



Southern Alameda County Rail Integrated Analysis

Appendix C: Layover Facility Site Feasibility Analysis

March 22, 2023

In partnership with:













Memo

Date:	Tuesday, March 22, 2022
Project:	Southern Alameda County Integrated Rail Analysis (SoCo Rail Study)
To:	Kara Vuicich, MTC Project Manager
From:	HDR and AECOM
Subject:	Layover Facility Site Feasibility Analysis

Introduction

Study Overview

Passenger rail is an essential element of the Bay Area's and California's surface transportation system. As highway congestion within the San Francisco Bay Area and Northern California Megaregion has grown, so has rail's role as an alternative to driving. Increased rail service also fosters transit-oriented development (TOD) in areas served by passenger rail stations, which stimulates the local economy while promoting walkable communities and energy-efficient lifestyles.

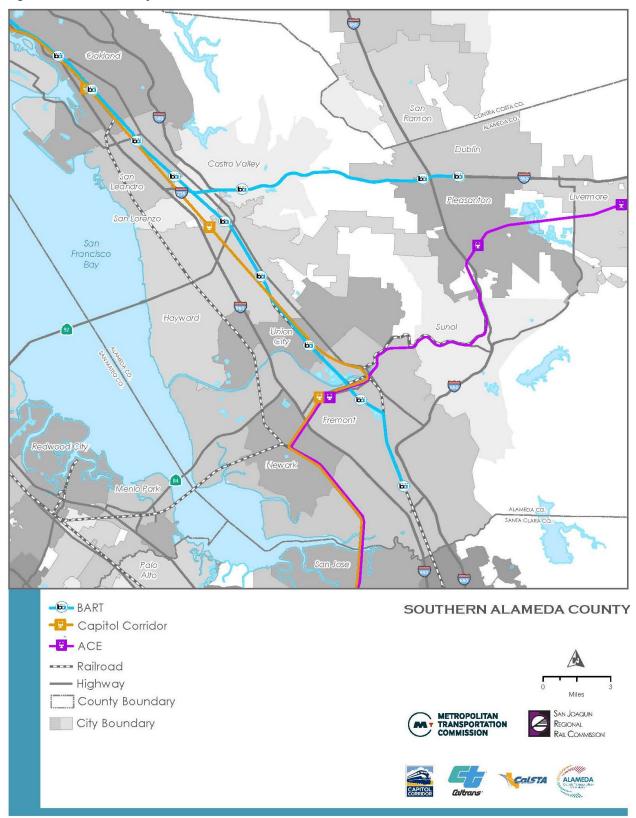
Understanding that passenger rail is an integral part of the Bay Area's overall transportation network, the Metropolitan Transportation Commission (MTC) has partnered with San Joaquin Regional Rail Commission (SJRRC), Alameda County Transportation Commission (CTC), Capitol Corridor Joint Powers Authority (CCJPA), and California State Transportation Agency (CalSTA) to conduct the Southern Alameda County Integrated Rail Analysis (SoCo Rail Study). This study evaluates passenger rail needs in southern Alameda County and opportunities for more seamless rail service connectivity with a goal of identifying and developing an East Bay Rail Hub in the Mid-Term Horizon. The overall purpose of the new hub is to facilitate rail operations and future rail service plans, improve rail transit mobility and access for the region and megaregion, and increase rail (and overall transit) ridership. The general project area, including the rail services in the area, is shown in **Figure 1**.

Purpose of This Memorandum

During Phase 1 of the SoCo Rail Study, MTC and its partners identified and studied several locations for the East Bay Rail Hub, and at the conclusion of that phase of study the existing Union City BART Station was recommended for further study. In the Mid-Term Horizon, defined as the next 5 to 10 years, the East Bay Rail Hub will allow for additional ACE service into the Bay Area, provide an ACE-BART connection, and facilitate a high level of connectivity to key travel markets throughout the Bay Area.



Figure 1. SoCo Rail Study Area





The recommended Union City Hub would be located on the Union Pacific (UP) Oakland Subdivision, adjacent to the Union City BART Station. The East Bay Rail Hub concept includes ACE rail service to and from the Union City Hub, which would require inbound AM peak-period trains to lay over during the day before returning for outbound service in the PM peak period.

This memorandum summarizes the analysis of potential options for a necessary layover facility, in conjunction with the Union City BART Station as the East Bay Hub, to accommodate train storage when not in service in the Mid-Term Horizon (approximately 10 years). This memorandum is the first step in the development of Phase 2 of the SoCo Rail Study to develop the recommended Union City BART Station as the East Bay Rail Hub.

Layover Site Feasibility Analysis Process

Requirements and Assumptions

The first step in the approach to the layover facility feasibility analysis was to develop a high-level understanding of what the requirements may be for a potential layover facility associated with expansion of ACE service to Union City over UP railroad corridors. This included spatial and operational planning to determine the approximate footprint required to accommodate facilities for ACE train operating crews and other staff that include parking, a break room, an administration office, restrooms, and storage rooms. The spatial requirements for the ACE trainsets to operate efficiently was also considered, including the number of layover tracks, an access road, wayside power, and water service. In addition, preliminary assumptions were made regarding ACE's

Summary of Key Considerations

All options assume the East Bay Hub location at Union City BART

 Operations to and from the station site to the layover facility are key to the analysis

All options are located on or adjacent to Union Pacific (UP) right-of-way

 UP coordination and approval will be key to project success

Operations are assumed to begin in the midterm horizon

 Station, layover facility, and any additional necessary infrastructure improvements need to be constructed within this time frame

service characteristics and the number and length of ACE trains.

These requirements were informed by the development of the SJRRC ACE Mid-Term Service Configuration Plan, which was developed in close coordination with SJRRC staff. This process included a consideration of desired service levels and markets served, including commuter markets originating in the San Joaquin Valley and intercity markets served through connections at Merced with the Interim High-Speed Rail (HSR) Service.

This service configuration plan, illustrated in **Figure 2**, includes three ACE roundtrips serving Union City, with two in the commute direction (one originating in Natomas and the other in Merced) and one in the reverse-commute direction (originating in Union City). Both of the



Merced roundtrips will provide connections with HSR, with the reverse-direction service intended to serve Bay Area residents and visitors with a morning southbound and evening northbound connection.

PRELIMINARY Existing service **SUBJECT TO** Future baseline service Old North Sacramento CHANGE Sacramento Extension (5 roundtrips) Midtown Sacramento Lathrop to Ceres / Merced Extension 5th roundtrip to / from Bay Area Sacramento City College (restoration of 4th roundtrip SKT-SJC) Flk Grove Stockton Layover Facility (SKM) Lodi (new) East Bay Hub service Commute direction (into Bay Area) Reverse direction (for HSR connection in Merced) **HSR** service ■ 1 roundtrip (AM and PM) ■ 1/2 roundtrip (AM only or PM only) Downtown Stockton Stockton (Cabral) PM direction Street Timed train-to-train connections • 1 roundtrip (AM and PM) → 1/2 roundtrip (AM only or PM only) North Lathrop Downtown Manteca Ripon Modesto (new) Ceres Union City Livingston Merced (new) 🧽 Kings-Tulare Bakersfield Santa Clara San Jose 🕬 📆

Figure 2. SJRRC's ACE Mid-Term Service Configuration Plan

Source: AECOM, 2022

Identification of Potentially Feasible Layover Options

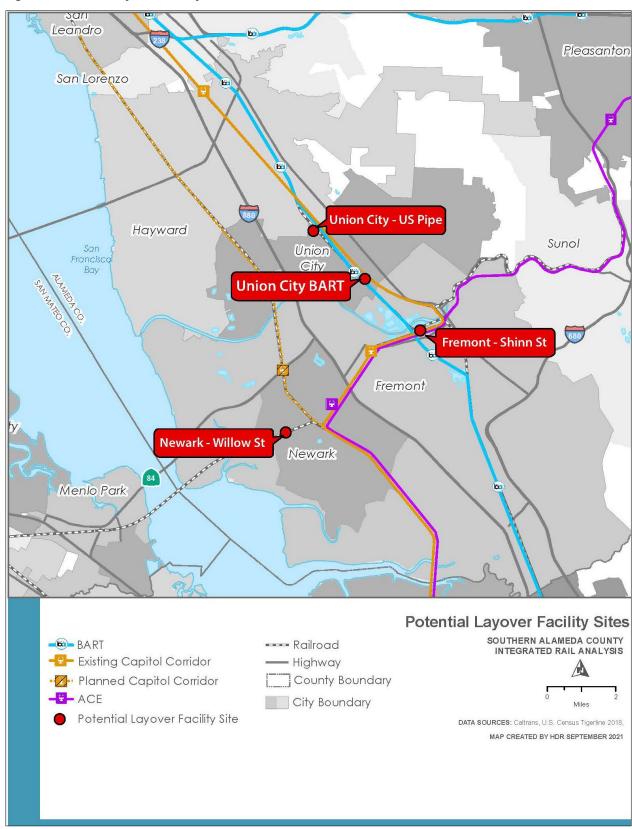
Taking all the assumed layover facility requirements and SJRRC's ACE Mid-Term Service Plan into consideration, and after a thorough investigation of potential sites in the vicinity of the Union City Hub, the following four sites were deemed appropriate for further analysis:

- Union City BART
- Union City US Pipe
- Fremont Shinn Street
- Newark Willow Street

Figure 3 shows the locations of these sites, in relation to the Union City BART Station where the rail-to-rail hub connection has been identified in Phase 1 of this study.



Figure 3. Potential Layover Facility Sites



Source: HDR, 2022



Methodology

The layover site feasibility analysis is based on a high-level assessment of the following four considerations: Project Complexity, Land Use Compatibility, Environmental Constraints, and Operational Feasibility. Each site is analyzed across all four evaluation categories; based on an assessment of reasonably foreseeable benefits and impacts it is given a rating of one through five – with one being the most feasible (and most favorable) and five being the least feasible (and least favorable). This section describes the inputs used for each evaluation category.

Project Complexity

Project complexity is assessed by examining the following considerations:

- Infrastructure needs: ACE trains would be utilizing the UP Oakland Subdivision to access a station to be built adjacent to the Union City BART Station. Once passengers alight ACE trains at the Union City Hub, the train would then travel to the layover facility. The infrastructure needs look at whether or not there would be a need to invest in new infrastructure and capital improvements in order to make that journey from the Union City BART Station to the layover facility in the AM peak period and then back to the Union City BART Station in the PM peak period to have passengers board before heading back to Stockton. The greater the need for infrastructure improvements equates to a more complex project, making that layover facility less feasible as a mid-term solution for ACE trains.
- Physical constraints: In the areas that may require capital improvements to accommodate ACE Trains accessing the layover facility from the Union City BART Station, there may be physical elements that drastically increase the complexity of the project. These include but are not limited to at-grade road crossings, grade crossings to access other UP Subdivisions, other rail infrastructure and hydrological features that may prevent additional trackwork. A layover facility would receive a higher feasibility/favorability score if there were fewer physical constraints than a layover facility that has more physical constraints.
- Rough-order-of-magnitude capital costs: Based on the assessment of infrastructure needs and physical constraints, a very high-level rough order of magnitude (ROM) cost estimate is developed that considered costs for the layover facility, station platform, main line capacity improvements, remediation (as necessary), owner costs, and contingencies. The lower the ROM capital costs, the higher feasibility/favorability score for that layover facility option.

Land Use Compatibility

The four identified sites for the potential layover facility are all set in different areas with different land use contexts. Land use compatibility is assessed by utilizing geographic information system (GIS) data, site visits, and other existing documentation (e.g., municipal general plans) to get a better understanding of the adjacent existing and planned land uses, site access, and right-of-way ownership. A layover facility would generally be considered a "light industrial" land use and would therefore generally be more compatible when located adjacent to other industrial uses. Uses with higher concentrations of people, such as commercial (office/retail) and residential, would generally be less compatible with the layover facility. Each site is analyzed for



pros/benefits and cons/impacts with respect to the surrounding land uses and is assigned a feasibility rating based on the level of land use compatibility.

Environmental Constraints

Utilizing GIS data, site visits, and other existing documentation, environmental constraints are assessed through a high-level analysis of the following California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) resource areas:

- Aesthetics
- Air quality
- Biological resources
- Cultural resources
- Hazards & hazardous materials
- Hydrology & water quality
- Land use & planning
- Noise & vibration
- Recreation & Section 4(f) properties
- Transportation
- Tribal cultural resources

For each resource area, a preliminary analysis of the CEQA Appendix G checklist is conducted to help identify potential environmental constraints associated with each layover facility site. A layover facility with more potential environmental constraints could be a more complex and/or costly project and thus be less feasible/favorable to implement in the Mid-Term Horizon. Detailed tables and mapping of the environmental constrains for each site can be found in **Attachment A**.

Operational Feasibility

Three considerations are used to assess the operational feasibility of the potential layover sites:

• Compatibility with service plan: Assuming the future Mid-Term ACE timetable does not allow the reverse-direction service out of Union City to be operated as a combined run with one of the two commute-direction roundtrips originating in the Central Valley, the layover facility would need to accommodate overnight storage for one train, together with the requisite ancillary facilities and amenities for the associated train crew (e.g., parking). For the purposes of this analysis, a total desired storage capacity for up to three trains was assumed in order to provide SJRRC with the maximum operational flexibility in the Mid-Term Horizon. This storage could be accomplished with either: (1) a combination of two layover tracks within the footprint of a layover facility plus a utilization of the station track to service as the third storage track, or (2) having three layover tracks entirely within the footprint of a layover facility. Each layover facility site was evaluated to confirm that it could satisfy these space and facility requirements. A layover facility that more easily satisfies these requirements would generally be more feasible for implementation.



- Effects on infrastructure and design: Track and right-of-way improvements that may be required by UP to allow for operation of the proposed service, including deadhead (non-revenue) movements between the BART station and the layover facility, were identified. A layover facility with less potential for associated infrastructure improvements would be more feasible as a Mid-Term solution. Potential impacts to the design or functionality of the future hub, including station access and passenger flow for both the new station and the existing BART station, were also evaluated. A layover facility with fewer impacts to the design or functionality of the future hub would be more feasible for implementation in the Mid-Term Horizon.
- Operational considerations: Approximate one-way deadhead mileage and running times
 were estimated for each layover facility. Deadhead movements affect many aspects of dayto-day operation of the service, including train/crew scheduling and layover/maintenance
 windows, as well as operational costs and general service functionality/reliability. A layover
 facility with longer deadhead mileage and running times results in greater operational
 demands and would generally be less feasible for implementation.

Potential Layover Site Feasibility Comparison

The resulting ratings for each option under each feasibility evaluation category is summarized and the option with the highest overall rating is recommended to advance in the study as the layover facility.

Analysis Results

This section presents the analysis results for the four potential layover facilities: Union City BART; Union City – US Pipe; Fremont – Shinn Street; and Newark – Willow Street. Each site is discussed in terms of their Project Complexity, Land Use Compatibility, Environmental Constraints and Operational Feasibility.

Union City BART

As depicted in Figure 2, the potential Union City BART layover facility is located approximately 0.04 mile south of the partially constructed pedestrian crossing over the UP Oakland Subdivision at the Union City BART Station. The potential layover facility is just east of the existing UP Oakland Subdivision and totally enclosed within the Waste Consolidation Area (WCA) in what has been identified by Union City as part of "The Core" of their Station District TOD in the "Station District Specific Plan".

Project Complexity

As shown in **Figure 4** and described on the following page, there are two major constraints at the potential layover facility at the Union City BART site.



Figure 4. Project Complexity: Union City BART



Source: HDR, 2022



The two major constraints identified in the numbered call-outs in the figure are discussed below:

- 1. The WCA would require remediation: The WCA is a 14-acre capped landfill at the Pacific States Steel Corporation (PSSC) Site that contains steel slag, impacted soil, and other debris. The cost and complexity of remediation is the biggest constraint for this site. There have been multiple studies over several years to better understand how to remediate the site and prepare it for development. Full waste removal and site restoration (Clean Closure) would require excavation of approximately 1,000,000 tons of materials, with the estimated cost around \$200 million or more. This potential layover site would only utilize a small portion of the WCA and would most likely not have to bear the cost of full removal and restoration, and the development of this site as a layover facility could prove to be a catalyst to initiate restoration and development of the site.
- 2. There is a planned at-grade pedestrian crossing: The City of Union City is planning an at-grade pedestrian crossing across the UP main rail line to provide access between the Union City BART Station and development east of the station, including East Plaza, Transit Loop Road, a new public park and sculpture garden, and housing. There is a possibility, depending on the configuration of the station platform, that the at-grade pedestrian crossing would have to be replaced with a grade-separated pedestrian crossing, to eliminate potential conflicts between pedestrians and the trains that run on the UP Oakland Subdivision.

It is also important to consider that the Union City ACE station track would be a single-ended spur, and that the layover facility would have access south of both the station and the layover facility. The only additional mainline trackwork is assumed to be in the immediate vicinity of the layover facility, since there would be no deadhead moves on the main track.

Table 1 shows the high-level ROM cost estimate for the Union City BART site. Cost estimates are conservative and developed based on readily available information and engineering judgment. The estimated costs for the Union City BART site would be approximately \$159,000,000 with the highest cost categories, aside from contingencies, related to the remediation of the WCA site. Note that as design develops, and additional investigations and studies are completed for the WCA site, the estimated cost to remediate and develop the portion of the site needed for the layover facility may be different from the current estimate.

Table 1. Cost Estimates: Union City BART

Union City BART			
Cost Category (all costs rounded)	Rough Order of Magnitude (ROM) Cost		
Layover Facility Cost	\$20,000,000		
Station Platform Cost	\$15,000,000		
Main Line Capacity Cost	\$-		
Remediation Costs	\$50,000,000		
Owner Costs	\$21,000,000		
Contingency	\$53,000,000		
ROM Totals	\$159,000,000		

Source: HDR: 2022



Land Use Compatibility

The land use context for the Union City BART site is illustrated in **Figure 5**. The site is situated southeast of the BART station within an area that is zoned for "Station Mixed Use Commercial" by the City of Union City and designated for TOD under the Station District Specific Plan. The pros and cons related to land use compatibility are described below:

PROS

- The site is adjacent to the Union City BART Station, which is a compatible land use. Both the BART station and the layover facility are uses dedicated to the operation of transit service. Additionally, the City of Union City has suggested that there may be availability of crew facilities within the updated Union City BART Station. The WCA is undeveloped land that offers major opportunities for comprehensive remediation/restoration and a development solution to accelerate build-out of the Station District.
- The site is adjacent to existing transit/rail rights-of-way (ROWs) for the UP Oakland Subdivision and BART, which are compatible with the proposed layover facility and also prevent future development from encroaching onto the layover facility.
- Road access exists from the south via the future Quarry Lakes Parkway, a new arterial
 roadway running east—west between Mission Boulevard and Paseo Padre Parkway. Road
 access exists from the east via roadways that have been constructed as part of build-out of
 the Station District, and there is a possibility of creating an access road in the WCA to
 specifically serve the layover facility.

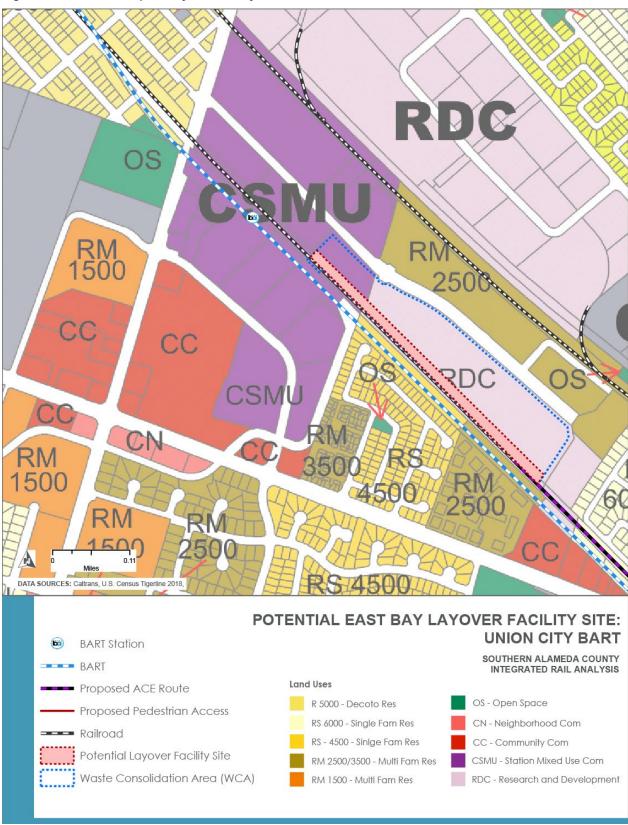
CONS

- The WCA is surrounded on the east, south and southwest by existing and/or planned residential and mixed-use development. Existing residential development is located opposite the site along the west edge of the BART ROW and southeast of the site along the east edge of the UP Oakland Subdivision. The site itself falls almost entirely within the Station District's Core subarea of the Station District (which is currently already partially developed east of 11th Street), with a small sliver at the south end located within or adjacent to the Gateway subarea.
- The future Quarry Lakes Parkway will be grade separated under the UP and BART tracks, which could add an unforeseen layer of complexity to the layover facility.

Overall, the land use compatibility is high for the Union City BART site. It is bounded by the UP and BART ROWs and would be adjacent to the future ACE station in Union City. There is also the opportunity to create excellent access points via the future Quarry Lakes Parkway and new access roads within the WCA.



Figure 5. Land Use Compatibility: Union City BART



Source: AECOM, HDR, 2022



Environmental Constraints

Key environmental constraints that could impact the development of a potential layover facility at the Union City BART site are illustrated in **Figure 6**.

The environmental constraints related to the numbered call-outs in the figure are discussed below:

- 1. Hazards & hazardous materials: The entire area is a brownfield site (former PSSC steel mill), and the proposed layover facility would be constructed on a former slag heap rising 22 feet above ground level. The site has been capped with an engineered system of clay and other materials designed to prevent the infiltration of water into the slag and the exposure of the hazardous materials. While the site is currently otherwise vacant, construction of the layover facility may require (potentially costly) additional site mitigation/remediation to remove hazardous materials.
- 2. Hydrology & water quality: A small portion of the site immediately southeast of the BART station falls within a Federal Emergency Management Agency (FEMA) Special Flood Hazard Area and is susceptible to flooding during a 100-year flood.
- **3.** *Noise & vibration:* The proposed layover facility would result in increased train operations in close proximity to existing residences, particularly at the southeast corner of the layover site.

Overall, the Union City BART site performs well in terms of environmental constraints, with the largest potential concern associated with hazardous materials stemming from the site's previous use as a slag heap. Potential constraints in other resource areas are generally less critical and are unlikely to pose substantial risks or concerns if this site is selected for the proposed layover facility.

Operational Feasibility

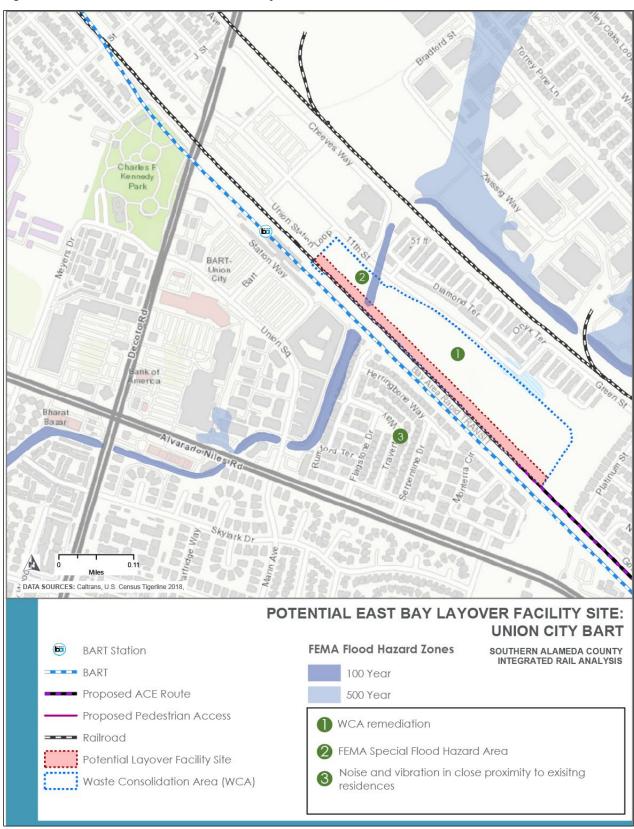
Figure 7 illustrates the existing rail lines in the SoCo rail study area, and the potential Union City BART site layover facility in relation to the ACE station at the Union City BART Station. The Union City BART layover site would be located along the UP Oakland Subdivision immediately south of the station.

The Union City BART layover facility site would be located just east of the UP Oakland Subdivision. Given this location is on the east side of the UP mainline tracks, the ACE station track, and platform would also need to be located on the east side of the UP mainline track to allow ACE trains to move between them without having to cross UP mainline tracks. These deadhead movements between the station and the layover facility would be negligible at the layover site.

Two layover tracks are assumed for initial configuration within the Union City BART layover facility site, though there is enough space to the east to allow for additional tracks in the future.



Figure 6. Environmental Constraints: Union City BART



Source: AECOM, HDR, 2022



Figure 7. Operational Feasibility: Union City BART

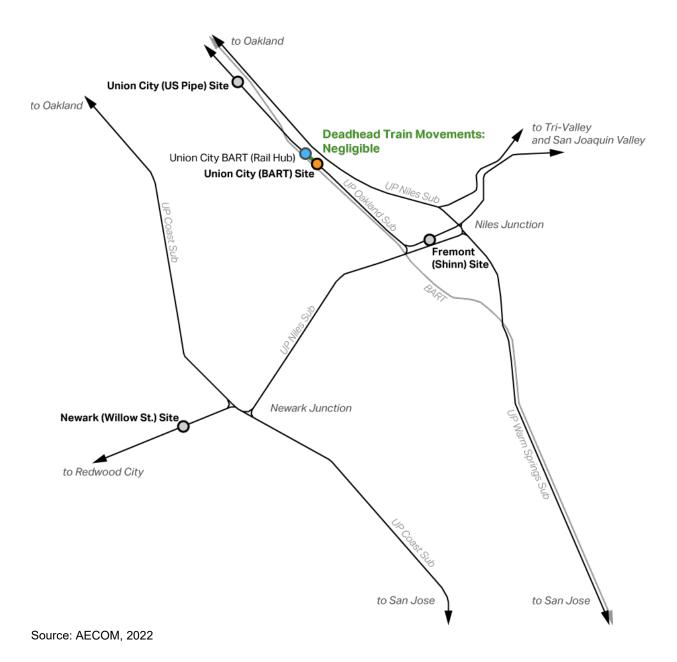


Figure 8 shows a progression of diagrams demonstrating how the train movements could be performed based on the three scheduling scenarios, with the assumption of two layover tracks being present within the layover facility footprint. This assumption applies to the Union City BART layover facility, as well as the Union City – US Pipe and Fremont – Shinn sites. This assumption (and therefore these diagrams) does not apply to the Newark – Willow Street layover facility site since the assumption for that site is three layover tracks, which would provide capacity that avoids the need to plan for how the reverse train would integrate with the



two inbound trains. Note, given there is a reversion-direction train, careful planning is needed to understand how trains interact in the vicinity of the station and layover facilities.

Scenario Reverse-direction departure is in between the inbound arrivals

Scenario Reverse-direction departure is last

Scenario Reverse-direction departure is last

Reverse-direction train from Union City (II) cannot departure is last

Reverse-direction train from Merced (M) cannot departure is last

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Figure 8. Train Movements Diagram to/from Layover Facility

The purpose of developing these scheduling scenarios is to gain an understanding of what schedule configuration would work best given the layover facilities in terms of train movements, which will then inform the development the overall systemwide schedule update for the ACE system, including the three Union City trains.

The three scheduling scenarios compared include:

- 1. Reverse-direction train departs the Union City BART Station platform prior to the arrival of the two inbound trains from Central Valley;
- 2. Reverse-direction train departs the Union City BART Station platform after the first inbound train arrives and before the second inbound train arrives from the Central Valley; and
- 3. Reverse-direction train departs the Union City BART Station platform after the two inbound trains from Natomas and Merced arrive.

Based on this operational configuration and proximity of the Union City BART layover facility site to the Union City Hub station, the operational pros and cons of this site used for the layover facility are provided below:

PROS

Required deadhead mileage and running time to/from the layover facility is negligible. This
eliminates the potential need for additional main track or other major corridor improvements



and maximizes operational efficiencies by reducing non-revenue movements and avoiding conflicts with freight and other passenger trains.

- The proximity of the layover facility to the station introduces substantial operational efficiencies with co-location of the station and layover site, making it possible to use the station track for both boarding/alighting and storage. This offers substantial benefits in reducing potential risk and cost associated with additional remediation for the WCA site, as a track layout only needing to accommodate one or two trains reduces the required site area and soil excavation. Crews would be able to easily walk between the station and the layover facility to perform light maintenance and cleaning for trains as needed.
- The platform location at the station would need to be on the east side of the UP ROW, given the location of the layover facility site is also envisioned to be immediately east of UP ROW, where there is more space than a location west of the UP ROW to accommodate the necessary facilities and amenities without obstructing or complicating BART station access. An east-side platform also provides ACE with better access and visibility to/from the street.

CONS

- The location south of the station necessitates train reversal at the platform when pulling into and out of the layover facility, which may result in increased dwell times at the platform and reduced operating flexibility.
- An east-side platform results in longer, potentially more complicated paths of travel for
 passengers transferring between ACE and BART. Potential additional main tracks in the
 future as part of the South Bay Connect project or this project may warrant a pedestrian
 tunnel or bridge in lieu of an at-grade crossing, requiring substantially more vertical
 circulation elements than would be necessary for a west-side platform.

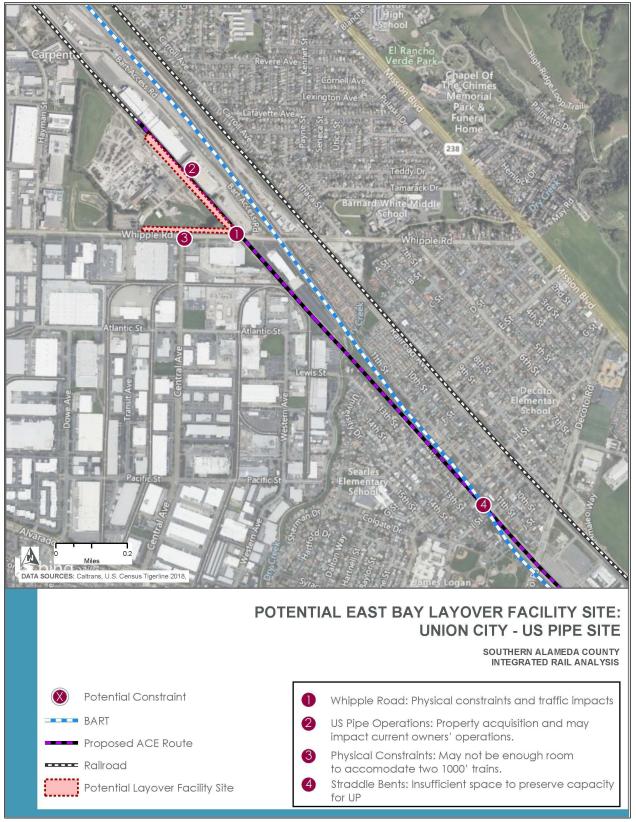
Overall, the Union City BART site performs well in terms of operational feasibility. While there are some cons associated with this location, they are substantially outweighed by the pros, including a minimal need for deadheading and no need for additional improvements to the rail corridor.

Union City – US Pipe Site

As depicted in Figure 2, the potential Union City – US Pipe layover facility is located approximately 1.5 miles north of the partially constructed pedestrian crossing over the UP Oakland Subdivision at the Union City BART Station. **Figure 9** shows that the potential layover facility is just west of the existing UP Oakland Subdivision and totally enclosed within the US Pipe production facility in the City of Union City. The US Pipe facility is approximately 66 acres and currently utilizes the UP Oakland Subdivision to import and export materials. Two potential layover facility locations were examined at the US Pipe site: along the west side of the existing UP Oakland Subdivision and along the north side of Whipple Road.



Figure 9. Project Complexity: Union City - US Pipe



Source: HDR, 2022



Project Complexity

As shown in Figure 9, there are four major constraints at the possible US Pipe site. The numbered call-outs in the figure correspond to the numbered bullet points below.

- 1. Whipple Road at-grade crossing: Currently the UP Oakland Subdivision traverses Whipple Road via an at-grade crossing. ACE trains would have to access the US Pipe site across Whipple Road in the AM peak period and then heading back to the Union City Station site in the PM peak period. These movements would create greater gate down times at Whipple Road and could degrade traffic flow.
- **2.** Extensive property acquisition: Both layover locations at the US Pipe site would require extensive property acquisition and may impact US Pipe's current and future operations.
- 3. Whipple Road constraints: The layover facility adjacent to Whipple Road may not have enough room for two 1000-foot layover tracks and would not accommodate the trains needed for ACE to service the Union City station.
- 4. Existing BART straddle bents: A straddle bent is a pier structure that spans a rail track or roadway. Near 12th Street and I Street in Union City, there is a straddle bent that elevates BART tracks over the UP Oakland Subdivision tracks. There are geometric constraints that would create insufficient space to preserve capacity for UP and provide a running track for deadhead ACE trains. Figure 10 shows the current alignment under the straddle bent and Figure 11 illustrates that there is currently room for two trains under the current straddle bent, but there would not be enough room for a third track.

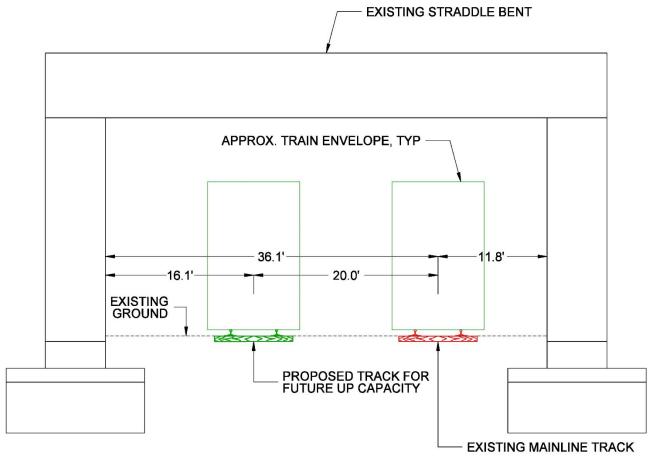
Figure 10. BART Straddle Bents: Union City - US Pipe



Source: AECOM, 2021



Figure 11. BART Straddle Bents: Union City - US Pipe



Source: HDR, 2022

It is also important to consider that one train would layover at the Union City Station and two trains would layover at US Pipe, this would cause unnecessary complexity for train staff, both conductors and maintenance. The Union City Station track would have to be a double-ended siding. There would be a need for one additional main track from the Union City Station to the US Pipe layover facility and there would need to be a modification to the BART straddle bents.

Table 2 shows the high-level ROM cost estimate for the Union City – US Pipe site. Cost estimates are conservative and developed based on readily available information and engineering judgment. The estimated cost for the Union City – US Pipe site would be roughly \$208,000,000 with the highest cost categories, aside from contingencies, related to the need to maintain UP's main line capacity and the likely additional track needed along the Oakland Subdivision.



Table 2. Cost Estimates: Union City - US Pipe

Union City – US Pipe			
Cost Category (all costs rounded)	Rough Order of Magnitude (ROM) Cost		
Layover Facility Cost	\$12,000,000		
Station Platform Cost	\$16,000,000		
Main Line Capacity Cost	\$78,000,000		
Remediation Costs	\$5,000,000		
Owner Costs	\$28,000,000		
Contingency	\$69,000,000		
ROM Totals	\$208,000,000		

Source: HDR: 2022

Land Use Compatibility

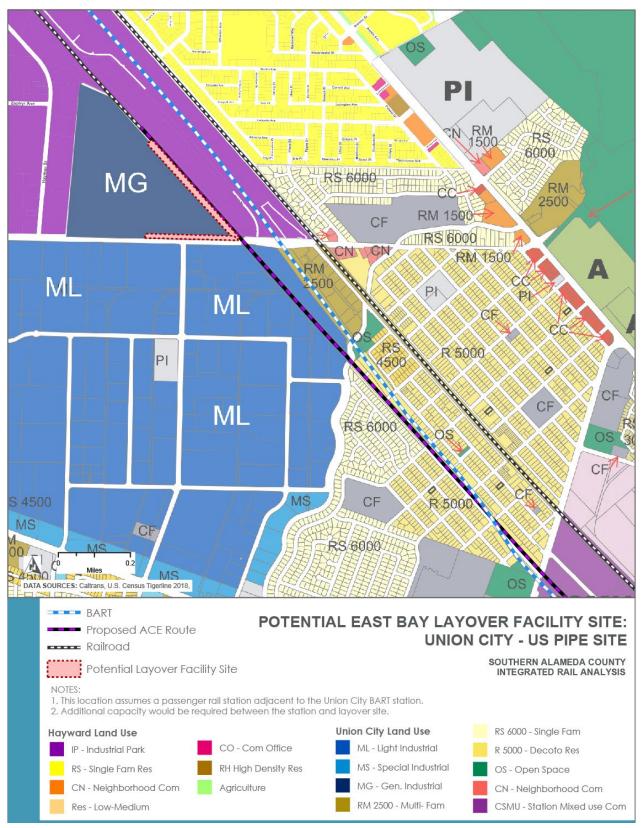
The land use context for the Union City – US Pipe site is illustrated in **Figure 12**. The site is located on an existing, active industrial property and is situated within an area that is zoned as "General Industrial" by the City of Union City. Nearby parcels within the City of Hayward are zoned as "Industrial Park". The pros and cons related to land use compatibility are described below:

PROS

- Adjacent and nearby land uses consist primarily of industrial (both light and heavy) and similar uses (e.g., wholesale retail, warehousing, etc.) and are compatible with the proposed layover facility. BART's Hayward Maintenance Complex is located opposite the site along the north/east edge of the UP Oakland Subdivision.
- The site is adjacent to existing transit/rail ROWs for the UP Oakland Subdivision and BART, which are compatible with the proposed layover facility and also prevent future development from encroaching onto the layover facility.
- The nearest residential land uses are located on the east side of the BART tracks, more than 500 feet from the site.
- Road access is available on the south side via Whipple Road, which will be widened in the
 future, improving traffic access and circulation. Future traffic volumes along Whipple Road,
 together with train movements at the UP Oakland Subdivision crossing, might indicate the
 need for grade separation, which could provide more geometric flexibility for the design of
 the layover facility.



Figure 12. Land Use Compatibility: Union City - US Pipe



Source: AECOM, HDR, 2022



CONS

- Heavy traffic volumes along Whipple Road (particularly after widening) may complicate layover facility access, absent a grade separation.
- The deadhead movements between Union City Station and the US Pipe site would traverse through a fairly dense residential neighborhood between Decoto Road and Whipple Road, where several homes are less than 100 feet from the existing track centerline along the UP Oakland Subdivision.

Overall, the land use compatibility is fairly high for the US Pipe site. There are compatible land uses surrounding the site and there is good access to the site via Whipple Road.

Environmental Constraints

Key environmental constraints that could impact the development of a potential layover facility at the Union City – US Pipe site are illustrated in **Figure 13**.

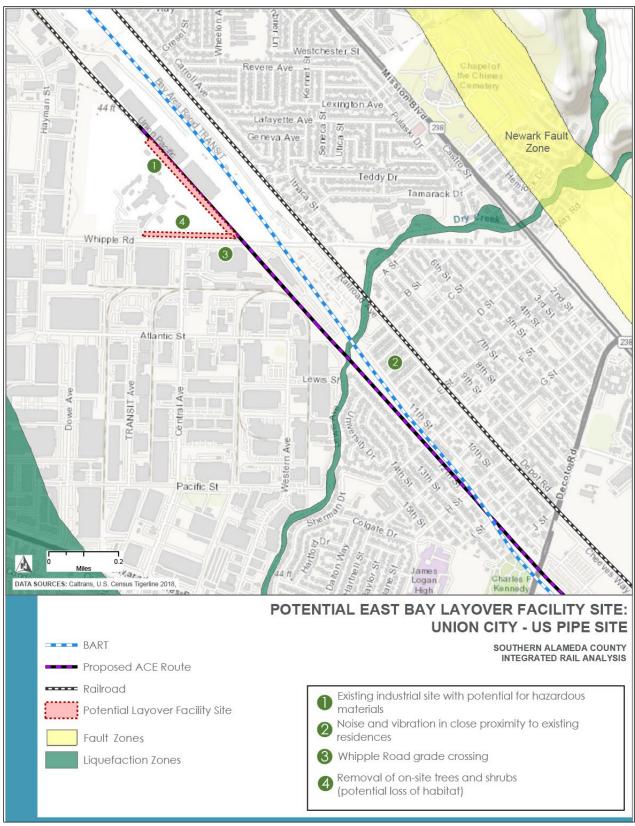
The environmental constraints at the potential Union City – US Pipe site called out in the figure are described below:

- 1. Hazards & hazardous materials: The site is an existing, active industrial use. The Alameda County Environmental Health Department (ACEHD) issued a Cease and Desist Order to US Pipe on December 20, 2000 to prohibit disposal of waste at the site, and a 70-acre portion of the US Pipe site underwent subsequent cleanup in August 2002 to address contamination caused by metal manufacturing. Given the extensive industrial history of the site, construction of the proposed layover facility may require (potentially costly) additional site mitigation/remediation to remove hazardous materials.
- 2. Noise & vibration: The proposed layover facility would result in increased train operations in close proximity to existing residences. Several residences between Whipple Road and Decoto Road would be located as close as 100 feet from the existing track centerline along the UP Oakland Subdivision.
- **3.** *Transportation:* Whipple Road is identified as a major truck route, which could result in short-term transportation impacts during construction activities at or near the grade crossing with the UP Oakland Subdivision.
- **4.** Biological resources: Depending on the location of the layover facility, construction may require the removal of existing large trees and shrubs at the site. Depending on the results of further analysis by a technical specialist (biologist), potential impacts to migratory birds or special status species may occur as a result of the station layover facility options.

Overall, the Union City – US Pipe site performs well in terms of environmental constraints and is generally similar to the Union City BART site. Similar to that site, the US Pipe site's long history as an industrial property could result in some risk associated with hazardous materials and associated remediation. However, there are also additional constraints (namely, in biological resources) that make the US Pipe site somewhat less attractive than the Union City BART site.



Figure 13. Environmental Constraints: Union City – US Pipe



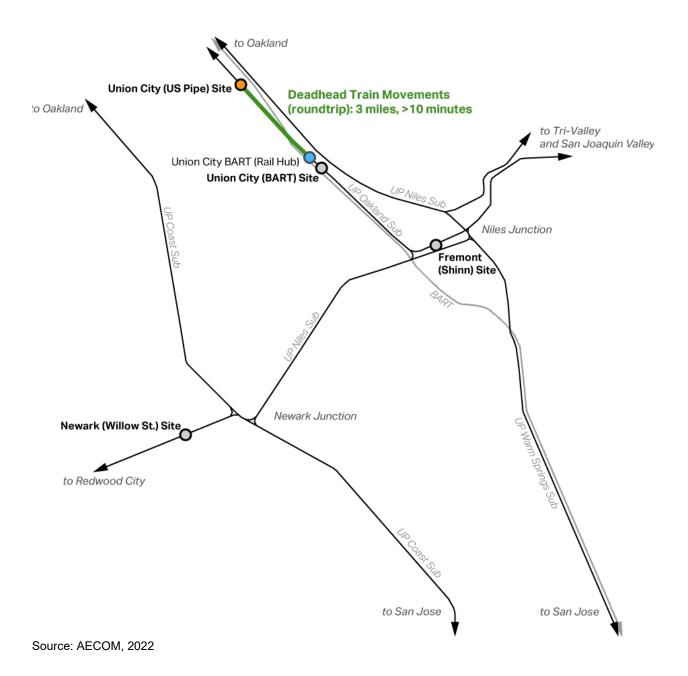
Source: HDR, 2022



Operational Feasibility

Figure 14 illustrates the existing rail lines in the SoCo rail study area, and the potential Union City – US Pipe site layover facility in relation to the ACE station at the Union City BART Station. The Union City – US Pipe layover facility site would be located along the UP Oakland Subdivision north of the station.

Figure 14. Operational Feasibility: Union City - US Pipe





The Union City – US Pipe layover facility site would be located west of the UP Oakland Subdivision ROW. Given this location is on the west side of the UP mainline tracks, the ACE station track and platform at the Union City Hub station would need to be located on the west side of the UP mainline track to allow ACE trains to move between them without having to cross UP mainline tracks as they access the layover site. In each direction, these deadhead movements between the station and the layover facility would be approximately 1.5 miles long and less than five minutes in duration. Two layover tracks are assumed for initial configuration within the layover facility.

Based on the operational configuration and proximity of the Union City – US Pipe layover facility site to the Union City Hub station, the operational pros and cons of this site as the layover facility are summarized below:

PROS

- Deadhead movements are relatively short, which results in better operational efficiencies and reduced potential for conflicts with freight trains.
- The location north of the station allows for natural, efficient train movements when transitioning between revenue and non-revenue operations, as there is no need to reverse train direction.
- The ideal platform location at the station would be on the west side of the UP ROW, which
 would allow for shorter, more convenient transfers between ACE and BART, with no (or only
 minimal) need for vertical circulation and grade changes.

CONS

- UP may require an additional main track between the station and the layover site to
 minimize conflicts with freight trains. This could involve substantial engineering challenges,
 including modifications to existing straddle bents supporting the BART aerial guideway and
 a potential grade separation at Whipple Road.
- There is limited space along the west side of the UP ROW at the BART station, which may
 present challenges for a west-side platform configuration. A west-side platform may
 complicate BART station access and also generally results in poorer access and visibility
 to/from street level for the ACE station.
- The station track could be used for storage/layover but requires transportation between the station and layover facility for crews performing light maintenance and cleaning.

Overall, the Union City – US Pipe site performs noticeably worse than the Union City BART site, primarily due to the significant engineering challenges associated with a potential additional main track between the station and the layover site. While this option has some potential benefits for operational flexibility and station functionality, these are substantially outweighed by the risk and cost implications of a potential additional main track.



Fremont - Shinn Street

As depicted in Figure 2, the potential Fremont – Shinn Street layover facility is located approximately 2.5 miles southeast of the planned at-grade pedestrian crossing over the UP Oakland Subdivision at the Union City BART Station. **Figure 15** shows the two possible layover facility locations at the Fremont – Shinn Street site, one on the north side of the existing UP mainline and the other on the south side.

Project Complexity

As seen in Figure 15, there are three major constraints at the possible Fremont – Shinn Street site, described below:

- 1. Clearance distance: There is minimal space between the existing tracks and the Shinn Pond embankment, making it difficult to add an additional track to accommodate UP's future capacity needs.
- 2. Additional main track and widening of Alameda Creek Bridge: In order to preserve future capacity for UP, it may be necessary to provide an additional main track between Union city and Fremont, which would require the widening of the existing UP bridge over Alameda Creek or the construction of a new bridge.
- **3.** *Property acquisition:* The layover facility would occupy a portion of the UP Fremont Yard and that capacity would need to be re-created elsewhere, if allowable at all.

As with the Union City – US Pipe site, this location assumes one train would lay over at the station, while two trains would lay over at the Fremont – Shinn Street layover facility. The dual locations may cause potential complexity for train staff, both conductors and maintenance crews.

Table 3 shows the high-level ROM cost estimate for the Fremont – Shinn Street site. Cost estimates are conservative and developed based on readily available information and engineering judgment. The approximate cost of the Fremont – Shinn Street site would be around \$169,000,000 with the highest cost categories, aside from contingencies, related to the preservation of main line capacity and likely need for an additional track to preserve UP's existing corridor.

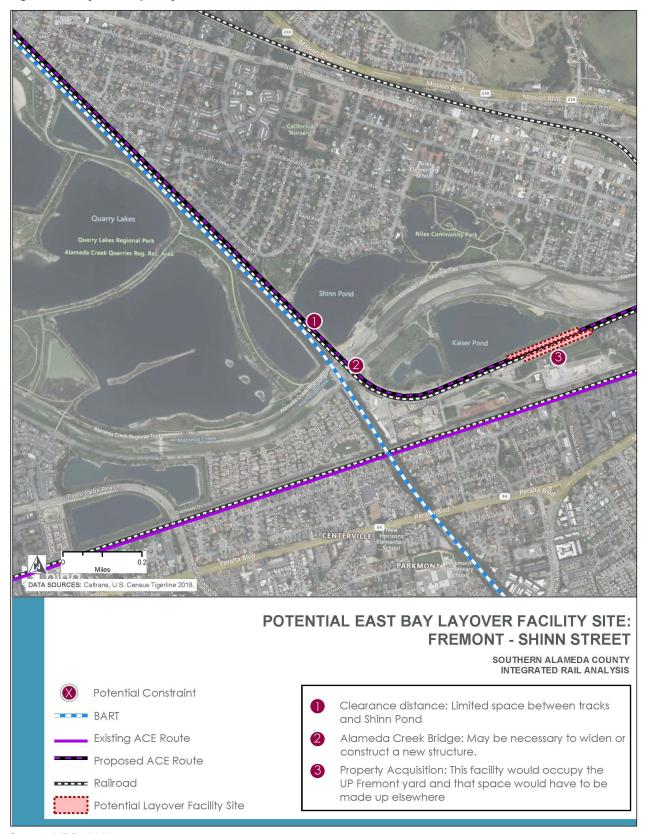
Table 3. Cost Estimates: Fremont - Shinn Street

Fremont – Shinn Street			
Cost Category (all costs rounded)	Rough Order of Magnitude (ROM) Cost		
Layover Facility Cost	\$13,000,000		
Station Platform Cost	\$10,000,000		
Main Line Capacity Cost	\$62,000,000		
Remediation Costs	\$5,000,000		
Owner Costs	\$23,000,000		
Contingency	\$56,000,000		
ROM Totals	\$169,000,000		

Source: HDR: 2022



Figure 15. Project Complexity: Fremont - Shinn Street



Source: HDR, 2022



Land Use Compatibility

The land use context for the Fremont – Shinn Street site is illustrated in **Figure 16**. The site is located immediately south of Kaiser Pond and Alameda Creek and is situated within an area that is zoned as "Industrial and Innovation" (specifically, "Service") by the City of Fremont. The area is also designated as a "Special Study Area" by the City's General Plan Map. The pros and cons related to land use compatibility are described below:

PROS

- Adjacent and nearby uses are generally compatible with the proposed layover facility and consist primarily of industrial uses, including trucking, warehousing, and a former drywall manufacturing facility.
- The site is situated within UP's Fremont Yard along the UP Oakland Subdivision and is near additional transit/rail ROWs, including the UP Niles Subdivision (Centerville Line) and BART.

CONS

- Road access is very limited and would likely be restricted to Shinn Street, passing through an existing residential neighborhood north of Peralta Boulevard.
- Land south of the Niles Centerville Line is largely built out with residential use.
- The City of Fremont's Special Study Area designation identifies a potential intermodal connection between ACE and BART, as well as potential TOD opportunities, for this area.
- Several private residences are located immediately east of the proposed site along Ford Lane.

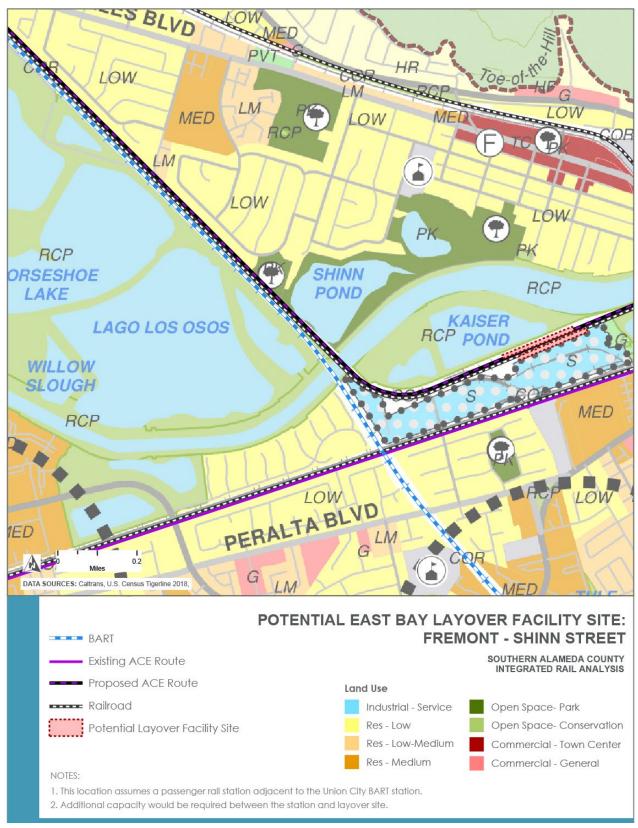
Overall, the land use compatibility is low for the Fremont – Shinn Street site. Although there are some compatible land uses surrounding the site, there are also substantial issues with the site, including limited roadway access and proximity to existing residential neighborhoods.

Environmental Constraints

Key environmental constraints that could impact the development of a potential layover facility at the Fremont – Shinn Street site are illustrated in **Figure 17**.



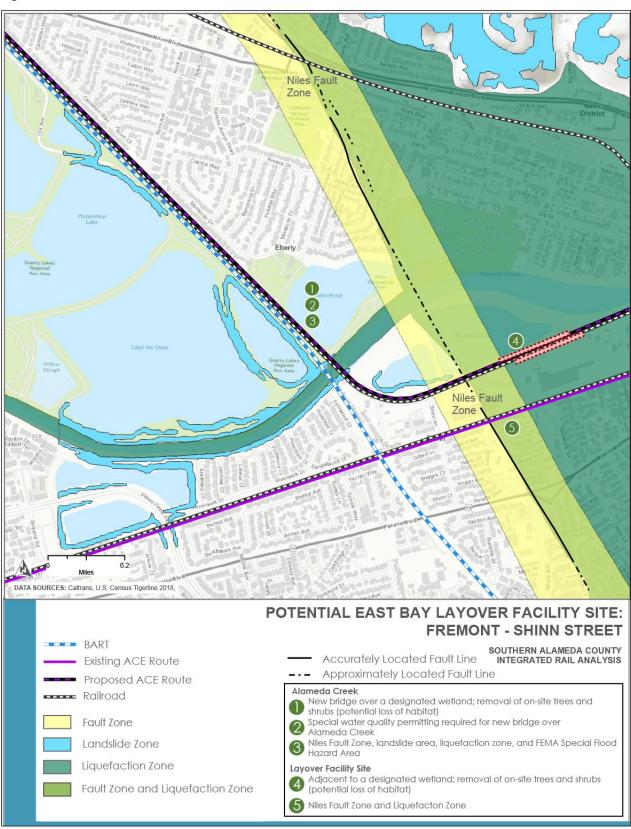
Figure 16. Land Use Compatibility: Fremont - Shinn Street



Source: AECOM, HDR, 2022



Figure 17. Environmental Constraints: Fremont – Shinn Street



Source: AECOM, HDR, 2022



The environmental constraints at the potential Fremont – Shinn Street layover site called out in Figure 17 are described below:

- 1. Biological resources: Improvements to the corridor between the station and layover facility may require a new bridge over a designated wetland (Alameda Creek) and the removal of existing large trees and shrubs, which may affect special status/sensitive species or migratory birds. A new bridge over Alameda Creek may also affect the South Bay Salt Pond Restoration Project, which aims to restore tidal marsh habitat, improve flood control, and restore the steelhead trout population at the mouth of Alameda Creek and up to 12 miles upstream. A new bridge for this layover site would be located approximately 9 miles upstream of the mouth of Alameda Creek.
- 2. Hydrology & water quality: A new bridge over Alameda Creek would require permits under the Clean Water Act (Sections 404 and 401) from the U.S. Army Corps of Engineers and the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) and a California Department of Fish & Wildlife (CDFW) Lakebed or Streambed Alteration Agreement.
- 3. Hazards & hazardous materials: The Alquist–Priolo Earthquake Fault Zones map shows that the corridor, between the station and the proposed layover facility, is located on the Niles Fault Zone. Portions of the corridor south of Kaiser Pond and over Alameda Creek are in a landslide area and liquefaction zone according to the California Department of Conservation. Alameda Creek is also designated by FEMA as SFHA Zone A (susceptible to flooding during a 100-year flood).
- **4.** Biological resources: The proposed layover facility site is adjacent to a designated wetland and there are several existing large trees and shrubs at or near the site. Construction of the facility may affect special status/sensitive species or migratory birds.
- **5.** Hazards & hazardous materials: The Alquist–Priolo Earthquake Fault Zones map shows that both options for the proposed layover facility site are adjacent to and/or within the Niles Fault Zone. Both site options are also within a liquefaction zone according to the California Department of Conservation.

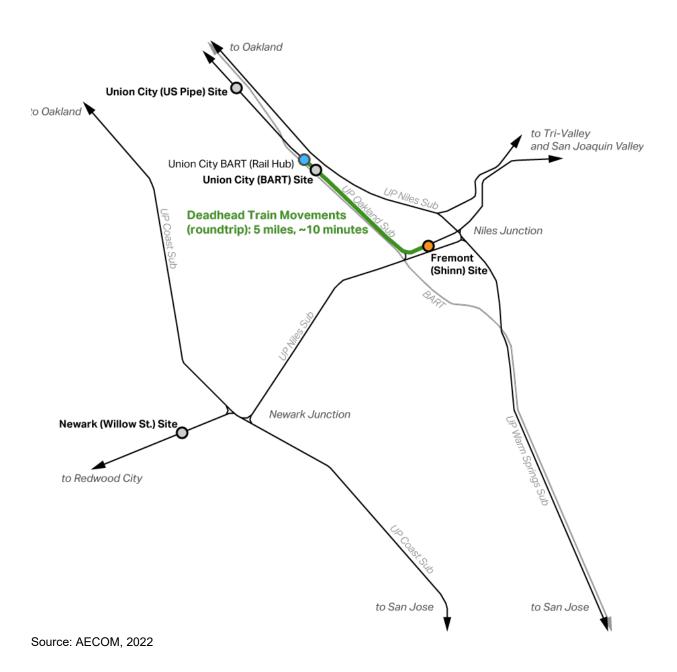
Overall, the Fremont – Shinn Street site performs noticeably worse than the Union City options in terms of environmental constraints. Given the distance between the station and potential layover facility and the likely need for improvements to the rail corridor, environmental impacts under the Fremont – Shinn Street option could be spread over a larger geographical area than under the Union City options. The need for a potential new bridge crossing Alameda Creek may result in impacts to biological resources, hydrology, and water quality and require multiple environmental permits. The preliminary analysis of hazards and hazardous materials also shows concerns related to earthquakes, liquefaction, and flooding.



Operational Feasibility

Figure 18 illustrates the existing rail lines in the SoCo rail study area, and the potential Fremont – Shinn Street site layover facility in relation to the ACE station at the Union City BART Station.

Figure 18. Operational Feasibility: Fremont – Shinn St.



The Fremont – Shinn Street layover site would be located along the UP Oakland Subdivision south of the station, within a portion of UP's existing Fremont Yard. While there are options for where the layover tracks could be designed (either the north or south side of the UP mainline track), locating the station platform on the east side is specified for this site. This is to



accommodate the possible need for a freight connector track between the UP Oakland Subdivision and the UP Niles Subdivision. If the ACE station platform was located on the west side of the UP main track, it would be necessary to have deadheading ACE trains cross over UP mainline track and the connector track. Deadhead movements between the station and the layover facility would be approximately 2.5 miles long and five minutes in travel time in each direction. Two layover tracks are assumed for initial configuration within the layover facility.

Based on the operational configuration and proximity of the Fremont – Shinn Street layover facility site to the Union City Hub station, the operational pros and cons of this site as the layover facility are summarized below:

PROS

• The station platform location at the station would be on the east side of the UP ROW, where there is more space to accommodate the necessary facilities and amenities without obstructing or complicating BART station access. An east-side platform also provides ACE with better access and visibility to/from the street. A west-side platform is possible but may conflict with a potential future track connection between the UP Oakland and Niles Subdivisions near the proposed layover site.

CONS

- Deadhead movements are longer, which may reduce operational efficiencies and increase the potential for conflicts with freight trains.
- The location south of the station necessitates train reversal at the platform when pulling into and out of the layover facility, which may result in increased dwell times at the platform and reduced operating flexibility.
- The reverse movements also result in additional use of UP's Oakland Subdivision, thus likely requiring an additional main track between the station and the layover site to minimize conflicts with freight trains. This could involve substantial engineering and environmental challenges, including a new bridge crossing over Alameda Creek.
- As the proposed layover site is within UP's Fremont Yard, UP may require replacement of lost track capacity.
- The station track could be used for storage/layover but requires transportation between the station and layover facility for crews performing light maintenance and cleaning.

Overall, the Fremont – Shinn Street site performs noticeably worse than the Union City BART site and somewhat worse than the Union City – US Pipe site. Increased deadhead mileage and running times under this option would result in poorer operating efficiencies and reliability, and a potential additional main track comes with the significant engineering and environmental challenges of a new bridge over Alameda Creek.



Newark - Willow Street

As depicted in Figure 2, the potential Newark – Willow Street layover facility is located approximately 7.5 miles southeast of the Union City BART Station. **Figure 19** shows the two possible layover facility locations at the Newark – Willow Street site, one on the north side of the existing mainline track and the other on the south side, while **Figure 20** displays potential constraints that exist upstream of the Newark – Willow Street site near Shinn Junction. In order for ACE trains to access the Newark – Willow Street layover facility, they would need to move from the Oakland Subdivision to the Niles Centerville Line, and no track connection (wye) currently exists that allows for this necessary movement. As a result, a new connection would need to be built, resulting in construction and impacts at the location shown in Figure 20.

Project Complexity

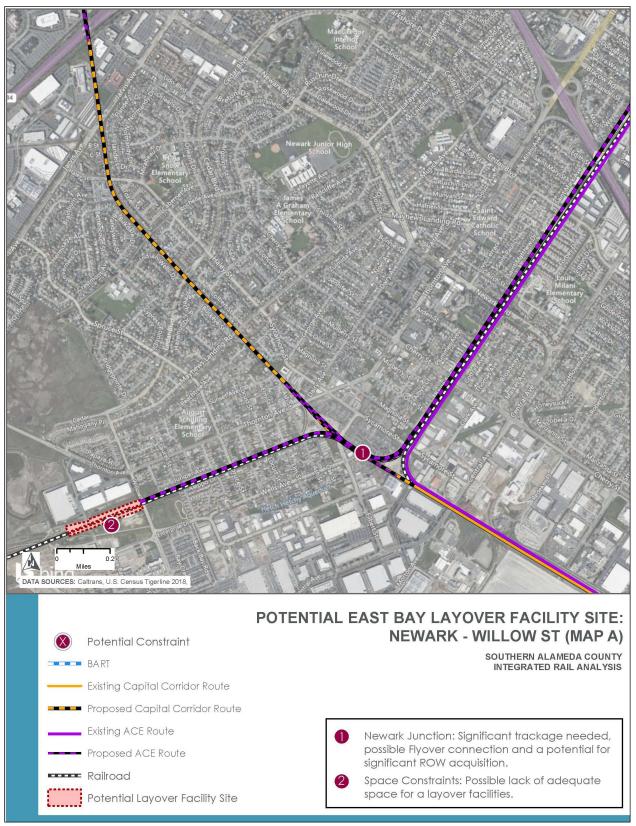
As seen in Figure 19 and Figure 20, there are four major constraints at the potential Newark -- Willow Street site. These constraints are discussed below:

- 1. Newark Junction and other additional trackage needed: This site would require significant additional trackage or a flyover connection at the Newark Junction, potentially requiring significant ROW acquisition. There would be a need for a staging track along the Niles Subdivision between I-880 and control point (CP) Cherry to hold deadhead trains waiting to cross the Coast Subdivision. In addition, there would be the need for an additional track from CP Carter to the layover site.
- 2. Constrained location of layover facility: There is potential lack of adequate area for a layover facility on the west side of Willow Street.
- 3. Additional main track and widening of Alameda Creek Bridge: In order to preserve future capacity for UP, it may be necessary to provide an additional main track between Union City and Fremont, which would require the widening of the existing UP bridge over Alameda Creek or the construction of a new bridge.
- **4.** Tunneling under BART: There would be a need to construct a tunnel under the BART embankment near Shinn Street to provide the necessary connection between the UP Oakland Subdivision and the Niles Centerville Line.

This layover facility would be a stub-ended three-track facility, accommodating three trains and facilitating daily maintenance activities.



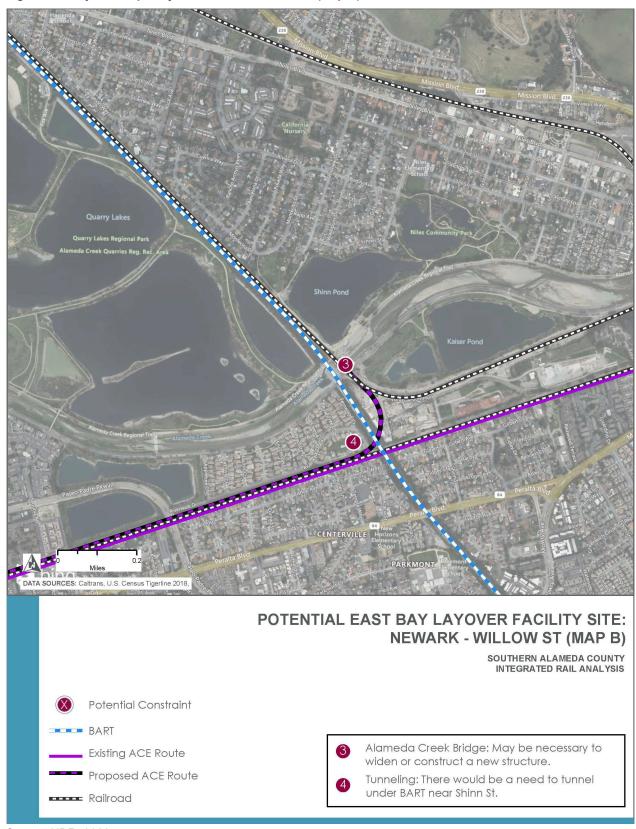
Figure 19. Project Complexity: Newark - Willow Street (Map A)



Source: HDR, 2022



Figure 20. Project Complexity: Newark - Willow Street (Map B)



Source: HDR, 2022



Table 4 shows the high-level ROM Cost estimate for the Newark – Willow Street site. Cost estimates are conservative and developed based on readily available information and engineering judgment. The approximate cost of the Newark – Willow Street site would be approximately \$270,000,000, with the highest cost categories, aside from contingencies, related to the main line capacity improvements (i.e., likely new tracks and bridges) needed to preserve UP's existing corridor and the tunnel under BART needed to connect the Oakland Subdivision to the Niles Centerville Line.

Table 4. Cost Estimates: Newark - Willow Street

Newark – Willow Street						
Cost Category (all costs rounded)	Rough Order of Magnitude (ROM) Cost					
Layover Facility Cost	\$13,000,000					
Station Platform Cost	\$10,000,000					
Main Line Capacity Cost	\$120,000,000					
Remediation Costs	\$1,000,000					
Owner Costs	\$36,000,000					
Contingency	\$90,000,000					
ROM Totals	\$270,000,000					

Source: HDR: 2022

Land Use Compatibility

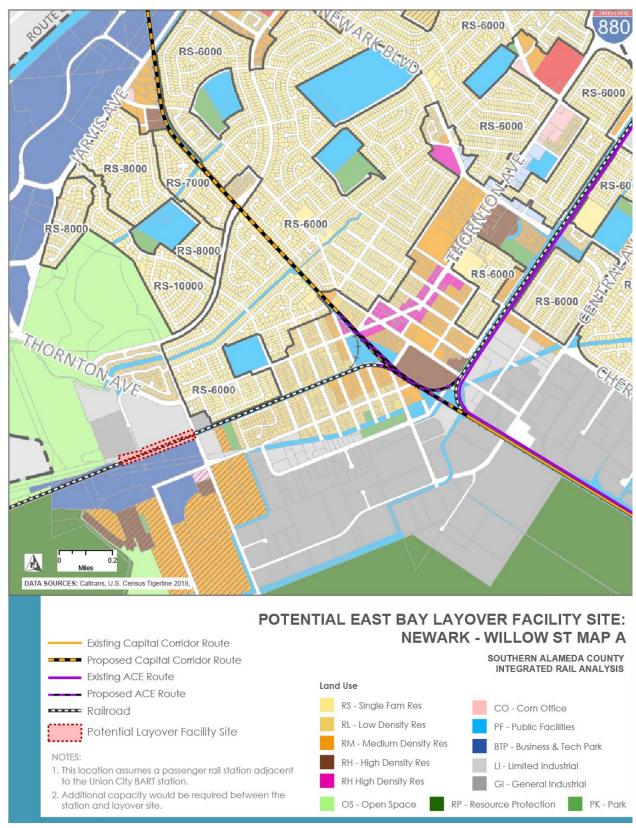
The land use context for the Newark – Willow Street site is illustrated in **Figure 21**, with **Figure 22** illustrating the land uses upstream of the Newark – Willow Street site near Shinn Junction. The site is situated on vacant, undeveloped land zoned as "Business and Technology Park" and "Limited Industrial" by the City of Newark. The entirety of the areas south of the Dumbarton Line at this location are targeted for TOD by the City as part of the Bayside Newark plan (formerly known as the Dumbarton TOD plan). The pros and cons related to land use compatibility are described below:

PROS

- The sites are located on undeveloped property adjacent to the out-of-service Dumbarton
 Line. The Bayside Newark plan envisions a future Dumbarton Transit Station at this location
 on the Dumbarton Rail Corridor service, which could offer some synergistic long-term
 opportunities.
- Existing uses in the surrounding area are limited, but they consist primarily of industrial/warehousing, with some residential development farther away.
- There is good roadway access to the site via Willow Street.



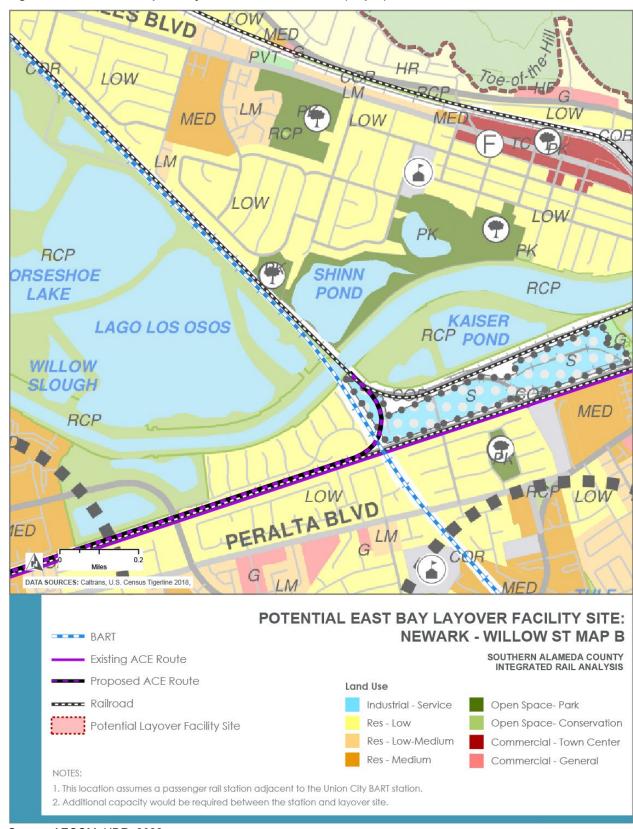
Figure 21. Land Use Compatibility: Newark - Willow Street (Map A)



Source: AECOM, HDR, 2022



Figure 22. Land Use Compatibility: Newark - Willow Street (Map B)



Source: AECOM, HDR, 2022



CONS

- The proposed layover facility would require a new connection of the Oakland Subdivision with the Niles Subdivision/Centerville Line (near Shinn Street), impacting an existing residential neighborhood immediately to the west of the BART ROW, south of Alameda Creek.
- The layover facility could conflict with the vision established in the Bayside Newark plan, which includes a Dumbarton Transit Station at this location and supporting mixed-use TOD immediately south of the Dumbarton Line.
- The proposed layover facility may also require property acquisition from the adjacent Ohlone Humane Society Wildlife Rescue Center.

Environmental Constraints

Key environmental constraints that could impact the development of a potential layover facility at the Newark – Willow Street site are illustrated in **Figure 23**, with **Figure 24** showing the environmental constraints upstream of the Newark – Willow Street site near Shinn Junction.

The environmental constraints at the potential Newark – Willow Street layover site, called out in Figure 23 related to the layover facility site, are described below:

- 1. Land use & planning: The proposed layover facility would be located on the site of a planned future rail station as envisioned under the Bayside Newark plan (Dumbarton TOD Specific Plan).
- **2.** Biological resources: The site is adjacent to a designated wetland and may affect special status/sensitive species or migratory birds, including the salt marsh harvest mouse, a known federal- and state-listed endangered species.
- **3.** Hazards & hazardous materials: The site is within and surrounded by a liquefaction zone according to the California Department of Conservation. The site is also designated by FEMA as SFHA Zone A (susceptible to flooding during a 100-year flood).
- **4.** *Transportation:* Deadhead movements between the station and the layover facility would result in increased train traffic at multiple grade crossings along the Centerville Line, through Newark Junction, and along the Dumbarton Line, including crossings with several major arterial and collector roadways (Fremont Boulevard, Blacow Road, Cedar Boulevard, Cherry Street, and Willow Street).
- **5.** *Noise & vibration:* The proposed layover facility would result in new train operations in inactive or lightly used corridors (Dumbarton Line) and in close proximity to existing residences. Many existing residences along the Centerville Line and Dumbarton Line would be located as close as 100 feet or less from the existing track centerline.

The environmental constraints at the potential Newark – Willow Street layover site, called out in Figure 24 related to the improvements near Alameda Creek, are described below:

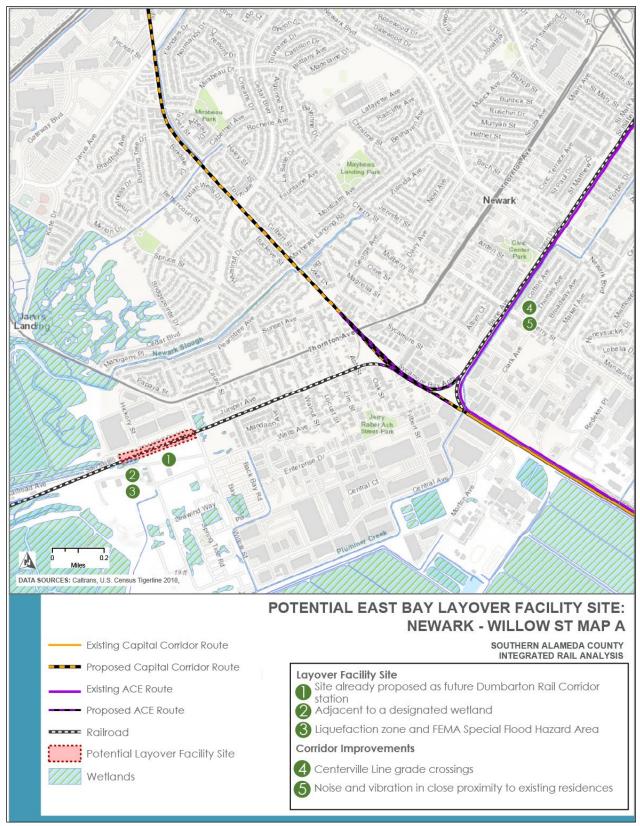


- 6. Biological resources: Improvements to the corridor between the station and layover facility may require a new bridge over a designated wetland (Alameda Creek) and the removal of existing large trees and shrubs, which may affect special status/sensitive species or migratory birds. A new bridge over Alameda Creek may also affect the South Bay Salt Pond Restoration Project, which aims to restore tidal marsh habitat, improve flood control, and restore the steelhead trout population at the mouth of Alameda Creek and up to 12 miles upstream.
- 7. Hydrology & water quality: A new bridge over Alameda Creek would require permits under the Clean Water Act (Sections 404 and 401) from the U.S. Army Corps of Engineers and the SFBRWQCB and a CDFW Lakebed or Streambed Alteration Agreement.
- 8. Hazards & hazardous materials: The Alquist–Priolo Earthquake Fault Zones map shows that the corridor between the station and the proposed layover facility is located on the Niles Fault Zone. Portions of the corridor south of Kaiser Pond and over Alameda Creek are in a landslide area and liquefaction zone according to the California Department of Conservation. Alameda Creek is also designated by FEMA as SFHA Zone A (susceptible to flooding during a 100-year flood).

Overall, the Newark – Willow Street layover facility site performs the worst among the four options. It shares many of the potential environmental constraints identified for the Fremont – Shinn Street option, with additional potential impacts in other resource areas (transportation) and a larger geographical extent.



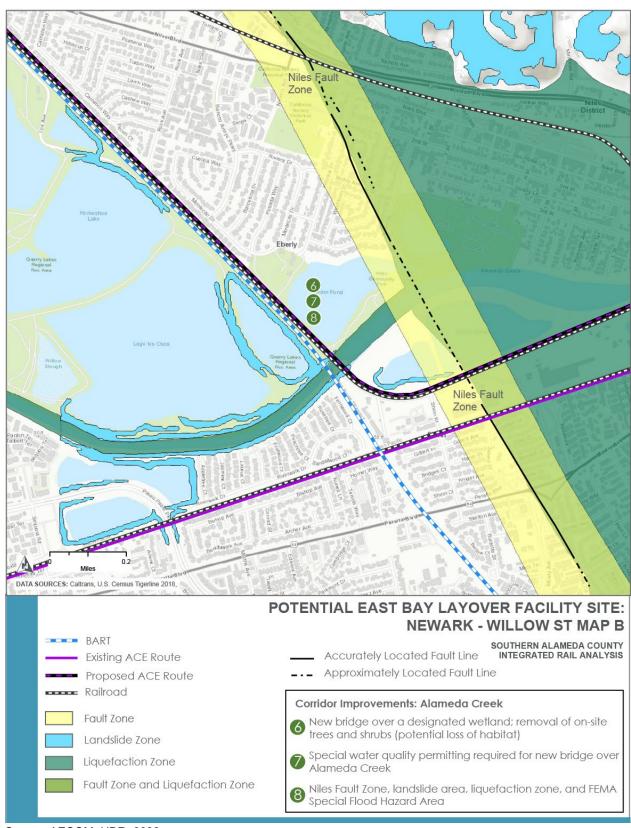
Figure 23. Environmental Constraints: Newark - Willow Street (Map A)



Source: AECOM, HDR, 2022



Figure 24. Environmental Constraints: Newark – Willow Street (Map B)



Source: AECOM, HDR, 2022



Operational Feasibility

Figure 25 illustrates the existing rail lines in the SoCo rail study area, and the potential Newark – Willow Street layover facility site in relation to the ACE station at the Union City BART Station. The Newark – Willow Street layover facility site would be located along the Dumbarton Line.

Figure 25. Operational Feasibility: Newark -- Willow St.





The Newark – Willow Street layover facility site would be located either immediately north or immediately south of the Dumbarton Rail Corridor. Currently, no trains operate along the Dumbarton Rail Corridor. In the future, rail may be re-established along the Dumbarton Rail Corridor. A new track connection would be needed between the UP Oakland Subdivision and UP Niles Subdivision, likely built on the west side of the UP mainline (along the Oakland Subdivision), requiring the ACE station track and platform at the Union City Hub station to be located on the west side of the UP mainline track. This would allow ACE trains to move along the Oakland Subdivision without needing to cross UP mainline tracks as they access the layover site.

Deadhead movements between the station and the layover facility, traveling on portions of the UP Oakland, Niles, and Coast Subdivisions, would be approximately 7.5 miles long and 15 minutes or more in travel time in each direction. Three layover tracks are assumed for initial configuration within the layover facility site.

Based on the operational configuration and proximity of the Newark – Willow Street layover facility site to the Union City Hub station, the operational pros and cons of this site as the layover facility are summarized below:

PROS

- The ideal platform location at the station would be on the west side of the UP ROW, which
 would allow for shorter, more convenient transfers between ACE and BART, with no (or only
 minimal) need for vertical circulation and grade changes.
- This option would be co-located with a planned station on the Dumbarton Rail Corridor service and offers potential long-term synergistic opportunities.

CONS

- Deadhead movements are substantially longer than under any of the other options, which is likely to impact operational efficiencies and increase the potential for conflicts with freight and passenger trains.
- UP may require segments of additional main track between the station and the layover site
 to minimize conflicts with freight trains. This could involve substantial engineering and
 environmental challenges, including a new bridge crossing over Alameda Creek, a new
 track connection near the Shinn industrial area between the UP Oakland and Niles
 Subdivisions, a new siding along the Centerville Line to hold trains, and an additional main
 track on the Dumbarton Line between Newark Junction and the layover site.
- The location south of the station necessitates train reversal at the platform when pulling into and out of the layover facility, which may result in increased dwell times at the platform and reduced operating flexibility.
- There is limited space along the west side of the UP ROW at the BART station, which may
 present challenges for a west-side platform configuration. A west-side platform may
 complicate BART station access and also generally results in poorer access and visibility
 to/from street level for the ACE station.



 Potential use of the station track for storage/layover would be limited, as the longer distance to/from the station would likely require separate maintenance and cleaning crews at the station and at the layover facility.

Overall, the Newark – Willow Street site performs the worst among the four site options in terms of operational feasibility, primarily due to significant drawbacks related to the extended distance between the layover facility and the station. While there are potential long-term synergies with a future station on the Dumbarton Rail Corridor service, the scale of potential corridor improvements to facilitate train movements to/from the layover facility is substantially larger than the other options. These potential improvements also come with significant engineering and environmental challenges (and, consequently, substantial risk and cost implications) for implementation of a layover facility in the Mid-Term Horizon.

While the feasibility analysis of the Newark – Willow Street site shows that it is generally not an ideal location for a stand-alone layover facility in the Mid-Term Horizon from an operations perspective, the site has substantial potential for a possible future transit station as originally envisioned under the Bayside Newark (formerly, Dumbarton TOD) plan. The site's location on vacant land along a rail corridor (Dumbarton Line) and near Newark Junction, where the UP Coast Subdivision and UP Niles Centerville Line intersect, makes it ideal for consideration as a longer-term rail hub. With the potential development of a rail station at this location and passenger rail service across the Dumbarton rail bridge, SJRRC may also consider potential future options to utilize the rail bridge for ACE service to the Peninsula and Silicon Valley.

A station at the Newark – Willow Street site could serve a number of important rail services, including the following:

- Future Dumbarton Rail Corridor service connecting Southern Alameda County with the Peninsula, providing a new Transbay rail crossing between two key Bay Area markets. In the longer-term timeframe, there is also an opportunity to consider interlining this service with the Caltrain corridor to provide one-seat rides to/from San Francisco.
- Tri-Cities shuttle service, providing local rail service within Union City, Fremont, and Newark
 and securing a high-quality BART connection for communities located outside the BART
 corridor. This could be implemented as a first phase of a Dumbarton Rail Corridor service.
- Long-term ACE extension to connect ACE commuter rail markets in eastern Alameda County and the San Joaquin Valley directly with the Peninsula via the Dumbarton Rail Bridge. In the longer-term timeframe, there is also potential to consider extending this service directly to/from San Francisco.

Layover Site Feasibility Analysis Comparison

As discussed in the methodology section, each of the four potential layover facility sites are analyzed for Project Complexity, Land Use Compatibility, Environmental Constraints, and Operational Feasibility. Across each category, each site is provided a rating from 1 to 5, with 1 being the most feasible/favorable and 5 being the least feasible/favorable. **Table 5** below shows the results of these ratings.



Table 5. Layover Site Comparison Matrix

Site	Project Complexity	Land Use Compatibility	Environmental Constraints	Operational Feasibility	
Union City BART	1	3	1	1	
Union City – US Pipe	3	2	2	2	
Fremont – Shinn St.	2	2	3	3	
Newark - Willow St.	5	4	4	5	

Source: HDR, 2022

Table 5 shows that the Union City BART site is the most feasible and most favorable location for the SoCo Rail Layover Facility in the mid-term horizon. The Union City – US Pipe site and the Fremont – Shinn Street site performed second and third, with the Newark – Willow Street site being the least feasible option for a potential layover facility.

Preliminary Station Platform and Layover Facility Concepts

As a result of this analysis, the Union City BART site is identified as the best performing layover facility option and recommended for advancement to detailed planning in the SoCo Rail Study. As part of the next phase, two options for an integrated station platform and layover facility design concept have been developed. This section describes these preliminary designs and provides preliminary ROM cost estimates for each option.

Option 1

The first option for a preliminary concept for an ACE integrated station platform and layover facility at the Union City BART site would be located south of the partially constructed at-grade pedestrian crossing. This option would utilize the at-grade pedestrian crossing, once finished, for access between the station platform and developments to the east, over to the Union City BART Station. This preliminary concept can be found in **Attachment B**.

Option 2

The second option for a preliminary concept for an ACE integrated station platform and layover facility at the Union City BART site would be located in-line with the partially constructed atgrade pedestrian crossing. This option would not utilize the at-grade pedestrian crossing and would result in the construction of a grade-separated pedestrian crossing for access between the station platform and developments to the east, over to the Union City BART Station. This preliminary concept can be found in Attachment B.



ROM Cost Estimates

The ROM cost estimate presented in the Project Complexity section of the Union City BART site analysis was based on the more expensive Option 2, described above. **Table 6** illustrates the ROM cost differential between the Option 1 and Option 2.

Table 6. ROM Cost Estimates for Union City BART Option 1 and Option 2

Cost Category (all costs rounded)	Union City BART Option 1	Union City BART Option 2		
Layover Facility Cost	\$23,000,000	\$20,000,000		
Station Platform Cost	\$10,000,000	\$15,000,000		
Main Line Capacity Cost	\$-	\$-		
Remediation Costs	\$50,000,000	\$50,000,000		
Owner Costs	\$21,000,000	\$21,000,000		
Contingency	\$52,000,000	\$53,000,000		
ROM Totals	\$156,000,000	\$159,000,000		

Source: HDR, 2022

As seen in Table 6, there is a slight difference in the ROM cost estimate between the two integrated station platform and layover facility concepts. The major components of the price difference are the modifications needed to the pedestrian crossing and the track requirements, given the option to avoid the pedestrian crossing (Option 1) or construct a grade-separated crossing (Option 2).

Next Steps

This technical memorandum represents the work done in Phase 2 of the SoCo Rail Study to identify the most feasible and favorable location for a layover facility. The results of these analyses were shared with staff from each of the three cities in which layover facilities have been proposed for evaluation – *Union City, Fremont, and Newark* – as well Alameda CTC to get their input on the analysis and preliminary preferred location. These stakeholders agreed that the Union City BART site is the most feasible and favorable site considering all four analysis categories and should advance for detailed analysis in Phase 2 of the SoCo Rail Study analysis, which will include further operational development, advanced conceptual design, equity analysis, and development of a rail Preliminary Study Report.



Glossary of Acronyms

ACE Altamont Corridor Express

ACEHD Alameda County Environmental Health Department

Alameda CTC Alameda County Transportation Commission

BART Bay Area Rapid Transit

CAD Computer-Aided Design

CalSTA California State Transportation Agency

CCJPA Capitol Corridor Joint Powers Authority

CDFW California Department of Fish & Wildlife

CEQA California Environmental Quality Act

FEMA Federal Emergency Management Agency

GIS Geographic Information System

HSR High-Speed Rail

MTC Metropolitan Transportation Commission

NEPA National Environmental Policy Act

PSSC Pacific States Steel Corporation

ROM Rough Order of Magnitude

ROW Right-of-Way

SFBRWQCB San Francisco Bay Regional Water Quality Control Board

SJRRC San Joaquin Regional Rail Commission

TOD Transit-Oriented Development

UP Union Pacific Railroad

WCA Waste Consolidation Area



Attachments

Attachment A: Environmental Constraints Preliminary Mapping and Analysis

Attachment B: ACE Integrated Station Platform and Layover Facility at the Union City BART Site – Options 1 & 2



Attachment A: Environmental Constraints Preliminary Mapping and Analysis

SOUTHERN ALAMEDA COUNTY INTEGRATED RAIL ANALYSIS LAYOVER FACILITY ALTERNATIVES ENVIRONMENTAL CONSTRAINTS

	Option 1 (Union City BART)	Option 2 (Union City – US Pipe)		LAYOVER FACILITY OPTIONS Option 3 (Fremont – Shinn Street)		Option 4 (Newark – Willow Street)		
RESOURCE AREA / CHECKLIST ITEM		Layover Facility	Corridor Improvements	Layover Facility	Corridor Improvements	Layover Facility	Corridor In North of Alameda Creek (shared with Option 3)	provements South/west of Alameda Creek
Aesthetics a) Have a substantial adverse effect on a scenic vista?	No substantial adverse effect on a scenic vista.	No substantial adverse effect on a scenic vista.	No substantial adverse effect on a scenic vista.	No substantial adverse effect on a scenic vista.	No substantial adverse effect on a scenic vista.	Urbanized area. No scenic resources. Project would not have the scale to	No substantial adverse effect on a scenic vista.	Urbanized area. No scenic resources. Project would not have the scale to
b) Substantially damage scenic resources, including, but not limited to, trees, rock		No scenic resources. Project would not have the scale to impact mountain	No scenic resources. Project would not have the scale to impact mountain	No scenic resources. Project would not have the scale to impact mountain	No scenic resources. Project would not have the scale to impact mountain	impact mountain ranges. Flat terrain. No scenic resources. Project would not have the scale to impact mountain.	No scenic resources. Project would not have the scale to impact mountain	impact mountain ranges. Flat terrain. No scenic resources. Project would not have the scale to impact mountain
outcroppings, and historic buildings within a state scenic highway?	ranges. Flat terrain. No scenic highways surrounding this footprint.	ranges. Flat terrain. No scenic highways surrounding this footprint.	ranges. Flat terrain. No scenic highways surrounding this footprint.	ranges. Flat terrain. No scenic highways surrounding this footprint.	ranges. Flat terrain. No scenic highways surrounding this footprint.	ranges. Flat terrain. No scenic highways surrounding this footprint.	ranges. Flat terrain. No scenic highways surrounding this footprint.	ranges. Flat terrain. No scenic highways surrounding this footprint.
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly excessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?		Within an urbanized area.	Within an urbanized area	Within an urbanized area.	Within an urbanized area.	Within an urbanized area.	Within an urbanized area.	Within an urbanized area.
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	Security lighting but in an urbanized area with substantial amount of light.	Security lighting but in an urbanized area with substantial amount of light.	Security lighting but in an urbanized area with substantial amount of light.	Security lighting but in an urbanized area with substantial amount of light.	Security lighting but in an urbanized area with substantial amount of light.	Security lighting but in an urbanized area with substantial amount of light.	Security lighting but in an urbanized area with substantial amount of light.	Security lighting but in an urbanized area with substantial amount of light.
Air Quality a) Conflict with or obstruct implementation of the applicable air quality plan?							to Dust control measures are implemented during construction activities prior to t issuance of any Grading Permit. Long-term operation of the proposed Project would not result in significant air pollutant emissions.	
	Bay Area Air Quality Management District: The monitoring data from 2017 shows that air quality as a result of exceeding O3 and PM.2.5 and PM.10 standards are problematic in the San Francisco Bay	Bay Area Air Quality Management District: The monitoring data from 2017 shows that air quality as a result of exceeding O3 and PMZ.5 and PMI O standards are problematic in the San Francisco Bay Area. An Air Quality Analysis would be required for construction (emissions	Bay Area Air Quality Management District: The monitoring data from 2017 shows that air quality as a result of exceeding O3 and PMZ.5 and PMI0 standards are problematic in the San Francisco Bay Area. An Air Quality Analysis would be required for construction (emissions	Bay Area Air Quality Management District: The monitoring data from 2017 shows that air quality as a result of exceeding O3 and PM2.5 and PM10 standards are problematic in the San Francisco Bay	Bay Area Air Quality Management District: The monitoring data from 2017 shows that air quality as a result of exceeding O3 and PMZ-5 and PMXD standards are problematic in the San Francisco Bay Area. An Air Quality Analysis would be required for construction (emissions	Bay Area Air Quality Management District: The monitoring data from 2017 shows that air quality as a result of exceedin O3 and PMZ-5 and PMIO standards are problematic in the San Francisco Bay Area. An Air Quality Analysis would be required for construction (emissions	Bay Area Air Quality Management District: g The monitoring data from 2017 shows that air quality as a result of exceeding O3 and PM2.5 and PM10 standards are problematic in the San Francisco Bay Area. An Air Quality Analysis would be required for construction (emissions	Bay Area Air Quality Management District: The monitoring data from 2017 shows that air quality as a result of exceedin O3 and PM2.5 and PM10 standards are problematic in the San Francisco Bay
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	Air Quality Analysis would be required for construction (emissions from construction equipment) and operations (additional trains and idling in the area)	Air Quality Analysis would be required for construction (emissions from construction equipment) and operations (additional trains and idling in the area).	Air Quality Analysis would be required for construction (emissions from construction equipment) and operations (additional trains).	Air Quality Analysis would be required for construction (emissions from construction equipment) and operations (additional trains and idling in the area)	Air Quality Analysis would be required for construction (emissions from construction equipment) and operations (additional trains).	Air Quality Analysis would be required for construction (emissions from construction equipment) and operations (additional trains and idling in the area)	Air Quality Analysis would be required for construction (emissions from construction equipment) and operations (additional trains).	Air Quality Analysis would be required for construction (emissions from construction equipment) and operations (additional trains, including in an inactive or lightly-used corridor).
(f) Expose sensitive receptors to substantial pollutant concentrations?	Closest residences are within 50 feet of the existing track centerline. Residents are considered sensitive receptors. A health risk analysis would be required.	Closest residences are within 850 feet of the site. Residents are considered sensitive receptors. A health risk analysis may be required.	Residential uses abut the corridor, with some residences within 100–150 feet of the existing track centerline. Residents are considered sensitive receptors. A health risk analysis may be required.	Site is approximately 750 feet from the closest residential area. Residents are considered sensitive receptors. A health risk analysis may be required.		Site is approximately 650 feet from the closest residential area and proximat to planned residential land use for the Bayside Newark TOD. Residents are considered sensitive receptors. A health risk analysis may be required.		Residential uses abut the corridor, with some residences within 100–150 fe
e) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biological Resources a) Have a substantial adverse effect, either directly or through habitat	Special-status species are not anticipated within the project footprint:	large trees and vegetation exist within the project footprint. Further	Large trees and vegetation exist within the project footprint. Further	The project site was a former gravel quarry and has been altered from its		The salt marsh harvest mouse is a federal- and state-listed endangered	The Alameda Creek Watershed has undergone significant modification.	Some areas of the ROW may require clearing and grubbing of trees and
species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	footprint. The city has plans to redevelop this area into Quarry Lakes Parkwa which is planned to be a fully grade separated roadway expersesd under both of the Union Pacific Railroad's Niles and Oakland Subdivisions (rail lines) and BART. This project would have a seperate environmental review process for this area.		survey to identify special-status species and sensitive species.	site and in adjacent area is dominated by invasive non-native plants as well as a host of non-native and native landscape plants. Former CEQA S-MNO revealed a list of 12 special-status plant species in the area. Special-status validifies pecies include the western pood Turtle. Assure by a technical specialist (biologist) would be required for further investigation.	Francisco Bay. The largest issues for Alameda Creek are dams and sedimentation. Dams create barriers for upteram fish migration and control water supply to downstream areas. Migratory fish historically spawned in the lower reaches trying to migrate inland. Within the 12 miles of the ACFC Charmel, efforts to restore steelhead involve removing or transforming migratory barriers. The South Bay Salt Pond Restoration Project is modifying the mouth of Alameda Creek. The Project Management Team for the Salt Pond Restoration project is comprised of the California State Coastal Conservancy (SCC), the California Department of Fish and Wildlife (DPW), the U.S. Fish and Wildlife Service (FWS), the Santa Clara's lallow Water District (SCVWD), the Alameda County Flood Control and Water Conservation District (ACFCWCD), and the U.S. Army Corps of Engineers (USACE).	technical specialist (biologist) are needed to identify special-status species, and sensitive species.	a sedimentation. Dams create barriers for upstream fish migration and control water supply to downstream rease. Migratory fish historically spawned in the upper reaches of Alameda Creek, and steelhead trout are still found in the upper reaches trying to migrate hinand. Within the 12 miles of the ACFC Channel, efforts to restore steelhead involve removing or transforming migratory barriers. The South Bay Salt Pond Restoration Project is modifying the mouth of Alameda Creek. The Project Management Team for the Salt Pond Restoration project is comprised of the California Sate Costal Conservancy (SCC) to California Department of Fish and Wildlife (CDPW), the U.S. Fish and Wildlife Service (FMS), the Santa Clara Valley Water District (SCVMD), the Alamac County Flood Control and Water Conservation District (ACFCWCD), and the U.S. Army Corps of Engineers (USACE).	Further invesigation and field surveys by a technical specialist (biologist) are needed to identify special-status species, and sensitive species.
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, colicies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	Riparian habitat or other sensitive natural communitues are not anticipated within the project footprint, however, there may be potential for migratory birds south of the project footprint. The City has plans to redevelop this area into Quarry Lakes Parkway, which is Janned to be a fully grad-separated roadway depressed under both of the Union Pacific Railroad's Niles and Oakland Subdivisions (rail lines) and BART. This project would have a seperate environmental review process for this area.		N/A	Western pond turtles occupy permanent and intermittent ponds and creeks. These turtles generally prefer deep (greater than 2 feet), quiet pools along streams, but they also occur in ponds and reservoirs. The project would not substantially interfere with the movement of any native resident or migratory fish or wildlife species or migratory wildlife corridors, or impede the use of wildlife species or migratory wildlife corridors, or impede the use of wildlife nursery sites. The proposed project does not involve the construction of any structures or blockades to wildlife movements, and only temporary disturbance would occur during vegetation removal, trimming, or ground-disturbing activities. Uthen adapted wildlife would move through the project site unhindered. Project activities would be relatively short term in duration and would not block use of the area. Migratory fish are blocked from entering Kaiser Pond via the fish screen installed on Alameda Creek.	Migratory fish historically spawned in the upper reaches of Alameda Creek, and steefhead rout are still flound in the lower reaches thying to migrate inland. Within the 12 miles of the ACFC Channel, efforts to restore steelhead involve removing or transforming migratory barriers. https://www.southbayrestoration.org/	N/A	Migratory fish historically spawned in the upper reaches of Alameda Creek, and steelhead rout are still floatin in the lower reaches trying to migrate inland. Within the 12 miles of the ACFC Channel, efforts to restore steelhead involve removing or transforming migratory barriers. https://www.southbayrestoration.org/	N/A
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	No wetlands are within the vicinity of the project footprint.	No wetlands are within the project footprint. Dry Creek is a wetland that is located approximately 0.46 miles south of the project footprint. No direct or indirect impacts are anticipated.	No wetlands are within the vicinity of the project footprint.	Kaiser Pond is a wetland. Project footprint would be adjacent to wetlands.	Alameda Creek is considered a wetland.	N/A	Alameda Creek is considered a wetland.	N/A
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	Bush removal would be required and may affect native wildlife nursery sites.	Such and tree removal would be required and may affect native wildlife nursery sites.	Bush and tree removal would be required and may affect native wildlife nursery sites.	the permit process if the tree is "A tree, other than a landmark tree, removed or damaged by a public utility to the extent that such removal or damage is necessary for building or maintaining the public utility's facilities" (Ord. 2481 § 1, 7-23-02) Ord. 11-2010 § 8, 5-25-10. 1990 Code § 4-5104).	s create barriers for upstream fish migration and control water supply to downstream areas. Migratory fish historically spawned in the upper reaches of Alameda Creek, and steelhead trout are still found in the lower reaches trying to migrate inland. Within the 12 miles of the ACFC Channel, efforts to	:	The largest issues for Alameda Creek are dams and sedimentation. Dams create barriers for upsteam fish migration and control water supply to downstream areas. Migratory fish historically spawned in the upper reaches of Alameda Creek, and steelhead trout are still found in the lower reaches trying to migrate indand. Within the 12 miles of the ACFC Channel, efforts to restore steelhead involve removing or transforming migratory barriers. Historically, Alameda Creek deposited silt throughout brian City, Fremort, and Newark, but having been redirected into a flood control channel, the creek is now more confined and sediment transport has been altered, causing sediment accumulation in the lower seven miles. The four miles closest to the say are influenced by tides and collect estuarine sediment, in addition to stream sediment. The ACFCWCD occasionally dredges the channel. Through its involvement in the South Bay sizt Pond Restoration Project, the ACFCWCD and its partners are modifying the mouth of Alameda Creek to promote socuring of upstream sediment and deposition of sediment in areas where it will create tidal marsh habitat and improve flood control.	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	N/A	Municipal Code Chapter 12.16, which requires a permit to cut trim, prune,	Trees are preserved or permits obtained according to the provisions of the Municipal Code Chapter 12.16, which requires a permit to cut trim, prune, plant, remove, injure, or interfere with any tree upon any street, park, or public place of the City. In addition, one tree shall be placed along the roadway for every 6 parking spaces installed.	N/A	N/A	N/A	N/A	N/A
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	N/A	N/A	NA	N/A	The South Bay Salt Pond Restoration Project is modifying the mouth of Alameda Creek to promote socuring of upstream sediment and deposition of sediment in areas where it will create tidal marsh habitat and improve flood control. The Project Management Team is comprised of the SCC, the CDPW, the U.S. FWS, SCVWD, ACFCWCD, and the USACE.		The South Bay Salt Pond Restoration Project is modifying the mouth of Alameda Creek to promote soouring of upstream sediment and deposition of sediment in areas where it will create tidal marsh habitat and improve flood control. The Project Management Team is comprised of the SCC, the CDFW, the U.S. FWS, SCVWD, ACFCWCD, and the USACE.	N/A

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March 2022

SOUTHERN ALAMEDA COUNTY INTEGRATED RAIL ANALYSIS LAYOVER FACILITY ALTERNATIVES ENVIRONMENTAL CONSTRAINTS

	LAYOVER FACILITY OPTIONS								
RESOURCE AREA / CHECKLIST ITEM	Option 1 (Union City BART)	Option 2 (Union City – US Pipe) Option 3 (Fremont – Shinn Street)			Option 4 (Newark – Willow Street)				
		Layover Facility	Corridor Improvements	Layover Facility	Corridor Improvements	Layover Facility	Corridor Im North of Alameda Creek (shared with Option 3)	provements South/west of Alameda Creek	
Cultural Resources a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	No historical resources are within a half mile of the project footprint.	No historical resources are within a half mile of the project footprint.	No historical resources are within a half mile of the project footprint.	California Nursery Historical Park 3650 Niles Blvd. Fremon, CA 94536 Shinn Historical Park and Arboretum 1251 Peralta Blvd.	Railroad corridor may be considered historic.	No National Register of Historic Places (National Register or NRHP) or California Register of Historical Resources (California Register or CRHR) lister determined, or potential archaeological sites, significant local, State, or Federal historic properties, landmarks, etc., have been identified in or adjacent to the footprint.	Railroad corridor may be considered historic.	Railroad corridor may be considered historic.	
				Fremont, CA 94536 Historical resources listed above are within a half-mile of the project footprint.					
c) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	Unknown archaelogical resources could be located within the project footprint, which would be determined during grading/excavation of hazardous materials. Mitigation measures would reduce potentially significant impacts to less than significant.	Not anticipated since this site has been previously disturbed.	Not anticipated since this site has been previously disturbed.	Any natural sediment deposits below 10 feet underlying Holocene-age deposits within the project site are considered to have a moderate to high sensitivity. Further refinement to engineering and desktop or field analysis would be reccommended.	Any natural sediment deposits below 10 feet underlying Holocene-age deposits within the project site are considered to have a moderate to high sensitity. Turther refinement to engineering and desktop or field analysis would be reccommended.	Any natural sediment deposits below 10 feet underlying Holocene-age deposits within the project site are considered to have a moderate to high sensitivity. Further refinement to engineering and desktop or field analysis would be reccommended.	Any natural sediment deposits below 10 feet underlying Holocene-age deposits within the project site are considered to have a moderate to high sensitivity. Further refinement to engineering and desktop or field analysis would be reccommended.	Any natural sediment deposits below 10 feet underlying Holocene-age deposits within the project site are considered to have a moderate to high sensitivity. Further refinement to engineering and desktop or field analysi would be reccommended.	
c) Disturb any human remains, including those interred outside of formal cemeteries?	Unknown human remains could be located within the project footprint, which would be determined during grading/excavation of hazardous materials. Mitigation measures would reduce potentially significant impacts to less than significant.		Not anticipated since this site has been previously disturbed.	Not anticipated since this site has been previously disturbed.	Not anticipated since this site has been previously disturbed.	Not anticipated since this site has been previously disturbed.	Not anticipated since this site has been previously disturbed.	Not anticipated since this site has been previously disturbed.	
Hazards and Hazardous Materials									
	and west of the site. The project site consists of a mound rising 22 feet above	Routine transport or disposal of hazardous materials during operations is not anticipated.			Historic and active railroad corridor. Excavation activities during civil grading to and construction may encounter dirt that is saturated with varying degrees or and discharge from trains.		Historic and active railroad corridor. Excavation activities during civil grading and construction may encounter dirt that is saturated with varying degrees oil and discharge from trains.		
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	Potentially yes if no mitigation measures are implemented.	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Could be a significant impact. The project site is within a half-mile of a high school located west at Alvarado Niles Road and H Street.	Could be a significant impact. The closest school is 0.62 miles southwest of the project footprint (Tom Kitayama Elementary School).	Could be a significant impact. The closest school is 0.62 miles southwest of the Project footprint (Tom Kitayama Elementary School).	No schools are within one-quarter of a mile.	Schools are within a quarter-mile of the corridor such as Niles Elementary School. Health Risk Assessment for AQ section would be conducted for sensitive receptors.	No schools are within one-quarter of a mile.	Schools are within a quarter-mile of the corridor such as Niles Elementary School. Health Risk Assessment for AQ section would be conducted for sensitive receptors.	Schools are within a quarter-mile of the corridor, Including New Horizons School, Holy Spirit School, and St. Edward School. Health Risk Assessment AQ section would be conducted for sensitive receptors.	
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	This is part of Pacific States Steel site (EnviroStor ID 80001841). Corrective action was made in March 2012 to clean up (J. S acres from polychlorinated biphenyls (PCBS) that was dispersed into the soil from equipment/instrument repair. CalEnviroScreen score of 46-50%.	was cleaned up in August 2002 due to metal manufacturing that caused	Not anticipated.	Not anticipated.	Not anticipated.	EnviroStor has no active cleanup sites.	Not anticipated.	Not anticipated:	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?		No airport land use plan or public airport exists within two miles of the project footprint. Hayward Executive Airport is 5 miles north.	Not located within two miles of an airport.	Not located within two miles of an airport.	Not located within two miles of an airport.	Not located within two miles of an airport.	Not located within two miles of an airport.	Not located within two miles of an airport.	
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.	
Hydrology and Water Quality									
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	N/A	N/A	N/A	Construction. Niles Cone Groundwater Basin. Construction activities may involve disturbance to the bank of Kaiser Pond during construction. Kaiser Pond is under the jurisdiction of the Corps, RWDCB, and CDPW. Any work on the bank of Kaiser Pond would be a regulated activity that would require permits from the Corps (CWA Section 404), RWCBB (CWA Section 401), and CDFW (Lake or Streambed Alteration Agreement).	A proposed bridge would be built on Alameda Creek and trigger Section 401 and 404 of the Clean Water Act. Alameda Creek drins to the southern part c San Francisco Bay. Would require permits from the Corps (CWA Section 404) RWQCB (CWA Section 401), and CDFW (Lake or Streambed Alteration Agreement).		A proposed bridge would be built on Alameda Creek and trigger Section 401 and 400 of the Cleam Water Act. Alameda Creek drains to the southern part of San Francisco Bay. Would require permits from the Corps (CWA Section 404), RWCGE (CWA Section 401), and CDFW (Lake or Streambed Alteration Agreement).	NPDES Construction Permit would be required since grading would be ove one acre.	
				Operations may affect water quality standards due to site adjacency to the Kaiser Ponds and oil from trains.					
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? c) Substantially alter the existing drainage pattern of the site or area, including	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
to Jacobathany and the decaying unamage potential the site of a feet make it is not a feet addition of impervious surfaces, in a manner which would:									
i) result in substantial erosion or siltation on- or off-site;	N/A	N/A	N/A	N/A	Impact due to bridge and footings.	N/A	Impact due to bridge and footings.	N/A	
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; iii) create or contribute runoff water which would exceed the capacity of	N/A	N/A	N/A	N/A	Impact due to bridge and footings.	N/A Less-than-signficant impact. Would increase impervious surfaces.	Impact due to bridge and footings.	N/A	
existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	nya.	IIVA	19/0	19/0	N/A	Less-than-significant impact. Would increase impervious surfaces.	11/1	II/A	
iv) impede or redirect flood flows? d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to	N/A Portion of project is located within flood Zone AE. Flood Zones X and AH are	N/A Not located within a flood bazard zone	N/A	N/A Not in a flood zone.	Impact due to bridge and footings. Alameda Creek is considered Zone A.	N/A Northern option is within flood Zones AE and Z.	Impact due to bridge and footings. Alameda Creek is considered Zone A.	N/A Portions of the corridor between SR-880 and Sycamore St. would be in Zo	
project inundation?	POTION OF PROJECT IS located within 11000 Zone AE. Flood Zones X and AH are east and west of the site.	Not located within a flood nazard zone.	N/A	Not in a 11000 zone. Alameda Creek water quality has generally been good, although it is currently		NOTTHERN OPTION IS WITHIN TIOOD ZONES AE and Z.	Alameda Creek is considered Zone A.	Portions of the corridor between St-880 and Sycamore St. would be in 201 AE and JA. Areas west of Willow St. are in Zone AE.	
) Conflict with or obstruct implementation of a water quality control plan or ustainable groundwater management plan?	ny a	IN/A	N/A	nvanieur Jees water quaint ji us generally been good, antiough it is out ertitlisted as an impaired water body on the 03(d) list of limpaired Water Bodson generated by the Water Board. The creek is listed as impaired due to high levels of diazion and from trash. This indicates a flow of pollutants (such as pesticide-laden sediments) through runoff and leaking sewer lines.	y IVA	N/A	N/A	IN/A	
Land Use and Planning a) Physically divide an established community?	Option 1a (southern option) Would significantly disrupt or divide an established community due to the location of the proposed track alignment to the south.	Would not disrupt or divide an established community.	Would not disrupt or divide an established community.	Would not disrupt or divide an established community.	Would not disrupt or divide an established community.	Would not disrupt or divide an established community.	Would not disrupt or divide an established community.	Would not disrupt or divide an established community.	
b) Cause a significant environmental impact due to a conflict with any land use	Option 1b (northern option) Would not disrupt or divide an established community due to the location of the proposed track alignment to the north. Aliens with existing land use according to the general plan.	Aligns with existing land use according to the general plan.	Would not disrupt or divide an established community	Aligns with existing land use according to the general plan.	Aligns with existing land use according to the general plan.	Aligns with existing land use according to the general plan.	Aligns with existing land use according to the general plan.	Aligns with existing land use according to the general plan.	
plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?		man.	as aprox of arrac of Gaussianea community						

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March 2022

SOUTHERN ALAMEDA COUNTY INTEGRATED RAIL ANALYSIS LAYOVER FACILITY ALTERNATIVES ENVIRONMENTAL CONSTRAINTS

	LAYOVER FACILITY OPTIONS							
RESOURCE AREA / CHECKLIST ITEM	0.00.14	Option 2 (Union City – US Pipe) Option 3 (Fremont – Shinn Street) Option 4 (Newark – Willow Street)						
	Option 1 (Union City BART)							mprovements
	(omen dity brain)	Layover Facility	Corridor Improvements	Layover Facility	Corridor Improvements	Layover Facility	North of Alameda Creek (shared with Option 3)	South/west of Alameda Creek
Noise and Vibration) Generation of a substantial temporary or permanent increase in ambient noise	Low- and medium-density residential land uses exist west, east, and south of	Operation would incur additional trains in the area and idling. Freight rail and	Operation would incur additional trains in the area. Freight rail and BART	Operation would incur additional trains in the area and idling. Freight rail	Construction would create noise for sensitive receptors. Operation would	Construction would create noise for sensitive receptors. Low- and medium-	Construction would create noise for sensitive receptors. Operation would	Some soundwalls exist throughout the corridor. Could create an impact sin
levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	the project footprint. Freight rail already operates along the ROW currently. Option 1a (southern option)	BART already operate along the ROW currently.	already operate along the ROW currently.			gd density residential land use exist on Willow St. Existing residential buildings are across the street from the footprint. Operation would incur additional trains in the area and idling.		
	Option Ja (Soutinern Option) Construction would permanately increase groundbourne noise levels due to the proximity of the prospect track alignment and existing housing south of the project footprint. Operation would incur additional trains in the area and idling, which would also contribute to significant noise level increases for existing housing.					u airs in the area and runing.		
	Option 16 (northern option) Construction would temporally increase groundbourne noise levels due to the proximity of the proposed track alignment and existing housing south of the project footprint. Operation would incur additional trains in the rand idling, which would also contribute to noise level increases. However, this increase would be less than under Option 1 since the station and track would be located further north away from residential housing to the south.							
Generation of excessive groundborne vibration or groundborne noise levels?	Low- and medium-density residential land uses exist west, east, and south of		Construction would temporarily increase groundbourne noise levels.	Operation would incur additional trains in the area and idling. Freight rail	Construction would create noise for sensitive receptors. Operation would	Construction would temporarily increase groundbourne vibration. Low- and	Construction would create noise for sensitive receptors. Operation would	Some soundwalls exist throughout the corridor. Could create an impact sinu
	Option 1a (southern option) Construction would permanately increase groundbourne noise levels due to the proxmity of the proposed track alignment and existing housing south of	Option 2b (east edge) Low- and medium-density residential land uses exist east and south of the	Operation would incur additional trains in the area. Freight rail and BART already operate along the ROW currently.	already operates along the ROW currently and both freight and passenger re currently operate on the nearby UP Niles Subdivision.	Il Incur additional trains in the area. Freight rail and BART already operate alor the ROW currently.	g medium-density residential land use exist on Willow St. Existing residential buildings are across the street from the footprint. Operation would incur additional trains in the area and idling.	Incur additional trains in the area. Freight rail and BART already operate along the ROW currently.	g portions of the corridor are lightly used or inactive.
	existing housing. Option 1b (northern option) Construction would temporarily increase groundbourne noise levels due to the proximity of the proposed track alignment and existing housing south of the project footprint. Operation would incur additional trains in the area and idling, with vowuld also contribute to noise level increases. However, this increase would be less than under Option 1 since the station and track would be located further north away from residential housing to the south.							
) For a project located within the vicinity of a private airstrip or an airport land see plan or, where such a plan has not been adopted, within two miles of a public irriport or public vesi irropt roughlic vesi irropt	No airport land use plan or public airport exists within two miles of the project footprint. Hayward Executive Airport is 7 miles north.	No airport land use plan or public airport exists within two miles of the project footprint. Hayward Executive Airport is 5 miles north.	No airport land use plan or public airport exists within two miles of the project footprint. Hayward Executive Airport is 5 miles north.	No airports existis within a two-mile radius of the project footprint. Palo Alto Airport is the closest public airport.	No airports exists within a two-mile radius of the project footprint. Palo Alte Airport is the closest public airport.	No airports exists within a two-mile radius of the project footprint. Palo Alton Airport is the closest public airport and is located 5.7 miles away across San Francisco Bay.	No airports oristis within a two-mile radius of the project footprint. Palo Alto Airport is the closest public airport.	No airports existis within a two-mile radius of the project footprint. Palo Al Airport is the closest public airport.
Recreation (CEQA) & Section 4(f) Properties (NEPA) a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?		No parks or Section 4(f) resources are within or surrounding the project footprint.	N/A	The site is adjacent to Kaiser Pond but falls within the existing railroad ROW, and would not affect recreational areas that are defined as Section 4(f) properties.	If optional bridge is built, temporary construction impacts would affect the bicycle path along Alameda Creek operating below the existing bridge. Operationally, no impacts are anticipated.	Ash Street Park is the closest park to the project footprint and is 0.62 miles away. The project would not increase the use of the park during operations o construction.	If optional bridge is built, temporary construction impacts would affect the re bicycle path along Alameda Creek operating below the existing bridge. Operationally, no impacts are anticipated.	No impacts anticipated.
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fransportation								
 Onflict with a program, plan, ordinance, or policy addressing the circulation ystem, including transit, roadway, bicycle and pedestrian facilities? 	The project would not conflict with a program, plan, ordinance, or policy addressing the circulation system. The project footprint lies within the Station City Specific Plan, which calls for improved transportation access/services and mixed-use TOD.	Oakland Subdivision.	Project construction may result in impacts to operations along the UP Oakland Subdivision, as well as to circulation along local roadways (including major roadways and truck routes such as Whipple Road and Decoto Road) an at grade crossings.	Project construction may result in impacts to operations along the UP Oakland Subdivision. Construction impact to existing bicycle route. d	Project construction may result in impacts to operations along the UP Oakland Subdivision.	Conflicts with the Bayside Newark (Dumbarton TOD) plan, which designates the project footprint as a future transit station.	Project construction may result in impacts to operations along the UP Oakland Subdivision.	Project construction may result in impacts to operations along the UP Niles Subdivision (Centerville Line) and UP Coast Subdivision, including both freign and passenger rail. Project construction may also affect circulation along lo roadways and at grade crossings.
b) Would the project conflict or be inconsistent with CEQA Guidelines section L5064.3, subdivision (b)?	No. The Project would support the reduction of VMT in the region by providing passenger rail service, which would reduce CO2 emissions from automobiles.	No. The Project would support the reduction of VMT in the region by providing passenger rail service, which would reduce CO2 emissions from automobiles.	No. The Project would support the reduction of VMT in the region by providing passenger rail service, which would reduce CO2 emissions from automobiles.	No. The Project would support the reduction of VMT in the region by providing passenger rail service, which would reduce CO2 emissions from automobiles.	No. The Project would support the reduction of VMT in the region by providing passenger rail service, which would reduce CO2 emissions from automobiles.	No. The Project would support the reduction of VMT in the region by providing passenger rail service, which would reduce CO2 emissions from automobiles.	No. The Project would support the reduction of VMT in the region by providing passenger rail service, which would reduce CO2 emissions from automobiles.	No. The Project would support the reduction of VMT in the region by providing passenger rail service, which would reduce CO2 emissions from automobiles.
	The Project would be designed in accordance with rail design criteria and local design requirements.	The Project would be designed in accordance with rail design criteria and local design requirements.	The Project would be designed in accordance with rail design criteria and local design requirements.	The Project would be designed in accordance with rail design criteria and local design requirements.	The Project would be designed in accordance with rail design criteria and local design requirements.	The Project would be designed in accordance with rail design criteria and local design requirements.	The Project would be designed in accordance with rail design criteria and local design requirements.	The Project would be designed in accordance with rail design criteria and local design requirements.
) Result in inadequate emergency access?	Adequate emergency access would be provided during construction and operation.	Adequate emergency access would be provided during construction and operation.	Adequate emergency access would be provided during construction and operation.	Adequate emergency access would be provided during construction and operation.	Adequate emergency access would be provided during construction and operation.	Adequate emergency access would be provided during construction and operation.	Adequate emergency access would be provided during construction and operation.	Grade crossings and signals would be designed to standards that would provide adequate emergency access.
ribal Cultural Resources Yould the project cause a substantial adverse change in the significance of a tribal	Further coordination with tribes required due to higher sensitivity to tribal	Further coordination with tribes required due to higher sensitivity to tribal	Further coordination with tribes required due to higher sensitivity to tribal	Further coordination with tribes required due to higher sensitivity to tribal	Further coordination with tribes required due to higher sensitivity to tribal	Further coordination with tribes required due to higher sensitivity to tribal	Further coordination with tribes required due to higher sensitivity to tribal	Further coordination with tribes required due to higher sensitivity to triba
ultural resource, defined in Public Resources Code section 21074 as either a site,	cultural resources. Lies within the ethnographic territory of the Ohlone. The	cultural resources. Lies within the ethnographic territory of the Ohlone. The	cultural resources. Lies within the ethnographic territory of the Ohlone. The	cultural resources. Lies within the ethnographic territory of the Ohlone. The	cultural resources. Lies within the ethnographic territory of the Ohlone. The	cultural resources. Lies within the ethnographic territory of the Ohlone. The	cultural resources. Lies within the ethnographic territory of the Ohlone. The	cultural resources. Lies within the ethnographic territory of the Ohlone. Th
eature, place, cultural landscape that is geographically defined in terms of the size nd scope of the landscape, sacred place, or object with cultural value to a allifornia Native American tribe, and that is:	territory of the Ohlone extended along the coast from the current-day locations of the Golden Gate Bridge in the north to just beyond Carmel in the south, and as much as 60 miles inland.	territory of the Ohlone extended along the coast from the current-day locations of the Golden Gate Bridge in the north to just beyond Carmel in the south, and as much as 60 miles inland.	territory of the Ohlone extended along the coast from the current-day locations of the Golden Gate Bridge in the north to just beyond Carmel in the south, and as much as 60 miles inland.	territory of the Ohlone extended along the coast from the current-day locations of the Golden Gate Bridge in the north to just beyond Carmel in the south, and as much as 60 milles inland.	territory of the Ohlone extended along the coast from the current-day locations of the Golden Gate Bridge in the north to just beyond Carmel in the south, and as much as 60 miles inland.	territory of the Ohlone extended along the coast from the current-day locations of the Golden Gate Bridge in the north to just beyond Carmel in the south, and as much as 60 miles inland.	territory of the Ohlone extended along the coast from the current-day locations of the Golden Gate Bridge in the north to just beyond Carmel in the south, and as much as 60 milles inland.	territory of the Ohlone extended along the coast from the current-day locations of the Golden Gate Bridge in the north to just beyond Carmel in th south, and as much as 60 miles inland.
) Listed or eligible for listing in the California Register of Historical Resources, or na local register of historical resources as defined in Public Resources Code ection 5020.1(k), or		No National Register of Historic Places (National Register or NRHP) or California Register of Historical Resources (California Register or CRHR) listed determined, or potential archaeological sites, significant local, State, or Federal historic properties, landmarks, etc., have been identified in or adjacent to the footprint.	No National Register of Historic Places (National Register or NRHP) or California Register of Historical Resources (California Register or CRHR) listed determined, or potential archaeological sites, significant local, State, or Federal historic properties, landmarks, etc., have been identified in or adjacent to the footprint.		Southern Pacific Railroad Dumbarton Cutoff	Southern Pacific Railroad Dumbarton Cutoff	Southern Pacific Railroad Dumbarton Cutoff	Southern Pacific Railroad Dumbarton Cutoff
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (of Public Resources Code Section 5092.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	N/A	N/A	N/A				Lies within the ethnographic territory of the Ohlone. The territory of the in Ohlone extended along the coast from the current-day locations of the Golder Gate Bridge in the north to just beyond Carmel in the south, and as much as 60 miles inland.	

3 of 3

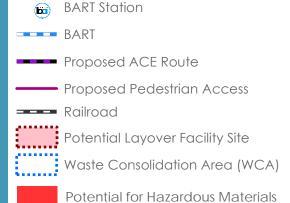
March 2022



Union City (BART)



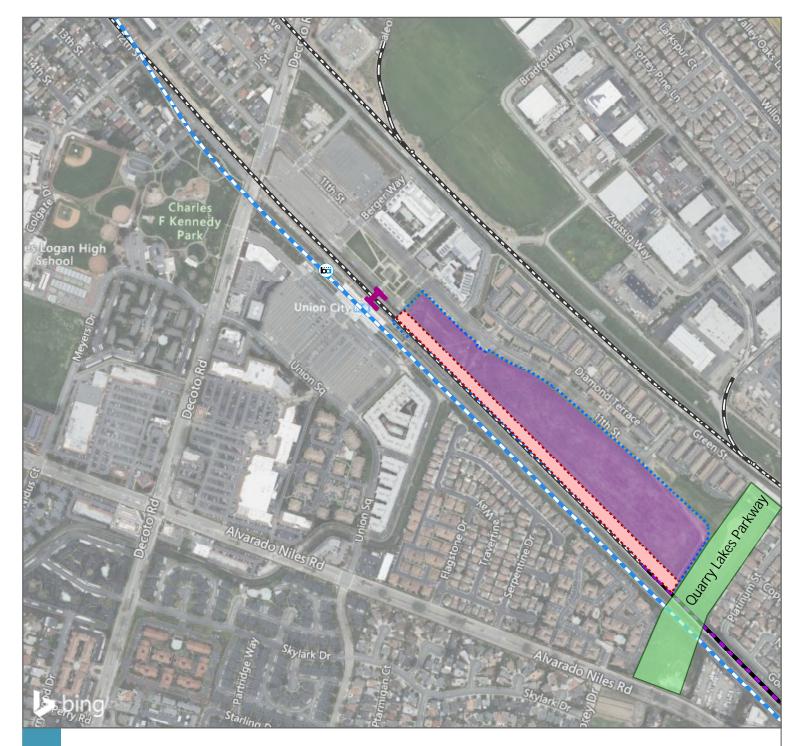
SOUTHERN ALAMEDA COUNTY INTEGRATED RAIL ANALYSIS





DATA SOURCES: Caltrans, U.S. Census Tigerline 2018,

CREATED ON: 3/2/2022





BART Station

SOUTHERN ALAMEDA COUNTY INTEGRATED RAIL ANALYSIS



Proposed ACE Route

Proposed Pedestrian Access

Railroad



Potential Layover Facility Site

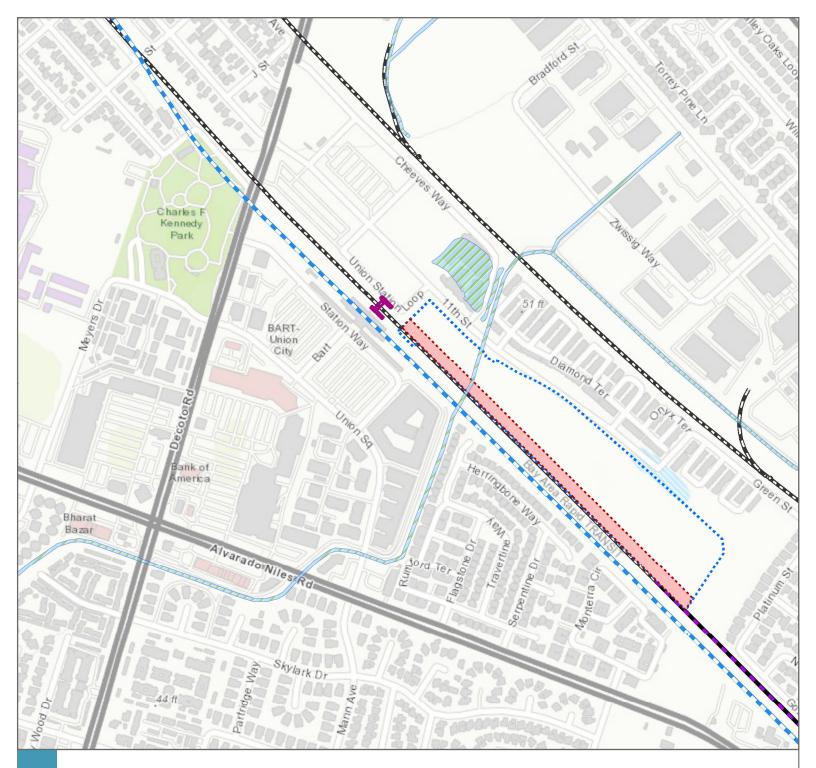
Waste Consolidation Area (WCA)

DATA SOURCES: Caltrans, U.S. Census Tigerline 2018,

CREATED ON: 3/2/2022

0.11

Station Mixed Use Commercial Land Use Type



BART Station

BART

Proposed ACE Route

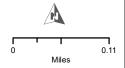
Proposed Pedestrian Access

Railroad

Potential Layover Facility Site

Waste Consolidation Area (WCA)

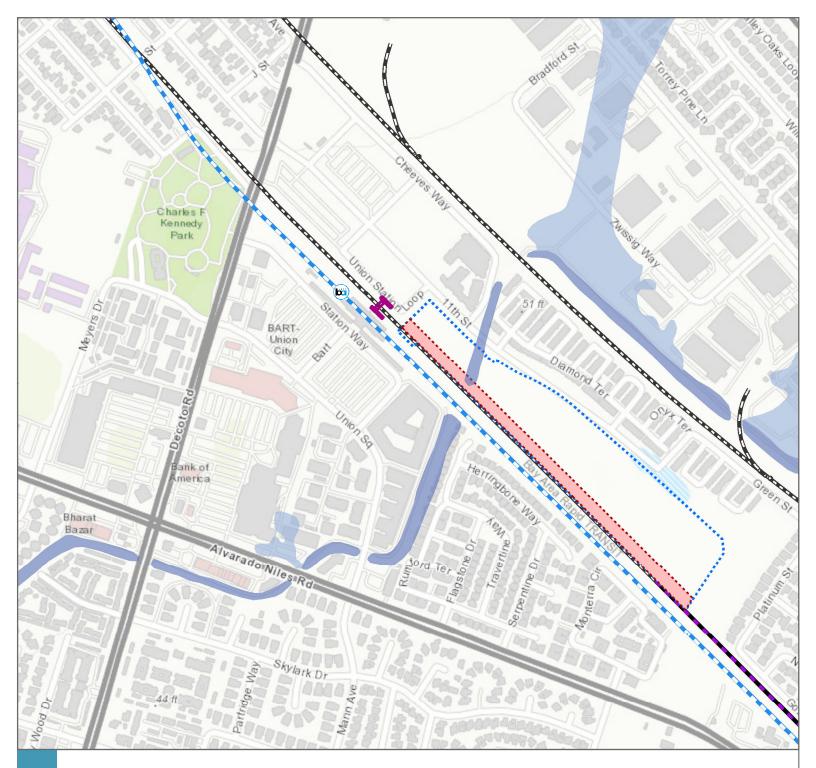
Wetlands



SOUTHERN ALAMEDA COUNTY INTEGRATED RAIL ANALYSIS

DATA SOURCES: California Department of Conservation, 2022

CREATED ON: 3/1/2022



BART Station

BART

Proposed ACE Route

Proposed Pedestrian Access

Railroad

Potential Layover Facility Site

Waste Consolidation Area (WCA)

FEMA Flood Hazard Zones

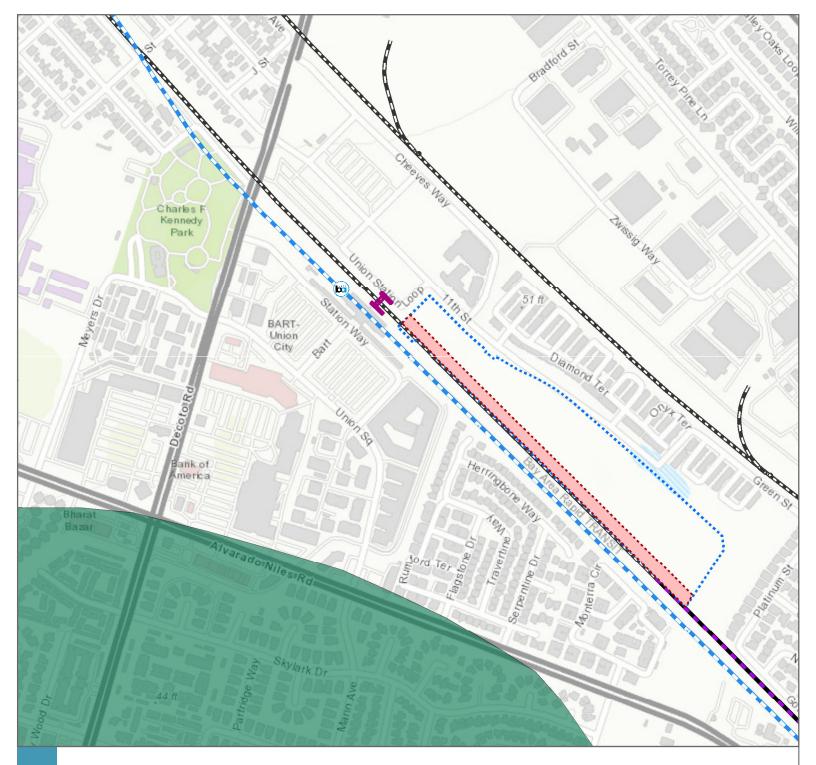
SOUTHERN ALAMEDA COUNTY INTEGRATED RAIL ANALYSIS





DATA SOURCES: FEMA, Association of Bay Area Governments, 2021

CREATED ON: 3/2/2022







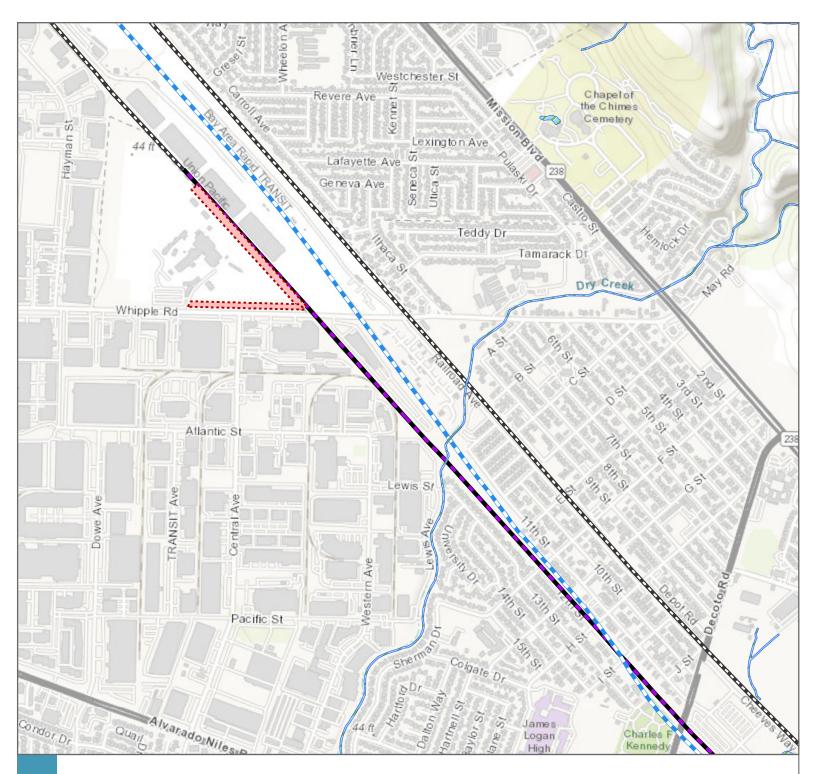
SOUTHERN ALAMEDA COUNTY INTEGRATED RAIL ANALYSIS

DATA SOURCES: California Department of Conservation, 2022

CREATED ON: 3/1/2022



Union City (US Pipe)



POTENTIAL EAST BAY LAYOVER FACILITY SITE: US PIPE SITE

BART

INTEGRATED RAIL ANALYSIS Proposed ACE Route

Railroad

Potential Layover Facility Site

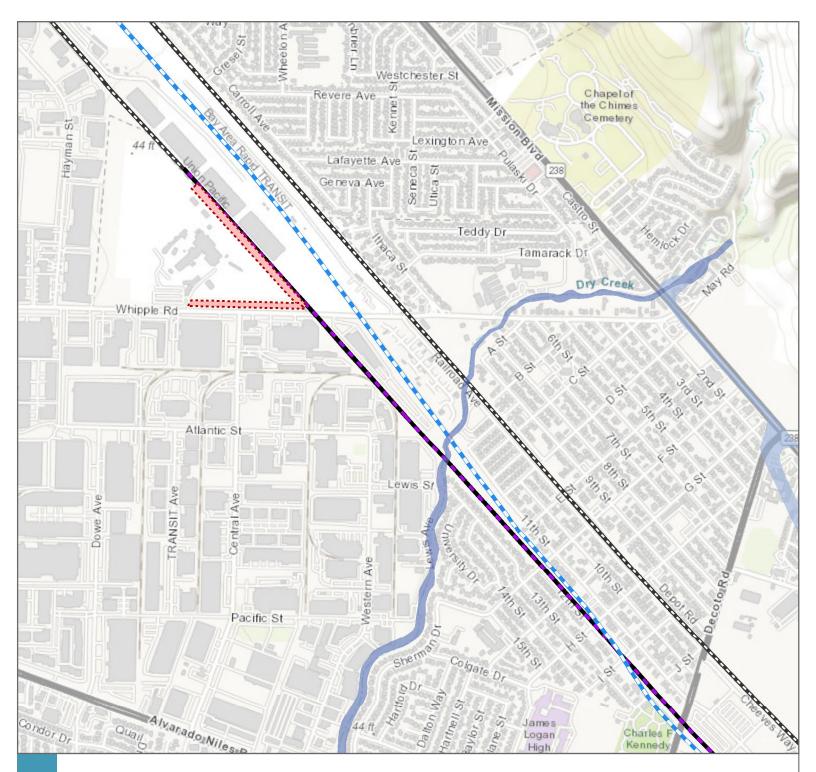
Wetlands



SOUTHERN ALAMEDA COUNTY

DATA SOURCES: California Department of Conservation, 2022.

CREATED ON: 3/1/2022



POTENTIAL EAST BAY LAYOVER FACILITY SITE: US PIPE SITE

Proposed ACE Route
Railroad
Potential Layover Facility Site

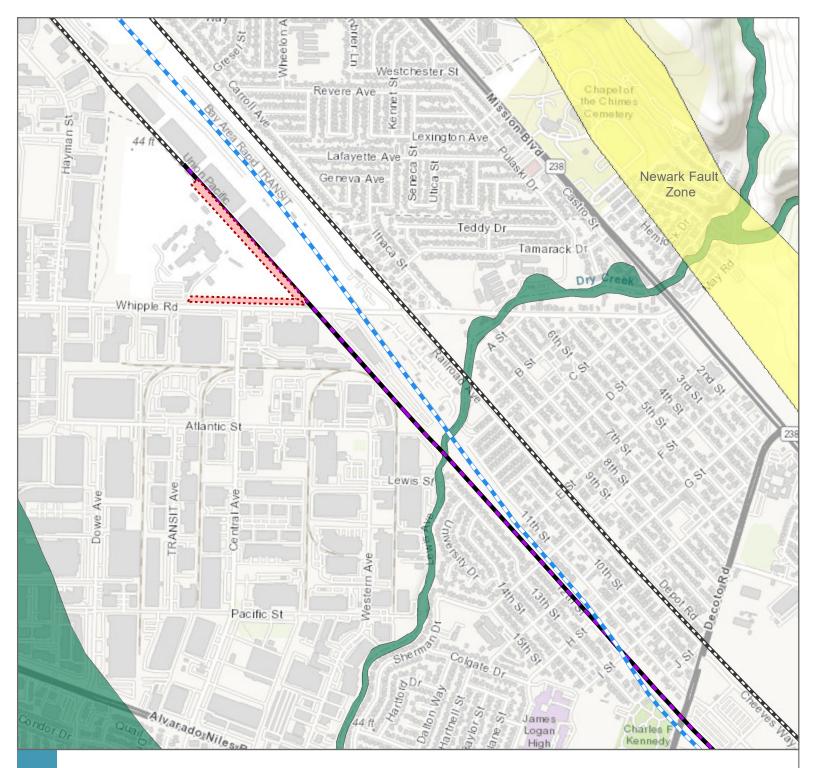
FEMA Flood Hazard Zones

100 Year 500 Year SOUTHERN ALAMEDA COUNTY INTEGRATED RAIL ANALYSIS



DATA SOURCES: FEMA, Association of Bay Area Governments, 2021

CREATED ON: 3/2/2022



POTENTIAL EAST BAY LAYOVER FACILITY SITE: US PIPE SITE

Proposed ACE Route
Railroad
Potential Layover Facility Site
Fault Zones
Liquefaction Zones



SOUTHERN ALAMEDA COUNTY

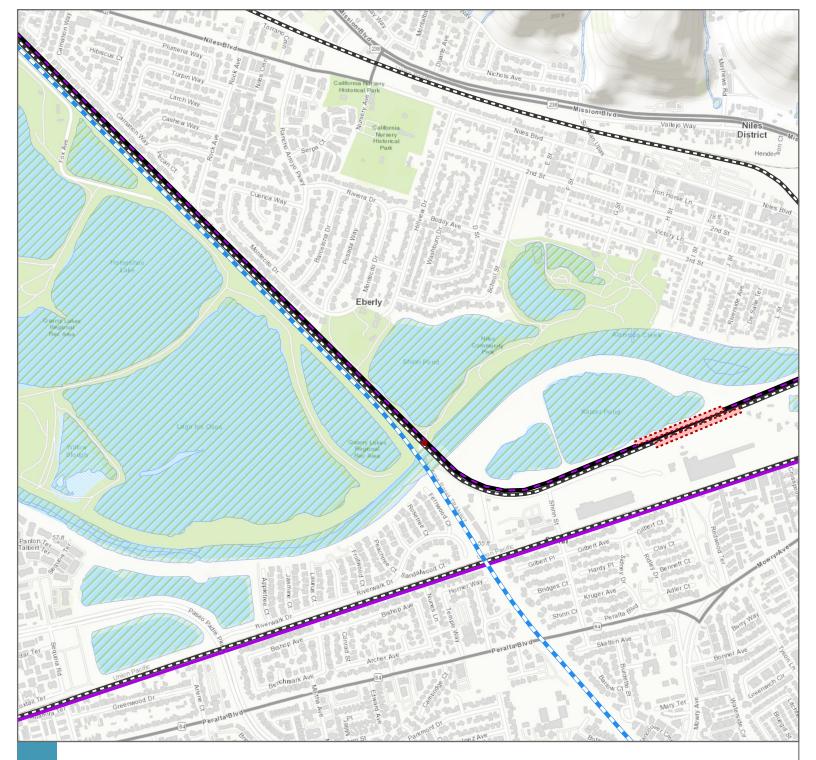
INTEGRATED RAIL ANALYSIS

DATA SOURCES: California Department of Conservation, 2022

CREATED ON: 3/1/2022



Fremont (Shinn Street)



POTENTIAL EAST BAY LAYOVER FACILITY SITE: FREMONT

Existing ACE Route
Proposed ACE Route
Railroad
Potential Layover Facility Site
Wetlands

BART

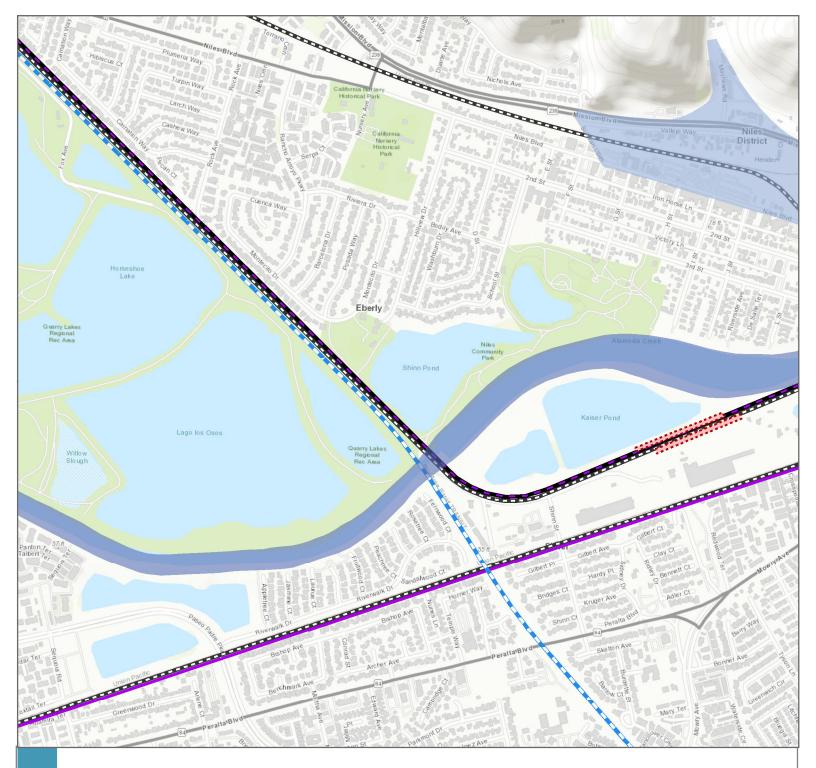


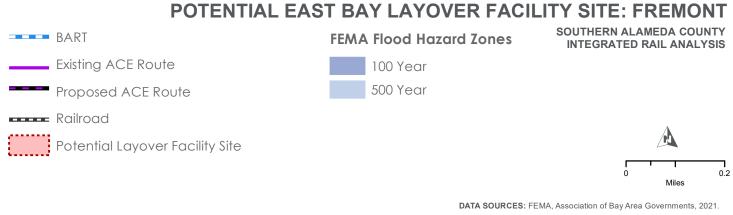
SOUTHERN ALAMEDA COUNTY

INTEGRATED RAIL ANALYSIS

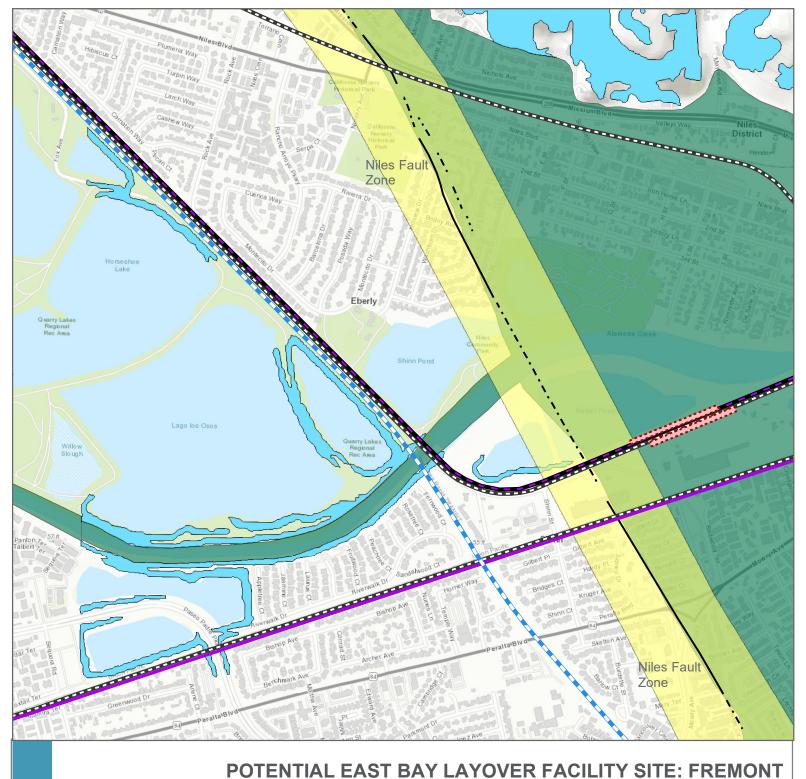
DATA SOURCES: California Department of Conservation, 2022

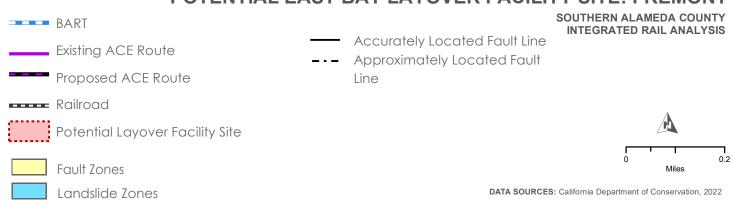
CREATED ON: 3/1/2022





CREATED ON: 3/2/2022



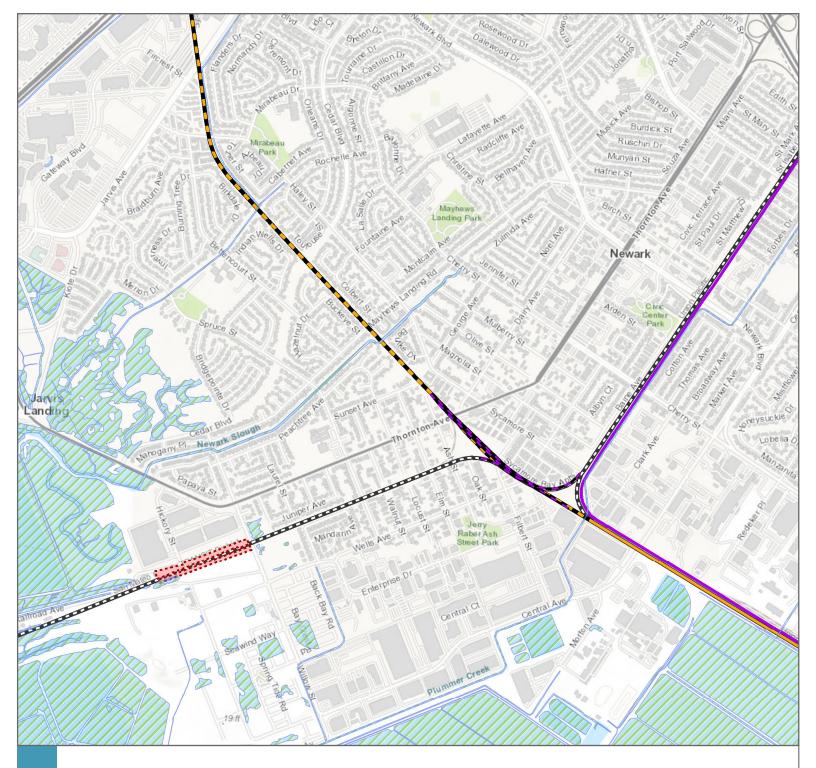


CREATED ON: 3/1/2022

Liquefaction Zones



Newark (Willow Street)



POTENTIAL EAST BAY LAYOVER FACILITY SITE: WILLOW ST.

Proposed Capital Corridor Route

Existing Capital Corridor Route

Existing ACE Route

Proposed ACE Route

Railroad

Potential Layover Facility Site

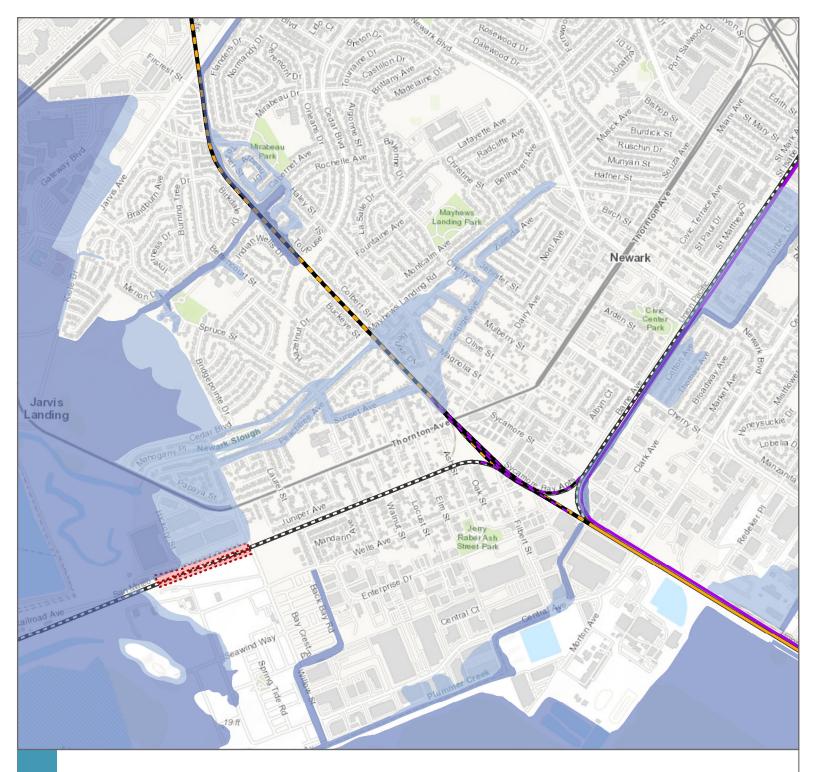




SOUTHERN ALAMEDA COUNTY INTEGRATED RAIL ANALYSIS

DATA SOURCES: California Department of Conservation, 2022

CREATED ON: 3/1/2022



POTENTIAL EAST BAY LAYOVER FACILITY SITE: WILLOW ST.

Existing Capital Corridor Route
Proposed Capital Corridor Route
Existing ACE Route
Proposed ACE Route
Railroad
Potential Layover Facility Site

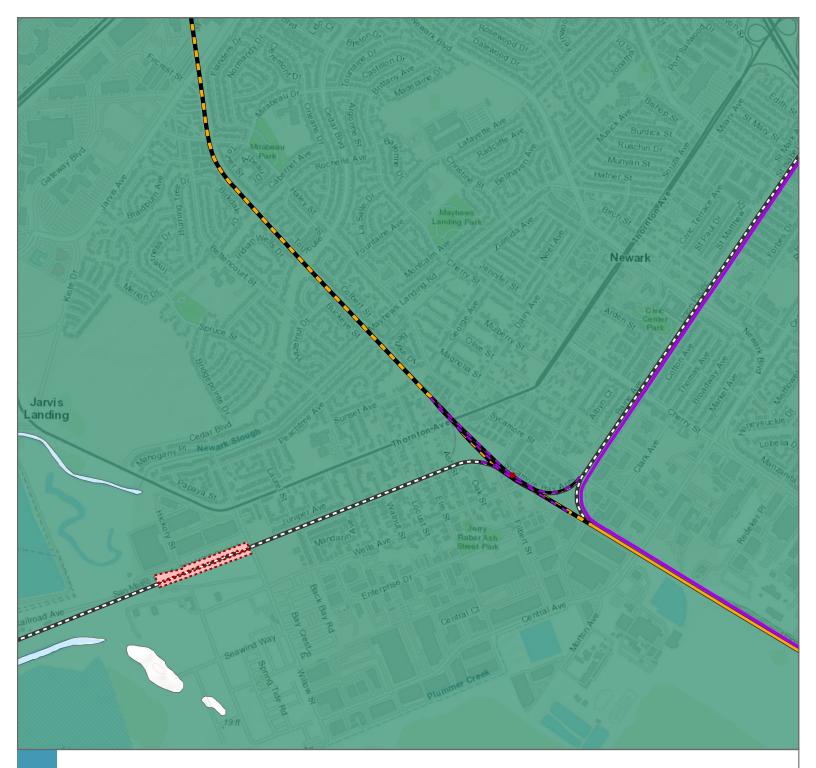
FEMA Flood Hazard Zones

100 Year 500 Year SOUTHERN ALAMEDA COUNTY INTEGRATED RAIL ANALYSIS



DATA SOURCES: FEMA, Association of Bay Area Governments, 2021

CREATED ON: 3/2/2022



POTENTIAL EAST BAY LAYOVER FACILITY SITE: WILLOW ST.

Existing Capital Corridor Route

Proposed Capital Corridor Route

Existing ACE Route

Proposed ACE Route

Railroad

Potential Layover Facility Site

Liquefaction Zones



SOUTHERN ALAMEDA COUNTY INTEGRATED RAIL ANALYSIS

DATA SOURCES: California Department of Conservation, 2022

CREATED ON: 3/1/2022



Attachment B: ACE Integrated Station Platform and Layover Facility at the Union City BART Site – Options 1 & 2

pw://HDR_US_West_01/6091/10002350/