be greater with the CCT alignment. The out of service CCT corridor currently has much less ambient noise and light. The right-of-way for the CCT alignment has undergone a re-growth of vegetation. With the introduction of HST service within the CCT alignment, noise, light and glare, and aesthetic impacts would be substantially more severe than adding HST service to the highly utilized UPRR alignment. The UPRR is a heavily used freight rail corridor and the grade separation improvements along this alignment would result in potential reductions in noise levels from existing conditions due to the elimination of horn noise and gate noise from existing services. Community use effects would occur with adding HST service to

**Figure 6.3-1
Sacramento to Stockton Alignment and Potential Station Options**



the out of service CCT alignment but would not occur with use of the UPRR alignment. Informal recreation uses related to hiking and wildlife viewing currently occur on the out of service CCT alignment. The local community long-term plans to develop the CCT right-of-way as a recreation corridor for trails for hiking and biking. Using the CCT alignment for HST service would preclude the current and planned recreation uses. In addition, the CCT has more adjacent land designated for residential and agricultural use than the UPRR alignment. As a result, the CCT would have more potential noise, community, and property impacts than the UPRR. While the Sacramento region is supportive of a statewide HST system serving Sacramento, there is substantial community opposition to placing the HST on the CCT alignment. Both the Sacramento Area Council of Governments (SACOG) and the City of Elk Grove (which is bisected by both alignments) support HST on the UPRR and oppose the use of the CCT alignment as a result of potential community impacts. Although SACOG supports the UPRR alignment through Elk Grove, they have expressed concern regarding the UPRR alignment bisecting the City of Galt, which is the southernmost community in Sacramento County.

The California Department of Parks and Recreation has expressed concern over both the UPRR and CCT alignments, stating both options potentially impact the Stone Lakes National Wildlife Refuge in Southern Sacramento County. Parks and Recreation prefers the CCT alignment, citing of the two alignment options the CCT alignment could have potentially fewer impacts on the wildlife and recreation areas of Stone Lakes Refuge. A comprehensive study to avoid and/or minimize the potential impacts to these sensitive areas would be completed as part of project level environmental review.

Preferred Station Locations:

- Sacramento: Downtown Sacramento

Analysis:

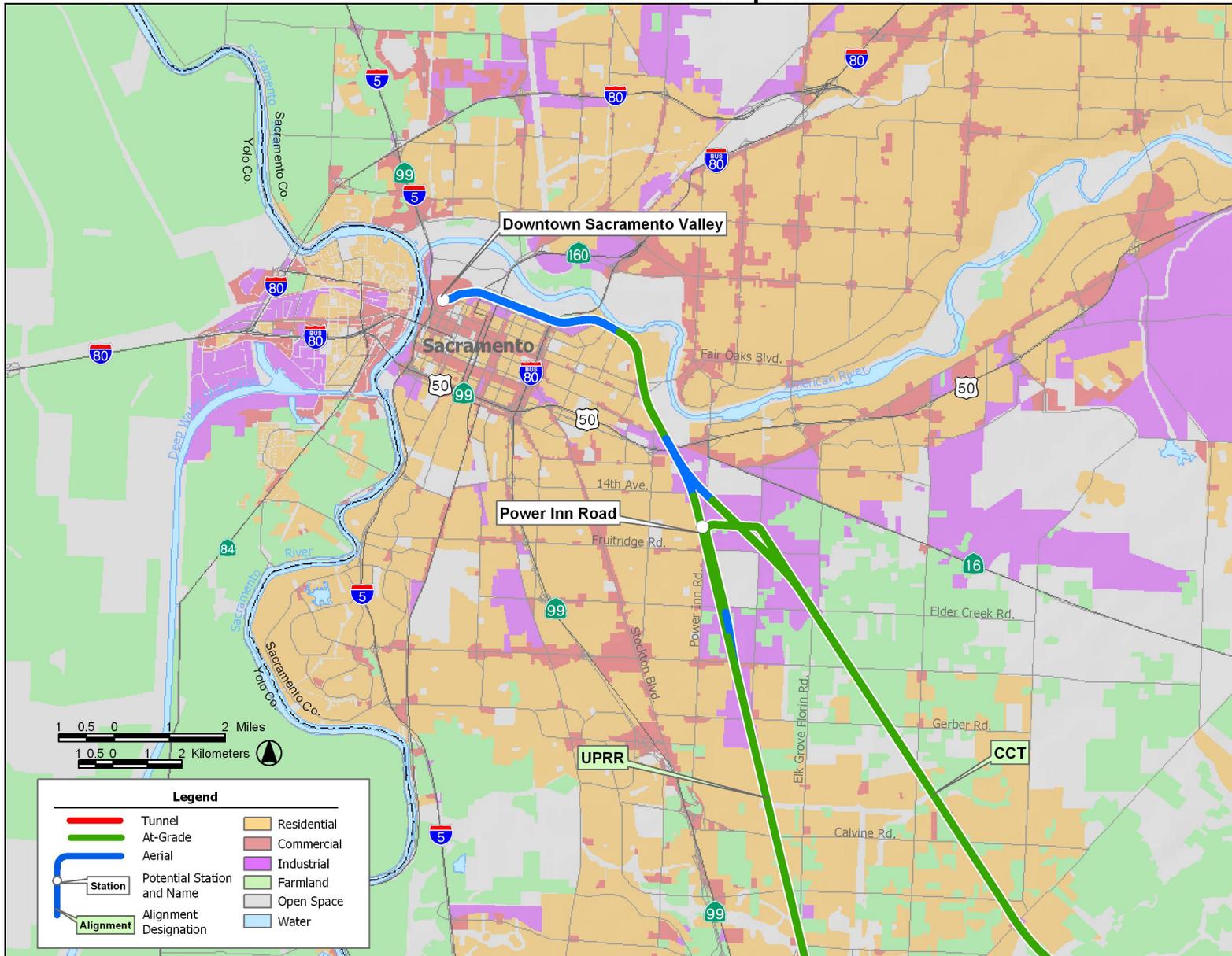
The Downtown Sacramento station is the preferred HST station option to serve the Sacramento metropolitan area (see Figure 6.3-5A). This station option would maximize opportunities for intermodal connectivity and is located in downtown Sacramento within walking distance of the State Capitol. This multimodal hub station location serves the existing Amtrak services to Sacramento, including the Capitol Corridor, and the Sacramento LRT, which is being extended to directly link with this station site. The HST platforms could be constructed on an aerial structure above the platforms for the existing rail services. The Downtown Sacramento station option is preferred by the City of Sacramento, and SACOG.

- Stockton: Stockton Downtown ACE

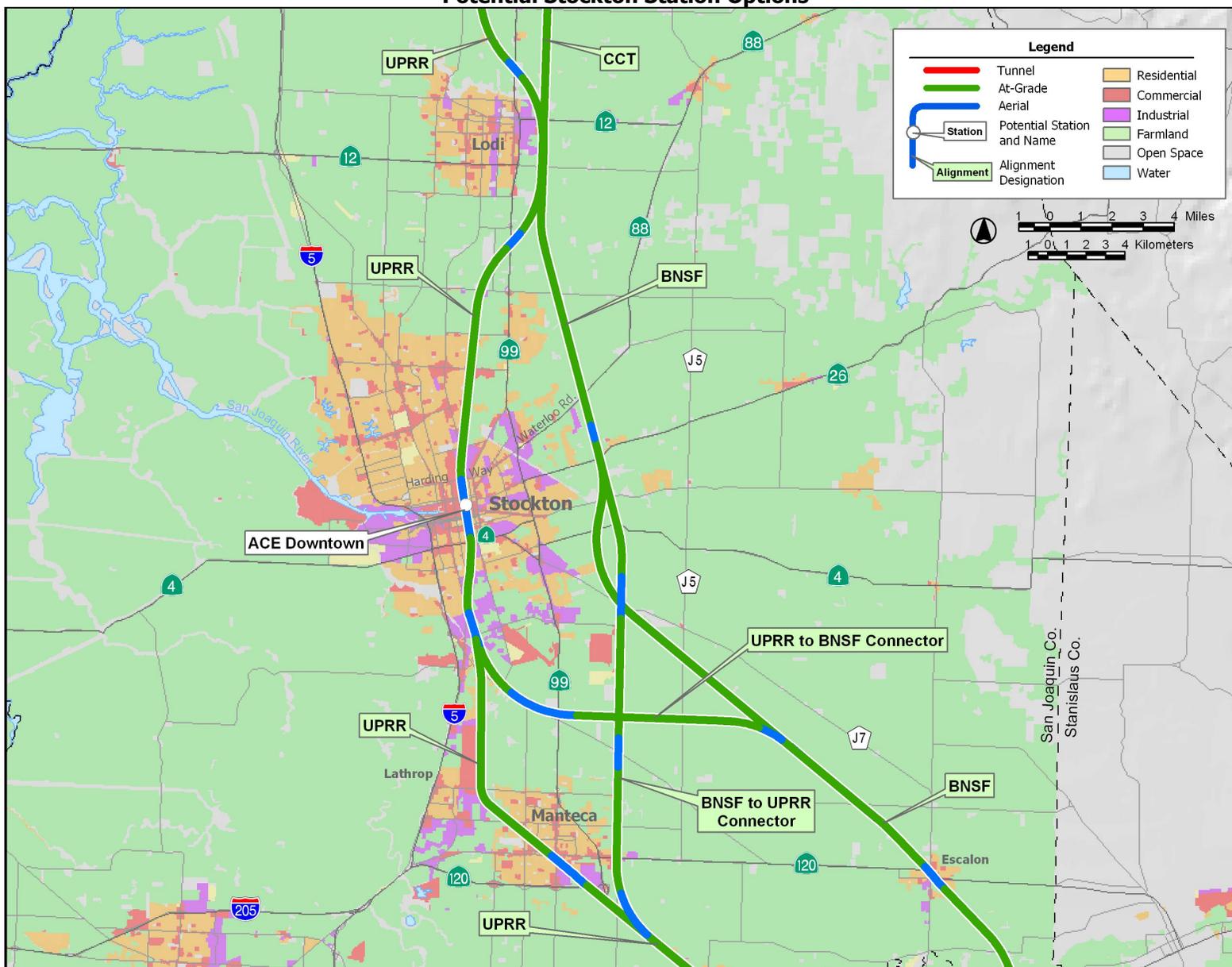
Analysis:

The Stockton Downtown ACE station option is the preferred HST station option to serve the Stockton area, and San Joaquin County (see Figure 6.3-5B). The Stockton Downtown ACE option would maximize connectivity with good freeway access and bus transit service, and would share the site with ACE commuter rail and present Amtrak services. Comments received by the Department of Transportation (Caltrans) recommend a potential HST station be considered for the BNSF rail alignment to the east of Stockton. In discussions with Caltrans they have indicated they are working on relocating the Stockton Amtrak station to a location along the BNSF alignment to the east of Stockton. A potential station along the BNSF alignment would be considered at the project level.

**Figure 6.3-5a
Potential Sacramento Station Options**



**Figure 6.3-5b
Potential Stockton Station Options**



6A.3.2 Stockton to Merced

The Authority, in consultation with the FRA, has identified a broad preferred corridor between the Central Valley and the Bay Area containing a number of route options within which further study will permit the identification of a single preferred alignment option. The preferences herein for the portion of the Stockton to Merced alignment and stations, which are also within the broad corridor identified for further study between the Central Valley and the Bay Area and are based upon current information. These recommendations are subject to change based upon the information provided in other future studies.

Preferred Alignment:

- Burlington Northern Santa Fe (BNSF)

Analysis:

The BNSF alignment is the preferred alignment option for HST service between Stockton and Merced (see Figure 6.3-2A).

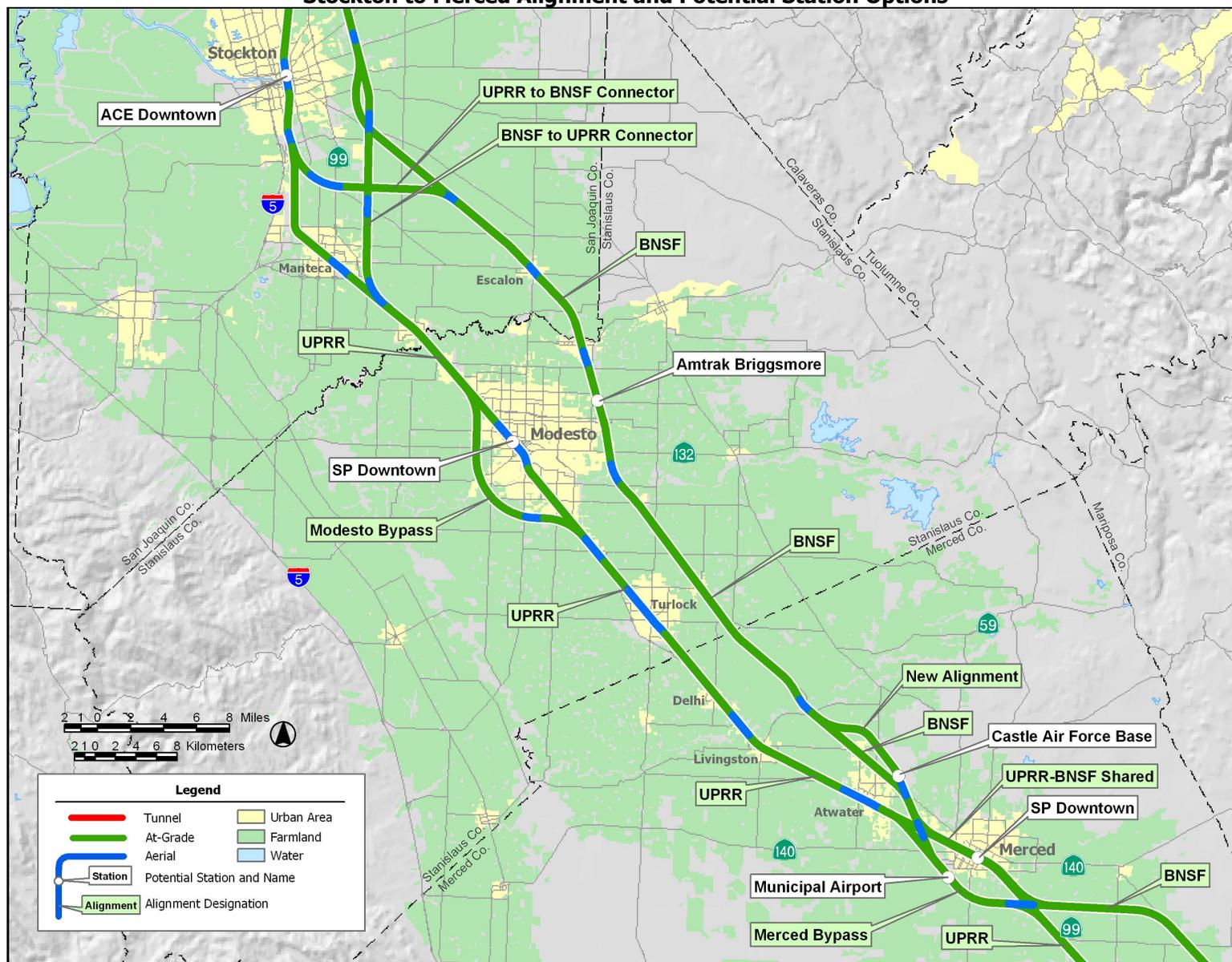
The BNSF alignment avoids most of the urban areas between Stockton and Merced and therefore would have less constructability issues, less property impacts, and cost less than the UPRR alignment. The BNSF alignment is estimated to be about \$400 million less costly than the UPRR alignment since it would include less urban area construction, would be mostly at grade (the UPRR alignment option includes aerial structures through Modesto and Turlock), and would not include an express loop around Modesto.

The BNSF alignment also would have fewer potential environmental impacts, and could serve the Castle Air Force Base station option serving Merced. Since the BNSF alignment minimizes urban area construction, it would have less potential for noise, cultural, property and community impacts than the UPRR option. Moreover, while the BNSF alignment would follow existing rail-right-of-way and minimize the potential for environmental impacts, the UPRR alignment would include a new express loop through agricultural land around Modesto because of speed restricting curves through downtown Modesto, which would have considerable potential for severance impacts and direct impacts to agricultural lands (about 97 ac (39 ha)). The USEPA has expressed concern over the additional impacts caused by bypasses to farmlands, noise and visual, water and biological resources.

The technical analysis of these options showed slight differences between the BNSF and UPRR alignments in regards to the potential impacts to biological and water resources. These results do not indicate a significant difference between the two HST alignment options. The BNSF option was determined to have fewer potential impacts to lakes (8.5 acres less) and habitat (129 – 200 acres less) and streams (0 – 850 linear ft) than the UPRR alignment, but more potential impacts to floodplains (171 – 193 ac) and wetlands (2.7 – 3.0 acres) than the UP alignment. Between Stockton and Modesto, all the threatened and endangered species along the UPRR alignment are vernal pool species, by contrast, along the BNSF there are relatively few occurrences of California tiger salamander, Swainson's hawk, and vernal pool tadpole shrimp, and the UPRR crosses territories with more sightings of threatened and endangered species between Modesto and Merced than the BNSF (see summary table Section 6.3.1B).

Impacts throughout this segment could be avoided and minimized by sharing the existing freight railroad right-of-way. If a decision were made to proceed with the HST system, the Authority would seek agreements with BNSF to utilize the existing rail right-of-way to the greatest extent feasible.

**Figure 6.3-2a
Stockton to Merced Alignment and Potential Station Options**



Preferred Station Locations:

- Modesto: Amtrak Briggsmore

Analysis:

The Amtrak Briggsmore option is the preferred HST station location to serve Stanislaus County (see Figure 6.3-2A). This is a multi-modal hub station and is the site of a new Amtrak station with a direct connection to Amtrak services and bus services. This is the only station option investigated in Stanislaus County along the preferred BNSF alignment option.

- Merced: One station only – either Castle Air Force Base (BNSF using UP alignment through downtown Merced) or Downtown Merced

Analysis:

The Authority prefers to continue to investigate both the Castle Air Force Base (AFB) and the Downtown Merced station options to serve Merced County (see Figure 6.3-2B). The Castle (AFB) site is about 7 miles (11 km) northwest from downtown Merced, but would provide the best access to the developing UC Merced campus via a new highway alignment along Bellevue Avenue. This option would require an additional two-track alignment loop line be constructed to serve Castle AFB station site. While this option would have less connectivity and accessibility to downtown Merced, it would have fewer construction impacts (since only two tracks would be required through downtown Merced). USEPA has expressed concern over loop concepts in the Central Valley, noting that the additional tracks would increase potential environmental impacts; therefore, it is recommended that a potential station along the BNSF alignment be considered at the project level. The Castle AFB option is supported by the City and County of Merced, UC Merced, and the Merced High-Speed Rail Committee. Comments were also received from federal and state elected officials as well as local governments and organizations in support of a maintenance hub at Castle AFB.

The Downtown Merced site is located at the city center and the transit hub of Merced, has good access to SR-99, and would have higher connectivity than the Castle (AFB) site. However, the Downtown Merced option would have higher construction issues, due to the need for four tracks through downtown Merced to accommodate express services.

6A.3.3 Merced to Fresno

Preferred Alignment:

- Burlington Northern Santa Fe (BNSF)

Analysis:

The BNSF alignment is the preferred option for HST service between Merced and Fresno (see Figure 6.3-3A). The BNSF alignment avoids most of the urban areas between Merced and Fresno and would have substantially less constructability issues, would have fewer potential noise, cultural, property, and community impacts, and is estimated to cost about \$400 million less than the UPRR alignment. The BNSF alignment option has been considered with new alignment transitions just south of Merced and just north of Fresno and combined with the UPRR alignment through Fresno and Merced. USEPA has expressed concern over potential impacts on new corridor segments needed to connect the UPRR to the

**Figure 6.3-2b
Potential Merced Station Options**

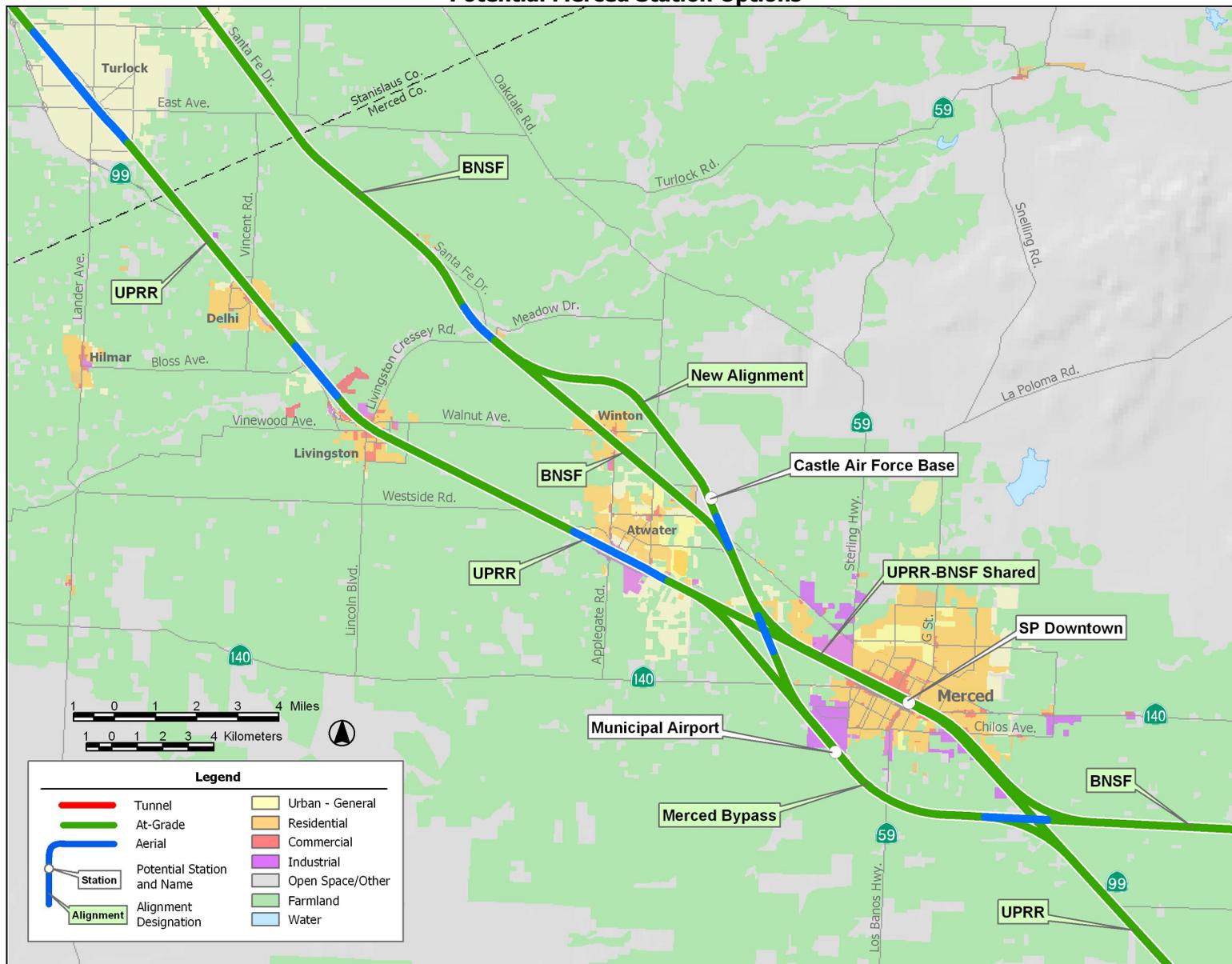
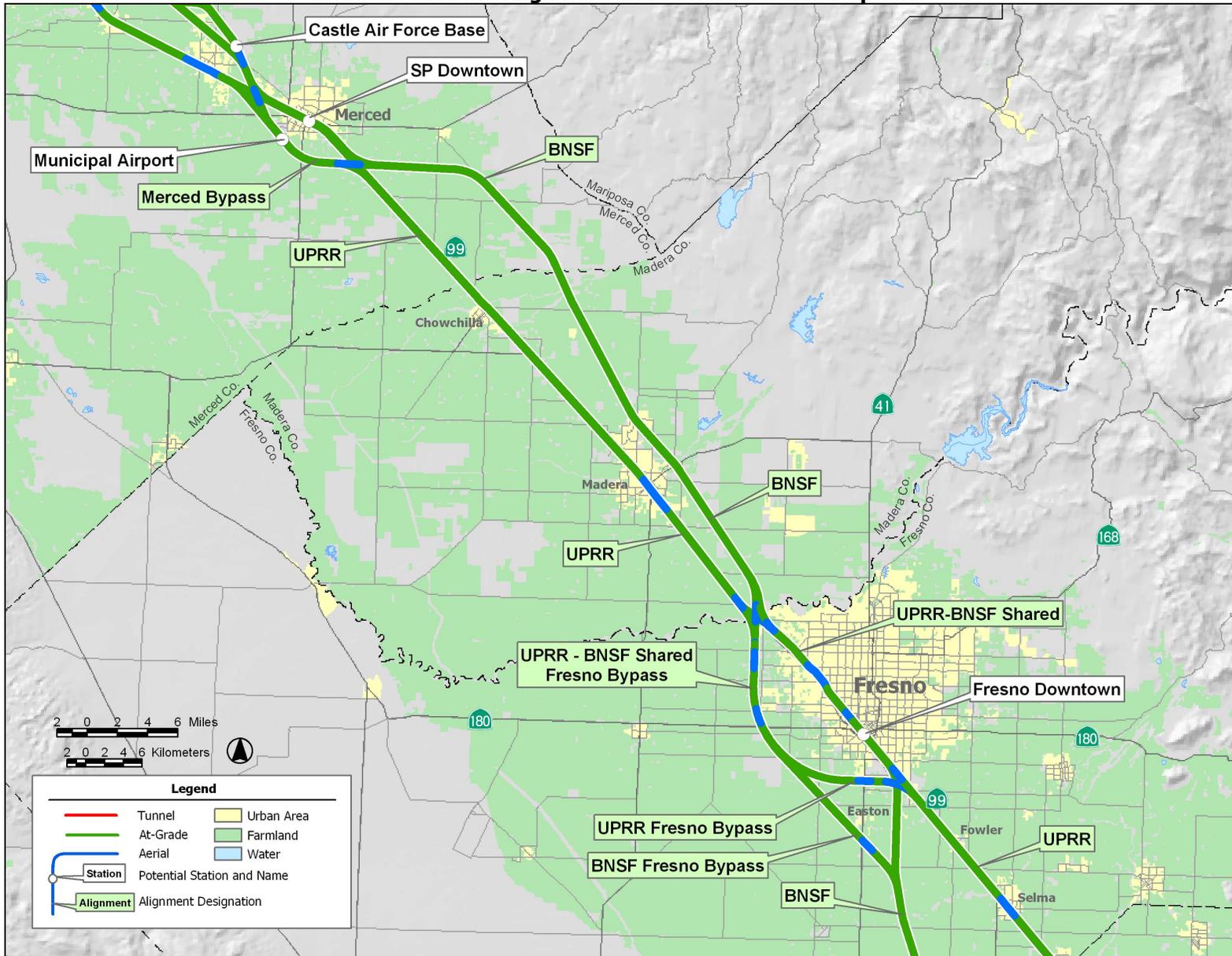


Figure 6.3-3a
Merced to Fresno Alignment and Potential Station Options



BNSF. Therefore the BNSF alignment, through Merced, would also be considered at the project level because of its potential to reduce land severance impacts.

The technical analysis of these options showed slightly higher potential impacts to biological and water resources for the BNSF alignment as compared to the UPRR alignment. However, at a program level of detail, these results do not indicate a significant difference between these two HST alignment options that are over 67-miles long. The BNSF option was determined to have 1.4 acres more potential impacts to wetlands, 9 acres more potential impacts to habitat, 4 more potential sensitive species, 1,050 linear feet more potential impacts to streams, and 1.3 acres more potential impacts to lakes than the UPRR alignment, but would have 10-17 acres less potential impacts to floodplains. In addition, the UPRR has greater potential impacts to the San Joaquin kit fox, with 25 records identified for the UPRR as compared with only 2 – 5 occurrence records for the BNSF (see summary table Section 6.3.1C).

Potential environmental impacts throughout this segment could be avoided and minimized to the extent the HST system could share the existing freight rail right-of-way. If a decision were made to proceed with the HST system, the Authority would seek agreements to utilize the existing rail right-of-way to the greatest extent feasible.

Preferred Station Location:

- Fresno: Downtown Fresno

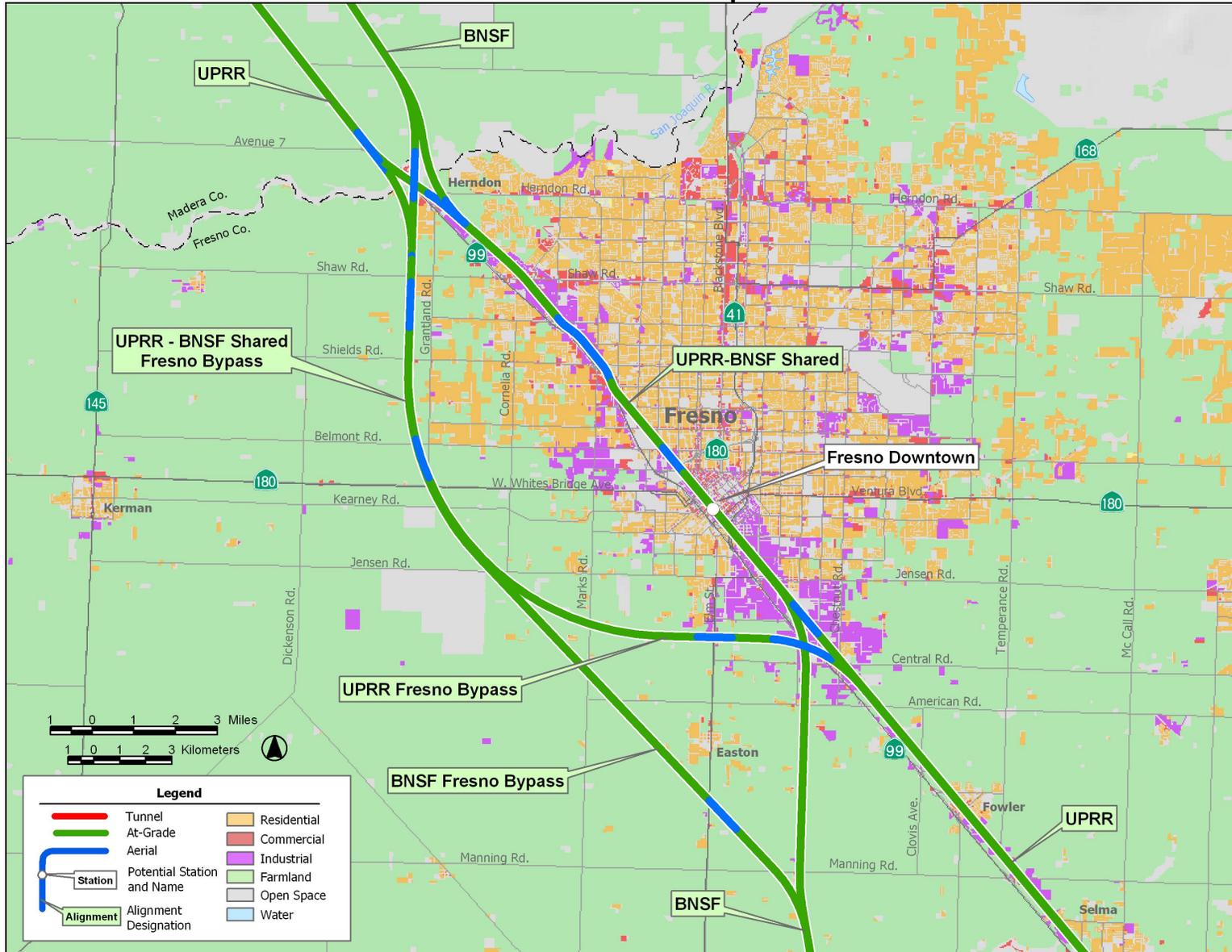
Analysis:

The Downtown Fresno option is the preferred HST station option to serve Fresno County, and the surrounding areas. The downtown Fresno station site has high connectivity and accessibility, with good freeway access and good connections to bus transit. This option is the preferred HST station site of the City of Fresno, Fresno County, and Fresno COG.

The direct option through Fresno, does not include an express loop outside of Fresno (see Figure 6.3-3B). This direct option would have high construction issues since four tracks would be needed through much of Fresno to accommodate express services, and a considerable amount of the alignment through Fresno would be on aerial structure. However, this option would have fewer potential environmental impacts (impacts to farmlands, biological resources, wetlands), and is estimated to be at least \$700 million less costly than the option with the express loop (since the express loop would include 22-26 additional miles of alignment construction [35-42 km]). Analysis of the Fresno loop line option suggests that the primary benefit of moving the high-speed mainline (express tracks) outside the urban area would be a 12-16% reduction in potential noise impacts.

Comments received from Fresno County and the Fresno COG support the location of all high-speed tracks through the City of Fresno along the UPRR alignment. The City of Fresno suggests the Authority continue to investigate the "loop track", west of Fresno, for the relocation of the BNSF alignment away from Downtown Fresno. Comments have been received from BIA of the San Joaquin Valley and Granville Homes suggesting pushing the express loop further west, due to planned development. Moving the loop further to the west would increase the potential farmland impacts and costs. Additionally, USEPA has expressed concern over the loop concept throughout the Central Valley, noting that the extra tracks and system requirements may more than double the acreage of potentially affected farmland, would increase noise and visual impacts, and would increase potential impacts to water and biological resources.

**Figure 6.3-3b
Potential Fresno Station Options**



6A.3.4 Fresno to Bakersfield

Preferred Alignment:

- Burlington Northern Santa Fe (BNSF)

Analysis:

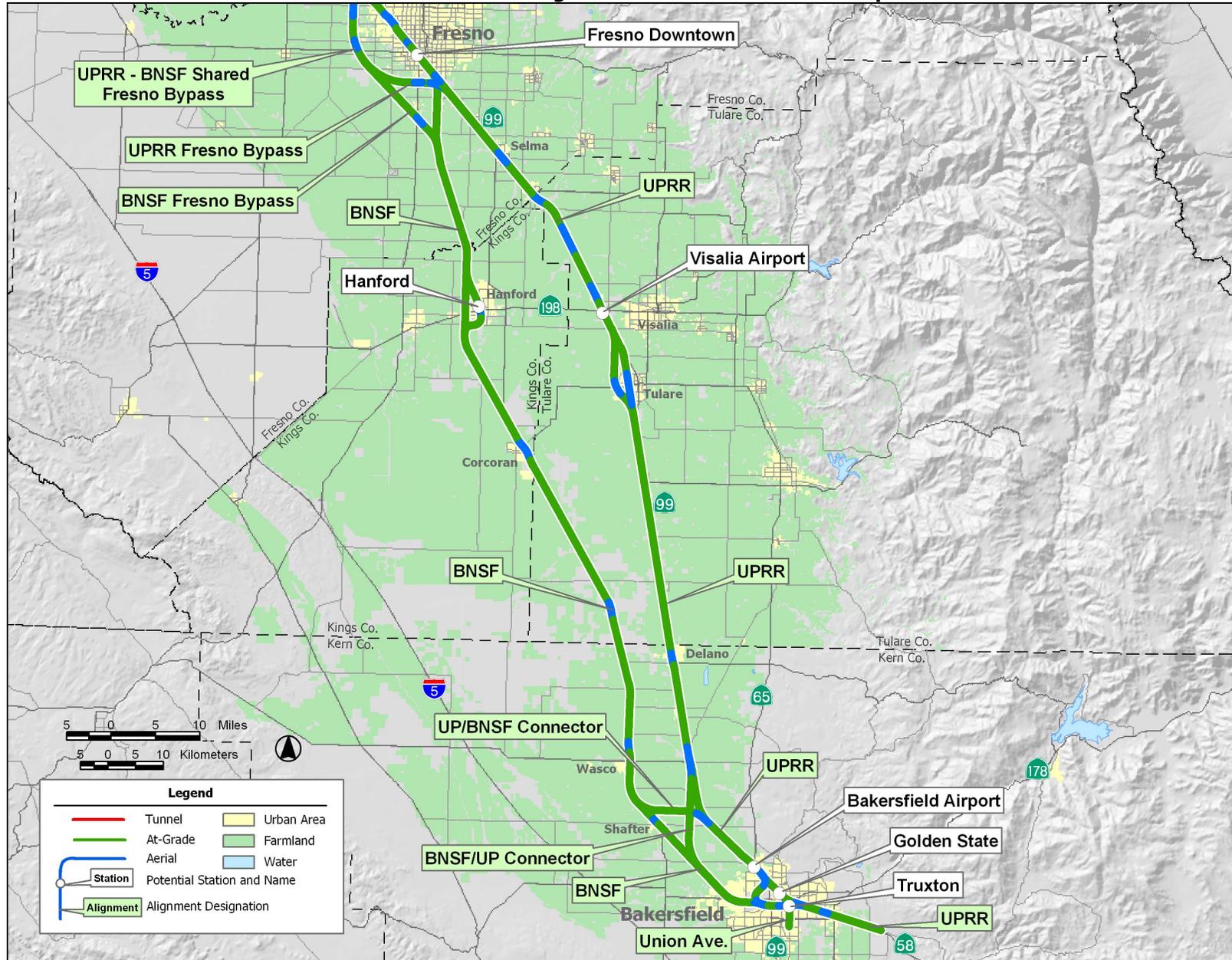
The BNSF alignment is the preferred option for HST service between Fresno and Bakersfield (see Figure 6.3-4A). The BNSF avoids most of the urban areas between Fresno and Bakersfield and is recommended as the preferred alignment because it would have fewer constructability issues, would have fewer potential noise, cultural, community, and property impacts, and is estimated to cost between \$590-800 million less the UPRR alignment options. In order to maintain high-speed service on the BNSF alignment, construction of a new HST alignment around Hanford would be needed.

Potential environmental impacts throughout this segment could be avoided and minimized if the HST system could share the existing freight rail right-of-way. If a decision is made to proceed with the proposed HST system, the Authority would seek agreements with BNSF to utilize the existing rail right-of-way to the greatest extent feasible.

The technical analysis resulted in differences between the BNSF and UPRR alignments in regards to the potential impacts to biological and water resources. However, these results do not indicate a significant difference between the BNSF and UP alignment options that vary between 106 to 111 miles in length. The BNSF option was determined to have fewer potential impacts to floodplains (22,116-25,227 linear feet less), streams (500-850 linear feet less), and lakes (0.0-0.3 ac less), but more potential impacts to habitat (259-343 ac more), number of special status species (0-2), and wetlands (0.6-1.5 ac more) than the UP alignment (see summary table Section 6.3.1D). The program-level analysis, utilizing the sightings reported in the CNDDDB, indicates that the BNSF alignment is considered San Joaquin kit fox habitat, while the UPRR alignment is not described as habitat. However, this information was not confirmed by biological surveys and appears to be a mapping anomaly of the CNDDDB. The habitat indicators for kit fox in the Bakersfield area include annual grassland and salt scrub vegetation within ruderal open space areas [Steve Avery, senior wildlife biologist and San Joaquin kit fox expert, Jones & Stokes]. There is no indication that these habitat indicators differ within the two alignments [Steve Avery]. In addition, the entire area encompassing both alignments is considered habitat for the San Joaquin kit fox according to USFWS [Kit Fox Habitat coverage information provided to FRA on January, 2005; Cheryl Hickman, USFWS]. Due to concern over the potential bisecting of the communities south of Fresno, the City and County of Fresno, Fresno COG, and the cities of Fowler, Selma, and Kingsburg are opposed to the UPRR alignment as proposed and suggest if the UPRR alignment is selected that a trench be considered to reduce the impacts to these smaller communities. The California Department of Parks and Recreation has stated a preference for the UPRR alignment between Fresno and Bakersfield. Parks and Recreation notes potential visual, noise and vibration impacts to the Colonel Allensworth State Historical Park, located south of Hanford along the BNSF alignment. A comprehensive study would be undertaken as part of project level environmental review to avoid and/or minimize the potential impacts to these sensitive areas and the historical park.

Considerable public and agency comments were received supporting the UPRR alignment with a Visalia Airport station stop, including comments from the Tulare County Association of Governments and the cities of Visalia and Tulare. The BNSF alignment is the preferred option for the HST services between Fresno and Bakersfield (see Figure 6.3-4A) with no potential station between Fresno and Bakersfield, however the Authority will undertake an additional study of an alignment option between Fresno and Bakersfield, or variations thereof, to serve a potential Visalia station located in an existing and/or planned urbanized area prior to the commencement of project-level environmental review for this segment. The

**Figure 6.3-4a
Fresno to Bakersfield Alignment and Potential Station Options**



Authority will work with local, state, and federal agencies as well as the public in carrying out these planning studies. Should a feasible and practicable alignment option be identified through these planning studies that is likely to be less damaging to water and biological resources, the alignment would be fully evaluated during project level environmental review.

Preferred Station Locations:

- Tulare and Kings County: No HST Station

Analysis:

The Authority has concluded that the existing Amtrak intercity rail service should link Kings County and Tulare County to the HST system and the preferred HST alternative has no station to directly serve Hanford (the Hanford site is the only station option for Tulare/Kings counties on the recommended BNSF alignment). The Hanford/Visalia station options would have the lowest ridership potential of all the potential stations investigated by the Authority. In 2020, a Hanford or Visalia station is forecast to have only between 140,000 and 160,000 annual total intercity boardings and alightings by 2020. In addition, as a result of not having the Hanford HST station would eliminate the alignment through Hanford, resulting in cost savings of about \$420 million plus less potential environmental impact since the HST alignment would avoid the Hanford urban area.

- Bakersfield: Truxtun (Downtown Bakersfield)

Analysis:

The Truxtun station option in downtown Bakersfield is the preferred HST station option to serve Kern County (see Figure 6.3-4B). The Truxtun HST station would have the highest connectivity and would connect to the new Bakersfield Amtrak Station and has good access to SR-99. The Truxtun site is in the city center of Bakersfield and is within walking distance the convention center and City Hall. This multi-modal station site would have the greatest potential for promoting transit-oriented development around the HST station and infill development within downtown Bakersfield. The City of Bakersfield, Kern County, Kern County COG, and the Kern County Transportation Foundation for HST service for Kern County prefer this station option.

6A.4 BAKERSFIELD-LOS ANGELES

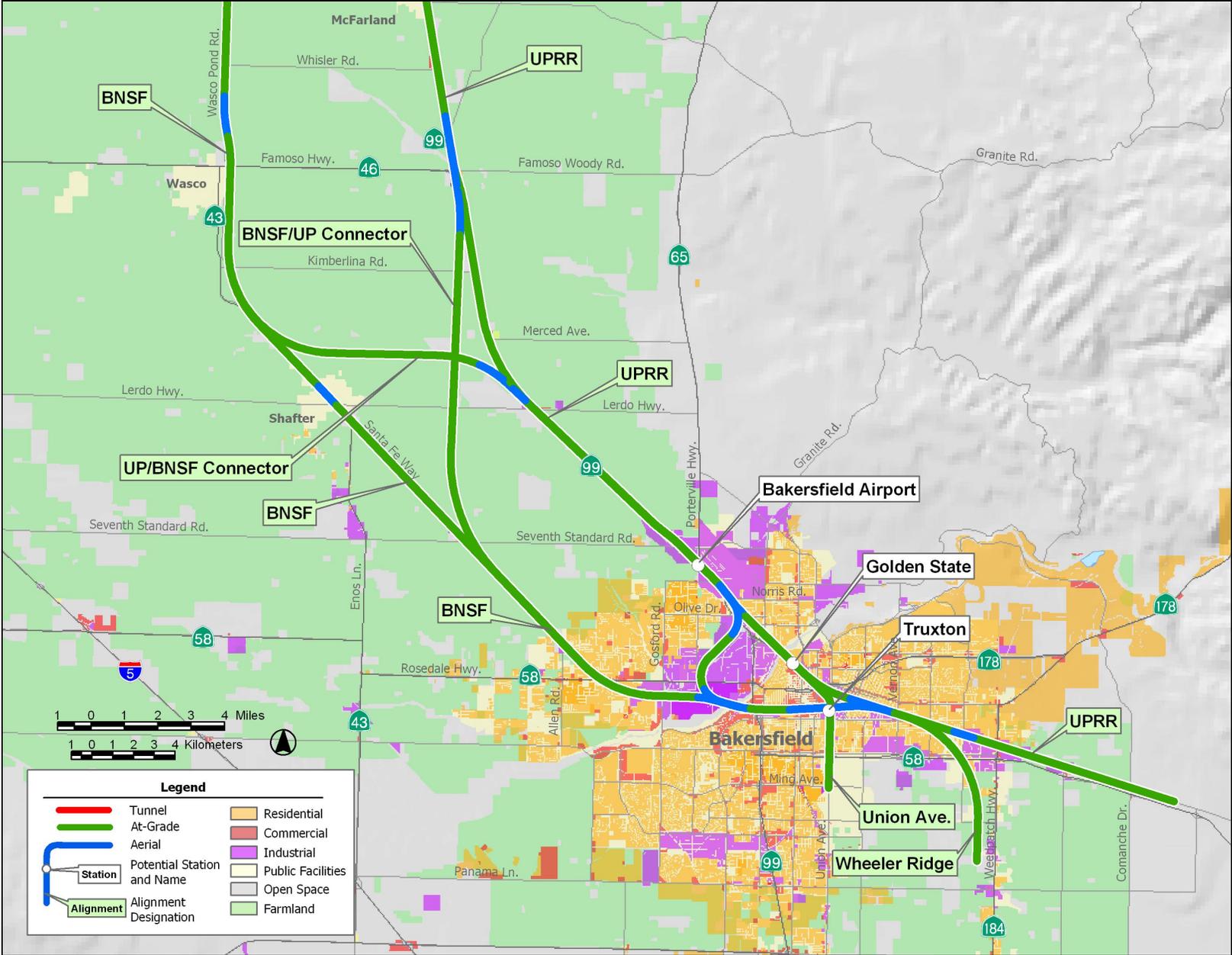
The region from Bakersfield to Los Angeles was divided into two segments: 1) Bakersfield to Sylmar; and 2) Sylmar to Los Angeles.

6A.4.1 Bakersfield to Sylmar

Preferred Alignment:

- SR-58/Soledad Canyon Corridor (Antelope Valley)

**Figure 6.3-4b
Potential Bakersfield Station Options**



Analysis:

The alignment through the SR-58/Soledad Canyon Corridor (Antelope Valley) with an HST station at Palmdale is the preferred option for crossing the Tehachapi Mountains between the Central Valley and Southern California. Although the longer Antelope Valley alignment would add about 10 minutes to express service travel times between northern and southern California and have less intercity ridership potential (trips between regions) than the I-5 alignment option, it would have fewer potential environmental impacts, it would be less subject to seismic activity and have considerably less tunneling and thereby have fewer constructability issues, and would increase connectivity and accessibility.

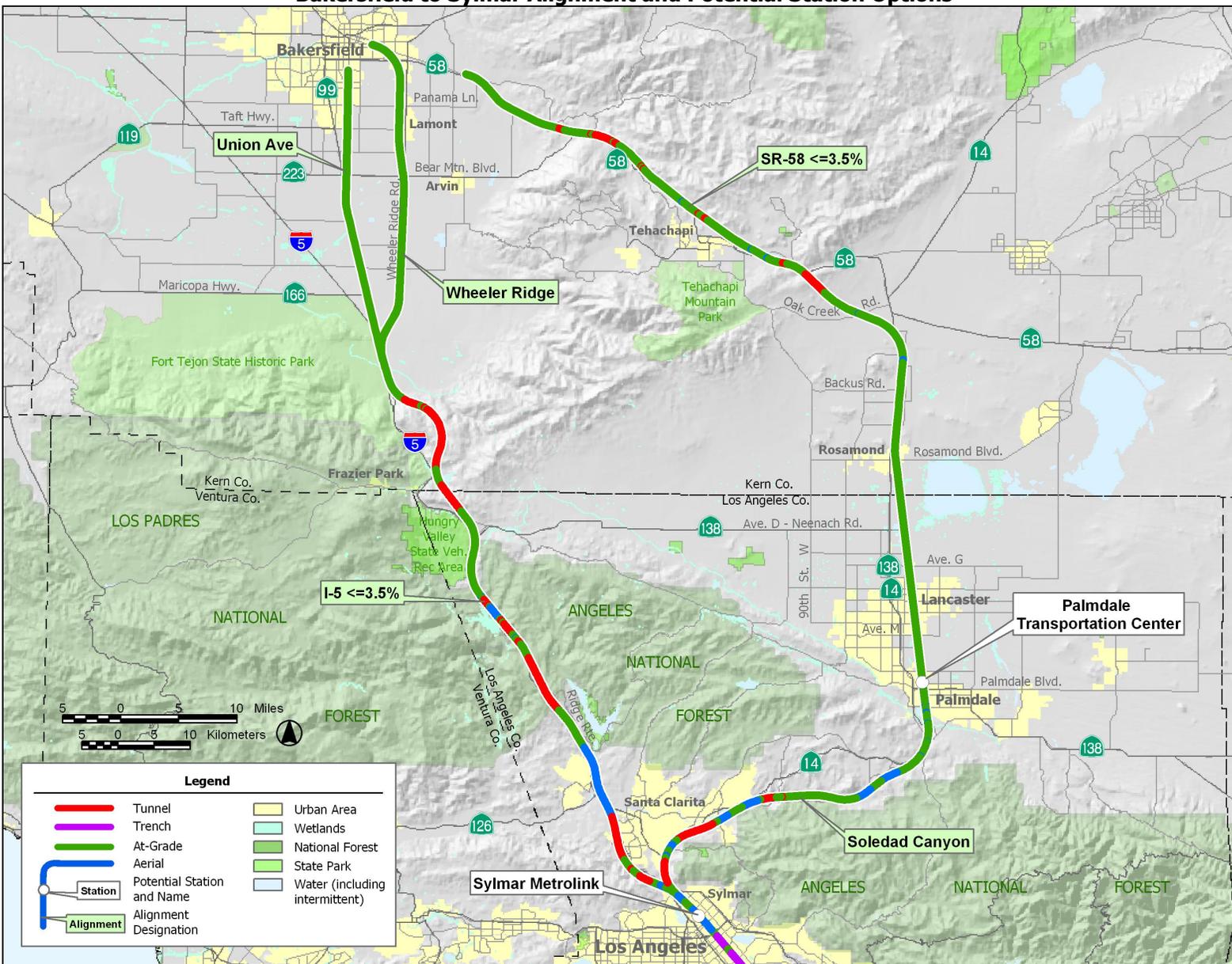
The Antelope Valley alignment is estimated to have more potential to impact cultural resources than the I-5 alignment options, and slightly more potential to impact biological resources. However, the Antelope Valley alignment would have a lower overall potential for water-related impacts because the potential impacts are related to the relatively small seasonal streams in Soledad Canyon and it would not encroach on any lakes. The Antelope Valley option would also have less potential impacts to wetlands and non-wetland waters than the I-5 options⁷. In addition, the Antelope Valley option was forecast to have less growth inducing impacts on urbanized land and farmland conversion than the I-5 options – because the I-5 options would result in more growth in the Central Valley. The most significant difference in regards to potential environmental impacts between the Antelope Valley option and I-5 alignments is in regards to major parklands (see Figure 6.4-1). The Antelope Valley alignment would not go through major parks. In contrast, the I-5 options would potentially impact Fort Tejon Historic Park, Angeles and Los Padres National Forests, Hungry Valley State Vehicular Recreation Area, Pyramid Lake and other local parks (see summary table Section 6.4.1).

The Antelope Valley alignment traverses less challenging terrain than the I-5 options, which would result considerably less tunneling overall (13 miles [21 km] of tunneling for the Antelope Valley option versus 23 [37 km] miles for I-5 options), and considerably shorter tunnels (maximum length of 3.4 miles [5.5 km] for the Antelope Valley option versus two tunnels greater than 5 miles [8 km] for the I-5 options) which would result in fewer constructability issues. Although the Antelope Valley option is about 35 miles longer than the I-5 alignment options, it is estimated to be slightly less expensive to construct as a result of less tunneling through the Tehachapi Mountains. In addition, due to its more gentle gradient, geology, topology and other features, the SR-58/Soledad Canyon Corridor offers greater opportunities for using potential HST alignment variations, particularly through the mountainous areas of the corridor, to avoid impacts to environmental resources. In contrast, the more challenging terrain of the I-5 Corridor greatly limits the ability to avoid sensitive resources and seismic constraints. The alignment optimization system (*Quantm*) that was utilized to identify and evaluate approximately 12 million alignment options for each mountain crossing could only find one practicable alignment option through the Tehachapi Mountains for the I-5 Corridor.

Submittals by the City of Palmdale (oral testimony by U.C. Berkeley Professor Ashraf Mahtab at the April 13, 2004 public hearing and technical report by Geodata that is included as an attachment to the City of Palmdale's written comments) show additional seismic hazards relating to the I-5 alignment that further differentiate these options from the Antelope Valley alignment. These submittals suggest that since the I-5 alignment options follow the San Gabriel fault for over 20 miles (see Figure 3.13-2) and cross through the area where the San Andreas and Garlock faults meet, they would have greater seismic hazard and constructability issues than the Antelope Valley option. The Draft Program EIR/EIS described both the I-5 and the Antelope Valley alignment options as having "high" potential for seismic hazards and active fault crossings, but did not differentiate between them. After reviewing the information submitted by the

⁷ An error was found on page 6-52 of the Draft Program EIR/EIS. For the Antelope Valley alignment under Biological Resources, waters should read 65,562 linear feet. The error was also made in Appendix 3, on page 3.15-D-8, Soledad Canyon Corridor, perennial non-wetland jurisdictional waters should read 146 linear feet as stated in the *Bakersfield to Los Angeles: Biological Resources Technical Evaluation Report (January 2004)*

**Figure 6.4-1
Bakersfield to Sylmar Alignment and Potential Station Options**



City of Palmdale, the Authority and its technical consultants believe that while the ratings for the alignments should not change, they concur that there are additional seismic hazards and risks for the I-5 alignment options from paralleling the San Gabriel fault, and also from traversing the "triangle" where the San Andreas and Garlock faults meet. The limited constructability of the I-5 alignment option combined with a high risk of seismic impacts makes the I-5 alignment option likely to be impracticable.

The Antelope Valley option would provide direct service to the Palmdale/Lancaster area, which increases the connectivity and accessibility of the HST network. The Antelope Valley is the fastest growing area in Los Angeles County and currently regional population forecasts estimate the Antelope Valley population could exceed 1 million by the year 2020. The HST system would also provide connectivity to Palmdale Airport and Metrolink commuter rail service.

Some public comments received on the Draft Program EIR/EIS supported the I-5 alignment options primarily because these would enable shorter travel times between Northern California and Los Angeles, and/or due to concerns regarding potential growth inducing impacts from an HST station at Palmdale. However, a number of the comments received indicated support for the Antelope Valley alignment. Public and agency support for the Antelope Valley option is strong in Los Angeles County because of the increased connectivity and accessibility it would provide for the Antelope Valley. Agencies which have indicated support for the Antelope Valley alignment include: the City of Los Angeles, the County of Los Angeles, Los Angeles County Metropolitan Transportation Authority (LAMTA), Los Angeles Department of Transportation, Southern California Association of Governments (SCAG), the City of Palmdale, City of Lancaster, County of Kern, Kern Council of Governments, and the City of Bakersfield.

Comments from the US Environmental Protection Agency (USEPA) and the US Army Corps of Engineers (USACE) on the Draft Program EIR/EIS stated concerns regarding potential impacts to the Santa Clara River through the Soledad Canyon portion of the Antelope Valley alignment. This Program EIR/EIS defines Soledad Canyon as "a relatively wide corridor area that includes both the SR-14 and UPRR alignments between the Antelope Valley and Santa Clarita" (Section 2.6.9C). Future study of the Antelope Valley alignment would consider an option that closely follows the SR-14 through Soledad Canyon as an avoidance option for potential impacts to the Santa Clara River. The Program EIR/EIS describes design practices to assure the avoidance of impacts to the Santa Clara River (see Section 3.15).

Preferred Station Locations:

- Palmdale/Antelope Valley: Palmdale Airport/Transportation Center

Analysis:

The Palmdale Airport/Transportation Center is the preferred HST station option to serve the Antelope Valley population. The Palmdale Airport/ Transportation Center would maximize opportunities for intermodal connectivity. It would be at or near (with the opportunity for convenient shuttle or people-mover service) the Palmdale Airport, directly link with Metrolink service, and be a hub for local bus services.

- Sylmar: Sylmar Metrolink

Analysis:

The Sylmar Metrolink option is the preferred HST station option to serve the San Fernando Valley, Simi Valley and Newhall/Santa Clarita areas. The Sylmar Metrolink option would provide a direct connection to the Metrolink regional commuter rail service and convenient access to the Los Angeles freeway network.

6A.4.2 Sylmar to Los Angeles

Preferred Alignment:

- MTA/Metrolink

Analysis:

The MTA/Metrolink is the preferred option for HST service between Sylmar and Los Angeles (See Figure 6.4-2). Between Burbank and Los Angeles Union Station, the MTA/Metrolink refers to a relatively wide corridor within which alignment variations will be studied at the project level. It is recommended because it would have less potential for environmental impact, and would have less constructability issues than the Combined I-5/Metrolink alignment option.

The MTA/Metrolink option would have fewer potential impacts to local and regional parks than the Combined I-5/Metrolink option. The Combined I-5/Metrolink alignment option has the potential to impact Griffith Park, Elysian Park and the Cornfield property (See Figure 6.4-2A). The Combined I-5/Metrolink route would also potentially impact slightly more biological resources than the MTA/Metrolink route (see summary table Section 6.4.2).

A considerable number of comments have been received regarding potential impacts to the Taylor Yard and Cornfield properties owned by California State Parks. The MTA/Metrolink alignment would potentially impact the periphery of Taylor Yard property, whereas the I-5/Metrolink alignment would bisect the Cornfield property. Taylor Yard and the Cornfield site were not identified in the Section 4(f) analysis (public parks and recreation) of the Draft Program EIR/EIS because at the time of the analysis in 2002, neither site was identified as an existing or future park in the sources reviewed for the analysis. However, since that time, the California Department of Parks and Recreation has acquired and initiated general plans for these two properties.

The MTA/Metrolink corridor is an existing rail corridor used by Metrolink commuter services and Amtrak intercity services. Use of the MTA/Metrolink corridor offers opportunities to mitigate potential HST impacts (e.g. by putting the alignment underground, on aerial structure, or by aligning it away from sensitive resources). The conceptual HST current design for the Program EIR/EIS assumes that the HST alignment would be along San Fernando Road adjacent to Taylor Yard (primarily to avoid curves). Locating the HST alignment along the existing Metrolink right-of-way around the Taylor Yard area should also be considered in future studies. In contrast the I-5/Metrolink alignment option would bisect the Cornfield property with a new, at-grade alignment. Constructing the I-5/Metrolink alignment underground through the Cornfield property would not be practical because of the need to transition to an aerial structure to serve the LAUS HST station site.

The MTA/Metrolink and Combined I-5/Metrolink options are expected to have similar construction costs. However, the Combined I-5/Metrolink could require approximately 2 miles (3.2 km) of tunneling (including segments under Silver Lake and Elysian Park), and therefore is considered to have more constructability issues than the MTA/Metrolink option. The combined I-5/Metrolink alignment is opposed by the City of Burbank because they believe it would have high impacts to established residential neighborhoods from the use of high-elevated structures over existing freeway overpasses through Burbank.

During the project-level review, in the Sylmar – Los Angeles segment, as well as other highly urbanized areas throughout the system, the Authority would work closely with the potentially affected communities to avoid, reduce, and/or include feasible measures to mitigate potential impacts to local communities.

**Figure 6.4-2
Sylmar to Los Angeles Alignment and Potential Station Options**



The Authority will seek to identify new feasible and practicable alignment variations less damaging to parklands, water, and biological resources as well having less community impacts, to evaluate during the project level environmental review. The Authority will work with local, state, and federal agencies as well as the public (including local neighborhoods) in carrying out future project-level studies.

Preferred Station Locations:

- Burbank: Burbank Metrolink Media City

Analysis:

The Burbank Metrolink Media City (Downtown) station is the preferred HST station option to serve the Burbank/Glendale area and the San Fernando Valley. It would be an aerial structure and would be less costly and easier to construct than the Burbank Airport site (which would have to be constructed in a trench). The Burbank Metrolink Media City station site would offer higher connectivity to the Burbank area. This station site is in downtown Burbank, and would provide a direct connection to the Metrolink regional commuter rail service, a hub for bus transit in the Burbank area, and good access to Burbank Airport. The Burbank Metrolink Media City station would be about 2.4 miles (3.9 km) from the Burbank Airport terminal, as compared to the airport access provided by the Burbank Airport site, which is about 1.6 miles (2.6 km) from the airport terminal.

- Los Angeles: Los Angeles Union Station

Analysis:

The existing Los Angeles Union Station (LAUS) is the preferred HST station option to serve Los Angeles. The LAUS HST station would be an elevated structure constructed over the current Metrolink and Amtrak tracks. LAUS is the transit/rail transportation hub of southern California and would have the highest connectivity and accessibility for serving the Los Angeles metropolitan area. LAUS is the primary destination for the Metrolink Commuter rail services, the Los Angeles Metro Red Line, the Pasadena Gold Line, the Amtrak Surfliner service, and the regional bus transit services. The existing LAUS option would have limited potential impacts on the environment. This option is the preferred by the City of Los Angeles Department of Transportation and LOSSAN Rail Corridor Agency.

6A.5 LOS ANGELES – INLAND EMPIRE – SAN DIEGO

The region from Los Angeles to San Diego via the Inland Empire was divided into three segments: 1) Los Angeles to March ARB; 2) March ARB to Mira Mesa; and 3) Mira Mesa to San Diego.

6A.5.1 Los Angeles to March ARB

Preferred Alignment:

- UPRR Riverside/UPRR Colton Line

Between LA Union Station and March ARB, each of the alignment options considered utilize existing freight railroad alignments and the HST would be either in or immediately adjacent to the freight railroad right-of-way. The UPRR Riverside/Colton alignment option is preferred between Los Angeles and March ARB (see Figure 6.5-1).

Comparing the two alignments between Los Angeles and Pomona, although the UPRR Riverside/Colton option is a more heavily used freight corridor (with more freight related constraints and future potential for freight expansion) than the UPRR Colton Line, the UPRR Riverside/Colton option would provide a much better connection to Los Angeles Union Station (LAUS) and to Northern California (since it connects to Union Station from the south). The UPRR Colton line enters LAUS from the north, and would likely require a direction reversal using LAUS as a stub-end station for trains traveling from the Inland Empire to northern California thereby could increase travel times between these markets by at least 10 minutes with the recommended HST station at LAUS. Between LAUS and March ARB, the alignment options considered would have similar potential for environmental impacts. The Riverside/Colton option would have the least potential costs, about \$1.2 billion less than the Colton Line option (see summary table Section 6.5.1).

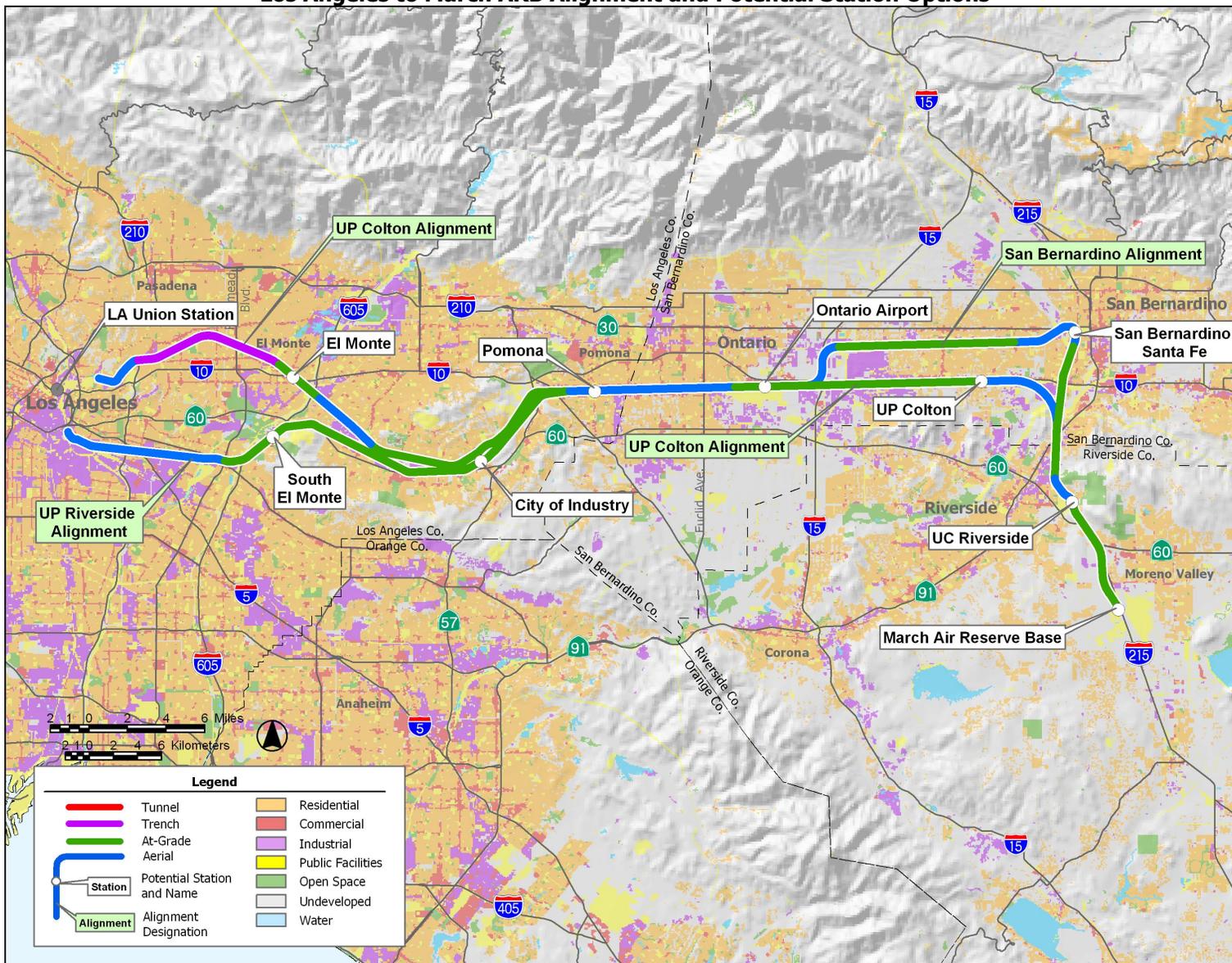
For the segment between Ontario and March ARB, the UPRR Colton Line (considered part of both the UPRR Riverside/Colton and UPRR Colton alignment options) would provide considerably higher speeds and faster travel times (estimated at 6 minutes less between LA and San Diego) than the option that would directly serve San Bernardino. A direct link to San Bernardino is estimated to cost \$700 million more (than either the Riverside/Colton option or the Colton option) and would not avoid or substantially reduce potential environmental impacts.

The San Bernardino Associated Governments (SANBAG) supports further investigation of both the direct link to San Bernardino and the freight alignment through Colton. The California Regional Water Quality Control Board supports the selection of the San Bernardino loop alignment. Southern California Regional Rail Authority (SCRRA) is opposed to having a stub-end station at LAUS, and commented that a potential revision of track configuration could remove existing passenger services from the Riverside Line (LA – Pomona) to open up capacity for freight operations.

Preferred Station Locations:

- East San Gabriel Valley Station Location: City of Industry

**Figure 6.5-1
Los Angeles to March ARB Alignment and Potential Station Options**



Analysis:

The City of Industry site is the preferred HST station option to serve East San Gabriel Valley (East Los Angeles County). The City of Industry site would have a wide range of multimodal connections to local and regional bus services, and Metrolink commuter rail service, and have good access to the freeway network. The City of Industry site would provide a central location between potential HST stations at LAUS and Ontario Airport. The City of Industry station would be constructed at grade and minimizes both cost and construction issues.

- Ontario Airport Connector Station

Analysis:

The Ontario Airport is a preferred HST station option. The UPRR Colton Line creates the northern boundary of the airport and is about a quarter of a mile from the air passenger terminal. The Ontario Airport HST station would support the objectives of the HST project by providing an interface with one of the larger airports in southern California. This station would also provide direct HST service to San Bernardino County.

- Riverside County/East San Bernardino County: University of California Riverside

Analysis:

The UC Riverside station option is the preferred HST station to serve the City of Riverside and Riverside County. The UC Riverside station site would provide the best access to Riverside. Should the HST project move forward, project level environmental review will involve continued work with the City of Riverside and the region to further define the HST alignment and the potential sites for the Riverside station option.

6A.5.2 March ARB to Mira MesaPreferred Alignment:

- I-215/I-15

Analysis:

The I-215/I-15 alignment option is preferred between March ARB and Mira Mesa (see summary table Section 6.5.2). The HST alignment option between March ARB and Mira Mesa would generally follow the Interstate 215 and then the Interstate 15 corridor to Mira Mesa (see Figure 6.5-2). This is the only existing major transportation corridor directly connecting the Inland Empire to San Diego. SANDAG, NCTD, MTDB, Caltrans District 11, Murrieta, Escondido and the City of San Diego all support direct HST service to San Diego via the Inland Empire (I-15 Corridor).

The USEPA is concerned with potential impacts to the Santa Margarita Ecological Reserve and the Santa Margarita River. In addition, the mountainous terrain just south of Temecula is considered to contain important tribal cultural areas and concerns have been raised regarding potential impacts to this area and the Exeava Temeku village (near the I-15/I-79 interchange). Ways of avoiding and minimizing potential impacts to these resources would be investigated during project level environmental review.

**Figure 6.5-2
March ARB to Mira Mesa Alignment and Potential Station Options**



Preferred Station Locations:

- Temecula Valley Station: Murrieta

Analysis:

The Murrieta station site is the preferred HST option to serve the Temecula and Murrieta area of Riverside County. The Murrieta Station site would have convenient access to I-15 and I-215. The City of Murrieta submitted comments in support of an HST station in Murrieta.

- Escondido Station Area: Escondido I-15

Analysis:

The Escondido Transit Center option would have better connectivity (within 1/8 of a mile of the transit center, and could link to Bus Rapid Transit and the Sprinter light rail transit service) and is strongly favored by the City of Escondido, SANDAG and NCTD. However, serving the Escondido Transit Center would require leaving the I-15 alignment and tunneling under the Centre City Parkway which would be more difficult and costly (estimated at over \$900 million more) to construct than the I-15 station option and the Escondido Transit Center would not avoid or substantially reduce potential environmental impacts. The I-15 station option is considered to be moderately compatible with the surrounding land uses, and would have few environmental concerns.

The I-15 station option is the preferred station option to serve Escondido, the I-15 corridor and North/East San Diego County since it is considerably less costly to construct and would be easier to construct than tunneling under Escondido. However, ultimate locations and the configurations of stations cannot be determined until project-level environmental review. Should the HST project move forward, project level environmental review would involve continued work with the City of Escondido and the region to further define the HST alignment and potential sites for the I-15 station.

6A.5.3 Mira Mesa to San Diego

Preferred Alignment:

- Continue to investigate both the Carroll Canyon and Miramar Road alignment options.

Analysis:

Both the Carroll Canyon and Miramar Road alignment options between Mira Mesa and San Diego are preferred for further investigation (see Figure 6.5-3). Either of these options would enable the HST system to directly serve downtown San Diego, whereas the I-15 to Qualcomm option would terminate about 8-miles from the city center at the Qualcomm Stadium (20 minutes by light rail). SANDAG, NCTD, MTDB, Caltrans District 11, and the City of San Diego all support direct HST service to downtown San Diego via the Inland Empire (I-215/I-15 Corridor).

The Qualcomm Stadium concept would be about \$140 million less to construct than the Carroll Canyon option, and \$70 million less than the Miramar Road option, but would not provide the same level of connectivity to downtown San Diego as the other alignment options. Although the I-15 option terminating at Qualcomm Stadium was forecast to have higher intercity ridership (350,000 more for 2020), the options that would directly serve Downtown San Diego would provide better connections to the regional transit system and airport.

**Figure 6.5-3
Mira Mesa to San Diego Alignment and Potential Station Options**



As compared to the I-15 option, the Carroll Canyon and Miramar Road options would have less potential impacts to parklands, vernal pools⁸, and less potential for growth-induced impacts, but more potential visual, cultural, and floodplains impacts (see summary table Section 6.5.3).

The United States Marine Corps has raised concern regarding the Miramar Road option which is directly adjacent to the Miramar housing complex and "sensitive habitats" and has noted that any efforts related to the proposed HST system that would limit or impact on the Marine Corps ability to perform its mission would be opposed. The City of San Diego commented that building the alignment below grade should be considered from Old Town to Downtown San Diego. SANDAG commented that the I-15 corridor would be attractive to long-distance commuters and has requested that the Authority consider a future partnership to look at details for an intercity/commuter service in the I-15 Corridor. However, the USEPA recommends avoiding placement of a HST route in canyons due to the "significant" permitting challenges such alternatives may face as a result of potentially large amounts of cut and fill, and increased potential for erosion, sedimentation, and other stream impacts. The US Department of the Interior (USDO I) has also raised concerns regarding a potential HST alignment through Carroll Canyon open space which is within the city of San Diego's MSCP preserve and an important feature in the San Diego County regional conservation strategy. Further project-level study of both the Carroll Canyon and Miramar Road alignment options would provide necessary information to avoid and minimize potential adverse impacts to the natural environment.

Preferred Station Locations:

- Mid-San Diego County Station: University City

Analysis:

The University City station option is the preferred HST option to serve the University City/University Town Centre/La Jolla area. A station to serve this high-density area of San Diego County is supported by the City of San Diego. SANDAG's commented that they support having a HST station to serve the North City (San Diego) area. SANDAG wants to continue to work with the Authority to determine the appropriate site for a North City station.

- San Diego Station: Downtown San Diego Santa Fe Depot

Analysis:

The Downtown San Diego Santa Fe Depot station option is the preferred station option to serve San Diego. The Downtown San Diego Santa Fe Depot is the transit "hub" station for downtown San Diego and locating the HST station here would result in the highest level of connectivity. This station option would be located in the city center where many potential HST passengers could walk to their destination and would offer good connectivity with San Diego International Airport, which is about two miles from this site. The Downtown San Diego Santa Fe Depot is also the terminus for the Coaster commuter rail service and the Amtrak Surfliner service, a major San Diego LRT station, and a bus transit hub.

⁸ U.S. Fish and Wildlife Service, "Vernal Pools of Southern California, Draft Recovery Plan," 1997

The Downtown San Diego station option is preferred by SANDAG, NCTD, MTDB and the City of San Diego. In addition, the San Diego Regional Airport Authority commented that the HSR station option at San Diego Airport may hamper their ability to improve airport facilities and could cause considerable traffic and parking problems.

6A.6 LOS ANGELES-ORANGE COUNTY-SAN DIEGO

The proposed HST system would extend no further south than Irvine (as a result of environmental constraints along the coast and in coastal communities between South Orange County and San Diego). For this region, non-electric "conventional" rail improvements to the existing state-supported "Surfliner" (Amtrak) service were the only design options considered between Irvine and San Diego in the Draft Program EIR/EIS.

The Authority has been working in a partnership with California Department of Transportation (Caltrans) Division of Rail to examine the potential "non electric" improvements for the existing rail corridor connecting Los Angeles, Orange County, and San Diego (LOSSAN). Caltrans has relied upon the Authority's technical studies to issue the LOSSAN Rail Improvements Draft Program EIR/EIS [State clearinghouse #2002031067]. The Authority has recognized that implementation of "non-electric" improvements in the Irvine to San Diego portion of the LOSSAN corridor for intercity service is the current responsibility of Caltrans Division of Rail and the Authority decided to take no further action in this Program EIR/EIS regarding conventional improvements in this area.

The Authority has, however, submitted separate recommendations for identifying preferred alternatives for the proposed LOSSAN conventional improvements as comments to Caltrans and the FRA.

6A.6.1 Los Angeles to Anaheim/Irvine

Preferred Alignment:

- LOSSAN Corridor – HST (Los Angeles to Irvine)

Analysis:

Direct service to Orange County as far south as Irvine along the LOSSAN corridor is the preferred option for HST service between Los Angeles and Orange County (see Figure 6.6-2). The conceptual design for this option assumes shared operations with other passenger services and separation from freight with 4 total tracks (2 for passenger rail services and 2 for freight) between Los Angeles and Fullerton. South of Fullerton the alignment would be two tracks with additional passing tracks at intermediate stations. The electrified HST would need to share tracks (at reduced speeds) with non-electric Metrolink commuter rail, Surfliner intercity service and occasional freight trains (there are fewer freight operations south of Fullerton).

Further analysis at the project level could indicate somewhat greater infrastructure requirements with potentially increased costs and environmental impacts. However, the cost and potential for environmental impact associated with the LOSSAN corridor option are expected to still be considerably less than those associated with the UPRR Santa Ana option. The preference for the LOSSAN alignment option is based on the assumption that the capacity and compatibility issues associated with the shared operations with existing non-electric service (Surfliners, Metrolink, and freight) can be resolved.

Shared use improvements to the LOSSAN corridor would be considerably less costly (about \$2.25 billion less) and would have considerably fewer environmental impacts than a new dedicated alignment along

the UPRR Santa Ana line, but the travel times would be longer (27 minutes LA-Anaheim vs. 16 minutes LA-Anaheim for UPRR Santa Ana) and HST operations could be constrained (capacity constraints, scheduling constraints, which are estimated to limit operations to between 18-45 trains a day in each direction by sharing tracks on the LOSSAN alignment (see summary table Section 6.6.2)).

This alignment would increase connectivity and accessibility to Orange County, California's second most populated county, and the transportation hubs of Anaheim and Irvine. Improvements to the LOSSAN corridor would provide a safer, more reliable, energy efficient intercity mode to serve Orange County and Southern Los Angeles County while improving the safety, reliability, and performance of the regional commuter, and "Surfliner" intercity service because of the fully grade separated tracks, separation from freight, and a state-of-the-art signaling and communications system. The HST service would greatly increase the capacity for intercity and commuter travel and reduce automobile traffic. Moreover, environmental impacts would be minimized since this alignment utilizes the existing LOSSAN right-of-way. Noise impacts from existing operations could be reduced due to the elimination of horn noise and gate noise from existing rail services as a result of adding grade separations at existing grade crossings.

Considerable support for direct HST service to Orange County utilizing the LOSSAN rail alignment has been expressed by the public and agencies in Orange County including: the Orange County Transportation Authority (OCTA), the City of Anaheim, the City of Irvine, the City of Fullerton, the LOSSAN Rail Corridor Agency, and Amtrak. Moreover, OCTA is opposed to the use of the UP Santa Ana Line for HST service. However, some concerns and opposition have been expressed to use of the LOSSAN alignment. The Burlington Northern Santa Fe (BNSF) made a general comment that the ability for BNSF to grow and expand with demand must be preserved. While Metrolink supports a fully grade separated LOSSAN corridor to Irvine, they have raised concerns that using LOSSAN as the HST alignment would hinder their ability to expand services. In addition, Metrolink commented that LOSSAN should be avoided as a route for "new modes" unless additional right-of-way width is purchased for any new HST tracks. The Gateway Cities Council of Governments comments raised concerns about potential impacts on land use, communities, neighborhoods, property and environmental justice for both the LOSSAN alignment and the UPRR Santa Ana Line, and stated their belief that significant property acquisition would be needed for the LOSSAN alignment through residential neighborhoods in Pico Rivera, and unincorporated portions of Los Angeles County. The Gateway Cities Council of Governments comments state, "the amount of data available in the EIR/EIS is not yet sufficient to make a decision regarding which corridor should be selected through our area and such a selection must be deferred to the future when such data have been compiled."

The goal of HST service reaching the Irvine Transportation Center is supported by OCTA. However, OCTA and cities in Orange County have raised concerns about extending HST service south of Anaheim because of difficulties due to the alignment, possible environmental justice issues, noise and vibration concerns, and other issues. The OCTA comment letter states, "Numerous cities south of Anaheim have documented their concerns for the trench option. We are concerned about how this proposal may affect existing and future rail capacity." The City of Orange raised concerns regarding potential property, community, and land use impacts adjacent to rail corridor and the City of Tustin submitted comments opposing HST service through Tustin (between Anaheim and Irvine). More detailed project-level environmental analysis and preliminary engineering will be required to determine whether OCTA and Orange County cities would continue to support HST service south of Anaheim.

Potential Station Locations:

- Southeast Los Angeles County (Gateway Cities): Norwalk (LOSSAN)

Analysis:

The Norwalk (LOSSAN) station is the preferred station to serve the Gateway Cities of south Los Angeles County, which include the cities of Vernon, Commerce, Montebello, Pico Rivera, Santa Fe Springs, Norwalk, and La Mirada. The Norwalk site would be at the Norwalk Metrolink Station with direct connectivity to the regional commuter rail service and is the bus transit hub for the area.

- Central Orange County: Anaheim Transportation Center

Analysis:

The Anaheim Edison Field Amtrak/Metrolink station option is the preferred station option to serve Anaheim. The Anaheim Transportation Center is the existing transit hub for Central Orange County with high connectivity for Central Orange County. This station serves Amtrak (Surfliner) intercity and Metrolink commuter rail services, is a bus transit hub, and has low potential for environmental impacts. The City of Anaheim and OCTA support having a HST station stop at Anaheim, and the Anaheim Transportation Center is their preferred station location. The City of Fullerton has requested that there be an additional Central Orange County HST station at Fullerton.

- Southern Orange County: Irvine Transportation Center

Analysis:

The Irvine Transportation Center station option is the preferred station option to serve Irvine and South Orange County. The Irvine Transportation Center HST station option located at the existing Amtrak/Metrolink Station on the LOSSAN corridor would be a multi-modal transit hub that would serve Southern Orange County. This station serves Amtrak (Surfliner) intercity and Metrolink commuter rail services, is a bus transit hub, and has low potential for environmental impacts. The City of Irvine and OCTA support having a HST station stop at Irvine and the Irvine Transportation Center is their preferred station location.

6A6.2 Los Angeles to LAX

Preferred Alignment: No direct HST service

Analysis:

The Authority has determined that a direct HST service to LAX not be part of the initial statewide HST network. The HST system would be connected to LAX and Western Los Angeles County by local transportation (shuttle, regional transit, or the automobile). A direct HST link to LAX requires a costly spur line with very limited maximum speeds that would have lower ridership potential than HST links to the San Diego (via the Inland Empire) and to Orange County.

The proposed HST system would serve the Inland Empire and San Diego using the I-215/I-15 corridor, and it is also recommended that the initial HST network serve Orange County via the LOSSAN alignment. Direct HST service to LAX would require an additional spur line south of Los Angeles Union Station (LAUS). Having the HST system to split in three different directions south of LAUS would considerably reduce the potential frequency of service for each of these corridors. Moreover, since a majority of the HST trains would be continuing from LAUS to either San Diego or Orange County, it is likely that many HST passengers wanting to reach LAX would still require a transfer at Union Station.

The MTA Harbor Subdivision rail right-of-way alignment is a little over 15 miles long and would cost about \$1.9 billion to construct, with an additional \$340 million needed for a sub-terrain station at LAX. Curves along the alignment would severely restrict speed throughout the alignment (average speed would be about 70 mph) resulting in a 13-minute travel time LA Union to LAX. This low-speed urban alignment could function very appropriately as a commuter rail line, which would be a feeder service to the HST system, or it could be considered for a future extension of the HST system once the initial network was operational (see summary table Section 6.6.1).

San Diego County Association of Governments (SANDAG) supports a direct link to LAX via the I-15 Corridor, and NCTD supports a direct link to LAX via Orange County. However, in Los Angeles County and the SCAG region, airport planning has been focused on trying to shift future growth away from the severely capacity constrained LAX to satellite airports such as Ontario, Burbank and Palmdale. Comments were received from Friends of the Green Line advocating that the MTA Harbor Subdivision right-of-way should be used for a future northern extension of the Green Line to serve local/regional transit. In addition, the Los Angeles Department of Transportation suggests moving the existing Green Line to the Harbor Subdivision and using the I-105 right-of-way (existing Green Line) for HST. The Southern California Association of Governments (SCAG) commented that they are planning a regional Maglev system. The SCAG Maglev system as currently envisioned would link LAUS and LAX as part of the regional Maglev network.

6A.7 CAPITAL COSTS FOR HST SEGMENTS WITH A PREFERRED ALIGNMENT

Estimated capital costs for HST alignment segments and stations have been described in the Program EIR/EIS and are summarized in Chapter 6. Although a representative HST system cost of \$33 to \$37 billion has been described in Chapter 4, the cost of the preferred HST system may differ. With the identification of a "broad corridor" as preferred between the San Francisco Bay Area and the Central Valley overall HST system capital cost is uncertain. The broad preferred corridor between the Bay Area and the Central Valley contains a number of feasible routes – some of which have not been investigated as part of this program EIR/EIS process. Previous analysis by the Authority has suggested that an Altamont Pass alignment option could reduce capital costs as compared with other options. Although preferred alignments are identified for the San Francisco to San Jose and Oakland to San Jose segments (based on current information), these recommendations (as previously noted) are subject to change based upon the information provided in future studies. Less extensive options that serve fewer Bay Area cities than the options studied in this Program EIR/EIS will be studied in the future. The alignment concepts identified between Stockton and Fresno also may change as a result of future studies of the mountain crossing between the Bay Area and Central Valley. A different mountain crossing alignment may require a considerably different alignment between Stockton and Fresno to facilitate connection and to avoid and minimize environmental impacts.

Other potential variation within the preferred HST Alternative adds further uncertainty to the overall capital cost, including: 1) in Southern California, relatively wide corridors have been identified between Palmdale and Sylmar (in "Soledad Canyon" between the Santa Clara River and State Route 14), and between Burbank and Los Angeles Union Station; 2) the Authority has acknowledged that all the station locations identified are "potential" HST stations, and that it is possible that some of the station locations identified in this Final Program EIR/EIS will not be built; 3) shared use of the LOSSAN corridor from Los Angeles to Orange County.

Based upon the existing data and the large range of options identified, the cost of the preferred HST system alternative is expected to cost at least \$33 billion (in 2003 dollars). Table 6A.7-1 below shows the estimated cost for construction of major segments where a preferred alignment has been chosen.

Table 6A.7-1
Capital and Project Level Analysis Cost Estimates
(Millions of 2003\$\$)

Segment	Length (miles)	Capital Cost
Fresno to Bakersfield ⁹	116	\$3,100
Bakersfield to Palmdale	84	\$3,900
Los Angeles to Irvine	44	\$2,300
Los Angeles to Anaheim	30	\$1,200
Los Angeles to Riverside	66	\$2,900
Riverside to Mira Mesa	74	\$4,000
Mira Mesa to San Diego	19	\$1,200

The estimated total capital costs (in 2003 dollars) for each of the alignment segments of the preferred HST Alternative account for all types of implementation costs of a proposed high-speed train system, including construction, right-of-way, environmental mitigation, and design and management services. The construction costs include procurement and installation of line infrastructure (tracks, bridges, tunnels, grade separations and power distribution); facilities (passenger stations, storage and maintenance facilities); systems (communications, train control); and removal or relocation of existing infrastructure (utilities, rail tracks). The right-of-way costs include the estimated costs to acquire properties needed for construction of the high-speed train infrastructure. The environmental mitigation costs include a rough estimate of the proportion of capital cost required for mitigating environmental impacts, based on similar completed highway and rail line construction projects. No specific mitigation costs are identified at this program level of review. Other implementation costs are included as estimated add-on percentages to construction costs to account for agency costs associated with administration of the program (design, environmental review and management).

⁹ This segment includes additional length (approximately 10 miles) and a station in downtown Fresno that was not included in the cost included in the Fresno to Bakersfield segment as it was defined in Chapter 6.

6B HST STATION AREA DEVELOPMENT

There would be great benefits to enhancing development patterns and increasing development densities near proposed HST stations. To provide maximum opportunity for station area development in accordance with the purpose and need and objectives for the HST system, the preferred HST station locations are all multi-modal hubs and are typically in traditional city centers. To further these objectives, when making decisions regarding both the final selection of station locations and the timing of station development, the Authority would consider the extent to which appropriate Station Area Plans and development principles have been adopted by local authorities.

In addition to potential benefits from minimizing land consumption needs for new growth, dense development near HST stations will concentrate activity conveniently located to stations. This would increase the utilization of the HST system, generating additional HST ridership and revenue to benefit the entire state. Reducing the land needed for new growth should reduce pressure for new development on nearby habitat areas and agricultural lands. Denser development allowances would also enhance joint development opportunities at and near the station, which in turn could increase the likelihood of private financial participation in construction related to the HST system. A dense development pattern can better support a comprehensive and extensive local transit system that can serve the local communities as well as providing access and egress to HST stations. The Authority's adopted policies will ensure that implementation of the HST in California would maximize the potential for station area development.

6B.1 General Principles for HST Station Area Development

HST station area development principles draw upon transit-oriented development (TOD) strategies that have been successfully applied to focus compact growth within walking distance of rail stations and other transit facilities. Applying TOD measures around HST stations is a strategy that works for large, dense urban areas, as well as smaller central cities and suburban areas. TOD can produce a variety of other local and regional benefits by encouraging walkable compact and infill development. Local governments would play a significant role in implementing station area development by adopting plans, policies, zoning provisions, and incentives for higher densities, and by approving a mix of urban land uses. Almost all TOD measures adopted by public agencies involve some form of overlay zoning that designates a station area for development intensification, mixed land uses, and improvements to the pedestrian environment. TOD measures are generally applied to areas within one-half mile of transit stations and this principal would be followed for HST stations.

Station area development principles that would be applied at the project-level for each HST station and the areas around the stations would include the following features:

- Higher density development in relation to the existing pattern of development in the surrounding area, along with requirements for density.
- A mix of land uses (retail, office, hotels, entertainment, residential, etc.) and mix of housing types to meet the needs of the local community should be included.
- A grid street pattern and compact pedestrian-oriented design that promotes walking, bicycle and transit access with streetscapes that include landscaping, small parks and pedestrian spaces.
- Context sensitive building design that considers the continuity of the building sizes, that coordinates the street-level and upper-level architectural detailing, roof forms, and the rhythm of windows and doors, should be provided and should include consideration of the general relationship of buildings to public spaces such as streets, plazas, other open space areas, and public parking structures.
- Limits on the amount and location of development related parking, with a preference that parking be placed in structures. TOD areas typically have reduced parking as compared to conventional parking requirements typical for retail, office and residential uses due to transit access and their walk-ability,

which would be expected for HST station area development, while sufficient train passenger parking would be essential to the system viability.

6B.2 Implementation of HST Station Area Development Guidelines

The statewide high-speed train system is likely to have more than 20 stations. The Authority has the powers necessary to oversee the construction and operation of a statewide high-speed rail system, and to purchase the land required for the infrastructure and operations of the system. The responsibility and powers needed to focus growth and station area development guidelines in the areas around high-speed stations are likely to reside primarily with local government.

The primary ways in which the Authority can help ensure that the HST system becomes an instrument for encouraging maximizing implementation of station area development principles include:

- Select station locations that are multi-modal transportation hubs with a preference for traditional city centers.
- Adopt HST station area development policies and principals that require TOD, and promote value-capture at and around station areas as a condition for selecting a HST station site.
- Encourage local governments where potential HST stations may be located to prepare and adopt Station Area Plans and amend City and County General Plans that incorporate station area development principles in the vicinity of HST stations.

1. Select Station Locations that are Multi-Modal Transportation Hubs preferably in Traditional City Centers.

HST stations in California will be multi-modal transportation hubs. To meet the Authority's adopted objectives¹, all the potential high-speed rail station locations that were selected would provide linkage with local and regional transit, airports, and highways. In particular, convenient links to other rail services (heavy rail, commuter rail, light rail, and conventional intercity) will promote TOD at stations by increasing ridership and pedestrian activity at these "hub" stations. A high level of accessibility and activity at the stations can make the nearby area more attractive for additional economic activity.

As described in Section 6A of this Program EIR/EIS, the preferred station sites are all multi-modal transportation hubs that would provide links with local and regional transit, airports and highways. Most of the potential stations identified for further evaluation are located in heart of the downtown/central city area of California's major cities. By identifying preferred downtown multi-modal station sites and eliminating potential "greenfield" sites², the Authority has described a proposed HST system that meets the objectives of minimizing potential impacts on the environment and maximizing connectivity with other modes of transportation. These locations also would have the most potential to support infill development and TOD.

2. Adopt HST Station Area Development Policies that Require TOD, and Promote Value-Capture At and Around Stations as a Condition for Selecting a HST Station Site.

Through subsequent CEQA and NEPA processes, the Authority will determine where stations will be located and how many HST stations there will be. The Authority intends to encourage the adoption of transit oriented development measures and to promote value-capture at and around the locations of HST

¹ See Section 1.2.1 "Purpose of High-Speed Train System".

² Sites in rural areas with very limited or no existing infrastructure.

stations.³ The Authority has identified TOD and value-capture at and around stations sites that support and promote high-speed rail ridership as essential components of high-speed train station locations. Local government will be expected to promote TOD, and to use value capture techniques to finance and maintain station amenities and the public spaces needed to create an attractive pedestrian environment. Since the HST stations will be public gathering places, value-capture techniques should be used to enhance station designs with additional transportation or public facilities. The Authority has also adopted a policy that parking for the HST stations would be provided at market rates (no free parking). The Authority will maximize application of TOD principles during the site-specific review of proposed station locations.

The Authority has prescribed the following criteria for HST station locations:

- Each station site must have the potential to promote higher density, mixed-use, pedestrian oriented development around the station.
- As the HST project proceeds to more detailed study, local governments are expected to provide (through planning and zoning) for TOD around HST station locations.
- As the project proceeds to more detailed study, local governments are expected to finance (e.g., through value capture or other financing techniques) and to maintain the public spaces needed to support the pedestrian traffic generated by hub stations.

3. Encourage Local Governments in which Potential HST Stations Would Be Located to Prepare and Adopt Station Area Plans, Amend City and County General Plans and Encourage TOD in the Vicinity of HST Stations.

Throughout future environmental processes and the implementation of HST, the Authority will continue to work closely with the communities being considered for HST stations. There are a number of mechanisms that local governments can use to encourage higher density HST oriented development in and around potential HST station locations and minimize undesirable growth effects. These include planning measures (such as specific plans, community plans, transit village plans, regional plans, and greenbelts), development agreements, zoning overlays, and, in some cases, use of redevelopment authority.

Increased density of development in and around HST stations provides a means to increase public benefits beyond the benefits of access to the HST system itself. Such benefits could include relief from traffic congestion, improved air quality, promotion of infill development and preservation of natural resources, increased stock of affordable housing, promotion of job opportunities, reduction in energy consumption, and improved cost-effectiveness of public infrastructure. The Authority and local government working together will need to determine which mechanisms best suit each community and could be implemented to enhance the benefits possible from potential HST station development.

Most successful contemporary examples of rail-influenced urban development have been the direct products of long-term strategic planning. For example, in France, and Japan, where there has been considerable success guiding new development around HST stations, local governments typically prepare long-term plans that focus growth at each HST station area. Regional plans are also typically used to coordinate station area development with existing urban areas and reserves for parks, agriculture and natural habitat.

A useful starting point for station-area development should be the preparation of an illustrative site and phasing plan for a selected station area that is realistic from a market perspective. Then a "Station Area Plan" can be prepared which will assure the community and potential developers of a public commitment to promote compact, and efficient, pedestrian-oriented development around station-areas. Local

³ As part of the "Staff Recommendations" adopted at the January 26, 2005 Authority Board Meeting in Sacramento.

government can review the availability of land around potential station sites to achieve development that is of sufficient size to be economically viable. In addition, infrastructure improvements for station area development may require public investment, either directly or through tax increment financing. These elements along with other development incentives can appropriately be included in the Station Area Plan.

Significant growth is expected in large areas of California with or without an HST system. The proposed HST system, however, would be consistent with and promote the State's adopted smart growth principles,⁴ and should be a catalyst for wider adoption of smart growth principles in communities near HST stations. It should encourage infill development, help to protect environmental and agricultural resources by encouraging more efficient land use, and encourage efficient and compact development, along with infrastructure that provides adequate transportation and other utilities and minimizes ongoing cost to taxpayers.

The incorporation of Station Area Plans and development principles will affect the Authority's decisions regarding both the final selection of station locations and the timing of station development. The Authority would encourage the local government authority having development jurisdiction at and around potential HST stations to take the following steps:

- In partnership with the Authority, develop a Station Area Plan⁵ for all land within one-half mile of the HST pedestrian entrance that adheres to the station area development principles (described above).
- Incorporate the Station Area Plan through amendment of the City or County General Plan and Zoning.
- Use a community planning process to plan the street, pedestrian, bicycle environment, and park and open spaces, and to establish appropriate zoning adopting the station area development principles.
- Use community planning processes to develop regional plans, and conforming amendments to general plans, which would focus development in existing communities and would provide for long-term protection of farmland, habitat, and open space.

⁴ As expressed in the Wiggins Bill (AB857, 2003), and in government code 65041.1

⁵ Such a plan could take the form of a specific plan pursuant to California Government Code sections 65450-65457, or a Transit Village Development Plan pursuant to California Government Code sections 65460-65460.10, which specifies the content for such a plan, or another form as determined appropriate by local government.