

Description of Phase I Improvements

The Altamont Corridor Express (ACE) Extension Lathrop to Ceres/Merced contains both Phase I and Phase II improvements that are analyzed in this environmental impact report (EIR).¹ Phase I improvements would support the ACE service extension to Ceres possibly as soon as 2020, no later than 2023. Phase II improvements would support the ACE service extension to Merced, with service commencing as soon as 2025.² However, infrastructure improvements and extended passenger service may be provided in an incremental phased approach over time that would include only some of the Phase I or Phase II improvements.

The Proposed Project is the extension of ACE service from Lathrop to Ceres and Merced, and includes the following Phase I improvements.

- Two stations in Lathrop, consisting of the **Existing Lathrop/Manteca Station** and a new **North Lathrop Station**.
- The **Oakland-Fresno Subdivision Connection**, a new track connection between the Oakland and Fresno Subdivisions³ in Lathrop.
- The **Ceres Extension Alignment** consisting of upgrades to track, new tracks, and bridges within the Fresno Subdivision between Lathrop and Ceres.
- The **Ceres Layover Facility, variant 2** located south of Ceres to support extension operations.
- New **Downtown Manteca, Ripon, Modesto, and Ceres Stations** along the extension alignment.
- An interim bus bridge between Merced and Ceres, with stops at the **Turlock, Livingston, Atwater, and Merced Bus Stops**.

This EIR also analyzes several Phase I alternatives at an equal level of detail as the Proposed Project.⁴ These alternatives include the following Phase I improvements.

- Single-station scenarios in Lathrop, with:
 - The **Existing Lathrop/Manteca Station**, which would require the **Oakland-Fresno Subdivision Connection**;

¹ Phase I improvements are analyzed at a project level of detail based on preliminary engineering analysis in this EIR, and no further environmental analysis under the California Environmental Quality Act (CEQA) is anticipated. Phase II improvements are analyzed at a programmatic, more conceptual level of detail in this EIR because only conceptual engineering has been completed at this time. Subsequent project-level environmental documentation would be required for the Phase II improvements. For an explanation of the difference between project and program analyses, please refer to Chapter 1, *Introduction*, of this EIR and CEQA Guidelines Sections 15161 and 16168.

² The service extension to Merced is analyzed at a programmatic level at this time because this extension would be implemented at a later date, and because the location of the ACE Merced Station is dependent on the final location of the High-Speed Rail station and may be subject to change.

³ A *subdivision* is a portion of railroad or railway that operates under a single timetable (authority for train movement in the area).

⁴ In Chapter 6, Alternatives, several additional alternatives are analyzed at a lesser level of detail.

- A new **Relocated Lathrop/Manteca Station**, which would require the **Oakland-Fresno Subdivision Connection**; OR
- A new **North Lathrop Station**, which would not require the new subdivision connection.
- A different selection of stations for the two-station scenario in Lathrop, consisting of new **North Lathrop** and **Relocated Lathrop/Manteca Stations** and would require the **Oakland-Fresno Subdivision Connection**.
- The **Ceres Layover Facility, variant 1** rather than variant 2 of the layover facility.

Detailed descriptions of the Phase I and Phase II improvements and the alternatives analyzed at an equal level of detail are presented in this chapter and in Chapter 3, *Description of Phase II Improvements*, respectively. This chapter focuses on the Phase I improvements and provides information regarding operations and maintenance activities, construction activities, right-of-way (ROW) and easement needs, costs and funding sources, and required permits and approvals for the Phase I improvements.

2.1 Phase I Improvement Location and Limits

As shown in Figure 1-1, the limits of the Phase I improvements span San Joaquin, Stanislaus, and Merced Counties. San Joaquin Regional Rail Commission (SJRRC) proposes to extend ACE passenger rail service from Lathrop to Ceres in Phase I by constructing and upgrading tracks within the existing Union Pacific Railroad (UPRR) Fresno Subdivision ROW, a distance of approximately 24 miles. New stations and operating facilities would be constructed in the Lathrop area and along the extension alignment. The Phase I improvements include portions of the UPRR Oakland and Fresno Subdivisions ROW, additional ROW for new facilities (stations and layover yards) and for any construction or access areas located outside the ROW.

2.2 Background

SJRRC manages and operates ACE, which currently provides commuter and intercity rail service between San Jose and Stockton. The existing 86-mile ACE service corridor passes through Santa Clara, Alameda, and San Joaquin Counties. At the western end of the ACE corridor, ACE operates on an approximately 4-mile segment of track between San Jose and Santa Clara owned and operated by the Peninsula Corridor Joint Powers Board (PCJPB, also referred to as Caltrain). North of the Santa Clara Station to Stockton, ACE operates on approximately 82 miles of track owned by UPRR. ACE operates on portions of UPRR's Coast, Niles, Oakland, and Fresno Subdivisions.

SJRRC does not own the tracks on which ACE operates, but instead has entered into passenger rights agreements with both the PCJPB and UPRR to operate on portions of their respective tracks. ACE shares tracks with freight trains dispatched by UPRR within the UPRR ROW and with freight trains dispatched by Caltrain in the Caltrain corridor. In addition, other passenger train services (Caltrain, Amtrak Coast Starlight, and Capitol Corridor) also operate on PCJPB and UPRR tracks where ACE trains travel.

ACE currently operates four westbound trains in the morning from Stockton to San Jose and four eastbound trains in the afternoon from San Jose to Stockton during weekdays only. There are 10 ACE stations along the existing route (from west to east): San Jose Diridon, Santa Clara and Great

America stations in Santa Clara County; Fremont, Pleasanton, Livermore, and Vasco Road stations in Alameda County; and Tracy, Lathrop/Manteca, and Stockton stations in San Joaquin County.⁵ ACE currently does not operate on weekends. ACE trains usually consist of one diesel locomotive and five to seven bi-level passenger coaches and can reach a top speed of 79 miles per hour.

To enhance commuter and intercity rail service and to promote greater transit connectivity between the San Joaquin Valley and the San Francisco Bay Area (Bay Area), SJRRC is proposing to expand ACE service to Ceres with stations in downtown Manteca, Ripon, Modesto, and Ceres in Phase I and to Merced with stations in Turlock, Livingston or Atwater, and Merced in Phase II.

2.3 Phase I Improvements by Segment

For the analytical purposes of this EIR, impacts are discussed relative to the following geographic areas: Lathrop to Stockton, Lathrop to Ceres, Ceres to Merced, and existing ACE stations. Phase I improvements are only proposed in the Lathrop to Ceres and Ceres to Merced segments. No Phase I improvements are proposed along the existing ACE corridors between Stockton and San Jose. However, where applicable, this EIR analyzes Phase I operational impacts due to increased ridership at existing ACE destination stations⁶ in the Bay Area.

Specific physical Phase I improvements are illustrated in Figures 2-1 through 2-10. The environmental footprint⁷ associated with each Phase I improvement is illustrated in Appendix B, *ACE Extension Environmental Footprint*. In addition, Appendix C, *ACE Extension 15% Preliminary Engineering Plans*, contains track plans and section drawings, structure plans, roadway plans, utility plans, station plans, and ROW plans for these Phase I improvements.

The project-level analysis of the Phase I improvements in this EIR would allow the selected improvements to proceed with permitting, final design, and construction. It is possible that there would be a phased implementation of Phase I improvements. Infrastructure improvements and passenger service can be increased and extended in a phased approach over time. Thus, the development of physical improvements and expanded service should be seen as a range over time, as follows.

- Minimal improvements: Addition of station, parking and key track/infrastructure improvements and commencement of initial service or expansion of existing trains (one or more trains).
- Interim improvements: Construction of additional track improvements, such as the addition of a new main track, at specific areas of train congestion, and possibly additional parking improvements necessary because of increased ridership, which would allow further expansion of service beyond the initial service.
- Full build: Completion of all proposed improvements along existing and new ACE corridors.

⁵ PCJPB owns the San Jose Diridon and Santa Clara stations, and Capitol Corridor Joint Powers Authority (CCJPA) owns the Great America and Fremont stations. SJRRC owns and maintains the parking areas and station platforms at Pleasanton, Vasco Road, Tracy, Lathrop/Manteca, and Stockton. Portions of ACE parking areas at Pleasanton, Livermore, and Vasco Road stations are owned by the Alameda County Fairgrounds (eastern portion of Pleasanton Station's surface parking lot) and the City of Livermore (Livermore Station's parking structure and Vasco Road Station's surface parking lot); however, SJRRC maintains these facilities.

⁶ These stations are the San Jose Diridon, Santa Clara, Great America, Fremont, Pleasanton, Livermore, and Vasco Road stations.

⁷ The *footprint* is defined as the area covered by a facility or affected by construction activities.

2.3.1 Lathrop to Ceres

The Lathrop to Ceres segment is located in the southern portion of San Joaquin County and the central portion of Stanislaus County. In this segment, ACE trains currently operate on the Oakland Subdivision, located between the city limits of Lathrop and Manteca. North of Manteca, ACE trains connect to the Fresno Subdivision traveling north toward Stockton. As part of Phase I improvements, ACE proposes to extend passenger rail service from Lathrop to Ceres on the Fresno Subdivision. Improvements in this segment include the following categories.

- Lathrop station options: improvements to an existing station or new or additional stations that would operate as a transfer station with the extension to Ceres
- Ceres extension improvements: track improvements and new stations/facilities that would support the extension to Ceres.

Infrastructure improvements and service expansion could be implemented in phases over time, starting with station, parking and key track/infrastructure improvements and initial service, then incremental additional improvements, and then full build.

2.3.1.1 Lathrop Station Options

There are three station options in the Lathrop area—the **Relocated Lathrop/Manteca Station**, **Existing Lathrop/Manteca Station**, and **North Lathrop Station**. Under the single-station scenario, the selected Lathrop station option would operate as a transfer station with the ACE Extension. If the **North Lathrop Station** is selected for implementation, an additional Lathrop-area station (**Relocated Lathrop/Manteca Station** or **Existing Lathrop/Manteca Station**) could also be implemented, allowing for up to two stops in the Lathrop area (two-station scenario).⁸

- The Proposed Project would include two stations in Lathrop, consisting of the **Existing Lathrop/Manteca Station**, and new **North Lathrop Station**.

The **Relocated Lathrop/Manteca Station** is an alternative location considered in lieu of the **Existing Lathrop/Manteca Station** (under both the single-station and two-station scenarios) and **North Lathrop Station** (under the single-station scenario). In addition, all single-station scenarios are also alternatives.

The improvements required at each station would be different depending on whether one or two stations are implemented in Lathrop. In particular, the amount of parking required at each station under the single-station scenarios would be more than required for the two-station scenarios.⁹ The parking identified at each station is designed to accommodate the amount required for the single-station scenario, and a reduced parking supply could be provided at these stations under the two-station scenario. In addition, no tail track¹⁰ improvements would be required at the **Relocated**

⁸ Under the two-station scenario, trains between Stockton and San Jose could stop at both Lathrop-area stations (**Relocated Lathrop/Manteca Station** or **Existing Lathrop/Manteca Station** and the **North Lathrop Station**). Trains between Ceres and San Jose would stop at one Lathrop-area station (**Relocated Lathrop/Manteca Station** or **Existing Lathrop/Manteca Station**).

⁹ Ridership at the selected Lathrop station would be higher if they operate as a single-station, compared to operating as an additional station under the two-station scenario.

¹⁰ A *tail track* is a track layout that allows trains to park off the main track.

Lathrop/Manteca or Existing Lathrop/Manteca Stations in a two-station scenario because train transfers would occur at the **North Lathrop Station**.

Relocated Lathrop/Manteca Station

The **Relocated Lathrop/Manteca Station** would be constructed at the eastern edge of Manteca, just northeast of the State Route (SR) 120 undercrossing. This potential station is located along the existing ACE route on the Oakland Subdivision and is being considered as an alternative location to the **Existing Lathrop/Manteca Station**, which is surrounded by industrial uses and has limited opportunities for improved access, amenities, or expansion. This station is being evaluated at the request of the City of Manteca as a site that would provide increased visibility, ease of access to and from SR 120 at a new interchange planned at McKinley Avenue (California Department of Transportation 2018), adequate and safe parking, and other amenities. In addition to the planned SR 120 interchange project with the California Department of Transportation (Caltrans), the City is also improving access around the proposed station area as part of the *Family Entertainment Zone Master Plan* (City of Manteca 2016). The rail corridor in the vicinity of the **Relocated Lathrop/Manteca Station** consists of a single main track, and a 1.14-mile siding¹¹ track located between milepost (MP) 81.62 and MP 82.76 on the Oakland Subdivision.

Single-Station Scenario Improvements (Alternative)

As shown in Figure 2-1, development of the **Relocated Lathrop/Manteca Station** for the single-station scenario would consist of the following improvements.

- Construction of a new station track, station platform, and fence between the station track and main track.
- Construction of a new 0.23-mile tail track on the Oakland Subdivision from MP 81.54 to MP 81.77.
- Modification of the existing SR 120 undercrossing and construction of new retaining wall at MP 81.68 on the Oakland Subdivision.
- Construction of one new surface parking lot, providing 534 parking spaces.

To provide ACE service at this potential station, a new station track and station platform would be constructed to allow trains to pull into the station and passengers to board and disembark the train. A new 0.47-mile station track would turn out from the main track at MP 81.69 and rejoin the main track at MP 82.16 on the Oakland Subdivision. An approximately 15-foot-wide and 1,000-foot-long station platform would be constructed between MP 81.84 and MP 82.03. Passenger amenities and safety features, such as patron shelters with benches and map boxes, ticket validation machines, street lamps, guardrails, security equipment, and emergency call box stations, would be installed on the station platform area. A 1,000-foot-long fence would be constructed between the existing main track and the station track in the vicinity of the station platform.

From MP 81.77 on the new station track, a new 0.23-mile tail track would extend west under the SR 120 overhead structure and terminate at MP 81.54 on the Oakland Subdivision. The new tail track would be located south of the new station track and existing main and siding tracks. Crossing under the SR 120 overhead structure, the new tail track would be located south of the southern piers.

¹¹ A *siding* is a section of track alongside the main track where a train can temporarily pull off the main track for maintenance, coupling up cars or locomotives, or to let other trains pass along the main track.

Because the new tail track would cut into the southern abutment slope for the SR 120 overhead structure, a 350-foot-long retaining wall with cable railing at the top of the wall would be installed along the length of the existing abutment slope. The retaining wall would vary in height along the abutment slope, but would be approximately 15 feet tall at the highest point.

To meet parking demands generated by ACE service at this potential station, a new surface parking lot (South Lot) would be constructed on approximately 7.5 acres, directly south of the station platform and west of McKinley Avenue. Vehicle access to the South Lot would be provided by an entrance on McKinley Avenue. In addition, landscaping would be installed at the station, including at surface parking lot areas.

The majority of improvements at the **Relocated Lathrop/Manteca Station** would be located outside the UPRR ROW, particularly the parking improvements. Table 2-8 provides a list of parcels outside the UPRR ROW that would be affected by this improvement.

Two-Station Scenario Improvements (Alternative)

If the **Relocated Lathrop/Manteca Station** is selected as the additional Lathrop-area station to the **North Lathrop Station**, development of the **Relocated Lathrop/Manteca Station** for the two-station scenario would consist of the following improvements.

- Construction of a new station track, station platform, and fence between the station track and main track.
- Construction of one new surface parking lot, providing up to 534 parking spaces.

Under the two-station scenario, the new station track, station platform, fence between the station track and main track, and new surface parking lot would be the same as described under the single-station scenario. The 534 parking spaces provided at the South Lot could be reduced under the two-station scenario. No tail track or SR 120 undercrossing modifications would be required. For detailed description of station track, station platform, fence between the station track and main track, and new surface parking lot improvements, refer to the *Single-Station Scenario Improvements (Alternative)* section.

Existing Lathrop/Manteca Station Improvements

The **Existing Lathrop/Manteca Station** is located at 17800 Shideler Parkway, north of the West Yosemite Avenue at-grade crossing, in Lathrop. The rail corridor in the vicinity of the **Existing Lathrop/Manteca Station** consists of a single main track, and a 1.14-mile siding track located between MP 81.62 and MP 82.76 on the Oakland Subdivision. The siding track is located east of the main track and joins the main track at MP 82.76 just before crossing the West Yosemite Avenue at grade, south of the **Existing Lathrop/Manteca Station** platform area. The rail corridor is a single main track passing through and north of the **Existing Lathrop/Manteca Station** platform area.

Single-Station Scenario Improvements (Alternative)

As shown in Figure 2-2, improvements at the **Existing Lathrop/Manteca Station** for the single-station scenario would consist of the following.

- Construction of a new 0.23-mile siding track on the Oakland Subdivision from MP 82.54 to MP 82.77.

- Extension of the existing siding track 0.86 mile to the north on the Oakland Subdivision from MP 82.68 to MP 83.54.
- Modification of the existing West Yosemite Avenue at-grade crossing at MP 82.79 on the Oakland Subdivision.

South of the station platform area, a second 0.23-mile siding track would be built west of the existing main track at MP 82.54 on the Oakland Subdivision and join the main track at MP 82.77, just before the West Yosemite Avenue at-grade crossing. The existing siding track located east of the main track would be extended 0.86 mile northward at MP 82.68, for a total siding track length of 1.90 miles. The extended siding track would cross West Yosemite Avenue at grade and join the existing main track at MP 83.54. Modifications to the West Yosemite Avenue crossing for the extended siding track would include installing concrete crossing panels¹² where the station track crosses the roadway and relocating the existing railroad crossing signal, guard/gate, and signal house¹³ at the westbound approach.

The existing parking supply (544 parking spaces) at the **Existing Lathrop/Manteca Station** would be sufficient to accommodate parking needs for Phase I operations with the ACE Extension and no parking improvements would be required.

All improvements for the **Existing Lathrop/Manteca Station** would be located within the existing UPRR ROW, and no new ROW would be acquired for this improvement.

Two-Station Scenario Improvements

If the **Existing Lathrop/Manteca Station** is selected as the additional Lathrop-area station to the **North Lathrop Station**, no track or parking improvements would be required at the **Existing Lathrop/Manteca Station** under the two-station scenario.

North Lathrop Station

The **North Lathrop Station** would be constructed in the northern portion of Lathrop, on presently vacant federal land that is part of the U.S. Department of Defense Sharpe Army Depot, but is not in use. This station would require a federal transfer of land. This potential station is located along the existing ACE route on the Fresno Subdivision and is being considered as an alternative location to the **Existing Lathrop/Manteca Station**, or as an additional location to the **Relocated Lathrop/Manteca Station** or **Existing Lathrop/Manteca Station**. There are extensive existing residential areas located directly adjacent to the station location to the northwest and southwest, thus providing ease of access for nearby residents to walk, bike, or drive to the station. The rail corridor in the vicinity of the **North Lathrop Station** consists of double main tracks, and a spur track¹⁴ turning out at MP 92.75 on the Fresno Subdivision towards the Sharpe Army Depot.

Single-Station Scenario Improvements (Alternative)

As shown in Figure 2-3, development of the **North Lathrop Station** for the single-station scenario would consist of the following improvements.

¹² *Crossing panels* are installed so that the tracks lie flush with the roadway.

¹³ A *signal house* stores the electrical devices used to operate the at-grade crossing signals.

¹⁴ A *spur track* is a short, usually dead-end section of track used to access a facility or loading/unloading ramp.

- 1 • Construction of new station tracks, station platform, and fence between the station track and
- 2 main track.
- 3 • Modification of the existing West Lathrop Road undercrossing at MP 93.00 on the Fresno
- 4 Subdivision.
- 5 • Removal of an existing spur turnout track¹⁵ at MP 92.75 on the Fresno Subdivision.
- 6 • Construction of a new 0.03-mile crossover track from MP 92.38 to MP 92.35 on the Fresno
- 7 Subdivision.
- 8 • Construction of a new pedestrian bridge crossing over the railroad tracks.
- 9 • Construction of a new driveway and surface parking lot, providing 548 parking spaces.
- 10 • Modification of West Lathrop Road to allow vehicle access to parking lot.

11 To provide ACE service at this new station, new station tracks and a station platform would be
 12 constructed to allow trains to pull into the station and passengers to board and disembark the train.
 13 The new 0.54-mile station track would turn out from the main track at MP 93.03 and rejoin the main
 14 track at MP 92.49 on the Fresno Subdivision. Crossing under the existing West Lathrop Road
 15 undercrossing at MP 93.00, pier protection¹⁶ would be installed along the existing eastern piers of
 16 the overhead structure. Between MP 92.99 and MP 92.57, the station track would be a double track
 17 and the station platform would be located between the double tracks. The existing spur turnout at
 18 MP 92.75 would be removed to accommodate the station track. A 0.03-mile crossover between the
 19 two existing main tracks at MP 92.38 and MP 92.35 would be constructed to enable trains to access
 20 the station tracks and platform.

21 An approximately 32-foot-wide and 1,000-foot-long station platform would be constructed between
 22 MP 92.92 and MP 92.73, north of the West Lathrop Road undercrossing. Passenger amenities and
 23 safety features, such as patron shelters with benches and map boxes, ticket validation machines,
 24 street lamps, guardrails, security equipment, and emergency call box stations, would be installed on
 25 the station platform area. A 1,200-foot-long fence would be constructed between the existing main
 26 tracks and the station track in the vicinity of the station platform. A pedestrian overcrossing would
 27 be constructed between the surface parking area and the station platform, crossing over the railroad
 28 tracks. A 1,500-foot-long fence would be constructed between the parking areas and the station
 29 platform and track.

30 To meet parking demands generated by ACE service at this new station, a new surface parking lot
 31 (East Lot) would be constructed on approximately 6.9 acres directly east of the station platform on
 32 the southern portion of the Sharpe Army Depot. Portions of existing track within the station
 33 footprint for the surface parking lot would be removed. A 1,500-foot-long fence would be
 34 constructed along the perimeter of the surface parking lot. Vehicle access to the East Lot would be
 35 provided by a new driveway from West Lathrop Road. In addition, West Lathrop Road would be
 36 modified to accommodate a designated turn lane for eastbound vehicles to enter the new driveway
 37 and parking lot. The new 0.24-mile driveway would be approximately 40 feet wide to accommodate
 38 two lanes of traffic and sidewalks on both sides. In addition, landscaping would be installed at the
 39 station, including at surface parking lot areas.

¹⁵ A *turnout track* enables trains to be guided from one track to another.

¹⁶ Overhead structures with a pier closer than 25 feet from the centerline of a new track require *pier protection* in the form of a crash wall. Pier protection is designed to resist impact and redirect equipment in case of derailment.

The majority of improvements at the **North Lathrop Station** would be located outside the UPRR ROW, particularly the parking improvements. Table 2-8 provides a list of parcels outside the UPRR ROW that would be affected by this improvement.

Two-Station Scenario Improvements

If either the **Relocated Lathrop/Manteca Station** or **Existing Lathrop/Manteca Station** is selected as the additional Lathrop-area station to the **North Lathrop Station**, development of the **North Lathrop Station** would consist of the same improvements as described under the single-station scenario, except that the 548 parking spaces provided at the East Lot could be reduced under the two-station scenario. For detailed description of improvements for the **North Lathrop Station**, refer to the *Single-Station Scenario Improvements (Alternative)* section.

2.3.1.2 Ceres Extension

Ceres Extension improvements that are part of the Proposed Project include the following.

- **Oakland-Fresno Subdivision Connection**
- **Ceres Extension Alignment**
- **Ceres Layover Facility, variant 2**
- Stations along the extension including **Downtown Manteca, Ripon, Modesto, and Ceres Stations**

The **Ceres Layover Facility, variant 1** is an alternative location considered in lieu of variant 2 of the layover facility.

Oakland-Fresno Subdivision Connection

ACE trains currently operate on the Oakland Subdivision, located between Lathrop and Manteca. North of Manteca, ACE trains connect to the Fresno Subdivision traveling north toward Stockton. The **Oakland-Fresno Subdivision Connection** would be constructed in the northeastern portion of Manteca and would allow ACE trains traveling on the Oakland Subdivision to turn directly onto the Fresno Subdivision to service stations in downtown Manteca, Ripon, Modesto, and Ceres. The **Oakland-Fresno Subdivision Connection** would be implemented if either the **Existing Lathrop/Manteca Station** or **Relocated Lathrop/Manteca Station** is selected for operation, or if the operational scenario with direct ACE service between Ceres and San Jose is pursued.

As shown in Figure 2-4a, improvements that are part of the **Oakland-Fresno Subdivision Connection** are as follows.

- Construction of a new 0.42-mile main track connecting the Oakland Subdivision at MP 84.16 to the Fresno Subdivision at MP 94.22.
- Construction of a new double-cell concrete box culvert crossing over an irrigation canal.

The **Oakland-Fresno Subdivision Connection** is a new 0.42-mile main track that would turn out from the Oakland Subdivision at MP 84.16 and connect to the Fresno Subdivision at MP 94.22. This track crossover would require a new UPRR ROW of approximately 50 feet on each side of the new track centerline for the length of the connection, for which UPRR has already acquired the required parcels. The new track connection would cross an existing irrigation canal north of East Louise

Avenue. A new 350-foot-long double-cell concrete box culvert would be constructed over the existing earth-lined irrigation canal.

The majority of improvements for the **Oakland-Fresno Subdivision Connection** would be located within parcels under UPRR acquisition, except for a portion of the new track connection crossing an irrigation canal. Table 2-8 provides a list of parcels outside the UPRR ROW that would be affected by this improvement.

Ceres Extension Alignment

As shown in Figures 2-4a through 2-4e, the extension to Ceres would construct a second main track and replace portions of existing track on the Fresno Subdivision. Improvements that are part of the **Ceres Extension Alignment** are as follows.

- Construction and replacement of tracks between MP 94.51 and MP 117.38 on the Fresno Subdivision.
 - Construction of a new 17.88-mile second main track from MP 94.51 to MP 112.39 on the Fresno Subdivision.
 - Replacement of 1.26 mile of existing track from MP 112.39 to MP 113.65 on the Fresno Subdivision.
 - Construction of a new 0.56-mile second main track from MP 112.66 to MP 113.22 on the Fresno Subdivision.
 - Construction of a new 3.73-mile second main track from MP 113.65 to MP 117.38 on the Fresno Subdivision.
- Modification of 19 existing at-grade crossings as shown in Table 2-1 on the Fresno Subdivision.
- Construction of a 0.04-mile crossover track between the existing main track and the new main track from MP 98.19 to MP 98.23 on the Fresno Subdivision
- Realignment of 0.12 mile of an existing spur turnout at MP 98.23 on the Fresno Subdivision.
- Modification of 12 existing undercrossings as shown in Table 2-2 on the Fresno Subdivision.
- Construction of a new single-track concrete bridge crossing over the Stanislaus River at MP 104.34 on the Fresno Subdivision.
- Construction of a new double-cell concrete box culvert crossing over an irrigation canal at MP 106.93 on the Fresno Subdivision.
- Construction of a new single-cell concrete box culvert crossing over a drainage at MP 109.98 on the Fresno Subdivision.
- Construction of a new single-track concrete bridge crossing over the Tuolumne River at MP 113.99 on the Fresno Subdivision.
- Realignment of 0.06 mile of an existing spur turnout at MP 114.77 on the Fresno Subdivision.

The new 17.88-mile second main track would turn out from the existing main track at MP 94.51 and at MP 112.39 on the Fresno Subdivision. The second main track would be located east of the existing main track, and for the majority of the alignment, would be located between SR 99 and existing tracks. A 0.04-mile crossover track would be constructed between the existing main track and the new main track between MP 98.19 and MP 98.23 and a short 0.12-mile portion of a spur turnout at MP 98.23 would be realigned to accommodate the second main track and to allow the continued use of the spur track to transport materials to and from the industrial uses in the area. At MP 112.39, the new main track would join the existing track and 1.26 mile of the existing track between MP 112.39 and MP 113.65 would be removed and replaced with a new track that complies with UPRR track standards for carrying trains at speeds compatible with passenger rail. Passing through downtown Modesto, a new 0.56-mile segment of second main track would extend from the existing siding track at MP 112.66 and join the existing main track at MP 113.22. South of downtown Modesto, a new 3.73-mile segment of second main track would extend from the upgraded track at MP 112.66 and join the existing main track at MP 117.38. A 0.06-mile portion of a spur turnout at MP 114.77 would be realigned to accommodate the second main track and to allow the continued use of the spur track to transport materials to and from the industrial uses in Bystrom.

Following the same alignment as the existing main track in the Fresno Subdivision, the new track would cross 19 existing at-grade crossings, under 12 existing overhead structures, over the Stanislaus River on a new bridge structure, over an irrigation canal and drainage, and over the Tuolumne River and River Road on a new bridge structure. Table 2-1 lists the modifications to existing at-grade crossings to accommodate the new second main track. Modifications to the existing at-grade crossings generally require installation of concrete crossing panels where the new main track crosses the roadway; relocation of railroad crossing signals, guards or gates, and signal houses; and installation of stop bars.¹⁷ Table 2-2 lists the modifications to existing undercrossings to accommodate the new second main track. Modifications to existing overhead structure undercrossings generally entail installation of pier protection along the existing piers for the overhead structures and retaining walls along the length of existing abutment slopes. Table 2-3 details the specifications of the new bridge structures crossing waterways that would be constructed to accommodate the new second main track crossing the Stanislaus and Tuolumne Rivers.

Table 2-1. Ceres Extension Alignment—At-Grade Crossing Modifications

Existing Roadway (west to east)	Modifications
Manteca	
MP 95.03, West Louise Avenue	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the westbound approach • Install stop bar at the westbound approach • Relocate signal house
MP 95.71, North Union Road	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the southbound approach • Install stop bar at the southbound approach • Relocate signal house

¹⁷ A *stop bar* is placed near an at-grade crossing to warn drivers and pedestrians of an approaching railroad crossing.

Existing Roadway (west to east)	Modifications
MP 96.14, North Walnut Avenue	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the southbound approach • Install stop bar at the southbound approach • Relocate signal house
MP 96.52, West Center Street	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the westbound approach • Install stop bar at the westbound approach • Relocate signal house
MP 96.72, West Yosemite Avenue	• Realign Manteca Avenue to be perpendicular with West Yosemite Avenue • Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the westbound approach • Install stop bar at the westbound approach • Install standard grade-crossing markings at the westbound approach • Install standard grade-crossing markings at the northbound South Willow Avenue approach
MP 97.00, South Main Street	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the southbound approach • Install stop bar at the southbound approach • Install standard grade-crossing markings at the westbound approach • Relocate signal house
MP 98.08, Spreckels Avenue	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the westbound approach • Install stop bar at the westbound approach • Install standard grade-crossing markings at northbound and southbound Moffat Boulevard approaches • Relocate signal house
MP 99.23, East Woodward Avenue	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the westbound approach • Install stop bar at the westbound approach • Install standard grade-crossing markings at the northbound Moffat Boulevard approach • Relocate signal house
MP 99.53, Austin Road	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the southbound approach • Install stop bar at the southbound approach • Install standard grade-crossing markings at eastbound and westbound approaches • Relocate signal house
Salida	
MP 106.17, Kiernan Avenue	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the westbound approach • Install stop bar at the westbound approach • Install standard grade-crossing markings at eastbound approach • Relocate signal house

Existing Roadway (west to east)	Modifications
MP 106.50, Broadway Avenue	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the westbound approach • Install stop bar at the westbound approach • Install standard grade-crossing markings at eastbound approach • Relocate signal house
Modesto	
MP 107.62, Salida Boulevard	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the westbound approach • Install stop bar at the westbound approach • Install standard grade-crossing markings at southbound approach • Relocate signal house
MP 111.64, Woodland Avenue	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the westbound approach • Relocate railroad crossing signals and guard/gates at the designated turn pocket from 9th Street • Install stop bar at the designated turn pocket from 9th Street • Install standard grade-crossing markings at westbound approach • Install standard grade-crossing markings at northbound 9th Street approach
MP 112.79, L Street	• Install concrete crossing panels where the new main track and layover track crosses the roadway • Relocate railroad crossing signals and guard/gates at the eastbound approach • Install stop bar at the eastbound approach • Install standard grade-crossing markings at eastbound approach • Relocate signal house
MP 112.88, K Street	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the eastbound approach • Install stop bar at the eastbound approach • Relocate signal house
MP 113.06, I Street	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the eastbound approach • Install stop bar at the eastbound approach • Relocate signal house
MP 113.15, H Street	• Install concrete crossing panels where the new main track crosses the roadway • Relocate signal house
MP 113.72, B Street	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the southbound approach • Install stop bar at the southbound approach • Relocate signal house
MP 114.91, Pescos Avenue	• Install concrete crossing panels where the new main track crosses the roadway • Relocate railroad crossing signals and guard/gates at the westbound approach • Install stop bar at the westbound approach • Relocate signal house

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Table 2-2. Ceres Extension Alignment—Undercrossing Modifications

Existing Overhead Structure (west to east)	Modifications
Manteca	
MP 98.35, SR 120 overhead structures	• Install pier protection on westbound SR 120 overhead structure's east pier • Install pier protection along two of eastbound SR 120 overhead structure's east piers
Ripon	
MP 102.64, Fulton Avenue overhead structure	• Install pier protection on Fulton Avenue overhead structure's north pier
MP 103.03, North Acacia Avenue pedestrian overhead structure	• Install pier protection on North Acacia Avenue pedestrian overhead structure's north pier
MP 103.45, Main Street overhead structure	• Install 256-foot-long retaining wall with cable railing at the top of the wall along the length of the existing abutment slope to the north; the retaining wall would vary in height along the abutment slope, approximately 15 feet tall at the highest point • Install pier protection along two of Main Street overhead structure's north piers
Salida	
MP 104.82, Hammett Road overhead structure	• Install 229-foot-long retaining wall with cable railing at the top of the wall along the length of the existing abutment slope to the north; the retaining wall would vary in height along the abutment slope, approximately 17 feet tall at the highest point • Install pier protection along two of Hammett Road overhead structure's east piers
Modesto	
MP 108.81, Beckwith Road overhead structure	• Install 274-foot-long retaining wall with cable railing at the top of the wall along the length of the existing abutment slope to the east; the retaining wall would vary in height along the abutment slope, approximately 23 feet tall at the highest point • Install pier protection along three of Beckwith Road overhead structure's east piers
MP 110.63, North Carpenter Road overhead structure	• Install 318-foot-long retaining wall with cable railing at the top of the wall along the length of the existing abutment slope to the north; the retaining wall would vary in height along the abutment slope, approximately 23 feet tall at the highest point • Install pier protection along four of North Carpenter Road overhead structure's east piers
MP 111.05, SR 99 overhead structure	• Install pier protection along eight of southbound and northbound SR 99 overhead structure's north piers • Install pier protection along eight of southbound and northbound SR 99 overhead structure's south piers

Existing Overhead Structure (west to east)	Modifications
MP 112.38, Kansas Avenue overhead structure	• Install pier protection along three of Kansas Avenue overhead structure's east piers
MP 114.76, SR 99 overhead structure	• Install pier protection along three of northbound SR 99 overhead structure's east piers • Install pier protection along four of southbound SR 99 overhead structure's east piers
MP 115.46, East Hatch Road overhead structure	• Install pier protection along four of East Hatch Road overhead structure's east piers
Ceres	
MP 116.83, East Whitmore Avenue overhead structure	• Install pier protection along four of East Whitmore Avenue overhead structure's east piers

Table 2-3. Ceres Extension Alignment—New Bridge Structures over Waterways

Location (west to east)	Bridge Structure
MP 104.34, Stanislaus River	• Single-track concrete bridge with portions of steel bracing, east of the existing single-track bridge • Width of bridge: 17 feet • Length of bridge: 760-foot, 20-span structure consisting of 16 30-foot spans on the northern end approaching the Stanislaus River, 3 60-foot spans, and 1 100-foot span crossing the Stanislaus River • Supporting structures: two abutments at each end of bridge and 19 piers between the span sections; two supporting piers would be placed in the Stanislaus River
MP 113.99, Tuolumne River	• Single-track concrete bridge with portions of steel bracing, east of the existing single-track bridge • Width of bridge: 17 feet • Length of bridge: 1,270-foot, 33-span structure consisting of 29 30-foot spans on the northern end approaching the Tuolumne River and four 100-foot spans crossing the Tuolumne River • Supporting structures: two abutments at each end of bridge and 32 piers between the span sections; three supporting piers would be placed in the Tuolumne River

A new 42-foot-long double-cell concrete box culvert would be constructed over the existing concrete-lined irrigation canal at MP 106.93. Crossing the drainage culvert at MP 109.98, a new 43-foot-long single-cell concrete box culvert would be constructed to accommodate the second main track.

All improvements for the **Ceres Extension Alignment** would be located within the existing UPRR ROW, and no new ROW would be acquired for this improvement.

Ceres Layover Facility

To support train layovers, storage, maintenance, and operations associated with the extension to Ceres, a new temporary layover facility would be constructed south of the **Ceres Station**. The temporary layover facility in Ceres would discontinue, pending the completion of the extension to Merced and a permanent layover facility in Merced. There are two layover facility variations considered for implementation and only one layover facility variant would be implemented.

The majority of improvements for the **Ceres Layover Facility, variants 1 and 2** would be located outside the UPRR ROW. Table 2-8 provides a list of parcels outside the UPRR ROW that would be affected by each variant of this improvement.

Ceres Layover Facility, Variant 1 (Alternative)

As shown in Figure 2-4e, improvements that are part of the **Ceres Layover Facility, variant 1** are as follows.

- Construction of a 0.09-mile crossover track between the existing main tracks from MP 117.97 to MP 118.06 on the Fresno Subdivision.
- Construction of a lead track¹⁸ and two new 0.55-mile storage tracks between MP 118.16 and MP 118.71 on the Fresno Subdivision.
- Realignment of a 0.55-mile portion of Lucas Road.

Variant 1 would be constructed between the East Service Road overhead structure and the Ceres Main Canal. A new 0.09-mile crossover track would be constructed between the existing main track and siding track from MP 117.97 to MP 118.06, north of the East Service Road overhead structure, to allow trains to access the temporary layover facility. The lead track to the layover facility would turn out from the existing siding track at MP 118.16 and MP 118.71 on the Fresno Subdivision. Two new 0.55-mile storage tracks would turn out from the lead track to the layover facility. The temporary layover facility would also include support facilities such as an administrative office, crew facilities, small parts storage, wet house fueling facilities with track panel containment, wayside power, and train cleaning function areas. Support facilities would be constructed to the west and along the length of the new storage tracks and a fence would be constructed around the perimeter of the temporary layover facility. A 0.55-mile portion of Lucas Road would be shifted approximately 50 feet to the west to accommodate the additional UPRR ROW required for the temporary layover facility. The realigned Lucas Road would be approximately 40 feet wide to accommodate two lanes of traffic and shoulders on both sides. Vehicle access to the temporary layover facility would be provided by two entrances on Lucas Road.

Ceres Layover Facility, Variant 2

As shown in Figure 2-4e, improvements that are part of the **Ceres Layover Facility, variant 2** are as follows.

- Extension of the existing siding track by 0.1 mile on the Fresno Subdivision from MP 119.49 to MP 119.54.

¹⁸ A *lead track* is a non-main track connecting a railroad yard or facility to the main line or running track.

- Widening of the existing culvert over an irrigation canal at MP 119.54 on the Fresno Subdivision.
- Construction of a lead track and two new 0.58-mile storage tracks between MP 119.54 and MP 120.12 on the Fresno Subdivision.

Variant 2 would be constructed north of the Faith Home Road overhead structure. At MP 119.59, the existing siding track would be extended 0.1 mile north and connect with the main track at MP 119.49. Crossing over the irrigation canal at MP 119.54, the culvert would be widened approximately 5 feet to support the extended siding track. The lead track to the layover facility would turn out from the siding track at MP 119.54 and MP 120.12 on the Fresno Subdivision. Two new 0.58-mile storage tracks would turn out from the lead track to the layover facility. The temporary layover facility would also include support facilities such as an administrative office, crew facilities, small parts storage, wet house fueling facilities with track panel containment, wayside power, and train cleaning function areas. Support facilities would be constructed to the west and along the length of the new storage track and a fence would be constructed around the perimeter of the temporary layover facility. Vehicle access to the temporary layover facility would be provided by an entrance on Kaiser Road.

Downtown Manteca Station

The **Downtown Manteca Station** would be constructed at the existing Manteca Transit Center located at 220 Moffat Boulevard. The existing transit center operates as a hub for local, commuter, and long-distance intercity bus services provided by Manteca Transit, San Joaquin Regional Transit District, and Greyhound. As shown in Figure 2-5, development of the **Downtown Manteca Station** would consist of the following improvements.

- Construction of a new station platform and fence between the second main track and existing main track.
- Construction of a new surface parking lot, providing 124 parking spaces.
- Realignment of the existing pedestrian/bicycle path adjacent to the new surface parking lot.

To provide ACE service at this new station, a new station platform would be constructed to allow passengers to board and disembark the train. An approximately 20-foot-wide and 1,000-foot-long station platform would be constructed between MP 97.01 and MP 97.20 on the Fresno Subdivision, east of the South Main Street grade crossing. Passenger amenities and safety features, such as patron shelters with benches and map boxes, ticket validation machines, street lamps, guardrails, security equipment, and emergency call box stations, would be installed on the station platform area. A 1,000-foot-long fence would be constructed between the existing main track and the second main track, which would function as the station track, in the vicinity of the station platform.

To meet parking demands generated by ACE service at this proposed station, a new surface parking lot (East Lot) would be constructed on approximately 0.9 acre, east of existing parking lot and the Manteca Recycling Center. Vehicle access to the East Lot would be provided by entrances on Moffat Boulevard. A portion of the existing pedestrian/bicycle path adjacent to the East Lot would be realigned. In addition, landscaping would be installed at the station, including at surface parking lot areas.

The majority of improvements at the **Downtown Manteca Station** would be located outside the UPRR ROW, particularly the parking improvements. Table 2-8 provides a list of parcels outside the UPRR ROW that would be affected by this improvement.

Ripon Station

The **Ripon Station** would be constructed in central Ripon, south of the northbound SR 99 on-ramp at Main Street. As shown in Figure 2-6, development of the **Ripon Station** would consist of the following improvements.

- Construction of a new station platform and fence between the second main track and existing main track.
- Construction of a new surface parking lot that would provide 197 parking spaces.
- Construction of a new pedestrian bridge crossing over the railroad tracks.

To provide ACE service at this new station, a new station platform would be constructed to allow passengers to board and disembark the train. An approximately 20-foot-wide and 1,000-foot-long station platform would be constructed between MP 103.47 and MP 103.66 on the Fresno Subdivision, southeast of the Main Street undercrossing. Passenger amenities and safety features, such as patron shelters with benches and map boxes, ticket validation machines, street lamps, guardrails, security equipment, and emergency call box stations, would be installed on the station platform area. A 1,000-foot-long fence would be constructed between the existing main track and the second main track, which would function as the station track, in the vicinity of the station platform.

To meet parking demands generated by ACE service at this proposed station, a new surface parking lot (South Lot) would be constructed on approximately 1.8 acres south of the South Industrial Avenue undercrossing at Main Street. Vehicle access to the South Lot would be provided by entrances on South Industrial Avenue. A pedestrian overcrossing would be constructed between the parcel to the east of South Industrial Avenue and the station platform, crossing over the railroad tracks. In addition, landscaping would be installed at the station, including at surface parking lot areas.

The majority of improvements at the **Ripon Station** would be located outside the UPRR ROW, particularly the parking improvements. Table 2-8 provides a list of parcels outside the UPRR ROW that would be affected by this improvement.

Modesto Station

The **Modesto Station** would be constructed at the existing Modesto Transportation Center located at 1001 Ninth Street in downtown Modesto. The existing transit center operates as a hub for local, commuter, and long-distance bus services provided by Modesto Area Express, Stanislaus Regional Transit, and Greyhound. As shown in Figure 2-7, development of the **Modesto Station** would consist of the following improvements.

- Construction of a new station platform and fence between the second main track and existing main track.
- Construction of improvements at two existing parking areas.

To provide ACE service at this new station, a new station platform would be constructed to allow passengers to board and disembark the train. An approximately 20-foot-wide and 1,000-foot-long station platform would be constructed between MP 112.89 and MP 113.05 on the Fresno Subdivision, between the K Street and I Street at-grade crossings. Passenger amenities and safety features, such as patron shelters with benches and map boxes, ticket validation machines, street

lamps, guardrails, security equipment, and emergency call box stations, would be installed on the station platform area. A 1,000-foot-long fence would be constructed between the existing main track and the second main track, which would function as the station track, in the vicinity of the station platform. The existing wall between the station platform and the Modesto Transportation Center would be removed and landscaping would be installed.

There are several existing parking areas owned by the City of Modesto located adjacent to and in the vicinity of the new **Modesto Station**. To meet parking demands generated by ACE service at this station, 374 parking spaces would be provided by 12 existing parking facilities in the vicinity of the station. SJRRC would work with the City to accommodate ACE validations for reduced parking fees in the existing facilities. The majority of these existing parking facilities do not require additional improvements. Improvements, such as providing a paved walkway, removing a fence, and rehabilitating and extending a surface parking lot, would be constructed at the two existing parking areas between L Street and I Street.

The majority of improvements at the **Modesto Station** would be located outside the UPRR ROW, particularly the parking improvements. Table 2-8 provides a list of parcels outside the UPRR ROW that would be affected by this improvement.

Ceres Station

The **Ceres Station** would be constructed in central Ceres, west of SR 99 on Railroad Avenue between Kinser Road and Central Avenue. As shown in Figure 2-8, development of the **Ceres Station** would consist of the following improvements.

- Construction of a station platform and fence between the second main track and existing main track.
- Construction of three new surface parking areas, providing 33 (East Lot 1), 61 (East Lot 2), and 22 (East Lot 3) parking spaces, for a total of 116 parking spaces.
- Construction of two new pedestrian paths crossing under SR 99 and new crosswalks along North Street and El Camino Avenue.
- Installation of a traffic signal at the intersection of the SR 99 southbound off-ramp and El Camino Avenue.
- Installation of a bus pull-in zone, signage, shelter with seating, and infrastructure supporting electric bus operations along El Camino Avenue between North Street and Second Street.

To provide ACE service at this new station, a new station platform would be constructed to allow passengers to board and disembark the train. The station platform would be constructed between SR 99 to the north and railroad track to the south. An approximately 15-foot-wide and 1,000-foot-long station platform would be constructed between MP 117.08 and MP 117.27 on the Fresno Subdivision, between the East Whitmore Avenue and Pine Street overhead structure undercrossings. Passenger amenities and safety features, such as patron shelters with benches and map boxes, ticket validation machines, street lamps, guardrails, security equipment, and emergency call box stations, would be installed on the station platform area. A 1,200-foot-long fence would be constructed between the existing main track and the second main track, which would function as the station track, in the vicinity of the station platform.

It is estimated that parking demands generated by ACE at this station would require approximately 206 parking spaces. To meet future parking demands generated by ACE service, three new surface

parking areas would be constructed along El Camino Avenue east of SR 99 and would provide 116 parking spaces. The remainder of parking (90 parking spaces) would be provided by nearby existing City on-street parking and parking lot supplies. New pedestrian paths would be constructed under SR 99 to provide access from the east lots to the station platform. From East Lot 1, the pedestrian path would be constructed along the North Street/SR 99 southbound off-ramp underpass to the station platform. The pedestrian path from East Lot 2 would be constructed along the Second Street/SR 99 southbound on-ramp underpass to provide access to the station platform. Pedestrian crosswalks would be constructed along the south side of North Street and west side of El Camino Avenue. A new traffic signal would be installed at the intersection of the SR 99 southbound off-ramp and El Camino Avenue. In addition, landscaping would be installed at the station, including at surface parking lot areas.

To provide interim bus bridge service between Merced and Ceres at this station, a new bus stop pole, shelter with seating, and bus-only pull-in/pull-out zone would be constructed along El Camino Avenue between North Street and Second Street. Passengers arriving by the bus bridge would be able to access the station platform via the pedestrian path. Electrical bus infrastructure, such as charging stations, to support bus bridge operations would be installed at the bus-only pull-in/pull-out zone.

The majority of improvements at the **Ceres Station** would be located outside the UPRR ROW, particularly the parking and bus stop improvements. The areas identified for surface parking and bus stop improvements at the **Ceres Station** are located within the City's public ROW.

2.3.2 Ceres to Merced Interim Bus Bridge

The Ceres to Merced segment is located in the central portion of Stanislaus County and the eastern portion of Merced County. ACE currently does not operate passenger rail services in this segment. As part of Phase I improvements, a bus bridge would operate between Merced and Ceres, with stops in Livingston, Atwater, and Turlock. The Merced County Association of Governments (MCAG) is anticipated to operate this bus service and SJRRC would work with MCAG to develop operational plans. Electric buses would be utilized for this service. This bus bridge would operate from the initiation of ACE service to Ceres until the ACE Extension to Merced is complete.

Figure 2-9 depicts the bus bridge route and locations of bus stops. Generally, the bus bridge route would use SR 99 and local streets to access bus stop locations. Along with the bus stop at the **Ceres Station** described in Section 2.3.1.2, *Ceres Extension*, there are four additional bus stops in this segment that are part of the Proposed Project:

- **Turlock Bus Stop**
- **Livingston Bus Stop**
- **Atwater Bus Stop**
- **Merced Bus Stop**

There are no physical improvements associated with the **Turlock, Livingston, and Atwater Bus Stops** because these location would use existing bus transit facilities and passenger amenities. Physical improvements would be required for the **Merced Bus Stop** to support bus bridge operations. Infrastructure improvements and service expansion would be implemented in phases over time, starting with station, parking, and key track/infrastructure improvements and initial service, then additional improvements to key capacity locations and additional service, and then full build.

2.3.2.1 Turlock Bus Stop

As shown in Figure 2-9, the **Turlock Bus Stop** for the bus bridge service between Merced and Ceres would be located at the existing Turlock Regional Transit Center at the intersection of West Hawkeye Avenue and Dels Lane. The existing transit center operates as a hub for local and commuter bus services provided by Turlock Transit, Stanislaus Regional Transit, and Merced County Transit. No physical improvements for the **Turlock Bus Stop** would be required to support bus bridge operations because existing infrastructure at the Turlock Regional Transit Center, such as bus bays and passenger amenities including parking, benches, shelters, and signage, would be used.

2.3.2.2 Livingston Bus Stop

As shown in Figure 2-9, the **Livingston Bus Stop** for the bus bridge service between Merced and Ceres would be located at an existing bus stop along Main Street between the Main Street at-grade crossing and B Street. The existing bus stop is serviced by a Merced County Transit intercity route. No physical improvements for the **Livingston Bus Stop** would be required to support bus bridge operations because existing infrastructure at the Merced County Transit bus stop, such as a bus pull-in zone and passenger amenities including benches, shelters, and signage, would be used. Parking for bus bridge passengers is assumed to be provided by nearby existing City on-street parking.

2.3.2.3 Atwater Bus Stop

As shown in Figure 2-9, the **Atwater Bus Stop** for the bus bridge service between Merced and Ceres would be located at the existing Atwater Transpo along Atwater Boulevard, between Third Street and First Street. The existing transit center is serviced by Merced County Transit intercity routes. No physical improvements for the **Atwater Bus Stop** would be required to support bus bridge operations because existing infrastructure at the Atwater Transpo, such as bus bays and passenger amenities including parking, benches, shelters, and signage, would be used.

2.3.2.4 Merced Bus Stop

As shown in Figure 2-9, the **Merced Bus Stop** for the bus bridge service between Merced and Ceres would be located at the existing Merced Transportation Center on West 16th Street between O Street and M Street. The existing transit center operates as a hub for local, commuter, regional, and long-distance bus services provided by Merced County Transit, Yosemite Area Regional Transportation System, Greyhound, VIA Trailways, and Transportes InterCalifornias. As shown in Figure 2-10, development of the **Merced Bus Stop** would consist of the following improvements.¹⁹

- Installation of infrastructure supporting electric bus operations at the Merced Transportation Center.

Electrical bus infrastructure, such as charging stations, to support bus bridge operations would be installed at the Merced Transportation Center. Existing infrastructure at the Merced Transportation Center, such as bus pull-in zones and passenger amenities including parking, benches, shelters, and signage, would be used.

¹⁹ Due to uncertainty in the specific location for the electric bus infrastructure, the bus stop footprint depicted in Figure 2-10 includes more area than actually required.

The improvements at the **Merced Bus Stop** would be located outside the UPRR ROW. Table 2-8 provides a list of parcels outside the UPRR ROW that would be affected by this improvement.

2.3.3 Core Capacity Improvements

Implementation of the ACE service extension in Phase I is anticipated to increase ACE ridership system-wide and may place a strain on the existing ACE core capacity.²⁰ Appendix D-1, *ACE Extension Core Capacity Memorandum*, details improvements needed to maintain adequate core capacity with Phase I operations. These entail the following:

1. Additional ACE/local transit shuttle services at the Great America and Pleasanton Stations. The additional shuttle services anticipated at the Great America and Pleasanton Stations with Phase I operations is described in Section 2.4.1, *Conceptual Service Plan*.
2. Additional cars for longer train consists on the truck line (Stockton to San Jose route). The costs associated with these additional cars are presented in Section 2.7.2, *Operation and Maintenance Costs and Revenues*.
3. Station platforms at the Pleasanton, Livermore, Vasco Road, Tracy, and Existing Lathrop/Manteca Stations would be lengthened to accommodate the longer train consists on the truck line. Existing platforms at these stations are approximately 450 feet and would be extended by approximately 550 feet for a total station platform length of 1,000 feet. The extended platforms would accommodate longer ACE trains proposed to be used. This project functions independently of the ACE Extension and has independent utility. The project has undergone environmental review and construction is anticipated for 2018. In addition, the Fremont station platforms would be extended, also as an independent project.

As noted in the *ACE Extension Core Capacity Memorandum* (Appendix D-1), the existing supply of parking provided at the existing ACE stations on the trunk line would be sufficient to accommodate parking needs for Phase I operations with the extension to Ceres. No additional parking would be required at the existing ACE stations with Phase I operations.

The core capacity improvements listed above are those SJRRC has identified for the near-term (up to 2025) which are required for Phase I operations. In 2040, ridership from Phase II operations and other projects (Valley Rail Sacramento Extension Project and California High-Speed Rail) may also affect the ACE core capacity. The specifics of these other projects, including comparable ridership projections, have yet to be developed. As such, it is considered premature to consider core capacity impacts based solely on 2040 ACE ridership forecasts. In the subsequent project-level environmental review, core capacity effects of Phase II and out to 2040 will be assessed.

²⁰ The *core* of the ACE system is the existing trunk line between Stockton and San Jose. Extension of ACE service beyond this core, such as the extension of ACE service to Ceres and Merced, would generate new ridership in addition to the established ACE markets. ACE must ensure that enough capacity is available on the trunk line—in other words, *core capacity*—to accommodate ridership from both the existing markets and the added extension markets.

2.4 Operations and Maintenance

2.4.1 Conceptual Service Plan

ACE currently operates four westbound trains in the morning from Stockton to San Jose and four eastbound trains in the afternoon from San Jose to Stockton during weekdays only. There is approximately one train per hour in the westbound direction departing the Stockton Station from 4 a.m. until 7 a.m. and one train per hour in the eastbound direction departing the San Jose Station from 3:30 p.m. to 6:30 p.m. ACE currently does not operate on the weekend.

There are two operational scenarios for Phase I, which are dependent on whether SJRRC chooses to implement direct ACE service from Ceres to San Jose. Figure 2-11 depicts the conceptual service plans for Phase I operations.

- Phase I operational scenario A: If no direct ACE service between Ceres and San Jose is pursued, ACE service in Phase I would consist of the following scenario. This operational scenario represents the “worst-case” (i.e., the greatest level of impact) for the purposes of analyzing potential environmental impacts.
 - In the morning, four westbound trains from Ceres to Lathrop, where passengers would transfer onto the four westbound trains from Stockton to San Jose at the selected Lathrop-area station (timed transfers). Four buses from Merced would meet the four trains at Ceres in the morning.
 - In the evening, four eastbound trains from San Jose to Stockton, where passengers would transfer onto the four eastbound trains from Lathrop to Ceres at the selected Lathrop-area station (timed transfers). Four buses would meet the four trains at Ceres in the evening and provide a connection to Merced.
- Phase I operational scenario B: If direct ACE service between Ceres and San Jose is pursued, ACE service in Phase I would consist of the following scenario.
 - In the morning, three westbound trains from Ceres to Lathrop, where passengers would transfer onto the three westbound trains from Stockton to San Jose at the selected Lathrop-area station (timed transfers); and one westbound train from Ceres to San Jose. Four buses from Merced would meet the four trains at Ceres in the morning.
 - In the evening, three eastbound trains from San Jose to Stockton, where passengers would transfer onto the three eastbound trains from Lathrop to Ceres at the selected Lathrop-area station (timed transfers); and one eastbound train from San Jose to Ceres. Four buses would meet the four trains at Ceres in the evening and provide a connection to Merced.

As with existing service, there would be four trains supporting the four daily roundtrips to San Jose in Phase I. Both Phase I operational scenarios would involve train operations between Ceres and Lathrop that would transfer passengers onto or from trains operating between Stockton and San Jose. Two trains would support the roundtrips between Ceres and Lathrop and would travel from Lathrop to Stockton to layover at the ACE Maintenance Facility mid-day.²¹ A total of six trains would

²¹ Because two trains would support the three or four daily roundtrips (depending on the Phase I operational scenario selected) between Ceres and Lathrop, there would be up to four one-way trips to account for the trains returning to the origin station. Between Lathrop and Stockton, there would also be up to four one-way trips to account for the trains laying over at the ACE Maintenance Facility in Stockton mid-day.

1 support Phase I ACE operations with the Ceres Extension. Compared to existing service, there would
2 be two additional trains in service with Phase I operations.

3 ACE currently provides shuttle services at the Great America and Pleasanton Stations. At the Great
4 America Station, currently 103 daily shuttle trips are provided by 9 routes. In 2020, the No Project
5 Alternative is anticipated to require 104 daily shuttle trips provided by the existing routes at the
6 Great America Station. To support the increased ridership system wide with Phase I operations, an
7 additional 18 daily shuttle trips provided by the existing routes are required at the Great America
8 Station, beyond the 2020 No Project Alternative. In 2040, the No Project Alternative is anticipated to
9 require 134 daily shuttle trips provided by the existing routes at the Great America Station. To
10 support the increased ridership system wide with Phase I operations, an additional 22 daily shuttle
11 trips provided by the existing routes are required at the Great America Station, beyond the 2040 No
12 Project Alternative.

13 At the Pleasanton Station, currently 13 daily shuttle trips are provided by 2 routes. In 2020, the No
14 Project Alternative is anticipated to require 14 daily shuttle trips provided by the existing routes at
15 the Pleasanton Station. To support the increased ridership system wide with Phase I operations, an
16 additional 4 daily shuttle trips provided by the existing routes are required at the Pleasanton
17 Station, beyond the 2020 No Project Alternative. In 2040, the No Project Alternative is anticipated to
18 require 19 daily shuttle trips provided by the existing routes at the Pleasanton Station. To support
19 the increased ridership system wide with Phase I operations, an additional 6 daily shuttle trips
20 provided by the existing routes are required at the Pleasanton Station, beyond the 2040 No Project
21 Alternative.

22 With the service extension to Ceres, a bus bridge would operate between Merced and Ceres, with
23 stops in Livingston and Turlock. The bus route would primarily utilize SR 99 and local streets in the
24 vicinity of stop locations. Bus bridge service would consist of four buses in the morning that would
25 shuttle passengers from Merced to Ceres, where passengers would transfer onto westbound
26 Stockton to San Jose trains. In the evening, four buses would meet passengers disembarking
27 eastbound San Jose to Stockton trains and provide bus services to Merced. Three buses would
28 support the four daily roundtrips between Ceres and Merced.²² The bus bridge service between
29 Merced and Ceres would discontinue, pending the completion of the ACE service extension to
30 Merced.

31 Based on a prototypical schedule, in Phase I, there would be no more than two trains per hour
32 crossing any particular segment. Tables 2-4 and 2-5 provides examples of prototypical schedule of
33 proposed Phase I ACE service with the extension to Ceres. These schedules were developed to
34 derive ridership estimates and for use in the analysis in this EIR. The actual schedules may vary.

²² Because three buses would support the four daily roundtrips between Ceres and Merced, there would be up to two one-way trips to account for the buses returning the origin station.

1 **Table 2-4. Phase I Operational Scenario A: Prototypical 2020 Schedule**

		Inbound											Outbound												
		BUS 01	SH 01	ACE 01	BUS 03	SH 03	ACE 03	BUS 05	SH 05	ACE 05	BUS 07	SH 07	ACE 07	ACE 04	SH 04	BUS 04	ACE 06	SH 06	BUS 06	ACE 08	SH 08	BUS 08	ACE 10	SH 10	BUS 10
Station Name	Merced	2:55			3:59			4:59			5:55					6:51			7:55			8:52			9:52
	Livingston	3:12			4:16			5:16			6:12					6:38			7:41			8:38			9:38
	Turlock	3:41			4:45			5:45			6:41					6:12			7:15			8:12			9:12
	Ceres	3:52	4:01		4:56	5:05		6:56	6:05		6:52	7:01			5:55	6:01		6:58	7:04		7:55	8:01		8:55	9:01
	Modesto		4:09			5:13			6:13			7:09			5:49			6:52			7:49			8:49	
	Ripon		4:20			5:24			6:24			7:20			5:37			6:40			7:37			8:37	
	Downtown Manteca		4:28			5:32			6:32			7:28			5:28			6:31			7:28			8:28	
	Stockton			4:33			5:33			6:33			7:33	5:27			6:28			7:27			8:27		
	North Lathrop		4:35	4:45		5:39	5:45		6:39	6:45		7:35	7:45	5:16	5:21		6:16	6:24		7:16	7:21		8:16	8:21	
	Lathrop/Manteca			4:52			5:52			6:52			7:52	5:10			6:10			7:10			8:10		
	Tracy			5:04			6:04			7:04			8:04	4:51			5:51			6:51			7:51		
	Vasco Road			5:33			6:33			7:33			8:33	4:22			5:22			6:22			7:22		
	Livermore			5:38			6:38			7:38			8:38	4:17			5:17			6:17			7:17		
	Pleasanton			5:46			6:46			7:46			8:46	4:08			5:08			6:08			7:08		
	Fremont			6:08			7:08			8:08			9:08	3:45			4:45			5:45			6:45		
	Great America			6:26			7:26			8:26			9:26	3:29			4:29			5:29			6:29		
	Santa Clara			6:33			7:33			8:33			9:33	3:20			4:20			5:20			6:20		
	San Jose			6:45			7:45			8:45			9:45	3:15			4:14			5:15			6:15		

Note: P.M. indicated in **bold text**

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3

1 **Table 2-5. Phase I Operational Scenario B: Prototypical 2020 Schedule**

		Inbound										Outbound											
		BUS 01	ACE 01	BUS 03	SH 03	ACE 03	BUS 05	SH 05	ACE 05	BUS 07	SH 07	ACE 07	ACE 04	BUS 04	ACE 06	SH 06	BUS 06	ACE 08	SH 08	BUS 08	ACE 10	SH 10	BUS 10
Station Name	Merced	3:11		3:59			4:59			5:55				6:40			7:55			8:52			9:52
	Livingston	3:28		4:16			5:16			6:12				6:26			7:41			8:38			9:38
	Turlock	3:57		4:45			5:45			6:41				6:00			7:15			8:12			9:12
	Ceres	4:08	4:17	4:56	5:05		5:56	6:05		6:52	7:01		5:43	5:49		6:58	7:04		7:55	8:01		8:55	9:01
	Modesto		4:25		5:13			6:13			7:09		5:37			6:52		7:49				8:49	
	Ripon		4:36		5:24			6:24			7:20		5:25			6:40		7:37				8:37	
	Downtown Manteca		4:44		5:32			6:32			7:28		5:17			6:31		7:28				8:28	
	Stockton					5:33			6:33			7:33			6:28			7:27			8:27		
	North Lathrop				5:39	5:45		6:39	6:45		7:35	7:45			6:16	6:24		7:16	7:21		8:16	8:21	
	Lathrop/Manteca		4:52			5:52			6:52			7:52	5:10		6:10			7:10			8:10		
	Tracy		5:04			6:04			7:04			8:04	4:51		5:51			6:51			7:51		
	Vasco Road		5:33			6:33			7:33			8:33	4:22		5:22			6:22			7:22		
	Livermore		5:38			6:38			7:38			8:38	4:17		5:17			6:17			7:17		
	Pleasanton		5:46			6:46			7:46			8:46	4:08		5:08			6:08			7:08		
	Fremont		6:08			7:08			8:08			9:08	3:45		4:45			5:45			6:45		
	Great America		6:26			7:26			8:26			9:26	3:29		4:29			5:29			6:29		
	Santa Clara		6:33			7:33			8:33			9:33	3:20		4:20			5:20			6:20		
	San Jose		6:45			7:45			8:45			9:45	3:15		4:15			5:15			6:15		

Note: P.M. indicated in **bold text**

2

2.4.2 Ridership

Implementation of the ACE service extension for Phase I is anticipated to result in increased ridership by 2020. Table 2-6 summarizes the existing ACE ridership and the projected base and maximum ridership for 2020 and 2040. Ridership for the ACE Extension Lathrop to Ceres/Merced is presented in more detail in Appendix D-2, *ACE Extension Ridership, Revenue, and Benefits Report*.

Table 2-6. ACE Extension—System Ridership with Phase I Operations

Ridership Scenarios	Annual Riders				
	2015	2020	% Increase from 2015	2040	% Increase from 2015
No Project Alternative ^a	1,285,200	1,511,700	18%	2,186,800	70%
Scenarios with Ceres Extension, 4 trains to San Jose					
Phase I Operational Scenario A ^b	--	1,946,500	51%	2,807,800	118%
Phase I Operational Scenario B ^c	--	1,947,500	52%	2,809,300	119%

Source: Appendix D-2, *ACE Extension Ridership, Revenue, and Benefits Report*.

Notes:

^a No Project Alternative consists of four roundtrip trains per weekday between Stockton and San Jose.

^b Operational Scenario A would include 4 trains from Stockton to San Jose, 4 train shuttles between Ceres and Lathrop, and 4 bus shuttles from Merced to Ceres.

^c Operational Scenario B would include 3 trains from Stockton to San Jose, 1 train from Ceres to San Jose, 3 train shuttles between Ceres and Lathrop, and 4 bus shuttles from Merced to Ceres.

2.4.3 Energy Consumption

The primary sources of energy used to operate ACE trains and at maintenance and station facilities are diesel fuel and electricity. Existing diesel fuel consumption is approximately 455,000 gallons per year (based on 2017 figures). Operations at the existing stations and maintenance facility required approximately 2,353,000 kilowatt hours (kWh) of electricity in 2016.

With Phase I operations, ACE diesel trains would require approximately 657,000 gallons of fuel per year. This represents an increase of approximately 202,000 gallons per year, or a 44 percent increase compared to existing conditions. Electrical use at new stations and facilities with Phase I operations would require approximately 2,744,000 kWh of electricity per year. This represents an increase of approximately 391,000 kWh of electricity per year, or a 17 percent increase compared to existing conditions. Section 4.6, *Energy*, provides a detailed analysis of energy demand associated with Phase I operations.

2.4.4 Maintenance Activities

2.4.4.1 Track Maintenance

SJRRC does not own the tracks on which ACE operates; instead, SJRRC has entered into trackage rights agreements with host railroads (both PCJPB and UPRR) to operate on portions of their respective tracks. Maintenance of way (MOW) is the responsibility of the host railroad. In general, MOW is the ongoing maintenance of track (e.g., tie replacement, switch greasing, ballast

recontouring), track structures, bridges, drainage features, signal apparatus and other signal infrastructure. Maintenance activities are both ongoing responses to daily issues and planned preventive maintenance. Depending on the corridor, host railroads would have other maintenance activities that are required, specific to the features located in the corridor.

PCJPB maintenance activities also include tree pruning and removal in areas where trees would pose a maintenance or safety concern. UPRR maintenance activities include annual vegetation trimming and herbicide application. With Phase I ACE operations, PCJPB and UPRR would continue to conduct maintenance activities associated with the rail corridor in accordance with their current practices.

2.4.4.2 Station Maintenance

ACE stations, served solely by ACE, are maintained by SJRRC even though the land may be owned by the local jurisdiction. The Fremont, Great America, Santa Clara, and San Jose Diridon Stations are maintained by other transit entities. SJRRC's Facility Department is responsible for maintenance and cleanup of stations between Pleasanton and Stockton. Maintenance crews are located at the ACE Maintenance Facility in Stockton, and are dispatched as needed from Stockton to the various stations. Typical maintenance activities include trash pickup, landscaping, painting, minor concrete work, and light bulb replacement. Contractors are hired for more extensive maintenance activities, such as major concrete work, platform extension, and paving. Certain stations have specific agreements with the local jurisdictions regarding maintenance activities that would be the responsibility of the local jurisdiction.

New stations would be established with Phase I improvements, including the following: **North Lathrop Station, Relocated Lathrop/Manteca Station** alternative, **Downtown Manteca Station, Ripon Station, Modesto Station, and Ceres Station**. SJRRC would own and maintain the station platforms at all new stations. As the **Downtown Manteca, Ripon, Modesto, and Ceres Stations** are either co-located at existing transit centers and the local jurisdiction owns the parcels identified for surface parking, or that on-street parking would be utilized at these stations, SJRRC would not maintain parking areas at these stations. In regards to the **North Lathrop Station** and the **Relocated Lathrop/Manteca Station** alternative, SJRRC would own and maintain the entire station area, including the station platforms and parking areas.

In addition, new bus stops (**Turlock, Livingston, Atwater, and Merced Bus Stops**) would be established to support the interim Ceres to Merced bus bridge during Phase I operations. However, since these bus stops are co-located at existing transit centers/bus stops, and passenger amenities and parking for bus bridge passengers would be provided at these existing transit center/bus stop locations, SJRRC would not maintain these bus stop locations.

2.4.4.3 Fleet Maintenance

SJRRC's existing fleet maintenance activities for ACE are conducted at the ACE Maintenance Facility located at 1020 East Alpine Avenue in Stockton, approximately 1.5 miles north of the Stockton Station. Regular train maintenance consists of daily inspections of equipment (as required by the Federal Railroad Administration), cleaning, and servicing activities such as fueling, filling of sand boxes, emptying of toilet tanks, and replenishing of fluids, supplies, and consumables (including trail crew supplies). Train washing can occur up to several times per week, or as required for any special event trains. Preventive and periodic maintenance, including light and heavy repairs of passenger

coaches and locomotives, are conducted as needed. With Phase I operations, fleet maintenance activities would continue at the ACE Maintenance Facility. The temporary **Ceres Layover Facility, variant 1 or 2** would support train layovers, storage, light maintenance, and daily servicing. For heavy maintenance and repairs, trains would be cycled back to the ACE Maintenance Facility.

2.5 Construction

Appendix B and Appendix C include specific details regarding the areas of disturbance associated with each improvement, potential utility conflicts and whether the utility would be protected or relocated, and construction staging areas and access for the Phase I improvements. A description of the construction activities that would be undertaken for the Phase I improvements and construction durations based on preliminary engineering are provided in the following subsections.

2.5.1 Construction Methods

2.5.1.1 Track Work

Construction of new track or upgrades to existing track would include grading for the track subgrade with graders and excavators and the placement of subballast and ballast. Concrete ties are then laid out. Continuous Welded Rail (1,000-foot-long rail strings) are welded together and clipped to ties. The ballast is tamped with on-track machinery along with the final adjustments to the alignment and profile. Construction of a new main track within the UPRR ROW would occur in segments; once the subgrade, ballast, and main track are installed for one segment, construction would continue down the alignment. The duration of construction activities for a new track generally lasts approximately a few days to a week for a given location.

Track construction could conflict with existing utility lines, and these lines would be relocated or protected. Appendix C depicts the potential utility conflicts and whether the utility would be protected or relocated.

2.5.1.2 Bridges, Underpasses, and Overpasses

Track work would also involve the construction of track-supporting structures, such as new bridges (track over waterway) and modifications to existing at-grade crossings and grade separation structures such as overheads (roadway over the rail).

Bridges over Waterways

The typical bridge (track over waterway) shown in the preliminary engineering plans consists of a combination of short spans supported on driven steel H-pile bents with precast concrete bent caps. Structures that require longer spans to avoid obstacles or provide adequate opening to pass design flows would likely be supported on cast-in-place reinforced concrete (RC) pier caps and columns extended from RC cast-in-drilled-hole pile shafts. The short spans consist of either precast concrete slab beams or double-cell box girders, and the longer spans would typically consist of either single-cell precast concrete box girders, steel-plate girders, steel-plate through-girders, or a steel through-truss.

Abutment and pier foundations outside the waterway are typically accessed by temporary dirt roads with the construction equipment working in a temporary construction easement that extends about 50 feet from the edges of the bridge deck on both sides. Wherever possible the main waterway is crossed by a single span placed by cranes operating on both banks reaching out and passing the girders across, with the new pier foundations located just outside of the anticipated waterway.

Pier foundations within the waterway may be accessed from the ground by pushing clean fill into the waterway on top of temporary pipe culverts or narrowing or diverting the waterway, then restoring the original condition when done. For the standard railroad trestle consisting of short spans on H-pile bents, it is possible to construct in a top-down, span-by-span process with a crane on the back span reaching out to build the next pier and place the next span. The reach and lifting capacity of the crane limits the feasibility of the span-by-span top-down method for longer spans. An alternative way of accessing pier foundations in the waterway is to build a temporary work trestle bridge from which the construction equipment can work.

A typical construction sequence for the bridges (track over water) follows.

- Prepare temporary construction access road(s).
- Construct temporary work trestle within the waterway.
- Install proposed cast-in-drilled-hole pile shafts.
- Form and cast RC columns.
- Form and cast RC pier caps.
- Place and install precast concrete box girders or steel girders with steel deck.
- Drive steel H-piles for standard railroad trestle bents.
- Place precast concrete bent caps and field weld connections to the piles.
- Place precast concrete abutment wingwalls.
- Place precast beams with attached curbs and sidewalks.
- Install deck waterproofing, ballast and track.
- Restore landscaping (revegetation).

Typical equipment used in the bridge construction may include the following.

- Excavator with bucket or breaker
- Bulldozer with blade or ripper
- Backhoe
- Loader
- Dump truck
- Crane with pile driving rig
- Crane with pile drilling rig

- Trucks with flatbed trailers and large crane(s) to haul, pick and place rebar cages, pile casings, column forms, girders, etc.

- Concrete trucks and pump trucks for cast-in-place concrete

Based on similar projects, construction of a railroad bridge crossing the river could last approximately 14 to 36 months, depending on the access and in-water work windows.

Modifications to At-Grade and Grade-Separated Crossings

Modifications to at-grade crossings to support new tracks generally require clearing and grubbing, for the installation of concrete crossing panels where the new main track crosses the roadway; relocation of railroad crossing signals, guards or gates, and signal houses; and installation of stop bars. Based on similar projects, construction associated with modified at-grade crossings would last approximately 7 to 15 working days, with an average of 9 working days.

Modifications to existing overhead structures generally require clearing, grubbing, and rough grading for the installation of pier protection along the existing piers supporting the overhead roadway structure and retaining walls along the length of existing abutment slopes. The structure types for overhead structures normally follow the code/design guidelines promulgated by either the local agency or Caltrans. Based on similar projects, construction associated with modified overhead structure undercrossings would last approximately 30 to 120 working days, with an average of 60 working days.

2.5.1.3 Station Improvements

Station improvements would include the construction of new station facilities, such as station platforms, station or tail tracks, and passenger amenities including surface parking lots or parking structures and pedestrian connection between the parking areas and station platform.

Construction activities associated with station platforms include clearing and grubbing, rough grading, structural excavation for walls, forming and pouring concrete for the walls, access stairs and ramps, platform surface, installation of signage, shelters, lighting, security, railings, benches and trash receptacles. Based on similar projects, construction of a station platform would last approximately 3 months.

Construction activities associated with station tracks would be similar to track work activities described in Section 2.5.1.1, *Track Work*.

Construction activities associated with surface parking areas include clearing and grubbing, rough grading, installation of drainage and utilities, final grading, installation of aggregate base, installation of curb and gutter, paving, landscaping, installation of lighting and security, and installation of signage and striping.

Construction activities associated with parking garages include clearing and grubbing, rough grading, structural excavation for foundation, installation of drainage and utilities, pouring of the concrete foundation, installation of precast concrete sections or forming and pouring cast-in-place concrete sections, installation of lighting, security and fire suppression, installation of elevators, and installation of signage and striping.

Construction activities associated with pedestrian overpasses and underpasses include clearing and grubbing, rough grading, installation of utilities, installation of cast-in-drilled-hole piles, installation

of ramp footings, placing column reinforcing steel, pouring structural concrete for columns, placing falsework for ramps and abutments, pouring structural concrete for ramps and abutments, placing reinforcing steel and pouring structural concrete for decks, placing handrails for ramps, erecting steel superstructure and installation of lighting.

2.5.2 Construction Schedule and Durations

SJRRC proposes to implement the ACE service extension to Ceres possibly as soon 2020, no later than 2023. Table 2-7 identifies the duration for construction of each Phase I improvement. The construction durations presented are not sequential; construction could occur simultaneously at several locations. The durations noted below are for actual construction activity. The Phase I improvements would require permitting, contractor selection, and final design prior to construction and thus the total duration from now could be longer than the construction durations noted in the table.

Table 2-7. Construction Durations for Phase I Improvements

Phase I Improvement	Construction Duration (months)
Lathrop to Ceres	
<i>Lathrop station options</i>	
Relocated Lathrop/Manteca Station	16
Existing Lathrop/Manteca Station	14
North Lathrop Station	20
<i>Ceres extension improvements</i>	
Oakland-Fresno Subdivision Connection	8
Ceres Extension Alignment	42
Alignment trackwork/signaling	18
Bridges	26
Ceres Layover Facility (variant 1 or 2)	24
Downtown Manteca Station	10
Ripon Station	20
Modesto Station	10
Ceres Station	12
Ceres to Merced	
Merced Bus Stop	3

2.6 Right-of-Way and Easement Needs

Table 2-8 lists the parcels outside the UPRR ROW that would be affected by Phase I improvements. These parcels may be acquired or require easements for track ROW or rail support facilities.

1 **Table 2-8. Right-of-Way and Easement Needs for Phase I Improvements**

Parcel (APN)	Ownership	Area (Acres)	Reason for Acquisition or Easement
Relocated Lathrop/Manteca Station (San Joaquin County)			
241-400-17	Private (Agricultural)	5.05	New ROW for parking
241-400-17	Private (Agricultural)	2.19	New easement for access road
241-400-18	Private (Agricultural)	0.10	New ROW for parking
241-400-18	Private (Agricultural)	0.28	New easement for access road
241-400-20	Private (Agricultural)	1.49	New ROW for parking
241-400-20	Private (Agricultural)	0.28	New easement for access road
North Lathrop Station (San Joaquin County)			
198-030-010	Public (Sharpe Army Depot, federal)	13.17	New ROW for parking
198-030-010	Public (Sharpe Army Depot, federal)	0.36	TCE for conform work to realign internal access road and fence along the perimeter of the Sharpe Army Depot
Oakland-Fresno Subdivision Connection (San Joaquin County)			
198-11-007	Public (SSJID)	0.23	New ROW for track connection
198-11-009	Private (UPRR)	2.56	Existing ROW for track connection
Ceres Layover Facility, variant 1 (Stanislaus County)			
041-012-001	Private (Residential, no relocation)	0.004	New ROW for roadway
041-012-001	Private (Residential, no relocation)	0.001	TCE for roadway construction
041-012-010	Private (Agricultural)	0.96	New ROW for roadway
041-012-010	Private (Agricultural)	0.77	TCE for roadway construction
041-013-004	Private (Agricultural)	2.09	New ROW for roadway
041-013-005	Private (Residential, no relocation)	0.87	New ROW for roadway
041-013-006	Private (Agricultural)	0.04	New ROW for roadway
Ceres Layover Facility, variant 2 (Stanislaus County)			
041-039-018	Private (Agricultural)	1.21	New ROW for layover facility
041-039-018	Private (Agricultural)	0.35	TCE for layover facility construction
041-039-031	Private (Agricultural)	0.88	New ROW for layover facility
041-039-031	Private (Agricultural)	0.21	TCE for layover facility construction
041-039-032	Private (Residential, no relocation)	0.88	New ROW for layover facility

Parcel (APN)	Ownership	Area (Acres)	Reason for Acquisition or Easement
041-039-032	Private (Residential, no relocation)	0.21	TCE for layover facility construction
041-039-033	Private (Agricultural/Commercial)	2.28	New ROW for layover facility
041-039-033	Private (Agricultural/Commercial)	0.50	TCE for layover facility construction
Downtown Manteca Station (San Joaquin County)			
221-03-8	Public (County)	0.26	New ROW for parking
221-04-34	Private (Vacant)	0.54	New ROW for parking
Ripon Station (San Joaquin County)			
259-39-10	Private (Commercial)	0.28	New ROW for access structure
Modesto Station (Stanislaus County)			
104-03-8	Public/Private (Parking)	2.27	TCE for parking rehabilitation
Merced Bus Stop (Merced County)			
031-360-001	Public (City)	-- ^a	Utility easement for infrastructure supporting electric bus operation

ROW = right-of-way

TCE = temporary construction easement

^a The amount of area required for the utility easement is unknown at this time.

2.7 Costs and Revenues

2.7.1 Capital Costs

Capital costs associated with Phase I improvement aspects of the Proposed Project would be approximately \$303 million. As part of Senate Bill 132 passed in April 2017, SJRRC was awarded \$400 million for the ACE service expansion in the San Joaquin Valley, including associated system improvement.

The extension of service to Ceres does not necessarily require the full build of Phase I improvements discussed in this EIR in order to extend service. Train service could be initially expanded or extended with station, parking, and key track/infrastructure improvements and then expanded over time with additional capacity improvements, and then be expanded fully with the full build suite of improvements.

The cost of additional rolling stock required for Phase I operations is estimated as \$66 million (2017 dollars) which would be a one-time cost. As shown in Table 2-9, capital costs associated with the construction of Phase I improvements differ slightly between the Proposed Project and potential alternatives. Capital costs associated with Phase I improvements are presented in more detail in Appendix E, *ACE Extension Opinion of Probable Cost Report*.

Table 2-9. Construction Cost Estimates for Phase I Improvements

Segment	Elements	Construction Cost
Lathrop to Ceres	<i>Lathrop stations</i>	
	Relocated Lathrop/Manteca Station, single-station scenario (alternative)	\$26,471,065
	Relocated Lathrop/Manteca Station, two-station scenario (alternative)	\$24,896,780
	Existing Lathrop/Manteca Station, single-station scenario (alternative)	\$9,426,020
	Existing Lathrop/Manteca Station, two-station scenario (Proposed Project)	--
	North Lathrop Station, single-station scenario (alternative)	\$43,537,504
	North Lathrop Station, two-station scenario (Proposed Project)	\$43,537,504
	The Proposed Project would include two stations in Lathrop, consisting of the Existing Lathrop/Manteca Station and the North Lathrop Station . The Relocated Lathrop/Manteca Station is an alternative location considered in lieu of the Existing Lathrop/Manteca Station (under both the single-station and two-station scenarios) and North Lathrop Station (under the single-station scenario). In addition, each single-station scenario where a station could operate as the only station in the Lathrop is also an alternative.	
	<i>Ceres extension improvements</i>	
	Oakland-Fresno Subdivision Connection	\$6,921,068
	Ceres Extension Alignment, trackwork/signaling	\$177,246,737

Segment	Elements	Construction Cost
	Ceres Extension Alignment, Stanislaus River bridge	\$9,174,777
	Ceres Extension Alignment, Tuolumne River bridge	\$15,317,111
	Ceres Layover Facility, variant 1 or 2	\$16,688,786
	Downtown Manteca Station	\$7,268,770
	Ripon Station	\$11,199,903
	Modesto Station	\$6,205,062
	Ceres Station	\$9,514,510
	The Proposed Project would include the Oakland-Fresno Subdivision Connection; Ceres Extension Alignment; Ceres Layover Facility, variant 2; and the Downtown Manteca, Ripon, Modesto, and Ceres Stations. The Ceres Layover Facility, variant 1 is an alternative location considered in lieu of variant 2 of the layover facility.	
<i>Ceres to Merced</i>	Turlock Bus Stop	--
	Livingston Bus Stop	--
	Atwater Bus Stop	--
	Merced Bus Stop	\$189,463
	The Proposed Project would include the Turlock, Livingston, Atwater and Merced Bus Stops.	
Total Phase I Proposed Project Costs		\$303,263,690
Range of Potential Costs with Alternatives		\$269,152,206 – \$328,160,470
Source: Appendix E, <i>ACE Extension Opinion of Probable Cost Report.</i>		

2.7.2 Operations and Maintenance Costs and Revenues

As shown in Table 2-10, existing annual operations and maintenance costs are estimated at approximately \$21.6 million. With Phase I operations, annual operations and maintenance costs are estimated at approximately \$28.4 million to \$29.6 million.

Table 2-10. Summary of Annual Projected Operations & Maintenance Cost (2017 \$-million)

Cost Element	Existing	Phase I Operations ^a	
		Scenario A	Scenario B
TOTAL	\$21.6	\$29.6	\$28.4
Notes:			
^a Operation and maintenance costs associated with the interim bus bridge between Ceres and Merced is not included in the costs presented as it is assumed to be operated and funded by a separate entity.			

As shown in Table 2-11, anticipated revenue associated with the No Project Alternative in 2020 and 2040 would be approximately \$10.3 million and \$14.9 million, respectively. Anticipated revenue associated with Phase I operations would be approximately \$14.4 million in 2020 and approximately \$20.7 million in 2040.

Table 2-11. ACE System Revenue with Phase I Operations

Ridership Scenarios	Annual Fare Revenue				
	2016	2020	% Increase from 2016	2040	% Increase from 2016
No Project Alternative ^a	\$8,135,417	\$10,284,500	26%	\$14,881,500	83%
Phase I Operational Scenario A ^b	--	\$14,361,500	77%	\$20,657,900	154%
Phase I Operational Scenario B ^c	--	\$14,381,800	77%	\$20,686,900	154%

Notes:

^a No Project Alternative consists of four roundtrip trains per weekday between Stockton and San Jose.^b Operational Scenario A would include 4 trains from Stockton to San Jose, 4 train shuttles between Ceres and Lathrop, and 4 bus shuttles from Merced to Ceres.^c Operational Scenario B would include 3 trains from Stockton to San Jose, 1 train from Ceres to San Jose, 3 train shuttles between Ceres and Lathrop, and 4 bus shuttles from Merced to Ceres.

The proposed service increases may be implemented in phases. Phase I operations and maintenance costs and revenues are presented in more detail in Appendix F, *ACE Extension Operating and Maintenance Cost Technical Memorandum*.

2.8 Permits and Approvals

Table 2-12 lists the permits and approvals that could be required for the Proposed Project's Phase I improvements or the alternatives. SJRRC would continue to coordinate with all local, regional, and state agencies to ensure that all necessary permits and approvals are received to support the schedule for Phase I improvements.

Table 2-12. Permits, Funding, and Other Approvals Anticipated for Phase I Improvements

Agency	Funding, Approval, or Permit
Federal Agencies	
Federal Railroad Administration (FRA)	Potential NEPA review and approval if federal funding available for project.
National Marine Fisheries Service (NMFS)	Concurrence of effects on listed fish species under the federal Endangered Species Act (ESA) Section 7 consultation process; issuance of a biological opinion
State Historic Preservation Office (SHPO)	Concurrence of effects on historic resources under Section 106 of the National Historic Preservation Act consultation process; potential development of a memorandum of agreement
U.S. Army Corps of Engineers (USACE)	Permit for effects on wetlands and other waters of the United States under Section 404 of the Clean Water Act (CWA)
U.S. Coast Guard	Bridge permit for new structures crossing over Stanislaus River and Tuolumne River
U.S. Department of Defense	Approval required for transfer of portion of Sharpe Depot for North Lathrop Station

Agency	Funding, Approval, or Permit
U.S. Fish and Wildlife Service (USFWS)	Concurrence of effects on listed terrestrial wildlife and plant species under ESA Section 7 consultation process; issuance of a biological opinion
State Agencies	
California State Transportation Authority (CalSTA)	Potential source of funding
California Department of Fish and Wildlife (CDFW)	Permits for the placement of structures affecting waterways under Section 1602 streambed alteration agreement; incidental take permits for effects on listed state wildlife and plant species under the California Endangered Species Act Section 2081
California Department of Toxic Substances (DTSC)	Review of worker health and safety plan
California Department of Transportation (Caltrans)	Encroachment permit for encroachment on state roadways and highways; potential source of funding
California Public Utilities Commission (CPUC)	Approvals required for rail crossing improvements
California State Lands Commission (SLC)	Approval required for structures crossing over Stanislaus River and Tuolumne River
Central Valley Flood Protection Board (CVFPB)	Encroachment permit for encroachment on CVFPB floodways and levees
Regional Water Quality Control Board (Regional Water Board)—Central Valley	Permits under the CWA Section 401 water quality certification/waste discharge requirements for placement of structures affecting waterways and under the Porter-Cologne Water Quality Control Act
State Water Resources Control Board (State Water Board)	General construction activity storm water permit under Section 402 National Pollutant Discharge Elimination System (NPDES)
Regional Agencies and Transportation Agencies	
San Joaquin Regional Rail Commission (SJRRRC)	Certification of CEQA environmental document; project proponent; project funding
San Joaquin Council of Governments	Funding coordination
Stanislaus Council of Governments	Funding coordination
Local Agencies (in geographic order from west to east)^a	
San Joaquin County	Encroachment permit for construction in county ROW Use and building permits for improvements outside rail ROW
City of Lathrop	Encroachment permit for construction in the city ROW Use and building permits for improvements outside rail ROW
City of Manteca	Encroachment permit for construction in the city ROW Use and building permits for improvements outside rail ROW
City of Ripon	Encroachment permit for construction in the city ROW Use and building permits for improvements outside rail ROW
Stanislaus County	Encroachment permit for construction in county ROW Use and building permits for improvements outside rail ROW
City of Modesto	Encroachment permit for construction in the city ROW Use and building permits for improvements outside rail ROW
City of Ceres	Encroachment permit for construction in the city ROW Use and building permits for improvements outside rail ROW

Agency	Funding, Approval, or Permit
City of Merced	Encroachment permit for construction in the city ROW. Potential use and building permits for improvements outside rail ROW.
Other Parties	
Kinder Morgan	Approval required for gas utilities relocation
Pacific Gas & Electric Company (PG&E)	Approval required for electrical utilities relocation
Sprint	Approval required for fiber optics utilities relocation
Union Pacific Railroad (UPRR)	Project approval; right of entry permit(s) for work conducted within UPRR ROW; design and installation permits/construction maintenance agreements for structures and facilities
^a UPRR is not subject to the land use jurisdiction of local governments.	

1
2

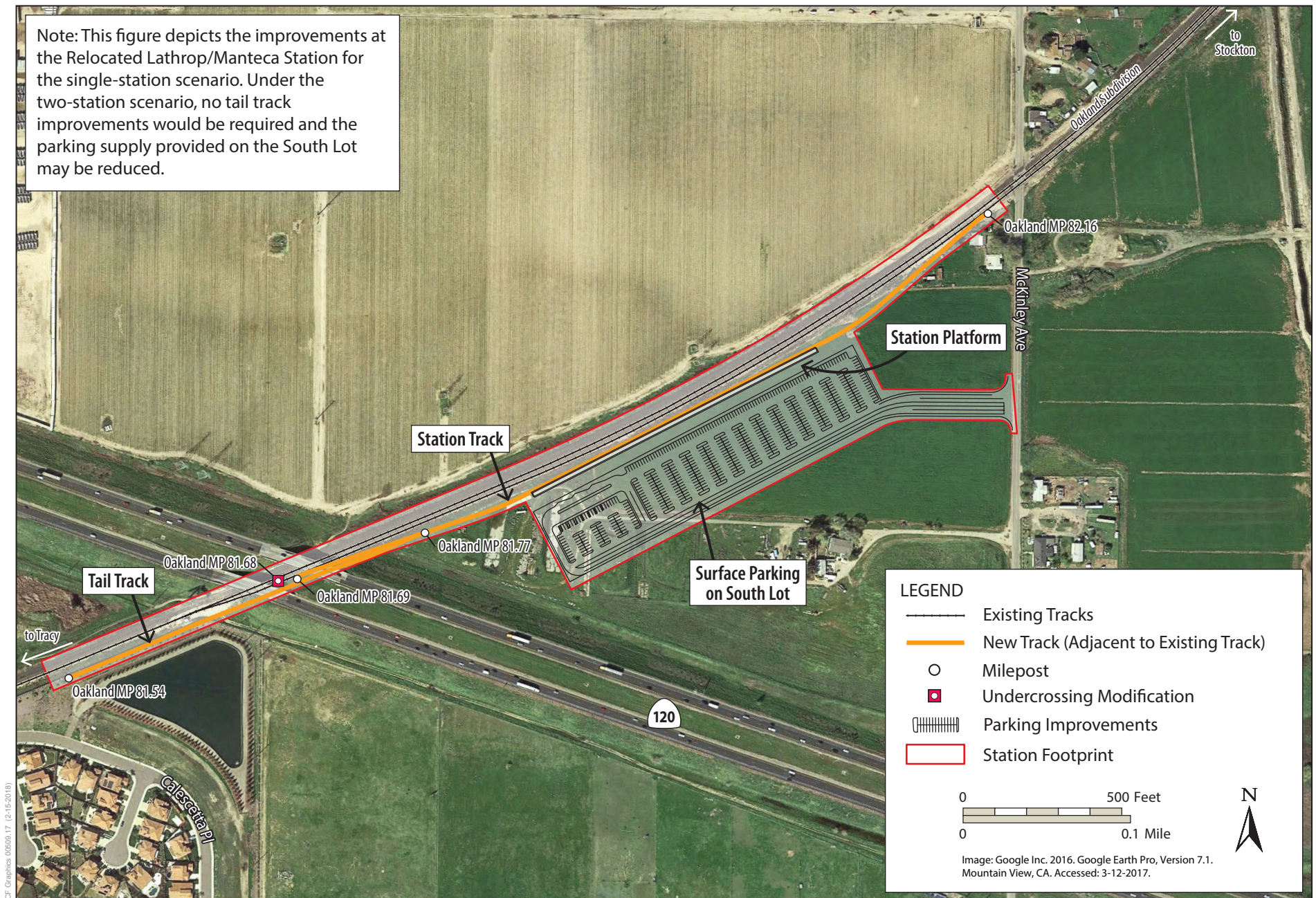


Figure 2-1
Relocated Lathrop/Manteca Station
ACE Extension Lathrop to Ceres/Merced

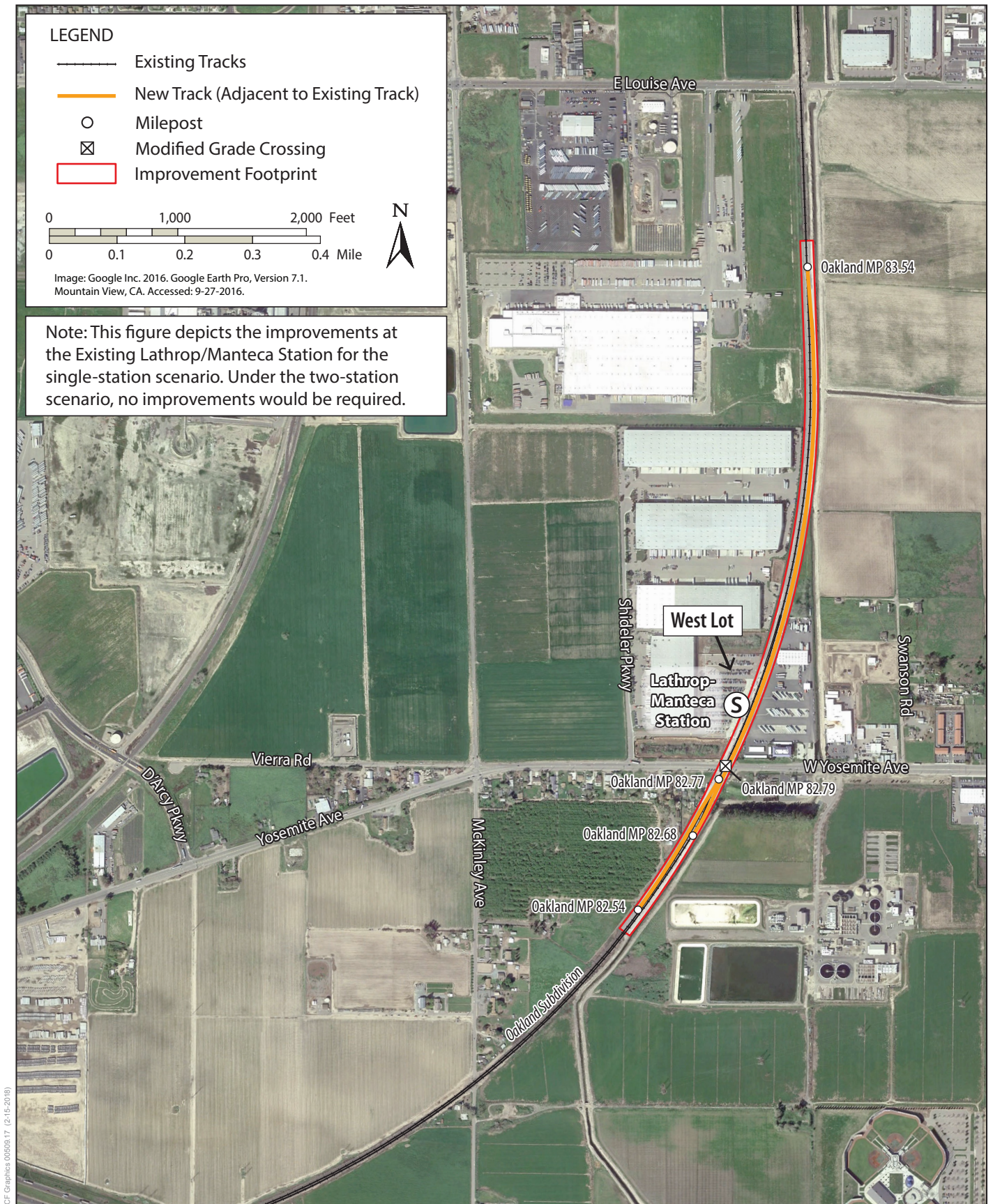
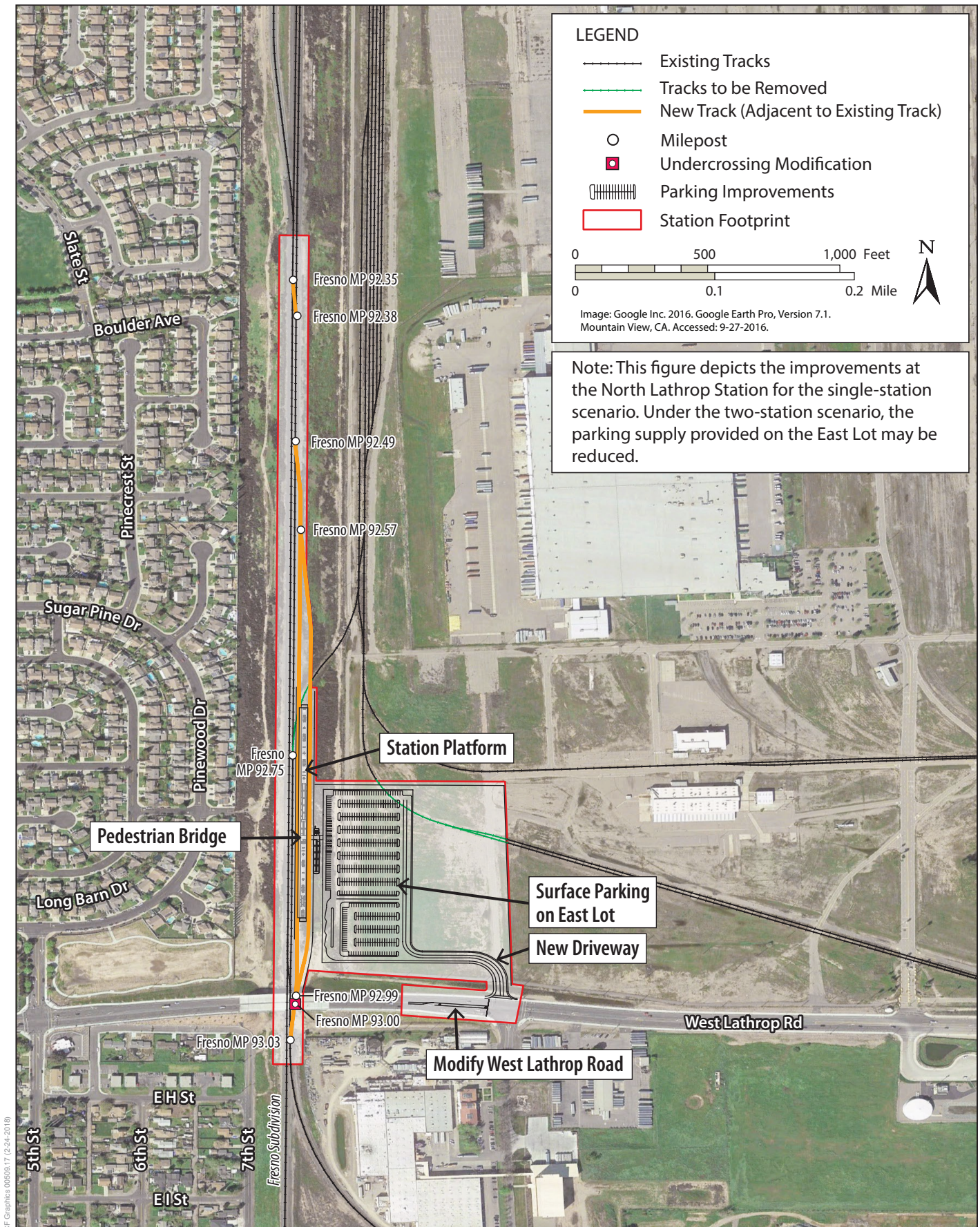
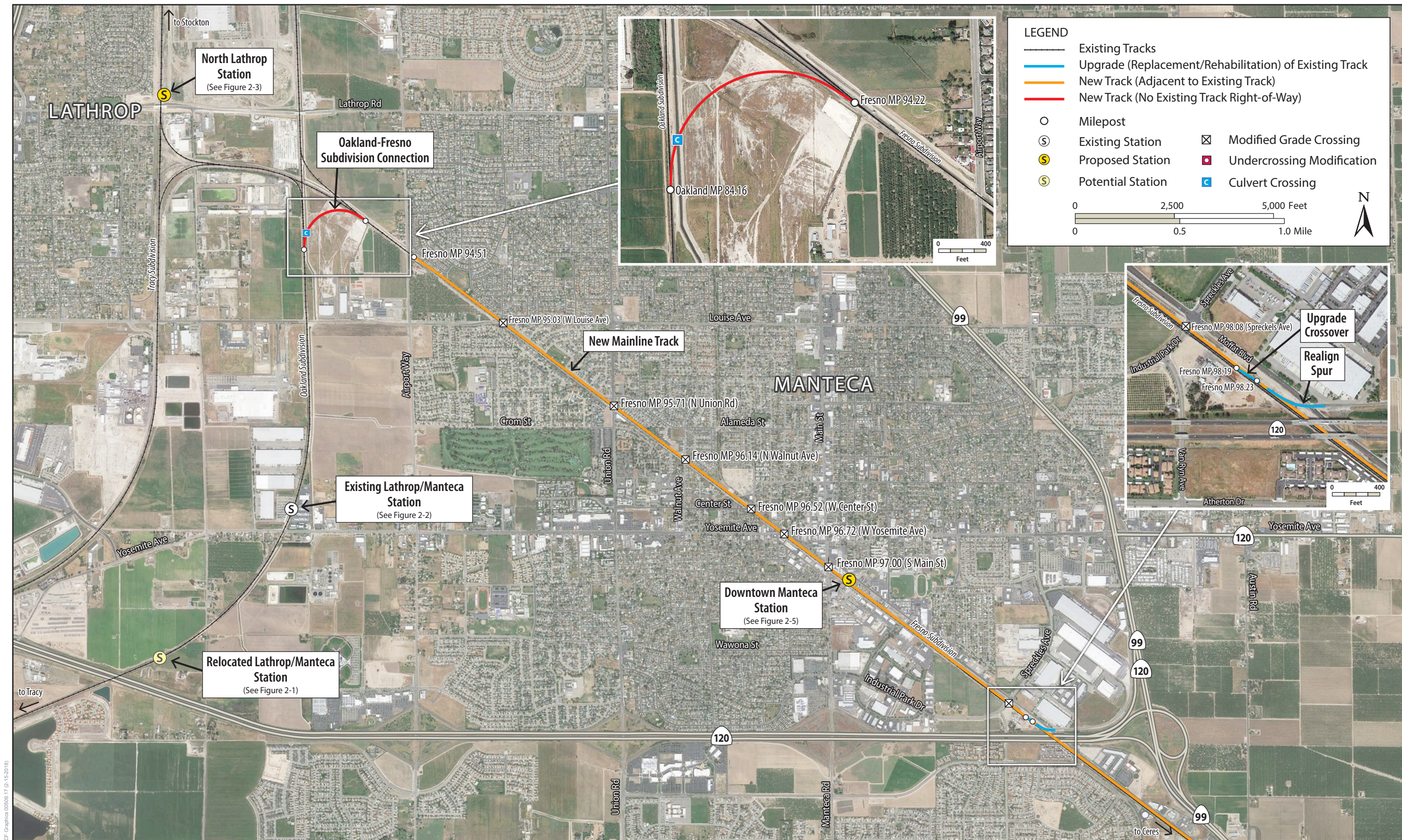


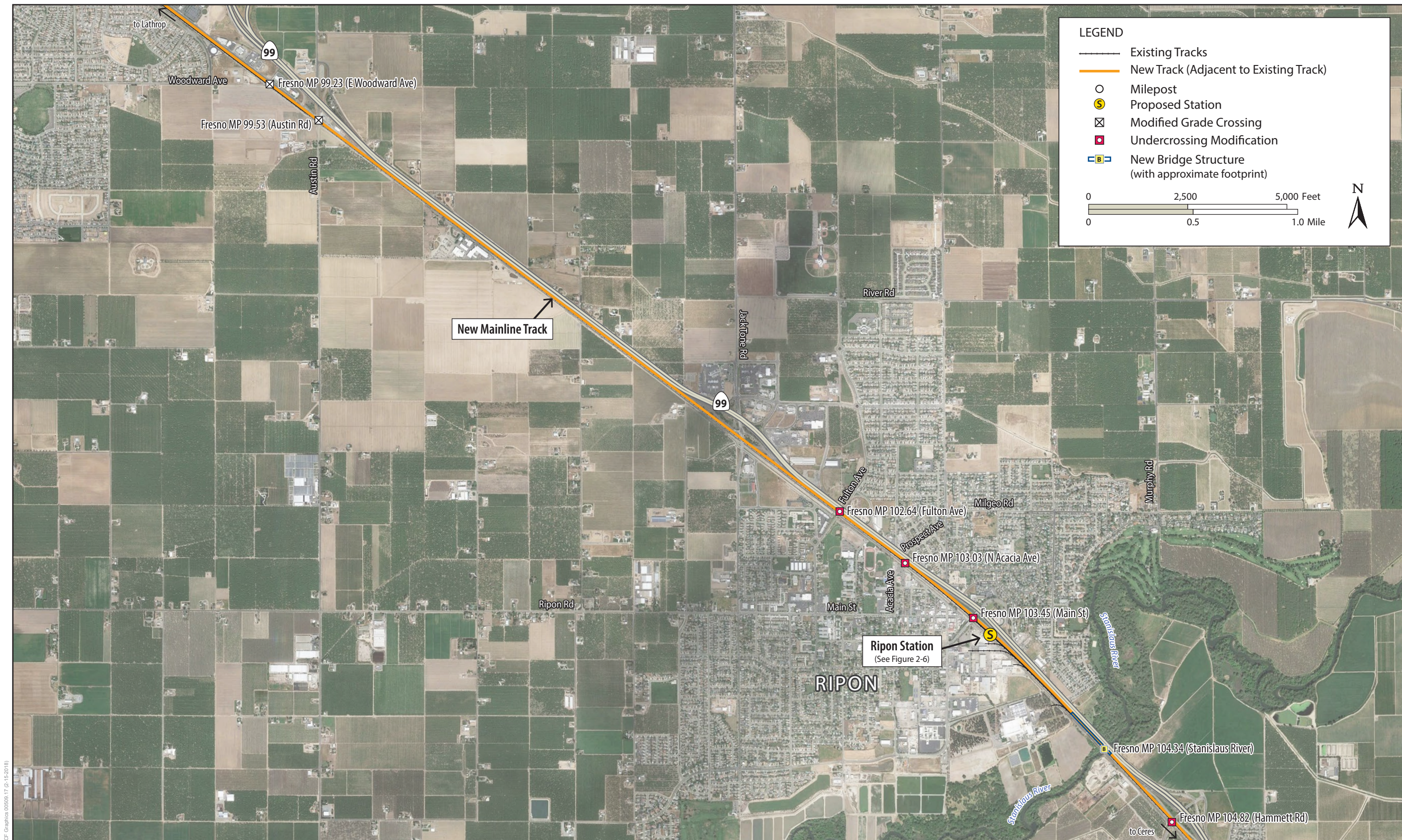
Figure 2-2
Existing Lathrop/Manteca Station
ACE Extension Lathrop to Ceres/Merced





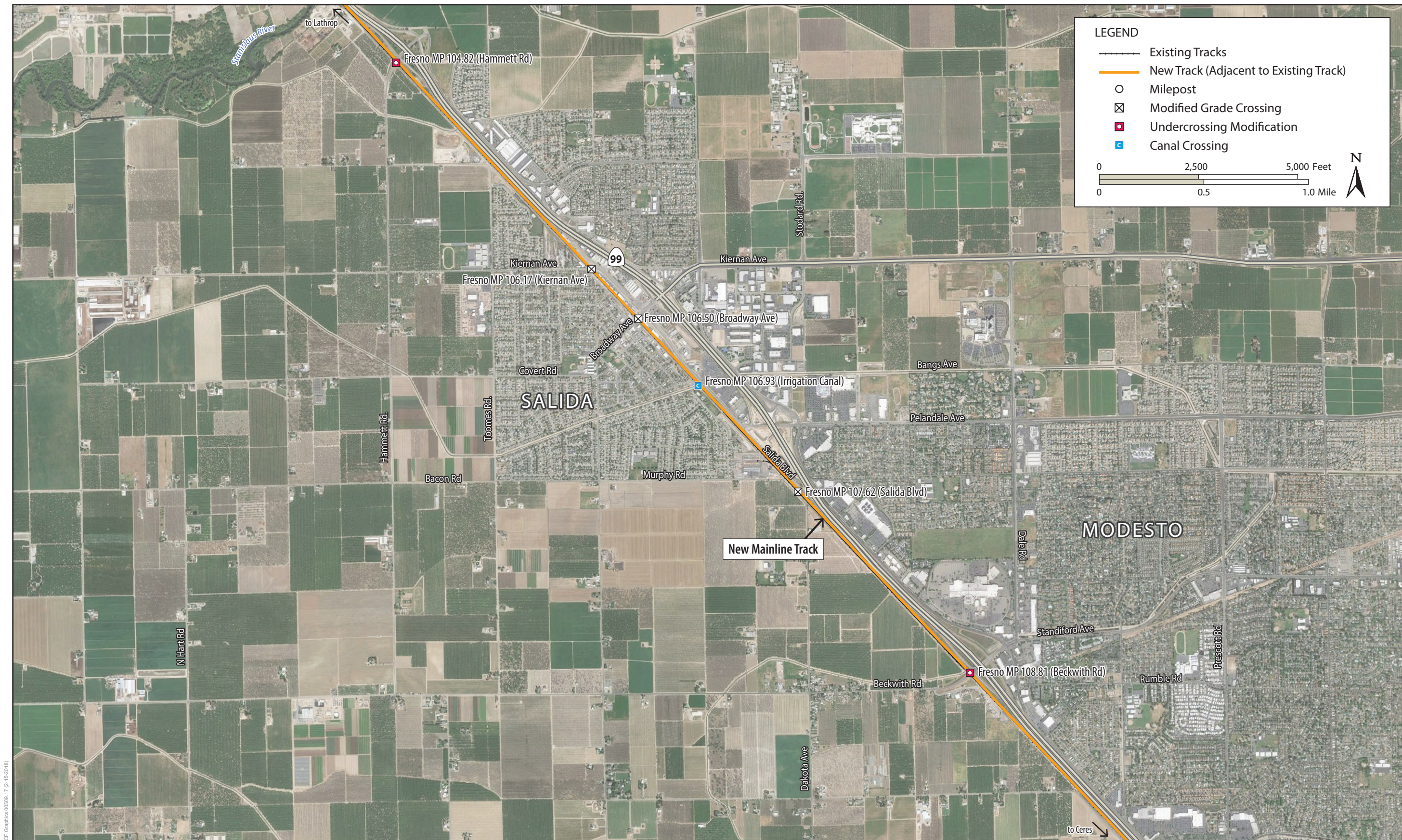
CF Graphics 00509, 17 (2-15-2018)

Figure 2-4a
Ceres Extension Alignment
 ACE Extension Lathrop to Ceres/Merced



CF Graphics 00509, 17 (2-15-2018)

Figure 2-4b
Ceres Extension Alignment
ACE Extension Lathrop to Ceres/Merced



CF Graphics 00509, 17 (2-15-2018)

Figure 2-4c
Ceres Extension Alignment
ACE Extension Lathrop to Ceres/Merced