MADERA STATION RELOCATION PROJECT

APPENDIX G
RIDERSHIP
TECHNICAL MEMORANDUM

SAN JOAQUIN JOINT POWERS AUTHORITY

October 2020

Appendix G
Ridership
Technical Memorandum

Madera Station Relocation Project

Prepared for:

San Joaquin Joint Powers Authority

949 Channel Street
Stockton, CA 95202

AECOM
Kaiser Center
300 Lakeside Dr
Oakland, CA 94612

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1. INTRODUCTION

This memorandum summarizes the ridership forecasts, estimated reduction in vehicle miles travelled (VMT), and estimated parking demand for the proposed Madera Station Relocation Project. Results are presented for both Phase 1 of the Project, which relocates the existing Madera San Joaquins Station in Madera Acres to a new station site along Avenue 12 in southern Madera County; and Phase 2, which is for high-speed rail (HSR) service as part of HSR Interim Operating Segment at the new Madera station site. This ridership analysis assumes that San Joaquin rail service rebounds once the COVID-19 pandemic is substantially over.

Of the stations served by all seven (7) San Joaquins daily round trips (pre-COVID service levels), the Madera Station had the second lowest station ridership, which is measured in passenger "ons" (boardings) and "offs (alightings). In FY 2019, Madera San Joaquins Station had 27,136 annual passenger ons/offs (or about 75 ons/offs per day).

2. PROJECT DESCRIPTION

The Project consists of various project elements that can be separated into two phases, based on their purpose and timing of construction and implementation. The first phase, or the "Phase 1 – San Joaquins Relocated Station" (Phase 1), consists of elements related to the Relocated Madera San Joaquins Station (Relocated Station) from Madera Acres to the location described in the vicinity of Avenue 12. The existing Madera San Joaquins Station would no longer be used for San Joaquins operations following commencement of San Joaquins service at the Relocated Station. The second phase of the Project, or the "Phase 2 – HSR Interim Operating Segment Station" (Phase 2), consists of high-speed rail improvements at the Relocated Station to allow for future HSR service along California's future Merced to Bakersfield High-Speed Rail Interim Operating Segment, to access the Relocated Station (Figures 2-4, and 2-5). This HSR services is anticipated to be operated by the SJJPA.

For both Phase 1 and 2, the design, construction, and operation of the project's rail components would comply with applicable standards from the Federal Railroad Administration (FRA) and/or California Public Utilities Commission (CPUC). Similarly, design, construction, and operation of site access improvements, including new roadways or modifications to existing roadways, would adhere to applicable standards such as the California Manual on Uniform Traffic Control Devices (MUTCD) and local design guidelines and specifications. Design approval for specific project components would be sought from the appropriate agencies as part of detailed design and subsequent stages of the Project.

2.1 Project Environmental Footprint

The Project Environmental Footprint (Project Footprint) is shown in Figure 2-1. In the north-south direction, the Project Footprint stretches approximately 3,600 feet north of Cottonwood Creek and approximately 150 feet south of Avenue 11 to accommodate trackwork associated with the Project. The Project Footprint also widens between Avenue 13 and Avenue 11 to accommodate the Project's station facilities and access road.

Figure 2-1. Proposed Project Environmental Footprint

2.2 Phase 1 – San Joaquins Relocated Station

2.2.1 PLATFORM

As described below, the Relocated Station for Phase 1would consist of a single side-loaded platform approximately 600 feet in length. The platform may include a canopy or canopies to offer protection from the elements for waiting passengers. There would also be fare machines, information panels, security video cameras, and lighting in the platform area. In general, the platform area would look similar to the existing Madera San Joaquins Station (Figure 1-3). Figures 2-2 and 2-3 show the proposed general layout of the Relocated Station, including the platform that the San Joaquins would utilize.

2.2.2 TRACKWORK

In order to access the Relocated Station platform, a new station siding track extending from the existing BNSF mainline single-track would be constructed. The entire length of the new station siding track, from the turnout locations at the north and south would be approximately 2,330 feet. The turnouts would be design for 50 mph. The new track would have a ballast base similar to the existing ballasted tracks on the BNSF Corridor.

2.2.3 BUS DEPOT

A bus depot would be constructed southeast of the proposed platform. The bus depot would be accessible via the access road. As part of the Phase 1, the entire footprint of the bus depot would be established, with space reserved for up to eight bus bays. However, only four of the eight bus bays would be constructed.

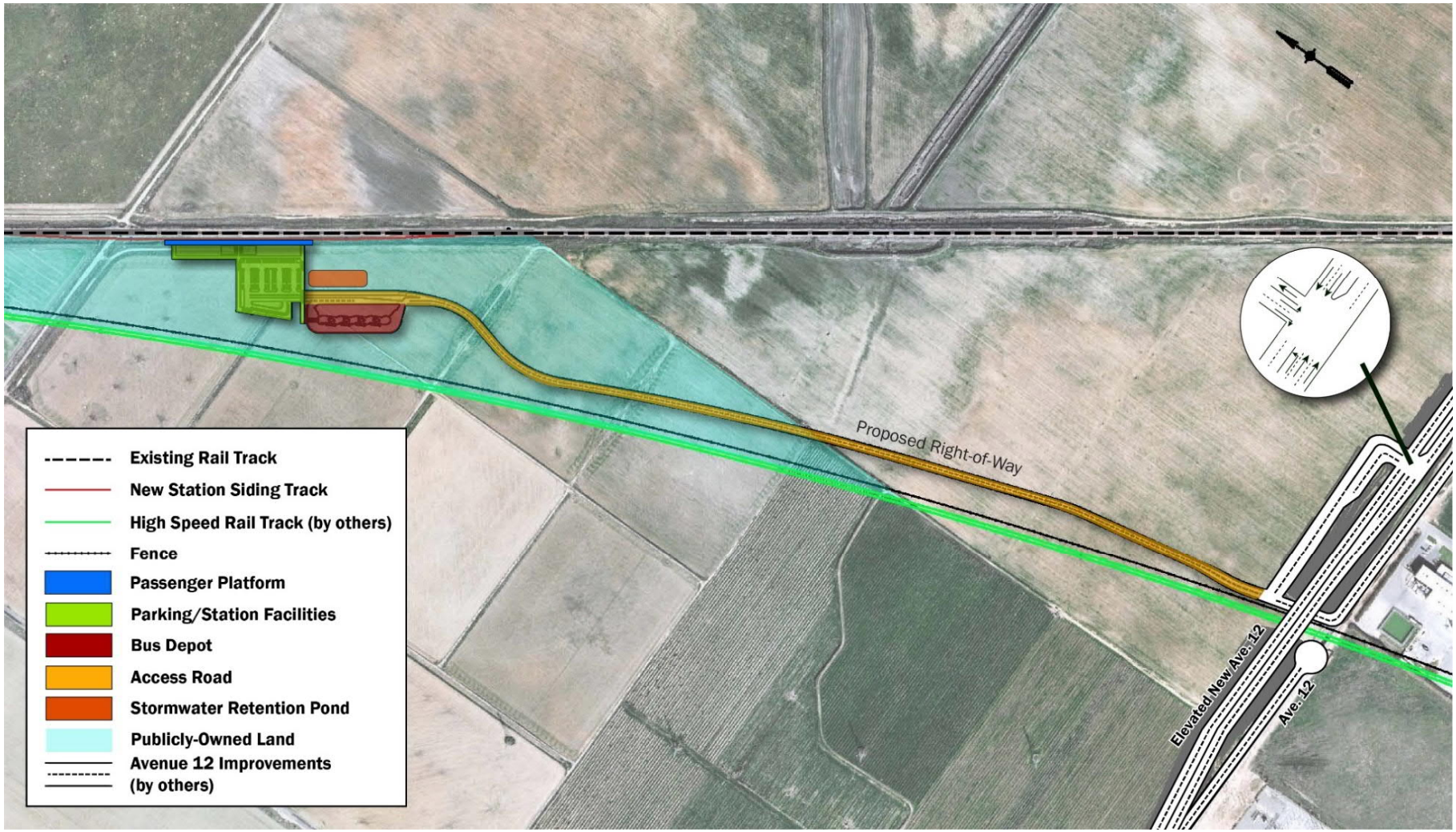
2.2.4 PARKING

A surface parking lot would be constructed adjacent to and west of the Relocated Station platform, with 98 parking spaces that would be equipped with lighting and security video cameras. No parking structures are proposed. The parking lot would be accessed through via an access road connecting from Avenue 12. Parking would include disability parking. Additionally, a pick-up/drop off facility with a turnaround loop would be located within the westernmost area of the parking lot.

2.2.5 ACCESS ROAD

A new two-lane access road would be constructed to provide access to the Relocated Station facilities from Avenue 12. The access road would primarily run adjacent to the CAHSR Project right-of-way and would connect to the new elevated section of Avenue 12 via a ramp structure on the north side of new grade-separated section of Avenue 12. Both the new elevated section of Avenue 12 and the ramp are being constructed as part of the CAHSR Project (Figure 2-2). No sidewalks or bike lanes would be included in the access road as part of Phase 1.

Figure 2-2 Proposed Design for Phase 1 – San Joaquins Relocated Station (Overview)



2.2.6 ROADWAY NETWORK

The access road would also connect to a section of road located in an underpass through the grade-separated Avenue 12 being constructed as part of the CAHSR Project. This underpass would provide a connection to the at-grade Avenue 12 frontage road on the south side of the new elevated section of Avenue 12. The Avenue 12 frontage road is not a Project element and is section of the same roadway that is the current Avenue 12 and would provide access to properties located immediately south of Avenue 12 and in between the CAHSR Project corridor to the west and the existing BNSF corridor to the east.

2.2.7 BUILDINGS AND STRUCTURES

A small building or buildings would be constructed to house restrooms and cleaning supplies/equipment for station maintenance, which would be located immediately west the station platform. The building(s) would be one-story (approximately 12 feet) tall. In addition, lighting posts with light-emitting diode (LED) light fixtures would be installed. Various types of signage would be also installed.

A stormwater drainage system would be constructed to provide drainage for stormwater from the access road, parking lot, and other station facilities. The drainage system would lead to a stormwater retention pond located immediately south of Phase 1 parking structure. The stormwater retention pond would be designed to accommodate additional stormwater anticipated from the expanded station facilities and access road associated with Phase 2.

An onsite Wastewater Treatment System (OWTS) would be constructed to treat wastewater from the planned station restroom. It is assumed that the project would not be hooked up to the sewer system.

2.2.8 TRAINS

Trainsets utilized by the San Joaquins and serving the new Relocated Station during Phase 1 would be FRA-complaint diesel-based rolling stock, the same or similar to trainset currently operated for the San Joaquins today. Most of the trainsets utilized for the San Joaquins Service will be hauled by Tier 4 locomotives at the time of service commencement (estimated for 2024).

2.3 Phase 2 – HSR Interim Operating Segment Station

2.3.1 PLATFORM

As part of Phase 2, a new single side-loaded platform would be constructed parallel to the CAHSR Project trackwork now under construction to the west and immediately adjacent to a new station siding track (see below for more details). The platform would be approximately 1,000 feet in length and may include canopies to protect passengers from the elements. The height of the platform would be designed to accommodate trainsets to be selected for the HSR system. The platform would also be located approximately 365 feet west of the northerly edge of the platform built as part of Phase 1 (Figures 2-4, 2-5, and 2-6).

Figure 2-3. Proposed Design for the Phase 1 – San Joaquins Relocated Station (Detailed View)

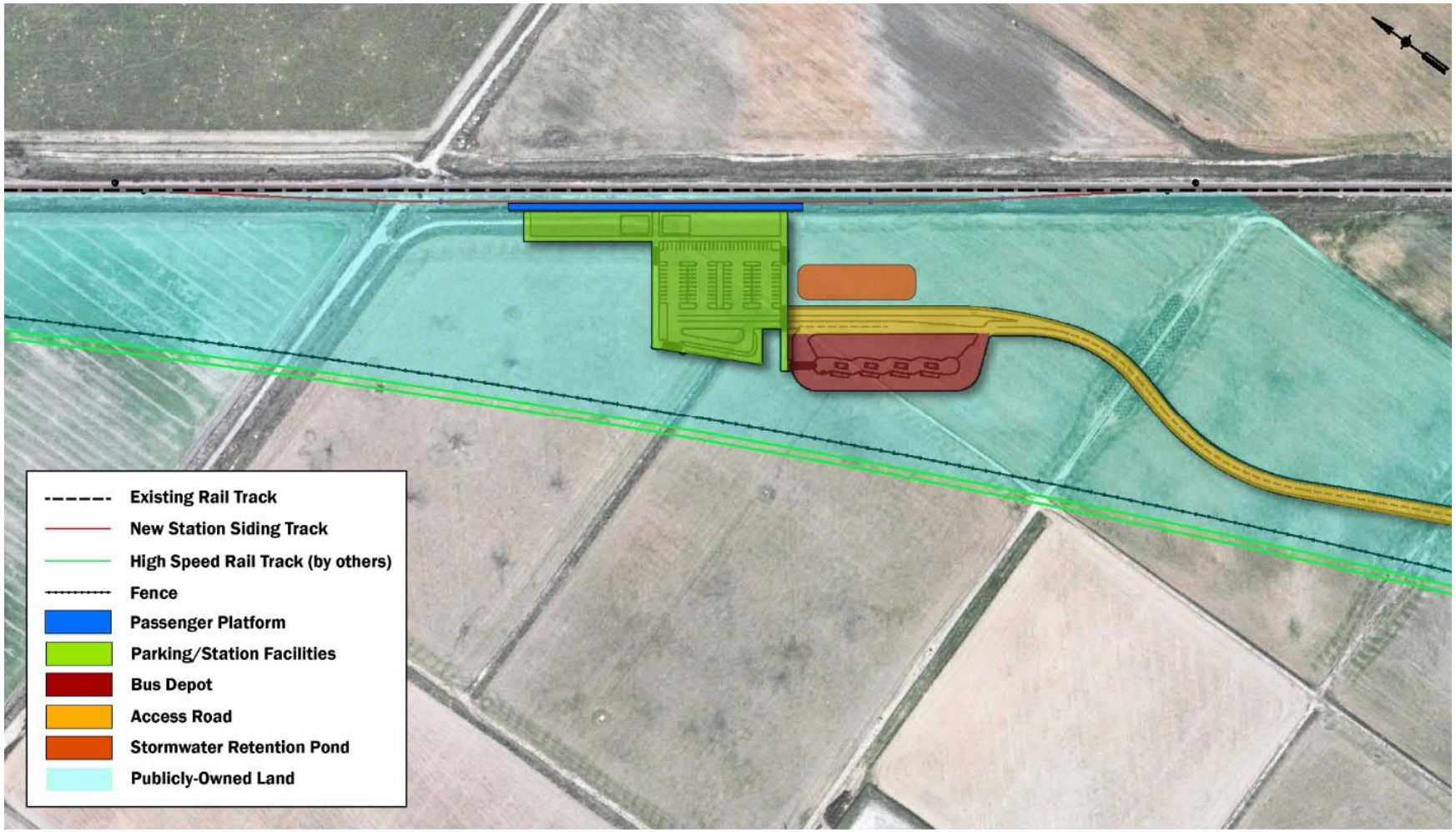


Figure 2-4. Proposed Design for the Project Phase 2 – HSR Interim Operating Segment Station (Overview)

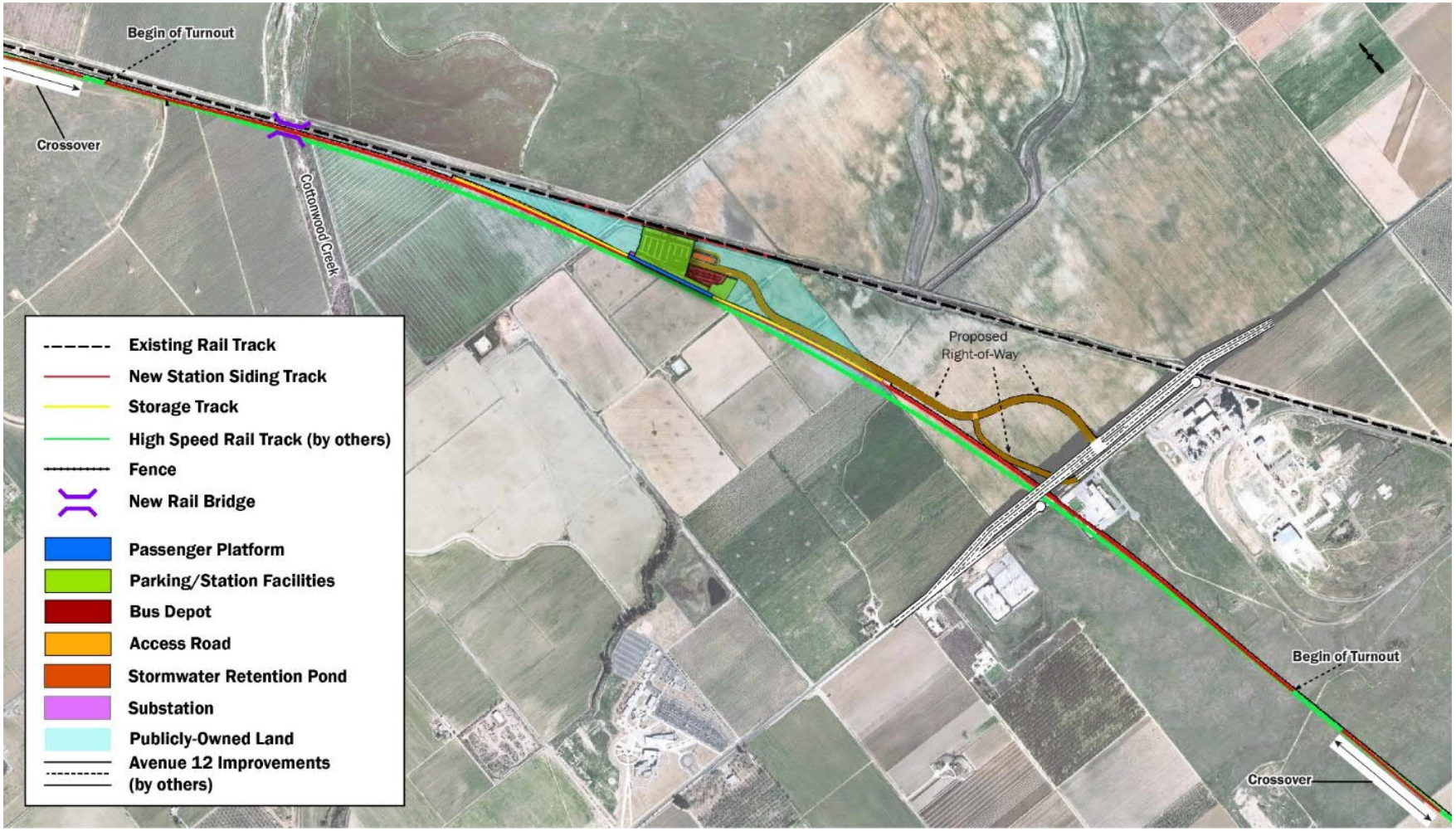


Figure 2-5. Proposed Design for the Project Phase 2 – HSR Interim Operating Segment Station (Detailed View)

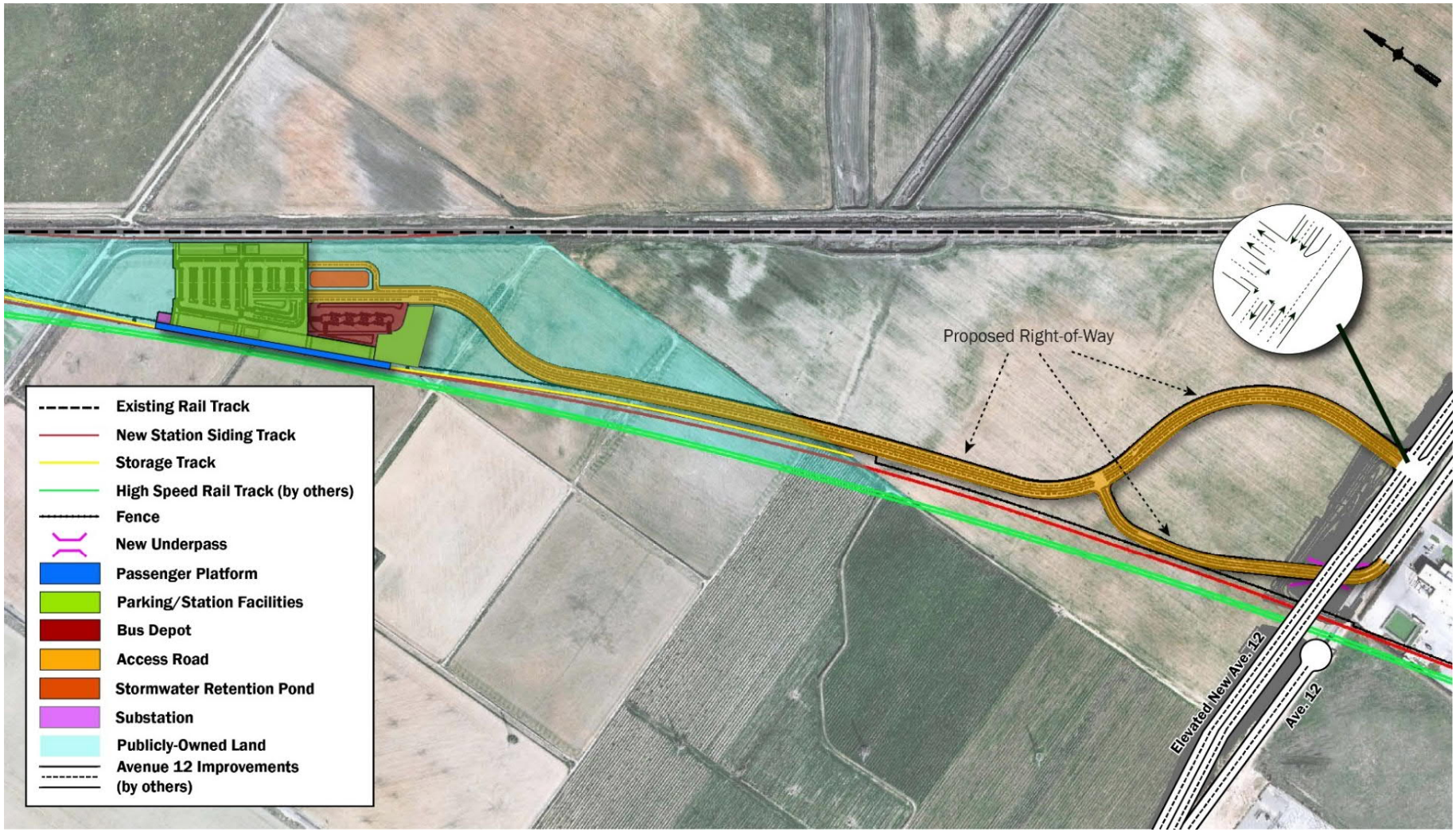
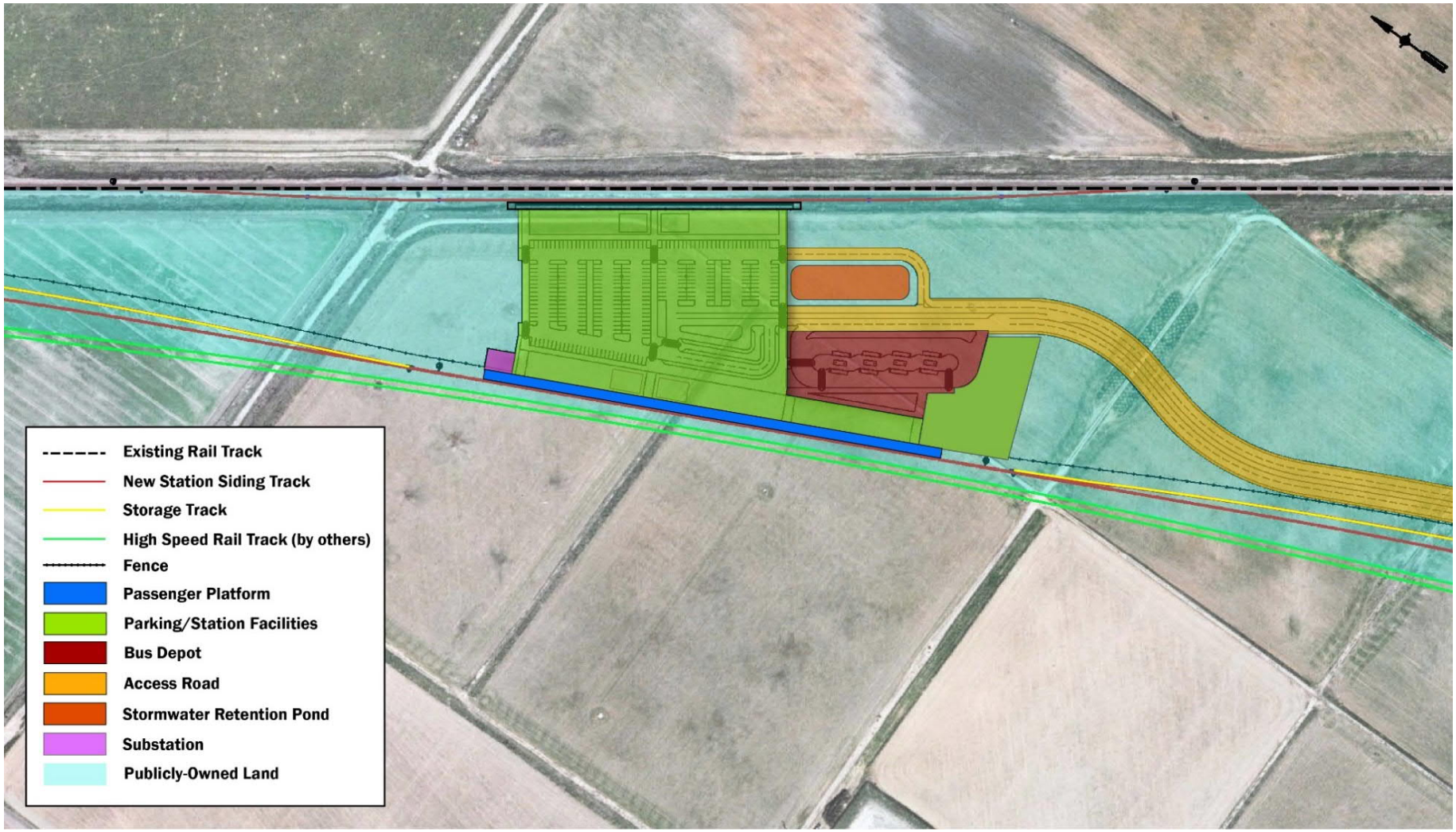


Figure 2-6. Proposed Design for the Project Phase 2 – HSR Interim Operating Segment Station (Station Close-In View)



2.3.2 Trackwork and Overhead Contact System

In order to provide access to the HSR platform, a new station siding track would be constructed to the east of the two-track mainline being constructed for the CAHSR Project. The entire length of the new station siding track, from the turnout locations at the north and south would be approximately 14,600 feet in length. The turnouts would be design for 110 mph. In addition, new crossover tracks would be constructed within the CAHSR Project corridor to the north and south of the new station siding track to allow southbound HSR trains to access the HSR platform at the Relocated Station. When including the north and south crossover tracks within the CAHSR Project right-of-way, this would extend the length of the trackwork associated with the Project to a total length of 17,300 feet. The northern crossover track would extend approximately 3,600 feet north of Cottonwood Creek. The southern crossover track would extend approximately 150 feet south of Avenue 11.

The station siding track would include a new rail bridge over Cottonwood Creek. The proposed bridge would be a single track, 5 span continuous cast-in-place, reinforced concrete slab type structure, matching the span arrangement and hydraulic conveyance capacity of the existing double-track bridge constructed as part of the CAHSR Project. The bridge would be 24 feet in width, 250 feet in length, and would be supported on 2 – 3' diameter cast-in-drilled-hole (CIDH) piles at each abutment and bent; each pile would be approximately 40 to 50 feet deep. The CIDH supported abutments would extend approximately 8 to 10 feet below the existing ground surface.

Two storage tracks for HSR trains would be constructed as part of Phase 2 of the Project. One storage track would extend from the station siding track to the north approximately 1,900 feet. A second storage track would extend south from station siding track approximately 1,900 feet (Figures 2-4, 2-5, and 2-6).

In association with the Phase 2 trackwork, an overhead contact system (OCS) would be constructed along entire length of the station siding track and storage tracks to provide electrical power to electrified trainsets. The OCS would consist of poles at intervals matching the OCS poles being constructed as part of the CAHSR Project. These OCS poles are expected to be approximately 30 feet tall and would have foundations approximately 6 to10 feet deep.

To provide power to the OCS system, a small Transmission Power Substation (TPSS) may be needed, though there is a possibility electrical power could be drawn from the OCS planned to be constructed in association with the adjacent mainline CHSRA Project tracks. If a TPSS is required, it would be located in an area in the vicinity of the north end of the HSR platform.

2.3.3 Bus Depot

A bus depot would be constructed just south of the access road as it approaches the Station parking lot. As part of Phase 1, the west side of the bus depot footprint would be built, including four bus bays. In Phase 2, four additional bus bays would be constructed such that a total of eight bus bays are operational.

2.3.4 Parking

The parking lot constructed as part of Phase 1 would be expanded by 179 additional spaces, for a total of 277 parking spaces in Phase 2. The additional parking would expand the size of surface lot; no parking structures are proposed. The parking area would be accessed through one road connecting from Avenue 12. Parking would

include disability parking. The pick-up/drop-off facility already provided in Phase 1 would be expanded with an additional 530 linear feet of curbside access divided between two additional lanes.

2.3.5 Access Road

In order to accommodate the trackwork required to reach the HSR platform, a portion of the access road constructed during Phase 1 would be reconfigured and relocated. The reconfigured portion of the access road would shift to the east and rise to meet the elevated portion of the Avenue 12 grade separation where a new signalized intersection would be created (Figure 2-5). The reconfigured portion of the access road would be a four-lane road. Furthermore, the remaining portion of the Phase 1 access road that extends north to the station, would be widened from the two-lanes to a four-lane road. A sidewalk and bike lanes would be also added to the widened access road during Phase 2.

In addition, a 2-lane auxiliary segment of access road would be built around the southern and eastern sides of the proposed stormwater retaining pond to provide an additional access point into the expanded parking lot.

2.3.6 Road Network

The new station siding track associated with Phase 2 of the Project would be constructed in the same space occupied by the automobile underpass currently under construction as part of the CAHSR Project. This would result in removal of the roadway in that space and severing the original automobile access to the Avenue 12 frontage road on the south of elevated Avenue 12. To address this, a new underpass would be constructed for automobiles slightly to the east (Figure 2-5). This new underpass would connect to the at-grade frontage road along the south side of Avenue 12. Construction of the new underpass in Phase 2 of the Project would require penetrating the retained fill of the Avenue 12 grade separation structure built as part of the CAHSR Project and constructing necessary support structures for the elevated Avenue 12.

2.3.7 Buildings and Structures

A building or buildings would be constructed in close proximity to the east of the HSR platform to provide space for station staffing support facilities, restrooms and cleaning supplies/equipment for station maintenance. The building(s) would be one-story (approximately 12 feet) tall. In addition, lighting posts and signage would be installed. Additional stormwater drainage facilities would be needed for the expanded station facilities and expanded roadway, but no additional work would be needed on the stormwater drainage basin constructed in Phase 1. Additional wastewater facilities would be need for additional bathroom planned near the CAHSR platform.

2.3.8 Trains

CAHSR trainsets would likely consist of lightweight electric multiple units (EMU) trainsets. However, no final decision has been made on rolling stock to-date. This project has no influence on the selection of CAHSR rolling stock.

2.4 Construction Period

The construction of the proposed Project would be done in phases. Phase 1 would include all Project elements required to allow for the operations of the San Joaquins service at the Relocated Station. Construction of Phase

1 of the Project is anticipated to last 12 months. Construction of Phase 1 is anticipated to commence in 2023 and be completed in 2024. The construction schedule for Phase 1 is being coordinated with the construction of the CAHSR Project. CHSRA has indicated they will need to utilize the site of the Relocated Station (currently owned by the CHSRA) as a staging area for the CAHSR project. Given this, the schedule for Phase 1 would be delayed from the original anticipated commencement date by approximately 1.5 years.

Phase 2 would include all Project elements required to allow for the operations of HSR trains at the Relocated Station. Construction of Phase 2 of the Project is anticipated to last approximately 2 years. Assuming funding is secured, construction for Phase 2 is anticipated to commence in 2026 and be completed in 2028.

Access to construction sites would occur via a temporary access road within the Project Footprint connecting with the proposed access road segments during Phase 1 and Phase 2. There could be limited, temporary road closures, and road construction that could potentially cause increased traffic congestion in areas where emergency vehicles operate. These improvements could potentially disrupt traffic during construction activities and interfere with emergency response times.

Contractors would use staging areas within the Project Footprint and standard industry equipment such as excavators, pavers, and dump and concrete trucks to support the construction of the Project. For the construction of the new bridge over Cottonwood Creek, pile-driving equipment would be utilized.

Best Management Practices (BMPs) that would be implemented as part of the Project include:

- Use of fabric-covered screening fences to minimize public views of the construction activities, equipment, and stockpiles.
- Positioning of light direction and shielding, which would minimize lighting spillover.
- Follow Caltrans' Construction Site Field Manual and Troubleshooting Guide (Caltrans 2003a), and the Construction Site BMP Manual (Caltrans 2003b) to reduce impacts to soil erosion
- Standard construction practices such as Best Available Technology Economically Feasible (BATs), Best Conventional Pollutant Control Technology (BCTs) would help reduce potential impacts related to storm water drainage systems

2.5 Operations

Phase 1 of the Project presumes up to eight (8) San Joaquins roundtrip a day when the Relocated Station opens for service (anticipated in 2024). Phase 2 presumes up to eighteen (18) HSR service roundtrips a day (anticipated to commence in 2029). Once HSR service commences to the Relocated Station during Phase 2, San Joaquins trains would no longer serve the Relocated Station and would instead terminate at a new downtown multi-modal hub station in Merced, where they would connect to HSR trains, leaving only 18 HSR daily roundtrips serving Relocated Station.

Once the San Joaquins terminate in Merced, it is possible that there could be local/regional passenger rail service in the future that utilizes the slots that the San Joaquins would no longer utilize. However, this would have to be separate project and is not in the scope of this Project.

3. RIDERSHIP FORECAST METHODOLOGY

Ridership forecasts for the No Build Scenario and for the Build Scenario for Phase 1 of the Project (for the San Joaquins passenger rail service) utilized the Altamont Corridor Express (ACE) Passenger Rail Forecasting Model ("ACE Model"). The ACE Model is based on a ridership model used for long- and short-distance Amtrak corridors throughout the United States, including state-supported services. The ACE Model is a comprehensive, integrated model that accounts for both intercity and commuter travel, specifically calibrated to the Northern California region, and has been used by SJJPA and SJRRC on a variety of planning efforts in the Altamont Corridor and the San Joaquin Valley for both ACE and the San Joaquins. Key inputs into the ACE Model include demographic forecasts (at the Census County Division, or CCD, level) and proposed timetables. The ACE Model also incorporates San Joaquins connections with Thruway buses, as well as potential connections with HSR and BART.

Ridership forecasts for the Build Scenario for Phase 2 of the Project (for HSR passenger rail service) are based on ridership estimates prepared by the Early Train Operator (ETO) for the HSR Interim Operating Segment (IOS), but with additional adjustments to capture demand from commuters and frequent travelers.

The methodologies for the No-Build Scenario for the Project, as well as both Build Scenarios for Phase 1 and Phase 2, are described individually in more detail below.

3.1 Ridership Forecast Methodology – No Build Scenario (2025)

The No-Build Scenario for the Project reflects conditions for a near-term future baseline year (2025) without the Project. This scenario is based on the San Joaquins service immediately prior to the COVID-19 pandemic, but with several adjustments due to planned service expansions by the SJJPA. In early 2020, the San Joaquins service operated seven (7) daily roundtrips, including five (5) between Oakland and Bakersfield and two (2) between Sacramento and Bakersfield. All seven (7) roundtrips served the existing Madera San Joaquins Station (Existing Station).

The following service expansions and adjustments are included in the No Build Scenario, as they have already been approved separate from the Project.

- Valley Rail Sacramento Extension Project, which has been environmentally cleared and is a fully funded project, includes the following changes to San Joaquins service (compared with conditions prior to the COVID-19 pandemic):
    - Addition of two (2) new daily roundtrips to the San Joaquins (both of which would serve Madera) along a new passenger rail corridor north of Stockton to Natomas along the UP Sacramento Subdivision.
        - One new daily roundtrip would run between Natomas/Sacramento Airport Station and Fresno Station.
        - One new daily roundtrip would run between Natomas/Sacramento Airport Station and Bakersfield Station.
    - Addition of five (5) new stations along the new route north of Stockton (on the UP Sacramento Subdivision), at Lodi, City College, Midtown Sacramento, Old North Sacramento, and Natomas/Sacramento Airport.

- Truncation of one (1) roundtrip between Oakland and Bakersfield to run between Oakland and Stockton ACE Station. The truncated roundtrip would no longer serve the Madera San Joaquins Station or other stations south of Stockton.
- Addition of the new San Joaquins Oakley Station in eastern Contra Costa County. Design and construction of the station platform has been environmentally cleared as the Oakley Station Platform Project and has received full funding from a TIRCP grant.[1] The City of Oakley is also completing a separate project to provide parking and other station amenities.

In total, the No Build Scenario assumes 8 daily San Joaquins roundtrips serving the Existing Station in Madera Acres.

3.2 Ridership Forecast Methodology – Build Scenario – Phase 1 (2025)

The Build Scenario for Phase 1 reflects conditions for the near-term future baseline year (2025), but with Phase 1 of the Project. It includes all elements of the No Build Scenario, but with the addition of the Relocated Station (for the San Joaquins service) near Avenue 12 in southern Madera County and the abandonment of service to the Existing Station in Madera Acres.

Much of the future growth forecasted for Madera County over the next 25 years is expected to occur in the southern portion of the County[2], particularly along Avenue 12, a major connection between SR 41 and SR 99. With the Relocated Station at Avenue 12, the San Joaquins would therefore be more accessible to the County's future high-growth areas, as well as in closer proximity to parts of northern Fresno County. With this geographical and land use context, it is expected that the Relocated Station would attract more riders than the Existing Station, including more frequent users that would travel more regularly for regional business travel/commutes and in longer-distance intercity/leisure travel markets, such as travel to and from the Sacramento region. Due to this context, the new location would also be better suited to capitalize on the service improvements under the Valley Rail Sacramento Extension Project, which include new stations in the Sacramento area, and the other changes described above in Section 3.1.

To ensure that the Build Scenario for Phase 1 reflects these effects, an additional "latent demand" adjustment was applied to the ACE Model ridership forecasts. First, estimates of the total market demand on each station pair were derived, using model data produced by Cambridge Systematics. Then, a variable rail mode share capture rate based on travel distance and train frequency (from Southern California's Metrolink commuter / regional passenger rail service) was applied to each station pair. The calculated latent demand was then extrapolated to an annual level based on an assumed average ridership frequency per station pair, generally reflecting the effects of travel time and distance. Shorter-distance markets, for example, would be expected to attract larger shares of commuters (who would be more likely to take the train more frequently), while longer-distance markets would primarily capture less frequent riders who would generally be taking the train for business trips or leisure.

Analysis was also conducted to help define the catchment area for the Relocated Station, reflecting the new location in a higher growth area of the county and also providing improved access to ridership originating from

(1) SJJPA Board Meeting, November 2019, Item 6.
(2) See the Land Use section of the Initial Study document for further discussion.

portions of northern Fresno County, which would be a combination of new riders to the San Joaquins and riders shifting from Fresno Station to the Relocated Station.

3.3 Ridership Forecast Methodology – Build Scenario – Phase 2 (2029)

The Build Scenario for Phase 2 reflects conditions for the long-term future baseline year (2029). It assumes the completion of the IOS of the statewide HSR network, which would be operating between Merced and Bakersfield with 18 daily roundtrips serving the Relocated Station at a new platform for HSR trains. With completion of the HSR IOS between Merced and Bakersfield, the San Joaquins would terminate at Merced, no longer serving stations to the south, including Madera.

The Early Train Operator (ETO) of CHSRA recently completed high-level service planning for the IOS within its "Central Valley and Peninsula Corridors Operations Finanancial Study Plan", which was released as a supporting document of the "2019 Project Update Report to the California State Legislature." While the primary purpose of the ETO's efforts revolves around revenue forecasting, the underlying ridership data can be used as a reference point to help quantify the expected ridership on HSR trains at the Relocated Station. Using information gained from Phase 1 modeling about ridership benefits from the relocation of the station to the Avenue 12 site, adjustments were applied to the ETO's ridership forecasts to better capture potential demand at the Relocated Station, including an anticipated new commuter market enabled by the establishment of early morning HSR train service in Phase 2 (which the San Joaquins do not currently provide). Estimates of this anticipated commute market were aided by using information from the commute market between Hanford and Fresno, an existing travel market that is already served by the San Joaquins and would be expected to grow in the future with HSR.

4. FORECASTED RIDERSHIP

Based on the assumption and ridership forecasting analysis described above a summary of forecasted ridership for the No-Build Scenario and the Build Scenario for Phase 1 and Phase 2 is presented in Table 4-1 below, followed by analysis for each scenario.

Table 4-1
Project Annual Total Ridership Summary

No Build[1] 2025 (San Joaquins)	Phase 1[2] 2025 (San Joaquins)	Project Phase 2[3] 2029 (High-Speed Rail Service)
40,200[1] (passenger ons/offs)	103,100[2] (passenger ons/offs)	210,600[3] (passenger ons/offs)

Notes:
[1]Assumes eight (8) San Joauquins roundtrips serving the Existing Station.
[2]Assumes eight (8) San Joauquins roundtrips serving the Relocated Station.
[3]Assumes eighteen (18) high-speed rail roundtrips serving the Relocated Station.

4.1 Forecasted Ridership – No Build Scenario (2025)

Accounting for forecasted population and employment growth and the proposed service changes described above in Section 3.1, annual ridership at the Existing Station in Madera Acres for the No Build Scenario in 2025 could reach up to approximately 40,200 passengers (sum of ons and offs).

4.2 Forecasted Ridership – Build Scenario – Phase 1 (2025)

Based on the methodology described in Section 3.2, the results indicate that ridership on the San Joaquins at the Relocated Station for Phase 1 in 2025 could reach up to approximately 103,100 passenger ons/offs annually in 2025 under Phase 1 of the Project. This accounts for existing riders shifting from the Existing Station, new riders associated with the larger demographic growth captured by moving the station to Avenue 12 compared to the Existing Station in Madera Acres, new riders due to the new catchment area that includes portions of northern Fresno County, and a portion of existing riders shifting from Fresno Station to the Relocated Station.

4.3 Forecasted Ridership – Build Scenario – Phase 2 (2029)

Based on the methodology described in Section 3.3, the results indicate that ridership on HSR trains at the Relocated Station for Phase 2 in 2029 could reach up to approximately 210,600 passenger ons/offs annually in 2029 under Phase 2 of the Project.

5. REDUCTION IN VEHICLE MILES TRAVELED (VMT)

5.1 Build Scenario – Phase 1

To quantify the VMT change with the Project, the annual ridership for the Build Scenario for Phase 1 (as summarized in Table 5-1) can be broken down into three general categories:

- Riders who were already taking the San Joaquins service at the Existing Station in Madera Acres and would continue to take the service at the Relocated Station along Avenue 12. In general, it is expected that average travel distance to/from the station would increase slightly for these riders, as the Relocated Station is located slightly further away from the built-up areas of the City of Madera than the existing station in Madera Acres.
- Riders who were already taking the San Joaquins service at the existing Fresno Station, but who would now switch to the relocated Madera station along Avenue 12. It is expected that most of these riders would be making a tradeoff of a slightly longer travel distance to/from the station for greater convenience (e.g., reduced travel time, less traffic congestion).
- All-new riders who would be attracted to the San Joaquins service directly because of the Project. These riders would generally be taking other modes for their trip but would now switch to the San Joaquins after completion of Phase 1, as the Relocated Station would be more convenient or attractive for them. The majority of these new riders would be switching from automobiles to get to their final destination and would therefore represent a reduction in VMT due to the Project.

Thus, only those passengers in the last of the three categories would represent a reduction in annual VMT, while passengers in the first two categories can conservatively be assumed to represent an increase in annual VMT.

The Build Scenario for Phase 1 of the Project would result in an annual net reduction in VMT compared to No Build Scenario. This reduction is estimated at approximately 3,189,300 VMT annually.

5.2 Build Scenario – Phase 2

Under the Build Scenario for Phase 2, HSR trains would replace the San Joaquins south of Merced, and riders who would already be taking the San Joaquins at the Relocated Station under Phase 1 of the Project would now

switch to HSR. With HSR providing increased speed (and reduced travel times) and improved frequency in the Central Valley, Phase 2 of the Project would also be expected to attract new riders to intercity rail, which would contribute to a much larger reduction in annual VMT than under Phase 1, as most of these riders would be shifting from automobiles to HSR trains for their entire trip.

As the ETO report (discussed above in Section 4.3) did not provide detailed ridership flow information for stations outside of the IOS or for connecting transit services (including ACE and the San Joaquins at Merced, as well as Thruway buses at Merced, Kings/Tulare, and Bakersfield), additional post-processing was conducted to distribute passengers beyond the IOS boundaries to their final origin or destination. This distribution was primarily based on a combination of existing ridership data for Thruway stops and the forecasted station-to-station flows under the Build Scenario for Phase 1, with additional adjustments incorporated to reflect new rail or Thruway connections that currently do not exist but would be implemented together with the IOS (e.g., Thruway buses operating on the Merced – Los Banos – Gilroy – San Jose route).

Overall, the Build Scenario for Phase 2 of the Project would result in an additional reduction in annual VMT over the Build Scenario for Phase 1. When combining both Phase 1 and Phase 2 together, the reduction in annual VMT is estimated at approximately 8,102,300 VMT.

Table 5-1
Total Reduction in Vehicles Miles Traveled

No Build 2025 (San Joaquins)	Phase 1 2025 (San Joaquins)	Project Phase 2 2029 (High-Speed Rail Service)
N/A	3,189,300	8,102,300

6. PARKING DEMAND ANALYSIS

Parking demand for the Project was also estimated using the ridership forecasts described above. The Relocated Station's average daily ridership was divided in half (as each passenger is assumed to make one roundtrip), and a factor of 70% was applied to account for mode share[(3)], isolating only those riders parking at the station. This was based on a factor used in the ACE Model and adjusted slightly downward to accommodate the higher level of pick-ups/drop-offs associated with intercity rail service than with a commuter rail service such as ACE. The resulting estimates for parking demand at the Relocated Station are 98 parking spaces under the Build Scenario for Phase 1 and 202 parking spaces under the Build Scenario for Phase 2.

Table 6-1
Total Estimated Demand for Parking

No Build 2025 (San Joaquins)	Phase 1 2025 (San Joaquins)	Project Phase 2 2029 (High-Speed Rail Service)
N/A	98 parking spaces	202 parking spaces

(3) The mode share component refers specifically to passengers who would be accessing the station by automobile and requiring parking at the station. Pick-up/drop-off passengers (e.g., "kiss-and-ride" passengers), for example, would not require parking at the station.