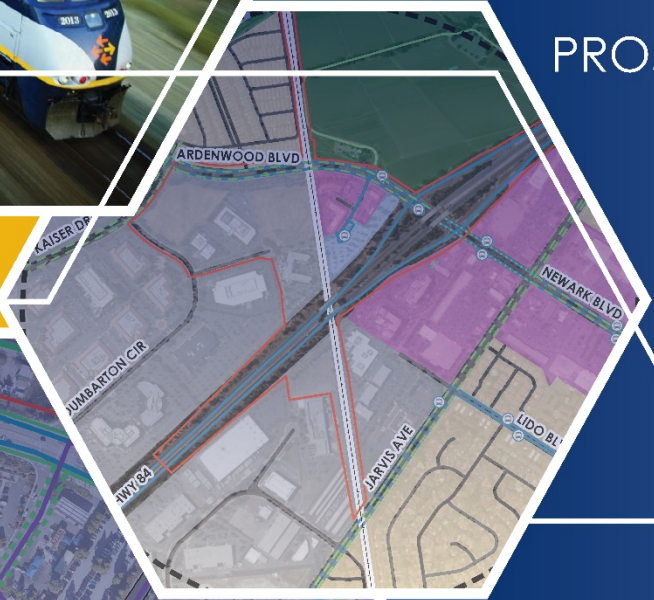
Capitol Corridor
South Bay Connect

PROJECT DEFINITION REPORT



NOVEMBER 2019

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Acronyms, Abbreviations, and Definitions

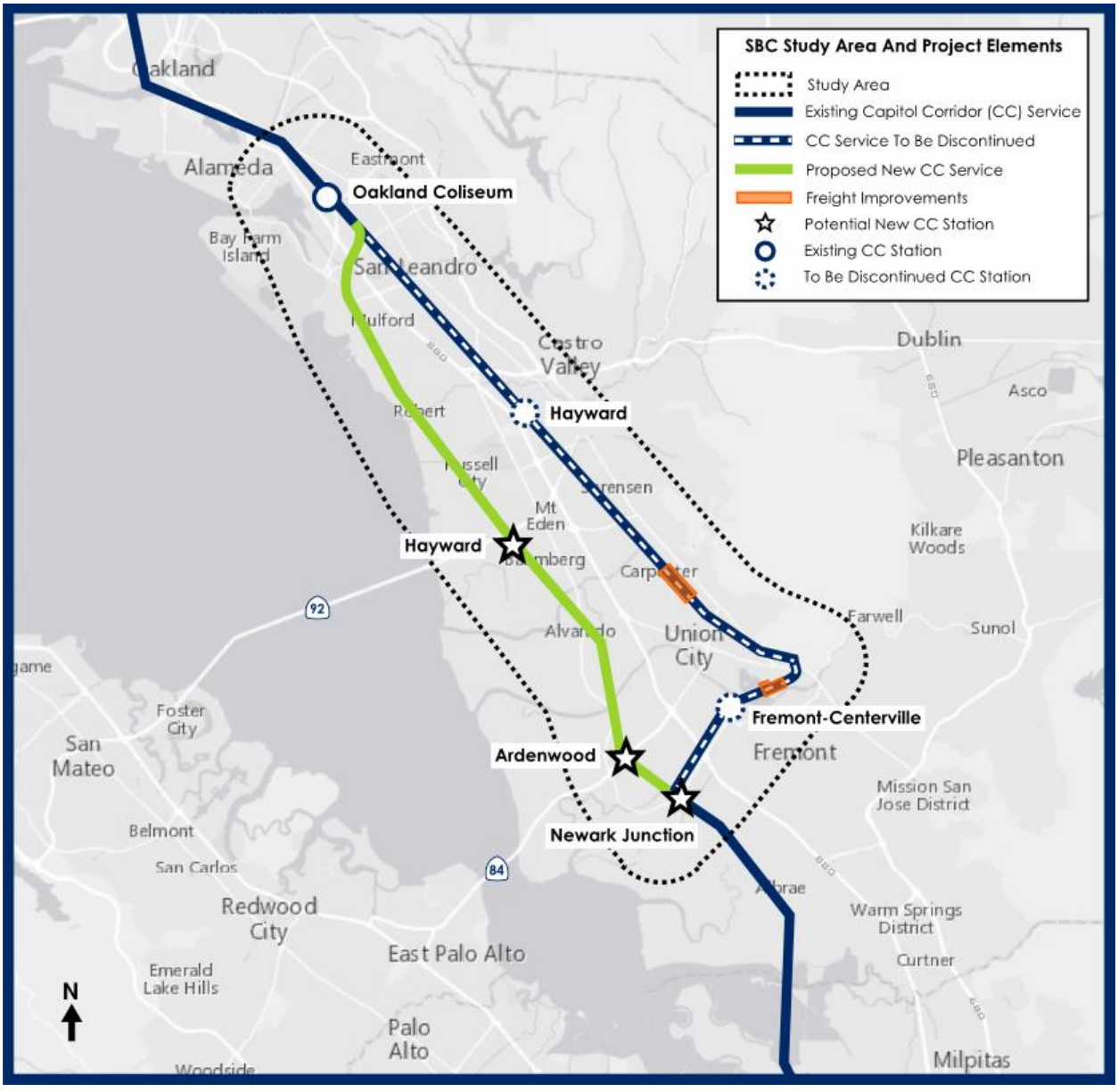
AC Transit	Alameda-Contra Costa Transit District
ACE	Altamont Corridor Express
ADA	Americans with Disabilities Act
Alameda CTC	Alameda County Transportation Commission
BART	Bay Area Rapid Transit District
Bay Area	The nine-county area consisting of Alameda, Contra Costa, Napa, Marin, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties
CalSTA	California State Transportation Agency
Caltrans	California Department of Transportation
Capitol Corridor	The intercity passenger rail service operated by the Capitol Corridor Joint Powers Authority between Auburn/Sacramento and San Jose
CCJPA	Capitol Corridor Joint Powers Authority, the managing agency of the Capitol Corridor service
DTCS	Dumbarton Transportation Corridor Study
East Bay	Bay Area subregion encompassing Alameda and Contra Costa Counties
FY	Fiscal Year, comprising July 1-June 30
GHG	Greenhouse gas
I-#	Interstate-#
ITIP	Interregional Transportation Improvement Program
Mid-Peninsula	Segment of the San Francisco Peninsula from Redwood City to East Palo Alto
MP	Mile post
MTC	Metropolitan Transportation Commission
Northern California Megaregion	The 21-county area encompassing the Bay Area, Monterey, Northern San Joaquin Valley, and Sacramento regions.
PDA	Priority Development Area
PDR	Project Definition Report
Peninsula	Segment of the San Francisco Peninsula comprised of San Mateo County and northern Santa Clara County
RM 3	Regional Measure 3
ROW	Right-of-Way

SamTrans	San Mateo County Transit District
SBC	South Bay Connect, (formerly referred to as Oakland to San Jose Phase 2A)
SCCP	Solutions for Congested Corridors Program
South Bay	Bay Area subregion comprised primarily of Santa Clara County
SR	State Route
STIP	State Transportation Improvement Program
TCEP	Trade Corridor Enhancement Program
TIRCP	Transit and Intercity Rail Capital Program
UPRR	Union Pacific Railroad
YOE	Year of expenditure

Section 1. Executive Summary

This Project Definition Report (PDR) outlines, analyzes, and validates the project definition and delivery strategy for the Capitol Corridor Joint Powers Authority's (CCJPA) South Bay Connect (SBC) project. SBC will relocate passenger and freight rail operations in Alameda County to support increased efficiency and safety for both services. The project will create a faster, more direct connection between Oakland and San Jose and build a new Capitol Corridor station to facilitate connections to destinations on the Peninsula (Figure 1).

Figure 1: South Bay Connect Project Map and Project Elements



Project Background and History

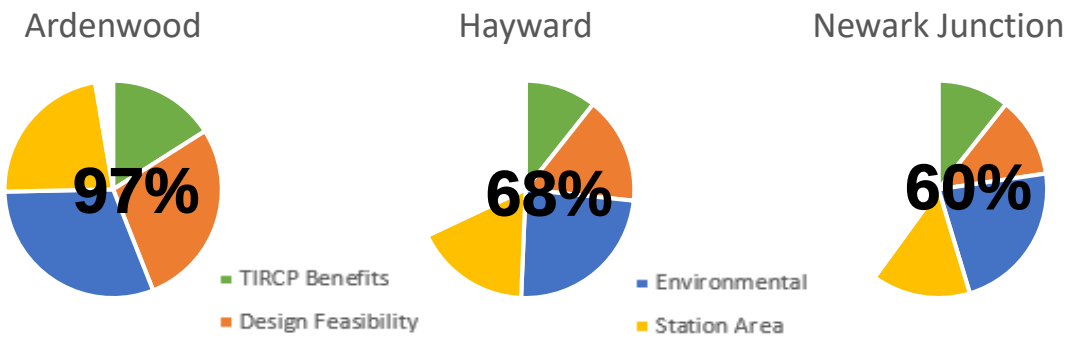
South Bay Connect is a key element in CCJPA's 2014 Vision Plan Update and 2016 Vision Implementation Plan, both of which call for relocating Capitol Corridor service between Oakland and Newark to the Coast Subdivision to provide a faster and more direct route from Oakland to San Jose.[1] CCJPA's Vision Plan reports also recommend establishing an intermodal station at the existing Ardenwood Park & Ride to facilitate connections to transit services across the Dumbarton corridor to the Mid-Peninsula. This link was identified in CCJPA's Service Optimization work as the largest unrealized connection in the Capitol Corridor system. Though CCJPA envisions future increases in service to San Jose, this is not included in the current phase of SBC.

Improvements to the rail network and operations between Oakland and San Jose are also an important component of the *2018 California State Rail Plan*.[2] The *State Rail Plan* calls for rerouting passenger rail service from the Niles Subdivision to the Coast Subdivision and rerouting freight operations from the Coast Subdivision to the Niles Subdivision to facilitate faster travel times by 2022. In the mid-term (2027), an East Bay hub station that provides north-south and east-west connections is planned. South Bay Connect has been awarded funding from local, regional, and state sources due to its anticipated regional and megaregional benefits, including a up to 13-minute travel time savings, enhanced connections to the Mid-Peninsula, and reduced greenhouse gas emissions.

Project Definition Evaluation

This Project Definition Report further defines the South Bay Connect project as it advances into the environmental and design phases. The PDR validates the feasibility of the SBC's project components, including upgrades to the Coast and Niles Subdivisions to support passenger rail service and freight operations and a new station along the Coast Subdivision. Potential station locations at Ardenwood, Hayward, and Newark Junction were evaluated based on four categories of criteria: primary TIRCP benefits, environmental, design feasibility, and station area. As shown in Figure 2 and Table 1, Ardenwood emerged as the most favorable and beneficial new Capitol Corridor station.

Figure 2: Station Location Evaluation Scoring Summary



[1] CCJPA's 2014 and 2016 Vision Plans
[2] 2018 California State Rail Plan

Table 1: Station Location Evaluation Scoring

Criteria Group	Maximum Possible Score	Ardenwood	Hayward	Newark Junction
Primary TIRCP Benefits	*12*	12	8	8
Design Feasibility	*21*	21	12	10
Environmental	*24*	23	18	17
Station Area	*18*	17	13	11
TOTAL	**75**	**73**	**51**	**46**

Project Delivery Plan

With Ardenwood identified as the preferred station location, this report further analyzes the project's design options and feasibility, phasing strategy, and delivery plan with consideration for environmental clearance, engineering, cost, and funding. Table 2 summarizes South Bay Connect's cost, funding, and schedule, which are further detailed in Section 5.2.

In order to meet the project schedule, the proposed phasing strategy prioritizes an approach that would allow construction to commence in Fiscal Year (FY) 2023 and revenue service on the Coast Subdivision to begin in the near-term. By incrementally implementing project elements with independent utility, such as a platform and basic station access, CCJPA can flexibly pursue its long-term objectives at Ardenwood based on early operations and the status of other transportation projects providing connections across the Dumbarton corridor.

Table 2: Project Delivery Plan

Phase	Cost (in thousands)	Identified Funding (in thousands)	Year of Completion
Environmental	$13,764	$13,764	FY2021
Design	$19,357	$19,357	FY2023
Construction including Right-of-Way (ROW)	$231,259	$163,242	FY2026
TOTAL	**$264,380**	**$196,363**	**FY2026**

Note: Costs shown in year of expenditure (YOE) dollars.

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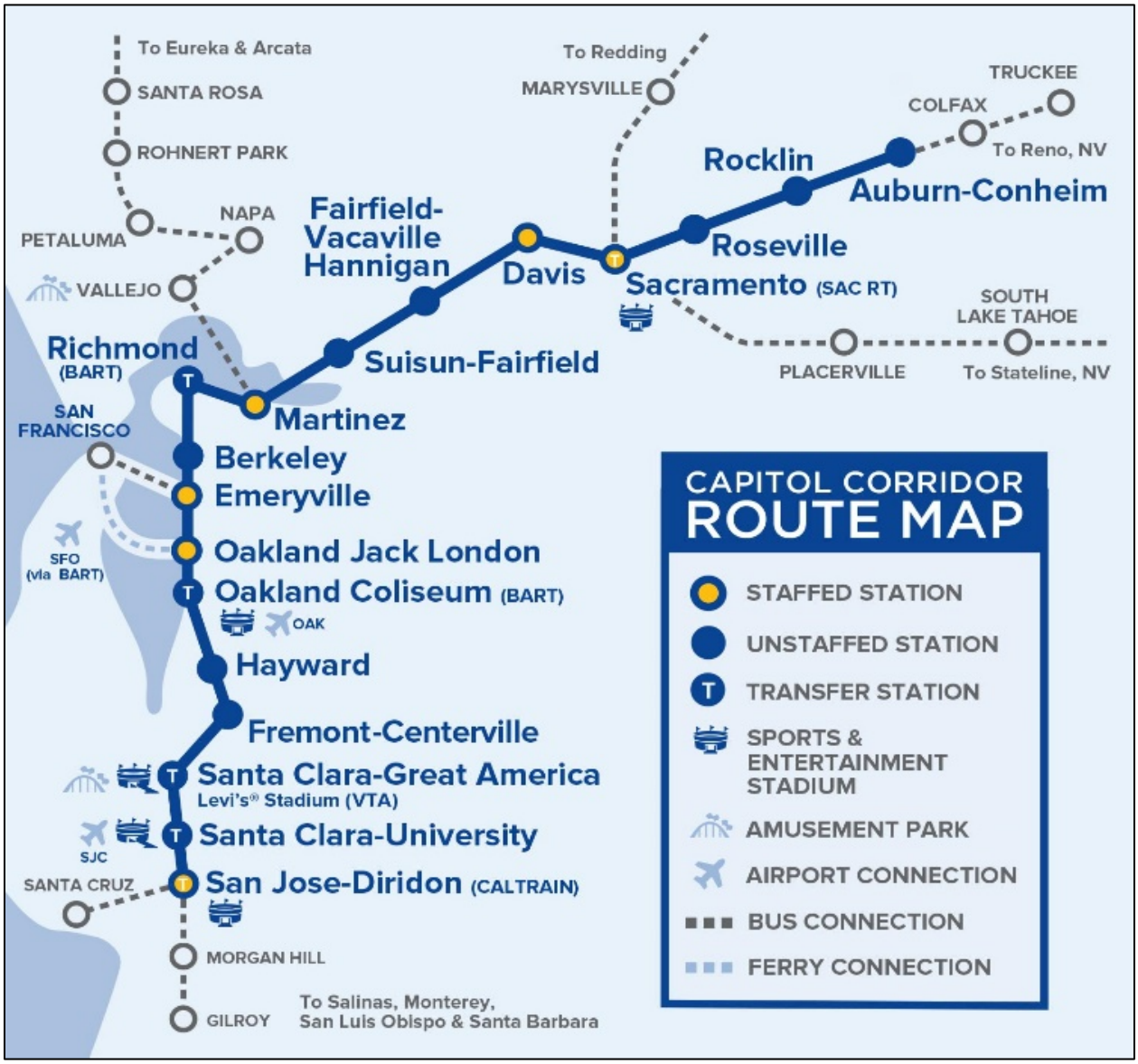
Section 2. Project Background and History

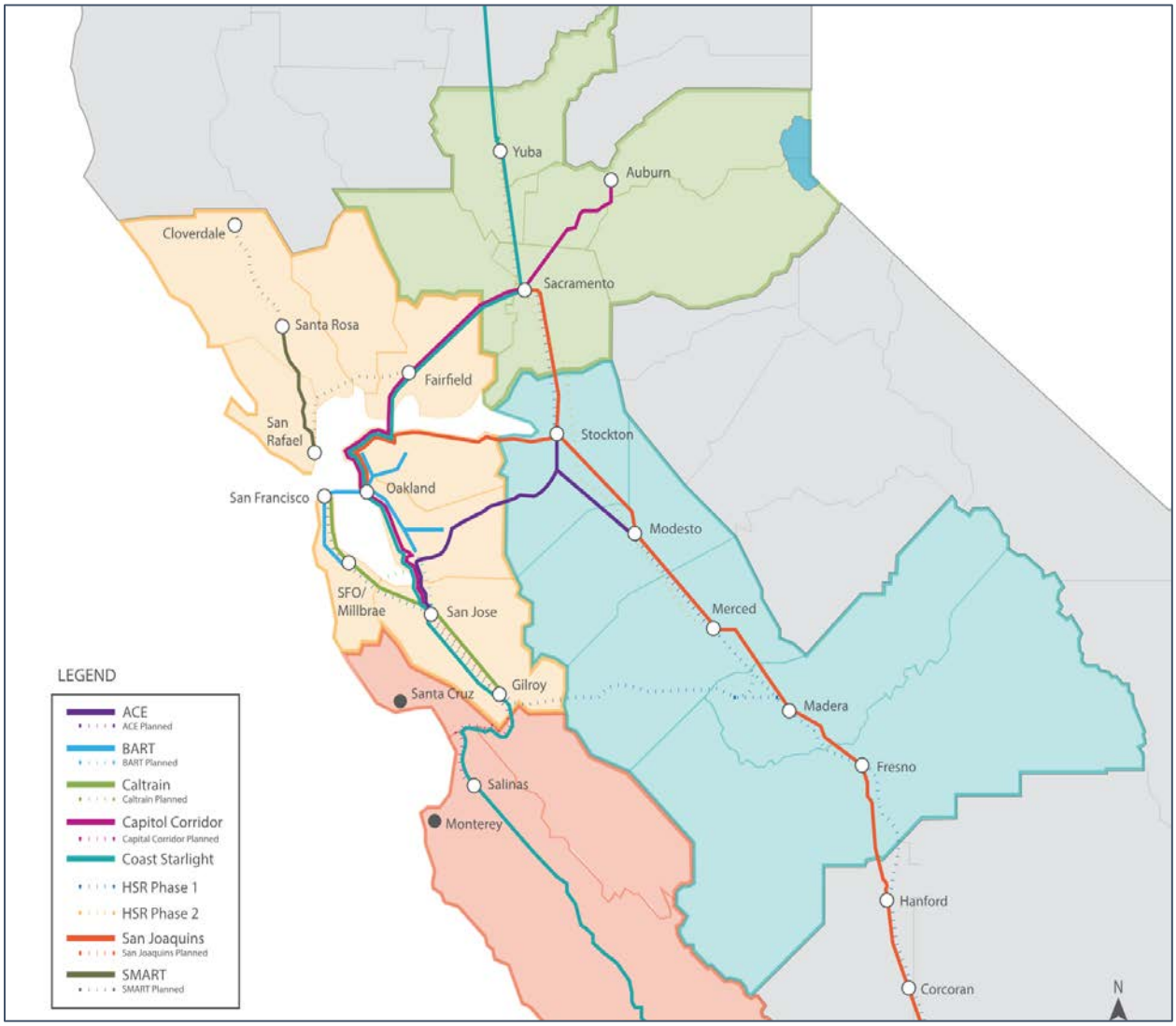
Capitol Corridor is an intercity passenger rail service that operates between the Sacramento region and Silicon Valley/San Jose. Capitol Corridor serves 18 stations in Placer, Sacramento, Yolo, Solano, Contra Costa, Alameda, and Santa Clara Counties, with thruway buses connecting to additional destinations, including San Francisco (Figure 3). Capitol Corridor serves more than 1.7 million annual riders and currently offers fifteen daily roundtrips between Sacramento and the Bay Area, seven of which continue south through Oakland to San Jose. Capitol Corridor operates along Union Pacific Railroad (UPRR) tracks over most of its 170-mile route, except for the southernmost 2.5 miles of the route, which are owned by the Peninsula Corridor Joint Powers Board. CCJPA is the managing agency for Capitol Corridor service.

Figure 3: Capitol Corridor Route Map



As shown in Figure 3 and Figure 4, riders can directly transfer from Capitol Corridor and thruway buses to other rail systems such as the Altamont Corridor Express (ACE), Bay Area Rapid Transit (BART), Caltrain, Sacramento Regional Transit, and San Joaquins. With its broad reach and connectivity, Capitol Corridor is the backbone of the Northern California Megaregional rail network.

Figure 4: Northern California Megaregional Rail Map



The *2018 California State Rail Plan* identified a bold vision for the future Megaregional Rail Network, which includes improving service and transit connectivity between Oakland and San Jose in the near-term and establishing an East Bay hub station to allow north-south and east-west connections across the Dumbarton corridor in the long-term.[3]

SBC seeks to relocate Capitol Corridor service from Niles Subdivision to the Coast Subdivision to enable a faster travel time between Oakland and San Jose. It will also build a new

[3] 2018 California State Rail Plan

Capitol Corridor station on the Coast Subdivision to facilitate transbay connections from the East Bay to the San Francisco Peninsula. SBC is a feasible near-term improvement that will be an initial step toward accomplishing the vision for Northern California's Megaregional Rail Network as shown in Figure 5.

Figure 5: *2018 State Rail Plan* Northern California Megaregional Rail Map (2040 Vision)

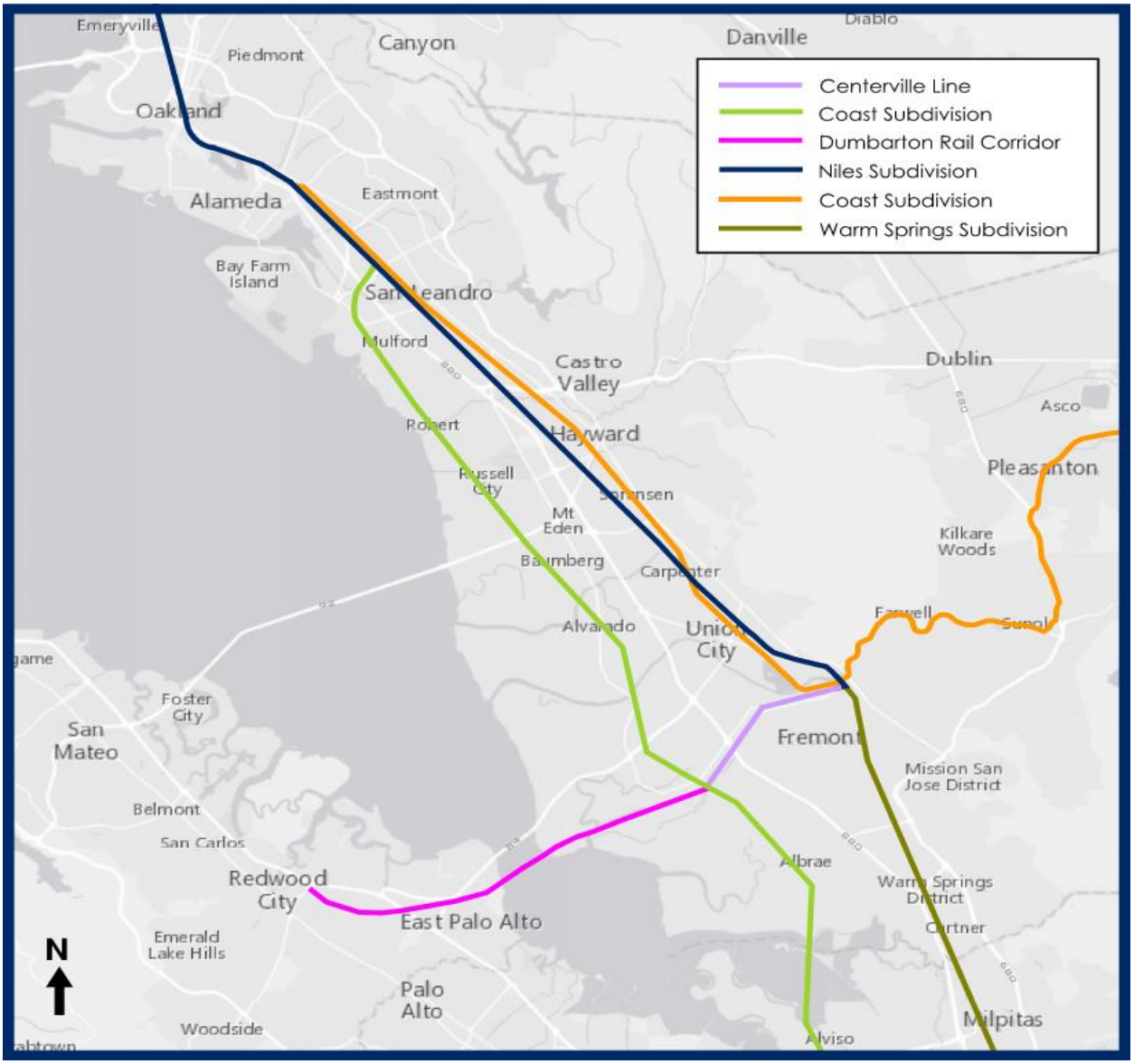
Source: *2018 California State Rail Plan*

EXISTING CONDITIONS

There are four north-south conventional rail lines- the Coast, Niles, Oakland, and Warm Springs Subdivisions- in Alameda County between Oakland and Newark. All four subdivisions are owned by UPRR and are shown in Figure 6.

There are two east-west rail lines in Alameda County, the Centerville Line that runs from the Coast Subdivision at Newark Junction to the Niles Subdivision at Shinn and the Dumbarton Rail Corridor that runs from the Coast Subdivision at Newark Junction across the San Francisco Bay to the Peninsula. UPRR owns the Centerville Line and the San Mateo County Transit District (SamTrans) owns the Dumbarton Rail Corridor. UPRR's Oakland Subdivision also turns at Niles Junction to serve as the east-west rail link into the Central Valley.

Figure 6: Freight Rail Subdivisions in the Project Area



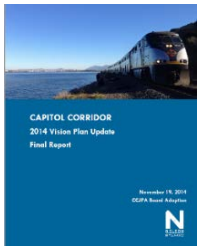
North of Newark Junction, the Coast Subdivision currently hosts primarily freight rail service, but it also accommodates Amtrak's Coast Starlight. The remaining passenger rail services, Capitol Corridor and ACE, use the Niles and Oakland Subdivisions and the Centerville Line. The Coast Subdivision largely passes through industrial areas in southern Alameda County, and it serves local manufacturing properties with rail spurs and sidings. There are 11 freight trips and two Amtrak Coast Starlight trips per day on the Coast Subdivision between Mile post (MP) 13.4 (Oakland) and MP 31.0 (Newark).[4] There are currently no passenger rail stations along this segment of the Coast Subdivision. South of MP 31.0, Capitol Corridor and ACE use the Coast Subdivision to reach San Jose.

On the Niles Subdivision, there are 16 freight trips per day and 14 daily Capitol Corridor trains. The Centerville Line hosts 11 freight trips and 22 passenger rail movements between Capitol Corridor and ACE daily.[5] There is currently no rail service on the Dumbarton Rail Corridor, though a new passenger service is currently being studied.[6]

SBC will relocate passenger rail service from the Niles Subdivision to the Coast Subdivision and freight movements from the Coast Subdivision to the Niles Subdivision. There is no change in either freight or passenger rail frequencies as a part of SBC. As a result of the project, however, the Niles Subdivision will see a reduction in passenger rail movements and an increase in freight rail movements, while the opposite will occur on the Coast Subdivision. As owner of the rail corridors, UPRR reserves the right to adjust freight volumes as it deems necessary on either of the two lines.

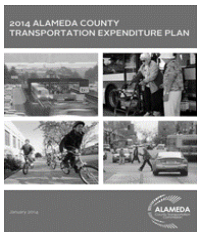
2.1. Consistency with Local, State, and Regional Plans

In addition to the *2018 California State Rail Plan*, SBC (formerly called Oakland to San Jose Phase 2A) is consistent with numerous local and regional plans. A brief overview of SBC's inclusion in local, regional, and state rail plans is provided below.



CCJPA 2014 VISION PLAN UPDATE[7]

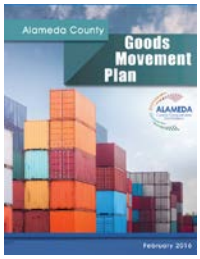
- Provides bold goals for the future of Capitol Corridor service.
- Explores service realignment on the Coast Subdivision between Oakland and San Jose.
- Proposes replacement of the Hayward and Fremont-Centerville stations with an Ardenwood station.



2014 ALAMEDA COUNTY MEASURE BB TRANSPORTATION EXPENDITURE PLAN[8]

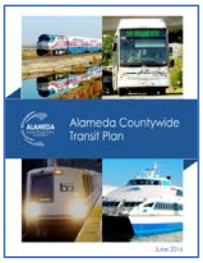
- Directs investment of voter-approved Measure BB.
- Programs $40 million for Capitol Corridor service expansion projects in Alameda County.

[4] ACTC *Current Daily Passenger and Freight Train Volumes* count
[5] ACTC *Current Daily Passenger and Freight Train Volumes* count
[6] Dumbarton Rail Corridor
[7] Capitol Corridor 2014 Vision Plan Update
[8] 2014 Alameda County Transportation Expenditure Plan



ALAMEDA COUNTY TRANSPORTATION COMMISSION (CTC) GOODS MOVEMENT PLAN (2016)[9]

- Identifies and prioritizes short- and long-term strategies to address goods movement needs in Alameda County and the Bay Area.
- Includes improvements to Industrial Parkway and Shinn.



ALAMEDA CTC COUNTYWIDE TRANSIT PLAN (2016)[10]

- Guides long-term transportation planning in Alameda County.
- Is consistent with CCJPA's Vision Plan that includes relocation of passenger rail service to the Coast Subdivision.

CAPITOL CORRIDOR VISION IMPLEMENTATION PLAN (2016)[11]

- Details actions and strategies to meet the goals identified in the *2014 Vision Plan Update*.
- Establishes the Coast Subdivision as the preferred alternative to improve service between Oakland and San Jose.
- Reinforces replacing the Hayward and Fremont-Centerville stations with an Ardenwood Station.
- Encourages coordinating with other transit operators to create timed transfers across SR 84 to destinations in the Mid-Peninsula.
- Seeks to provide a more direct "express" service alternative to BART through the East and South Bay.
- Calls for the eventual increase in service between Oakland and San Jose from 7 to 15 round trips.

PLAN BAY AREA 2040 (2017)[12]

- Guides long-term transportation and housing investments in the nine-county San Francisco Bay Area.
- Includes creating an intermodal hub that connects Capitol Corridor, ACE, and a potential future Dumbarton rail service.

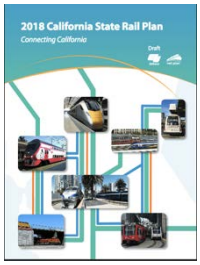
[9] Alameda County Goods Movement Plan
[10] Alameda Countywide Transit Plan
[11] Capitol Corridor Vision Implementation Plan
[12] Plan Bay Area 2040

DUMBARTON TRANSPORTATION CORRIDOR STUDY (DTCS) (2017)[13]

- Identifies alternatives to improve transit connectivity between the East Bay and the Peninsula.
- Connects alternatives with existing Capitol Corridor routes.
- Proposes developing a rail station at Ardenwood with a 1,200-space parking structure.
- Considers moving the transbay bus stop from current location in the Ardenwood Park & Ride to highway on-/off-ramps or a median highway stop with vertical circulation to the rail platform.

ALAMEDA CTC RAIL SAFETY ENHANCEMENT PROGRAM (2018)

- Recommends short-term grade crossing safety improvements at several locations along the Niles and Coast Subdivisions.



2018 CALIFORNIA STATE RAIL PLAN[14]

- Establishes a bold vision for prioritizing State investments in California's passenger and freight rail systems to create a robust network by 2040.
- 2022 Short-Term Plan includes improvements to service and transit connectivity between Oakland and San Jose.
- 2027 Long-Term Plan includes establishing an East Bay hub station near Newark, Hayward, or Fremont to allow north-south and east-west connections.

DUMBARTON FORWARD DESIGN ALTERNATIVES ASSESSMENT (2019)[15]

- Provides a range of near-term improvements along SR 84 to incentivize mode shift to transit.
- Recommends a pilot bus-on-shoulder program along SR 84 that utilizes the outside shoulder west of the Coast Subdivision overcrossing in the westbound direction and the inside shoulder east of Ardenwood Boulevard in the eastbound direction.
- Considers moving the transbay bus stop from current location in Ardenwood Park & Ride to freeway on-/off-ramps at Ardenwood Boulevard.
- Proposes to convert the outside lane to an HOV3+/bus-only lane approaching the toll plaza.

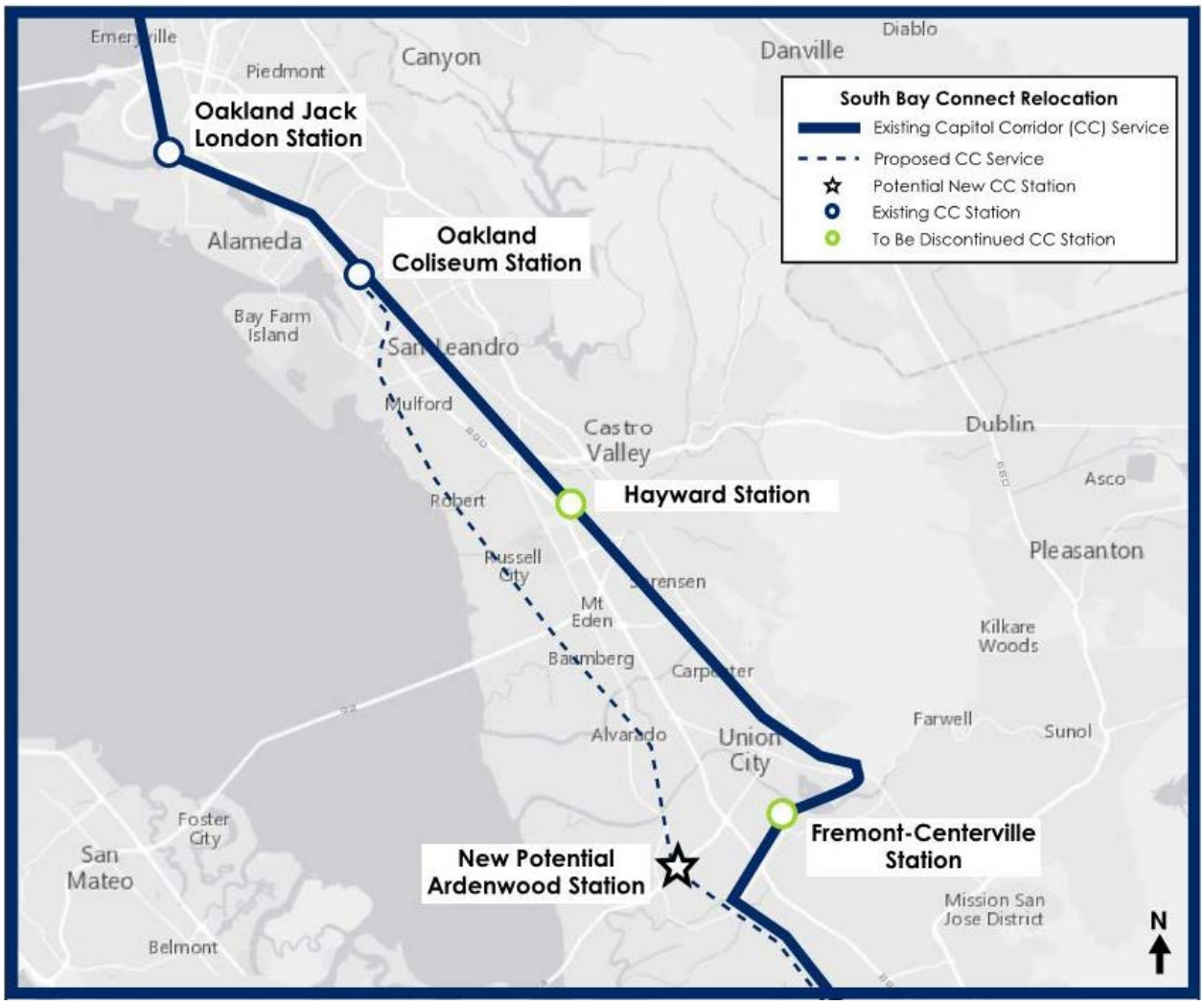
[13] Dumbarton Transportation Corridor Study
[14] 2018 California State Rail Plan
[15] Dumbarton Forward Operational Improvements

2.2. 2018 TIRCP Application and Award

In 2018, CCJPA was awarded $51 million from the Transit and Intercity Rail Capital Program (TIRCP) to advance SBC. Caltrans found that the project's multitude of benefits aligned with the goals identified in SB1 legislation and the 2018 TIRCP guidelines. Figure 7 shows a map of the project as proposed in the TIRCP application. Key project elements included in the application were:

- Relocating passenger and freight rail operations on the Niles and Coast Subdivisions between Oakland and Fremont/Newark to create operational improvements for both services.
    - Upgrading the Coast Subdivision to Federal Rail Administration Class 5 track standards to accommodate passenger rail service.
    - Creating improvements on the Niles Subdivision including a connection at Shinn, to allow for more efficient movement to and from the portion of the Oakland Subdivision that goes toward the Central Valley, and a connection at Industrial Parkway, where the Niles Subdivision crosses the Oakland Subdivision, to allow for freight rail to operate along the Niles Subdivision heading east.
- Rerouting Capitol Corridor service between the Oakland Coliseum station and Newark/Fremont.
    - Establishing a new intermodal station at the existing Ardenwood Park & Ride that connects rail service with express buses, private shuttles, and the surrounding bicycle and pedestrian network.
- Working with project partners including Alameda CTC, Metropolitan Transportation Commission (MTC), AC Transit, Caltrans District 4, City of Fremont, City of Newark, SamTrans, Caltrain, and private companies to develop the new intermodal station elements, initially proposed to include:
    - A median bus stop on SR 84.
    - A two-story parking structure.

Figure 7: SBC (Oakland to San Jose Phase 2A) TIRCP Application Project Map



PROJECT BENEFITS

SBC is anticipated to yield benefits to Capitol Corridor riders, residents, and businesses in the project area. Examining the ability of the project to deliver these benefits is a key focus of this report. The following four primary benefits as described in CCJPA's TIRCP application are detailed below.

- Reduce Greenhouse Gas (GHG) emissions and improve air quality.
- Increase ridership based on system and efficiency improvements.
- Coordinate and integrate with state rail and transit operators.
- Improve safety.

1. Reduce GHG Emissions and Improve Air Quality

Many of the highways in the project area are considered congested by MTC, including State Route (SR) 84 and SR 92, which are both vital bridge connections from the East Bay to the Mid-Peninsula.[16] Interstate 880 (I-880), the main highway between Oakland and San Jose, ranks as the seventh most congested Bay Area highway.[17] Reduced train travel times along the Capitol Corridor route in Alameda County, coupled with improved connections to transbay transit services, would encourage more travelers to take the train instead of driving on congested roads. The shift in travel behavior would positively impact air quality, as the decrease in congestion would result in the reduction of emissions associated with idling. These reductions are anticipated to reduce GHG and particulate matter emissions and reduce 289,390 metric tons of carbon dioxide emissions over 50 years. An additional benefit would be reduced train emissions through the center of Fremont, as the more direct passenger and freight rail routes would decrease the number of trains using the Centerville Line.

2. Increase Ridership Based on System and Efficiency Improvements

Operating along the Coast Subdivision will reduce Capitol Corridor travel times by up to13-minutes between Oakland and San Jose, attracting more riders to Capitol Corridor service. The current three-hour trip from Sacramento to San Jose will be shortened to approximately 2 hours and 45 minutes. Enhanced connections from Capitol Corridor to transbay transit options, including both public buses and private shuttles, will also attract riders going to and from the Peninsula. CCJPA's Service Optimization work identified that connections to and from the Peninsula were the most underserved market to market connection for travelers along the Capitol Corridor route. Due to this, integration with transit services using SR 84 is a top priority.

3. Coordinate and Integrate with State Rail and Transit Operators

Relocating passenger rail service to the Coast Subdivision provides an opportunity to integrate Capitol Corridor with transbay transit service, connecting the East Bay to mid-Peninsula cities. This would allow Capitol Corridor to serve different markets than BART and avoid duplicative investments as BART expands further into San Jose. Switching to the Coast Subdivision is also a necessary precursor for future Capitol Corridor service expansions to San Jose.

The freight rail elements of SBC align with the goals of major goods movement plans including the *State Rail Plan*, MTC's *Goods Movement Plan*, and Alameda CTC's *Goods Movement Plan* and *Rail Strategy Plan*.

4. Improve Safety

SBC will effectively separate passenger rail service and freight rail operations between Oakland and Newark, reducing the competition for capacity on the respective rail lines. Also, the rerouting will move Capitol Corridor and most freight trains off the Centerville Line, which will reduce the number of trains through busy at-grade crossings in central Fremont.

SBC safety improvements include upgrades to track and signals, positive train control (PTC) installation, additional grade crossing protection, and safety fencing.

[16] Vital Signs: Time Spent in Congestion
[17] Vital Signs: Time Spent in Congestion

SECONDARY PROJECT BENEFITS

The TIRCP application also identified nine secondary benefits, which are described below in Table 3.

Table 3: Secondary TIRCP Benefits

SBC Secondary TIRCP Benefit	Description
Implementation of Sustainable Communities Strategies	Consistency with MTC's Plan Bay Area 2040.
Benefits to Disadvantaged Communities, Low-Income Communities, and Low-Income Households	Provision of benefits to regionally and state-defined priority communities through reduced air pollution and better access to transit.
Project Priorities	Coordination with local, regional, and state partners to accomplish common transit goals.
Geographic Equity	Introduction of passenger rail service to growing areas that are currently underserved by rail.
Consistency with Sustainable Communities Strategy	Alignment of the projects with stated goals in MTC's Sustainable Communities Strategy.
Freight Benefits	Improvements to freight network efficiency, particularly for movements from the Port of Oakland to and through the Central Valley.
Non-State Supplemental Funding Commitments	Availability of regional and local funds to support the project.
Multi-Modal Integration	Integration of Capitol Corridor service with other modes of transportation, including rail, bus, bicycle, foot, and automobile.
Financial Plan for Expansion of Service	Implementation of system improvements without increasing CCJPA's operating budget.

2018 COST AND FUNDING

In the 2018 TIRCP application, CCJPA estimated the project cost to be $246 million in year of expenditure dollars. Included in the TIRCP estimate were improvements to the Coast and Niles Subdivisions and construction of a new intermodal station, assumed to be at the existing Ardenwood Park & Ride. Additional future station elements, including a highway median bus facility with vertical circulation to the platform below and a new parking structure, were not included in the conceptual preliminary cost estimate. Table 4 shows the project preliminary cost estimate and funding plan as described in the TIRCP application.

Table 4: 2018 TIRCP Application Conceptual Preliminary Cost Estimate and Funding Plan

		FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	Total
Preliminary Cost Estimate by Phase								
Environmental		$800	$1,600	$1,700				$4,100
Design			$9,800	$10,100	$10,400			$30,300
Right-of-Way (ROW)					$1,100			$1,100
Construction					$68,100	$70,100	$72,300	$210,500
Total Project Costs		**$800**	**$11,400**	**$11,800**	**$79,600**	**$70,100**	**$72,300**	**$246,000**
Funding by Source								
Committed Funding	State Transportation Improvement Program (STIP): Interregional Transportation Improvement Program (ITIP)					$20,000		$20,000
	State Rail Assistance (SRA)		$1,500	$2,000	$2,500	$2,500		$9,000
	Regional Measure 3 (RM 3)		$3,500	$3,300	$19,600	$14,100	$20,500	$61,000
	Measure BB		$1,400	$1,500	$10,000	$10,000	$16,800	$40,000
	Subtotal: Committed Funding		*$6,400*	*$6,800*	*$32,100*	*$46,600*	*$37,300*	*$130,000*
Prospective Funding	Consolidated Rail Infrastructure and Safety Improvements (CRISI)		$5,000	$5,000				$10,000
	Transit and Intercity Rail Capital Program (TIRCP)				$20,000	$11,000	$20,000	$51,000
	Solutions for Congested Corridors Program (SCCP)				$20,000			$20,000
	Trade Corridor Enhancement Program (TCEP)				$7,500	$12,500	$15,000	$35,000
	Subtotal: Prospective Funding		*$5,000*	*$5,000*	*$47,500*	*$13,500*	*$35,000*	*$116,000*
Total Identified Funding		**$800**	**$11,400**	**$11,800**	**$79,600**	**$70,100**	**$72,300**	**$246,000**

Note: Costs in thousands and YOE dollars.

Section 3. Project Definition Evaluation

As SBC advances into the environmental phase, the project requires further definition and analysis. This report outlines a preliminary purpose and need, determines the validity of the project components, and identifies potential fatal flaws in conceptual design alternatives.

3.1. Preliminary Purpose and Need

PURPOSE

The purpose of South Bay Connect is to create a more direct passenger rail route and significantly reduce rail travel time between Oakland and San Jose, facilitating more auto-competitive travel times for intercity passenger rail trips throughout the Northern California Megaregion. South Bay Connect will create new connections to transbay services and destinations on the Peninsula while maintaining the integrity of Capitol Corridor's intercity passenger rail service. A further objective is to separate passenger rail service and freight operations in southern Alameda County, improving operations for both and supporting the economic vitality of the megaregion.

NEED

- **Reduce passenger rail travel time** between Oakland and San Jose and throughout the larger megaregion to increase ridership on transit, ease congestion on the Bay Area's stressed roadways, and reduce auto supercommutes.
- **Diversify and enhance network integration** by reducing duplicative investments and differentiating Capitol Corridor's intercity rail service from commuter rail and other transit services, including BART's extension to San Jose.
- **Support economic vitality** by permitting enhanced rail movement and the preservation of freight rail capacity in the Northern California market through the reduction of conflicts between freight rail operations and passenger rail service.
- **Improve service between megaregional markets** by enhancing connections between high demand destinations, overcoming existing geographic service gaps between job centers and affordable housing on the Peninsula and the Capitol Corridor route.
- **Promote environmental sustainability** by reducing greenhouse gas emissions.

3.2. Track Improvements

COAST SUBDIVISION

To allow Capitol Corridor passenger service to utilize the Coast Subdivision, the existing track between Elmhurst Junction (MP 13.6) and Newark Junction (MP 31.0) needs to be upgraded to conform to FRA Class 5 track standards. Overall track improvements to prepare the Coast Subdivision for expanded intercity passenger rail service include:

- Replacement of portions of the rail and ties.
- Addition of several inches of ballast.
- Installation of new signal technology (centralized traffic control and PTC).
- Modifications to improve safety and security, including 17 miles of new fencing.
- Upgrade of Elmhurst Junction to a number 20 turnout to allow higher speeds.
- Installation of new passing track.

The existing 21 at-grade crossings in the project area may require modification due to the installation of new rail infrastructure, and intersecting streets may need minor improvements to conform to the track profile. Other modifications could include safety improvements to reduce potential conflicts with cars, bikes, and pedestrians crossing the tracks. These improvements would be identified at a later phase of the project. The exact improvements on the Coast Subdivision will be determined in coordination with UPRR. Preliminary engineering drawings of proposed Coast Subdivision improvements are in Appendix B.

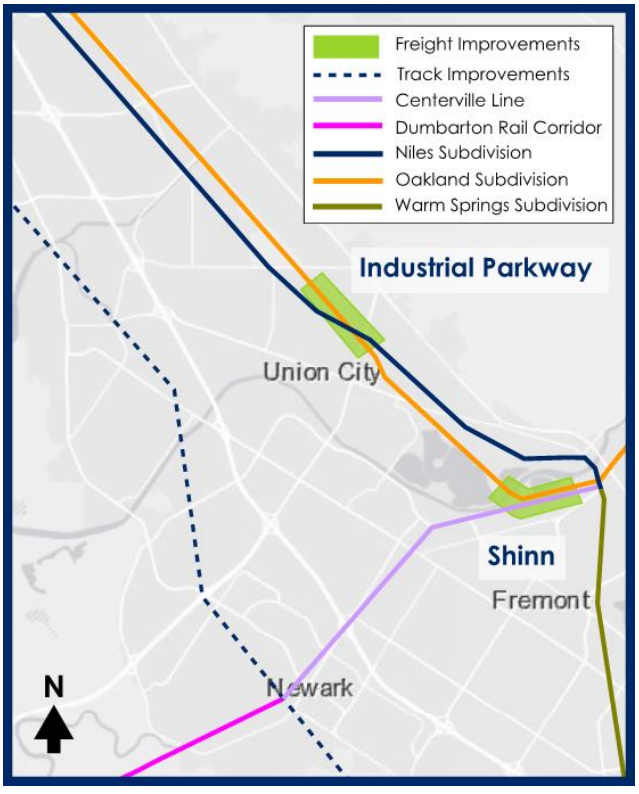
NILES AND OAKLAND SUBDIVISIONS

The freight components of SBC, shown in Figure 8, would allow for freight trains to travel south along the Niles Subdivision and then east toward the Central Valley to transport goods from the Port of Oakland to the rest of the state and country.

The improvements include a connection at Industrial Parkway (MP 24.0) that would allow freight trains traveling south to transfer from the Niles Subdivision to the Oakland Subdivision. A grade separation of Industrial Parkway is included to provide a safer crossing for all modes of transportation. In addition, the existing siding in Hayward will be extended to allow trains to pass each other, which will improve operations and reduce idling for freight trains.

A Shinn connection (MP 30.1) is needed to improve routing and operational efficiency between the Niles and Coast Subdivisions. The proposed Shinn connection would be located near both industrial and residential development. The new track connection is projected to have minimal ROW impacts and require limited property acquisitions. Further constraining the Shinn site is an existing BART bridge where the conventional rail tracks are proposed to connect. The BART bridge column clearance will need to be maintained during construction and operation. Due to these restrictions, the track section at the Shinn connection requires a tight curve radius, likely limiting train speeds to 10-20 miles per hour. New fencing will be constructed to replace the existing fence along the development property line of several residences. A noise and vibration analysis will be conducted for trains running through the corridor.

Figure 8: Industrial and Shinn Improvement Locations



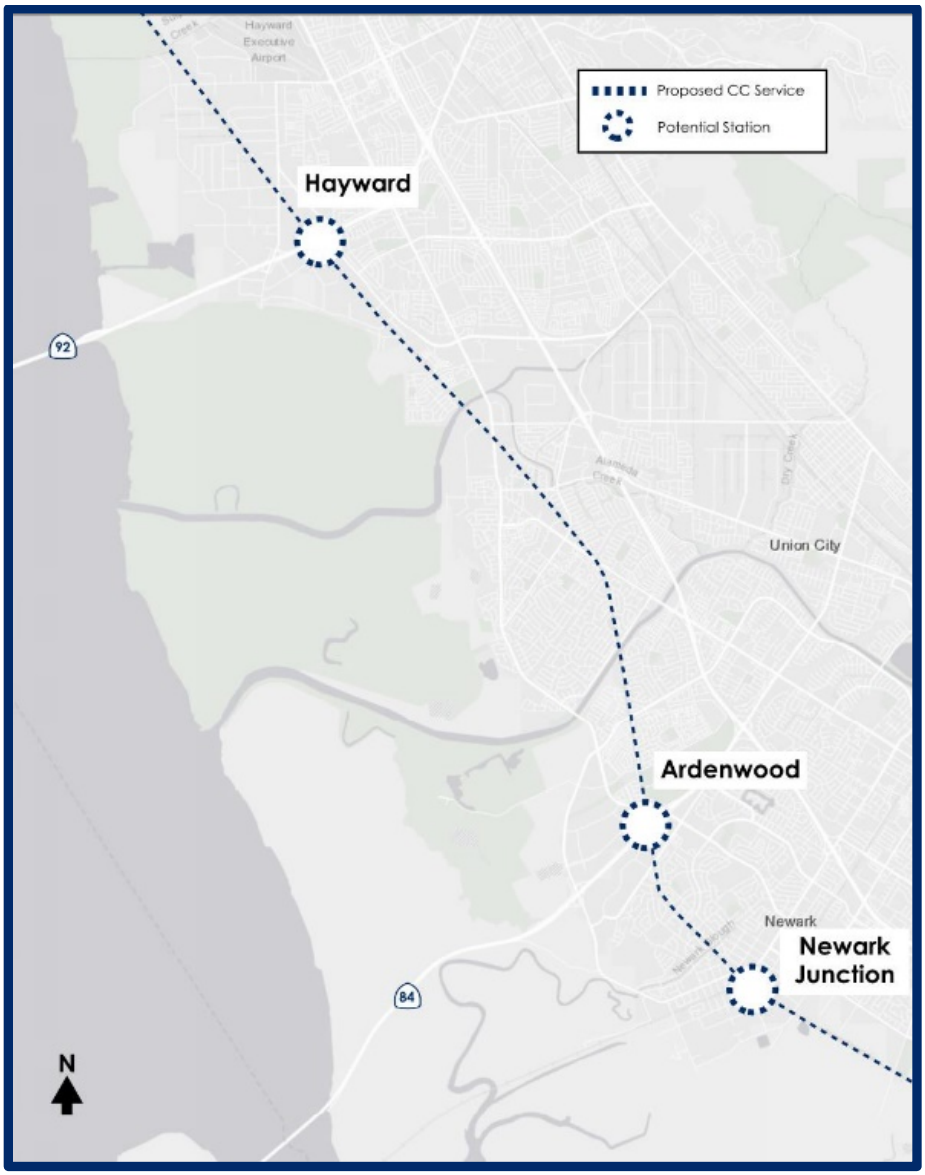
While it is assumed that the new connections at Industrial and Shinn will be required by UPRR, additional rail infrastructure could be required depending on the outcomes of a pending UPRR train volume modeling exercise. All improvements in the freight corridor will require further discussion and

coordination with UPRR to ensure they meet design guidelines and standards. Preliminary engineering drawings of the proposed freight improvements are in Appendix C.

3.3. Potential Station Locations

The Ardenwood station location was compared to two other potential station locations along the Coast Subdivision. Station areas, shown in Figure 9, were selected based on their proximity to transbay bridges or rail lines, since providing an enhanced connection to transbay transit services from the East Bay to the Mid-Peninsula is a key outcome of the project. This assessment produced two additional station study areas: 1) Hayward at SR 92 and 2) Newark Junction. All three potential station locations are described in detail below. The conceptual plans for all three sites can be found in Appendix D as well as in the following section.

Figure 9: Potential Station Site Study Areas



3.3.1 Potential Ardenwood Station Area and Options

STATION AREA

The Ardenwood station study area (Figure 10) is located where SR 84 passes over the Coast Subdivision tracks, on the border between Fremont and Newark. There is an existing Park & Ride at this location served by public buses and private shuttles to the Peninsula. There are thousands of jobs in the business parks adjacent to the tracks, and recent rezoning is expected to bring over 30,000 jobs to the nearby area.[18] This could make the station a popular morning terminus and afternoon origin point for Capitol Corridor riders, while also serving as an important transfer node for riders heading to the Peninsula.

The Ardenwood Park & Ride is in the northeast quadrant of the intersection of SR 84 and the Coast Subdivision. The Park & Ride accommodates transbay bus services such as the Dumbarton Express, AC Transit U Line, Stanford shuttles, and numerous employee shuttles. The Ardenwood Park & Ride has 300 free first-come, first-served parking spaces and 50 paid reserved spaces (available for $50 a month).[19] Just north of the Park & Ride is a small strip mall. The closest residential neighborhood begins about a quarter-mile from the Park & Ride.

West of the track is the Ardenwood Technology Park. In 2016, the City of Fremont rezoned approximately 160-acres of the Park, increasing maximum building heights and square footages. This rezoning is expected to bring 7,500 new jobs to the Park.[20] Tesla and Facebook have leased space in the Park and are in the process of moving employees to the Park.[21] At the undeveloped southwestern parcels of the Park, there is a plan to build 18 new stories of office building and 10 new levels of parking.[22]

STATION OPTIONS

The primary identified platform location at Ardenwood is directly adjacent to the Park & Ride. Ardenwood platform alternatives are compared in detail in Section 4.

At Ardenwood, MTC is considering a pilot project that would move transbay bus stops from the Park & Ride to SR 84 on ramps to eliminate the travel time associated with circulating between local streets and the highway.[23] Since this proposal would create an inconvenient transfer for Capitol Corridor riders, especially from the eastbound bus stop, potential new bus stop designs that would keep transbay buses on SR 84 while preserving a short transfer from Capitol Corridor were explored.

Two highway-level bus stop design options were developed: a two-way median bus stop with a bus crossover (Figure 12) and a split platform bus stop, with the westbound stop on the northern shoulder and the eastbound stop in the median (Figure 13). Conceptual design work has determined that both options are geometrically and operationally constrained and may be infeasible.

[18] Projections 2040 by Census Tract: Jobs
[19] East Bay Park & Ride Lots
[20] Fremont: Big chunk of Ardenwood Technology Park rezoned to attract high tech firms (Mercury News)
[21] Fremont business park is bought in wake of Tesla, Facebook leases (Mercury News)
[22] Zoning Administrator Permit: Ardenwood IV-I Office Park
[23] Dumbarton Forward Operational Improvements

Using the median for a bus stop would require the removal of SR 84's inside shoulders, which would create a nonstandard condition. Offsetting median platforms would not address this issue. Though this could be mitigated by restoring the highway cross section to its original width through widening the outside of SR 84, there would be significant expense and construction impacts from this.

To avoid impacting existing shoulders and travel lanes, a separate station structure could be built in between the SR 84 overpasses. A station structure that meets seismic movement standards, however, would not provide sufficient width for the 13-foot lanes that many transit operators require. Though a split platform option could overcome some of these geometric concerns, it would require significantly more infrastructure.

The median-only and split platform options both have large operational issues as well. Given the limited space in the area, there would likely be no room for buses to pass one another in the station area. To prevent buses from backing up onto other travel lanes, schedules would need to very precise and delays minimal. Since over 560 peak hour public buses and private shuttles use SR 84 daily, coordinating timetables would be very difficult.[24]

There are also funding challenges that would come with highway bus stops at Ardenwood. Solving the geometric and operational issues would likely require building new structures, which would be an expensive project. Beyond the likely large capital cost, the operation and maintenance of the facilities would be charged to either local cities or AC Transit.

Other potential highway-level bus stops would likely encounter similar constraints as the two options explored here. Due to the complexity and potential infeasibility of highway bus stops at Ardenwood, these options will not be pursued at this point in SBC. The SBC improvements advanced by the PDR (Figure 11), however, will not preclude the potential for highway bus stops in the future.

[24] Appendix E

Figure 10: Ardenwood Station Area Location Map

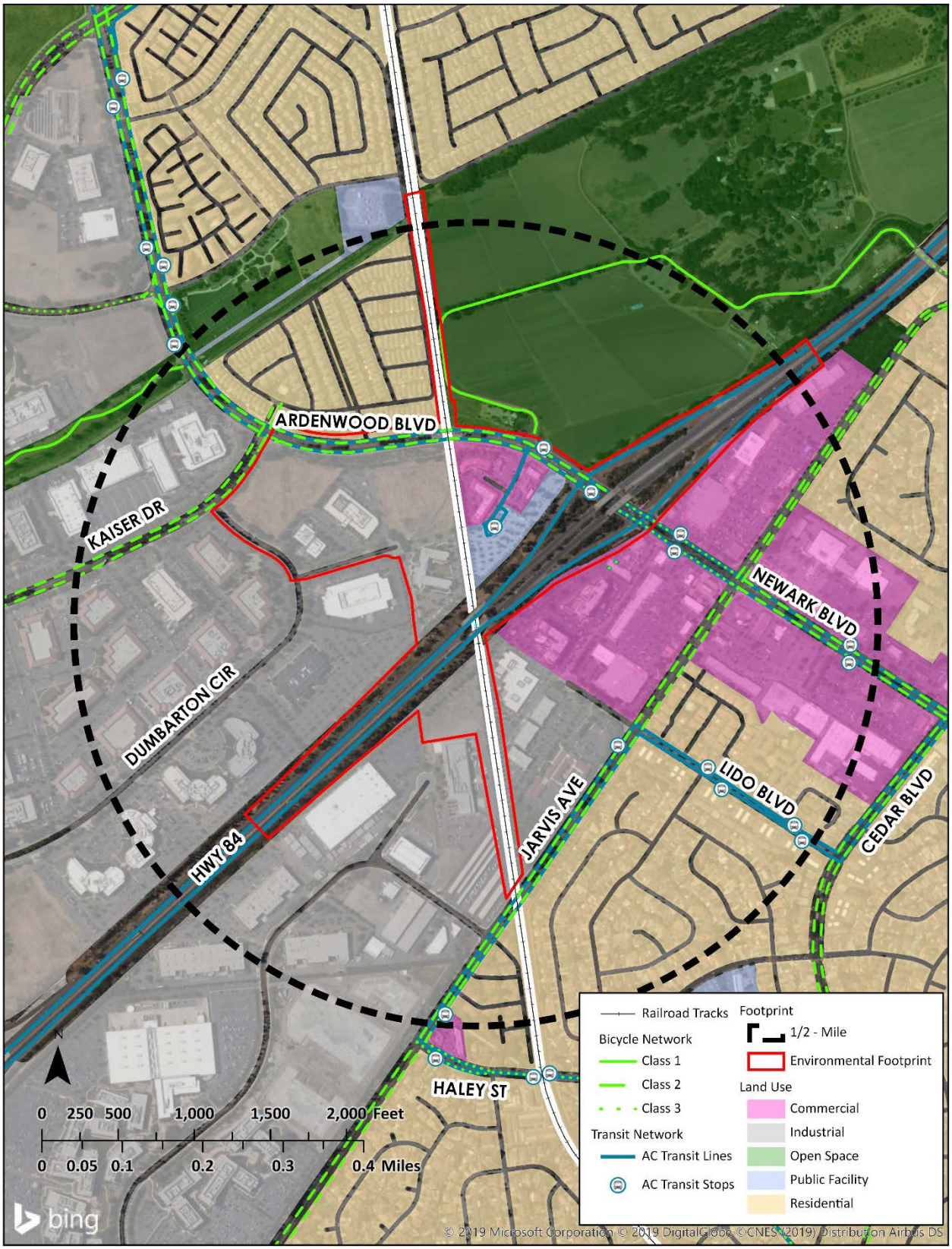
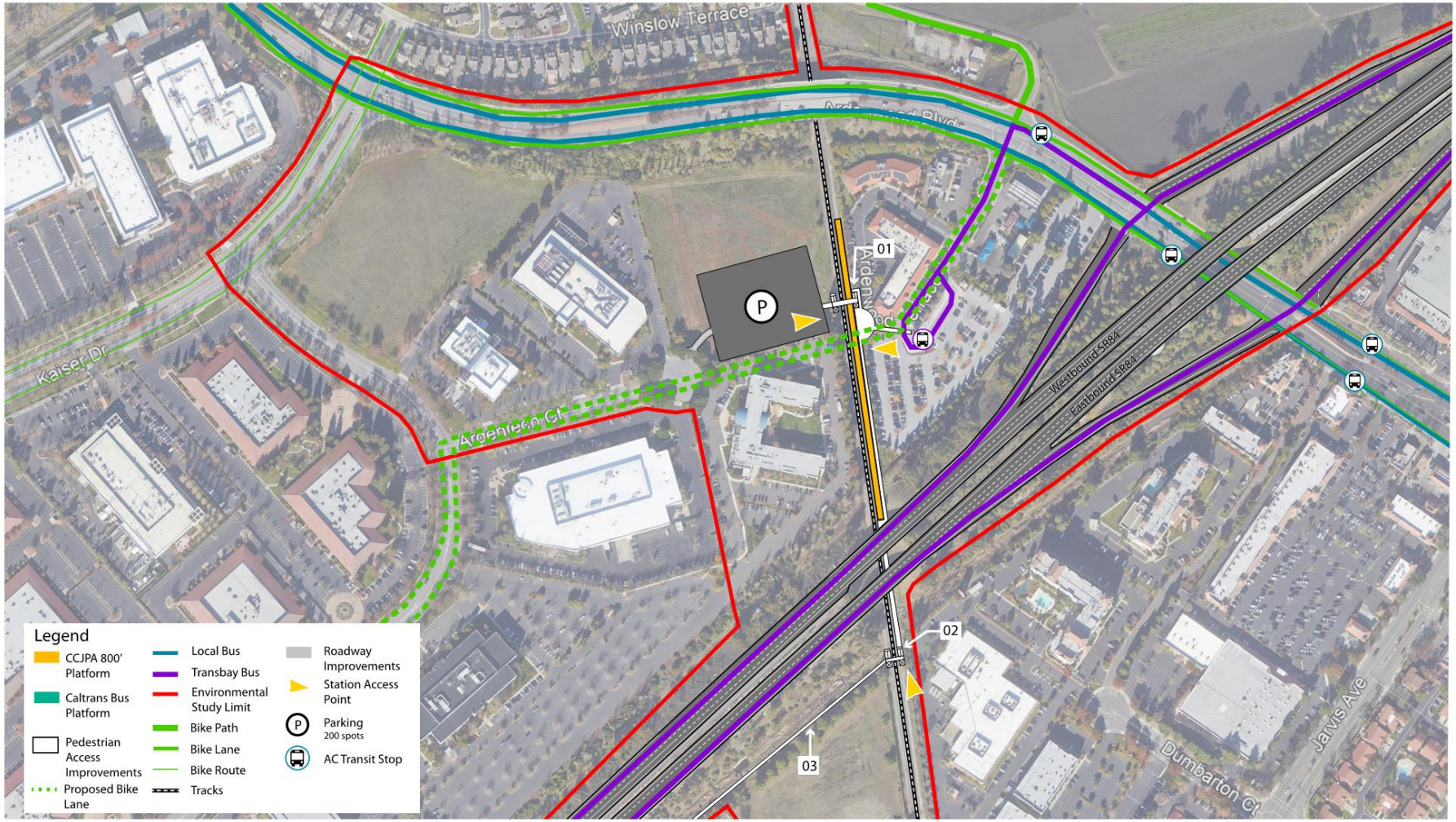


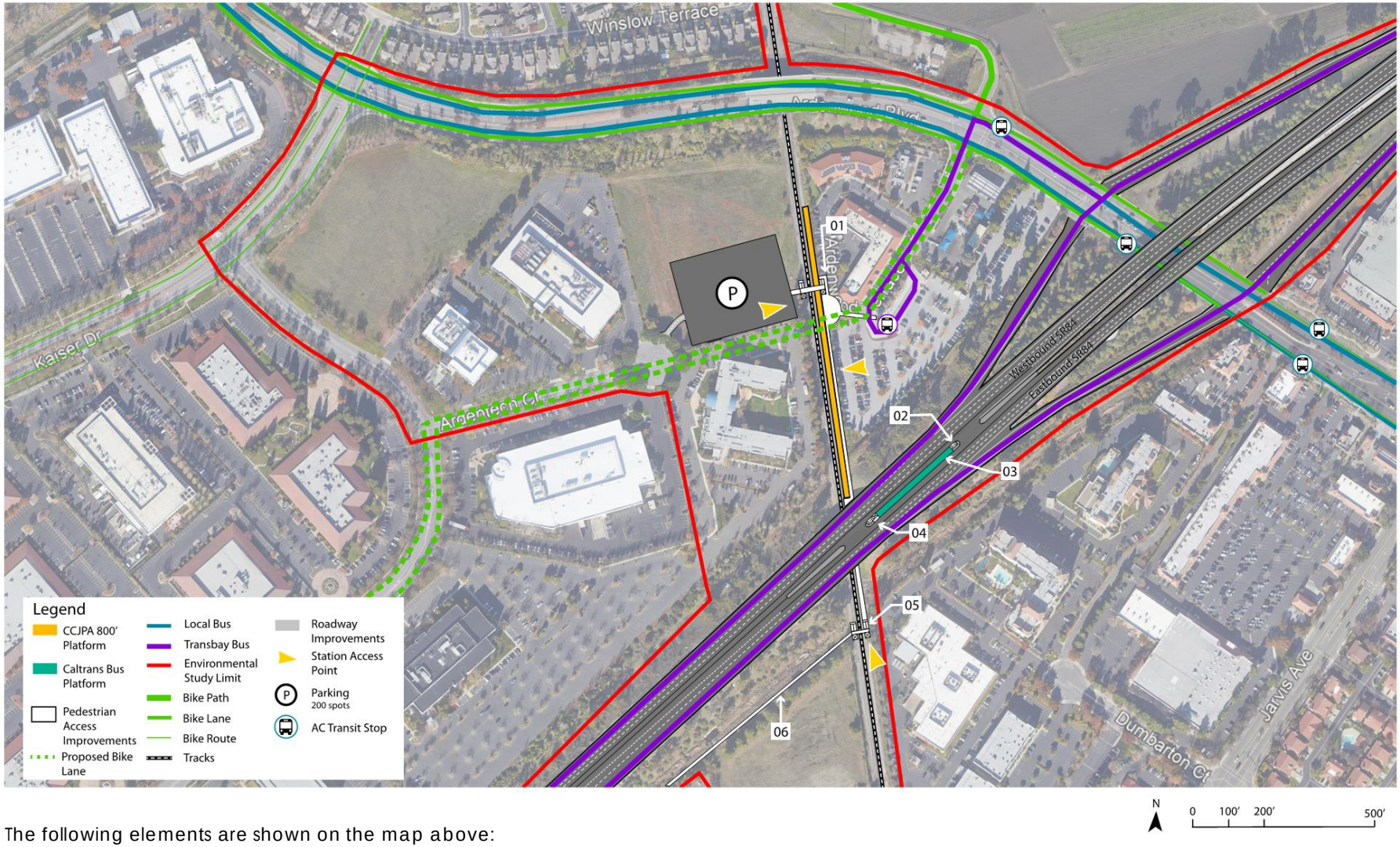
Figure 11: Ardenwood Station Area Conceptual Plan Option 1 – Existing Bus Stop



The following elements are shown on the map above:

1. Pedestrian crossing to northwest access and parking.
2. Pedestrian crossing to pedestrian pathway.
3. Pedestrian pathway.

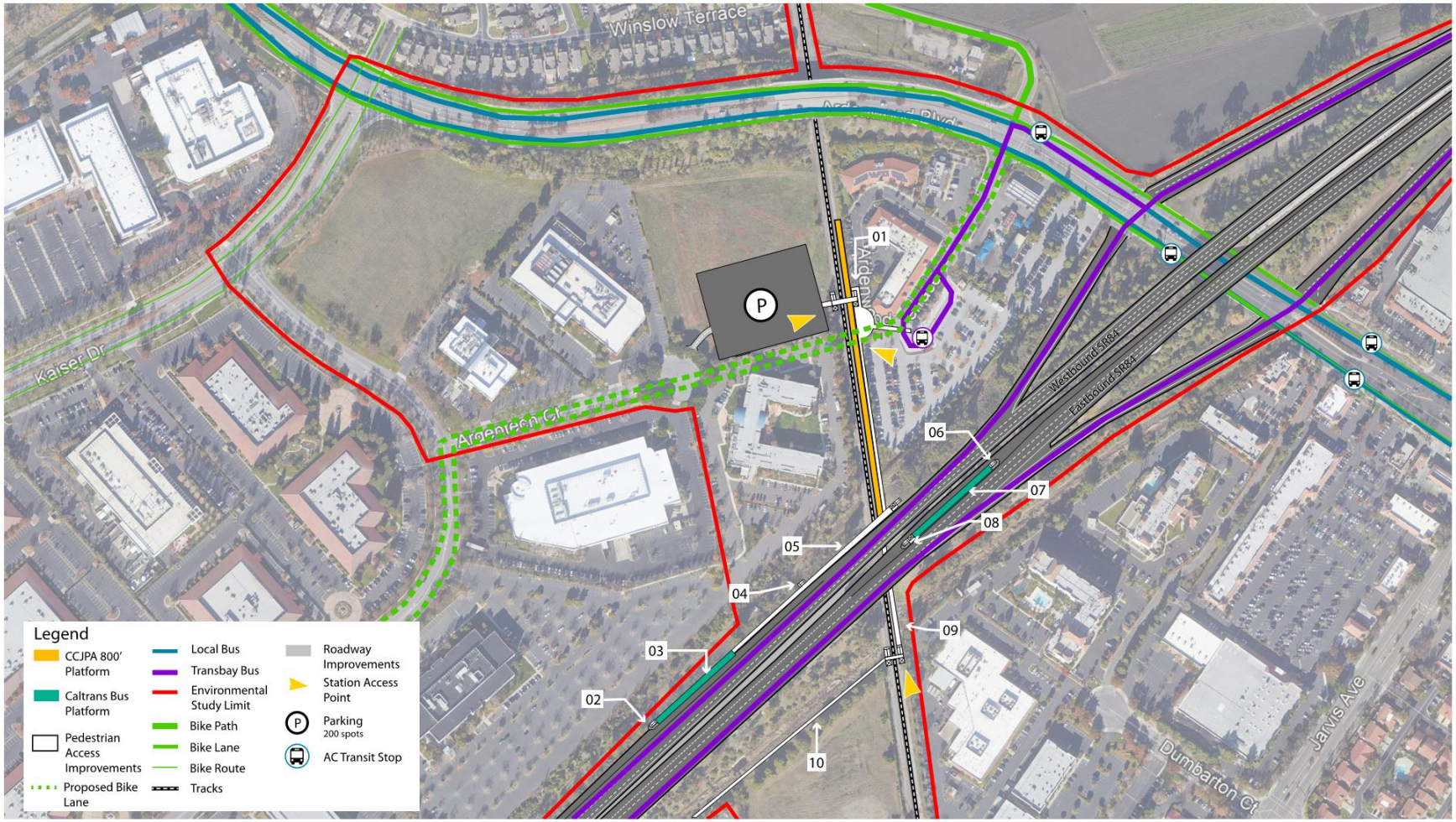
Figure 12: Ardenwood Station Area Conceptual Plan Option 2 – Hwy Median Bus Stop



The following elements are shown on the map above:

1. Pedestrian crossing to northwest access and parking.
2. Exit stair.
3. Bus platform.
4. Elevator, stair, and accessible path to platform below.
5. Pedestrian crossing to pedestrian pathway.
6. Pedestrian pathway.

Figure 13: Ardenwood Station Area Conceptual Plan Option 3 – Hwy Split Bus Stop



The following elements are shown on the map above:

1. Pedestrian crossing to northwest access and parking.
2. Exit stair.
3. Westbound bus platform.
4. Exit stair.
5. Pedestrian pathway to end elevator, stair, and accessible path and platform below.
6. Exit stair.
7. Eastbound bus platform.
8. Elevator, stair, and accessible path to platform below.
9. Pedestrian crossing to pedestrian pathway.
10. Pedestrian pathway.

3.3.2 Potential Hayward Station Area and Options

STATION AREA

The Hayward station study area is located at the SR 92 overpass of the Coast Subdivision as shown in Figure 14. The areas immediately east and west of the Coast Subdivision are almost entirely industrial. Residential areas begin about a quarter-mile east from the track.

While there are no existing transbay public buses or private shuttles serving the Hayward study area, there are about 200 combined public buses and private shuttles that cross over SR 92 during peak hours.[25]

STATION OPTION

A station located as close as possible to the highway would provide the best transfer potential for riders connecting between Capitol Corridor and transbay services to the Peninsula. Multiple potential station locations were analyzed in Hayward, but none of the land directly adjacent to SR 92 was identified as feasible space for a passenger rail station. Parcels just northwest of the overpass that have been acquired for redevelopment were considered as a potential site, but a station at this location was deemed inconsistent with developer plans.

A parcel at the ½ mile radius of the intersection of the Coast Subdivision and SR 92 has been identified as a potentially suitable location for a future rail station. At this location, near where Clawiter Road crosses the Coast Subdivision, the platform would be located on the northwest side of SR 92. Access to the station parking and platform would be provided off Clawiter Road. A pedestrian overcrossing would be provided at the middle of the platform to provide access to the industrial area east of the alignment. Though the area's triangular shape constrains design options, the needed station elements fit within the space. A conceptual site plan for the Hayward station is shown in Figure 15.

The at-grade crossings of Clawiter Road and Depot Road just north of the platform could require attention if a station is implemented, due to the increased pedestrian, bicyclist, and vehicle activity that could occur around the station. Adding grade separations so close to the platform would likely result in design changes that could impact project cost and schedule. Since the need for grade separations has not been determined, they are not included in Figure 15.

[25] Appendix E

Figure 14: Hayward Station Area Location Map

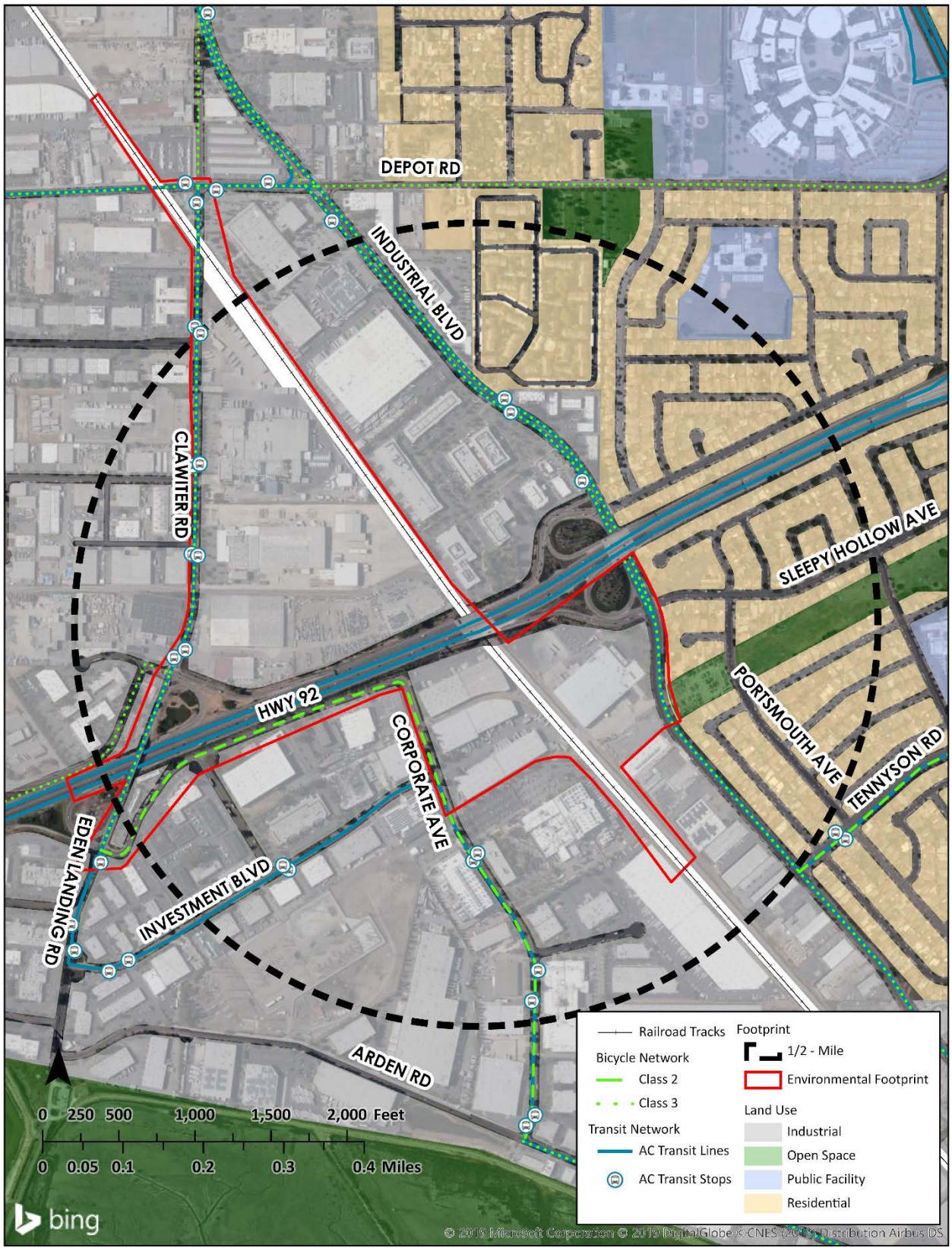
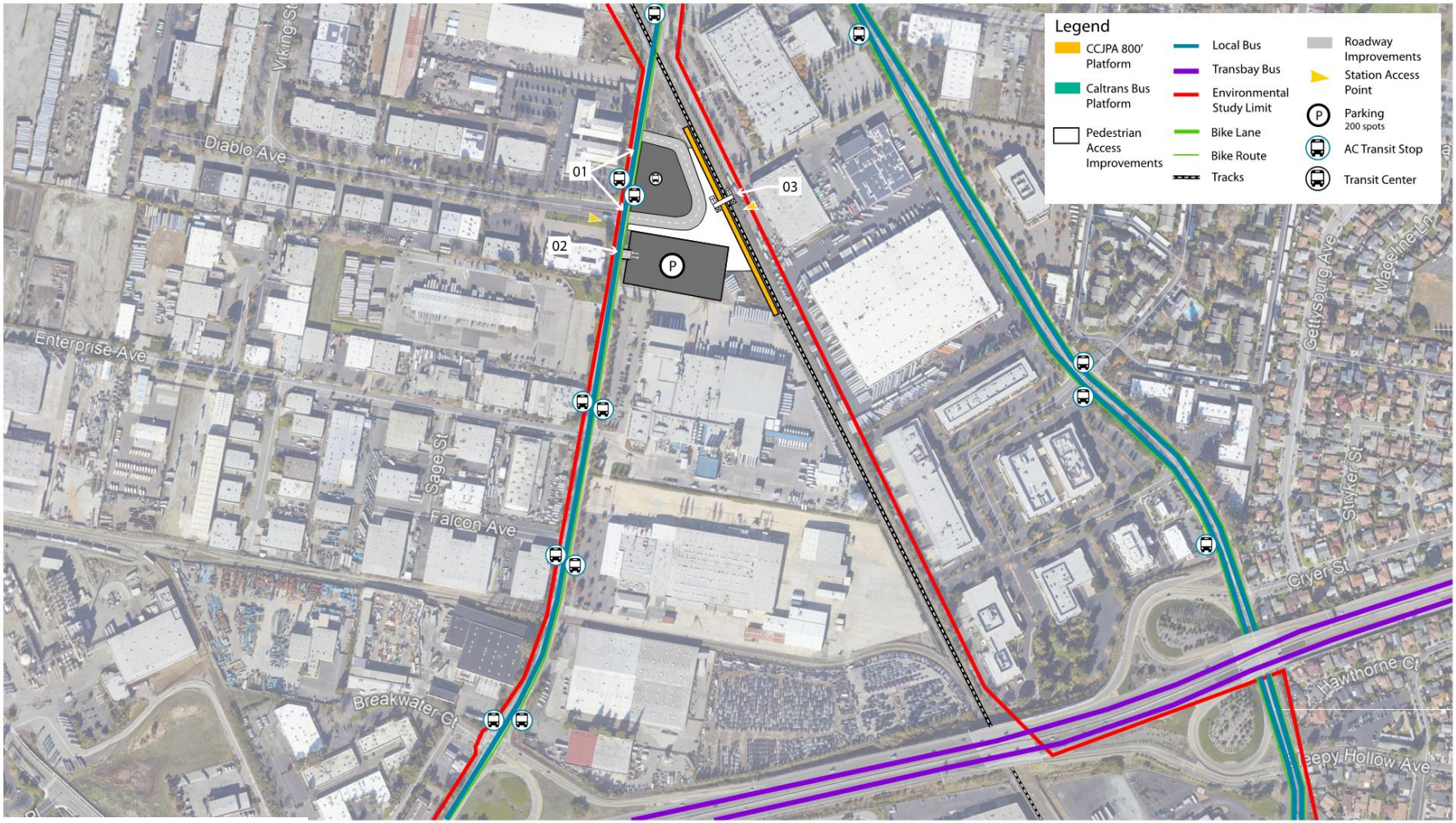


Figure 15: Hayward Station Area Conceptual Plan



The following elements are shown on the map above:

1. Transit center access.
2. Parking access.
3. Pedestrian crossing for east-west access with stairs and elevators.

3.3.3 Potential Newark Junction Station Area and Options

STATION AREA

The Newark Junction station study area (Figure 16) is the location where the Dumbarton Rail Corridor connects with the Coast Subdivision and Centerville Line. The north end of the study area (north of the Centerville Line) is predominately residential. The south end (south of the Centerville Line) is industrial. Newark Slough runs along the far northern edge of the study area. Plummer Creek cuts through the middle of the study area, parallel to the Centerville Line. There are no transbay bus options currently serving the study area.

STATION OPTION

Incorporating a station near Newark Junction would likely require re-alignment of the existing tracks at the Junction. In order to conform to criteria and place the platform on a tangent, the space available only provides for a 600' platform length. The shorter platform option shown prevents placing the platform on a curve. Access to the station parking and platform would be provided from Carter Avenue. The station would be located at ground level with parking on the second floor of the structure. The conceptual site plan is shown in Figure 17.

A complicated aspect of the current track configuration at Newark Junction is that it uses adjacent turnouts to cross the Coast Subdivision mainline. This configuration would need to be revised in order to improve connections and operating speeds through the Junction. This could impact the route efficiency of freight trains accessing the Cargill salt production plant facility nearby. Further analysis will be required to assess the impacts of additional track improvements due to limited space in the UPRR ROW.

Figure 16: Newark Junction Station Area Location Map

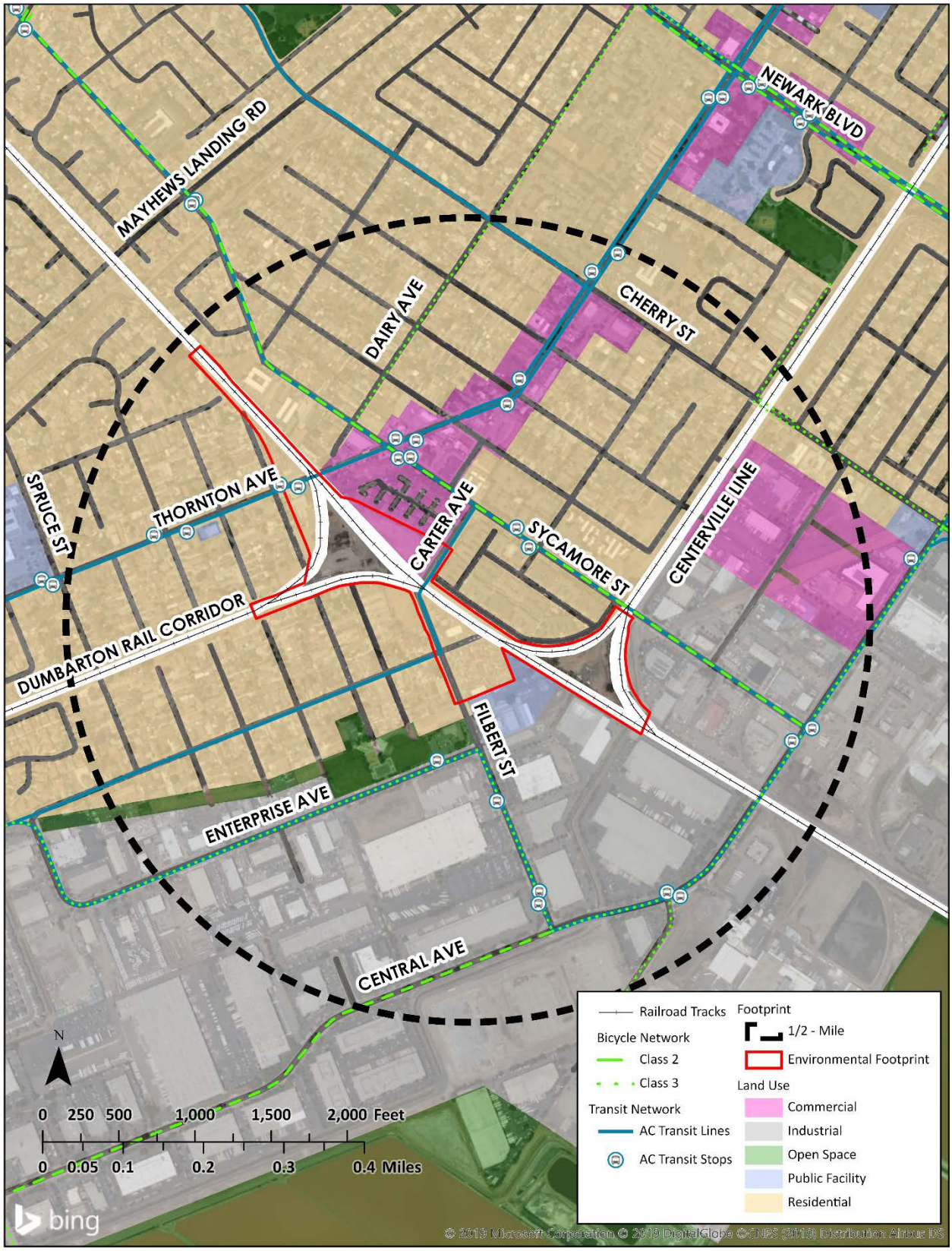
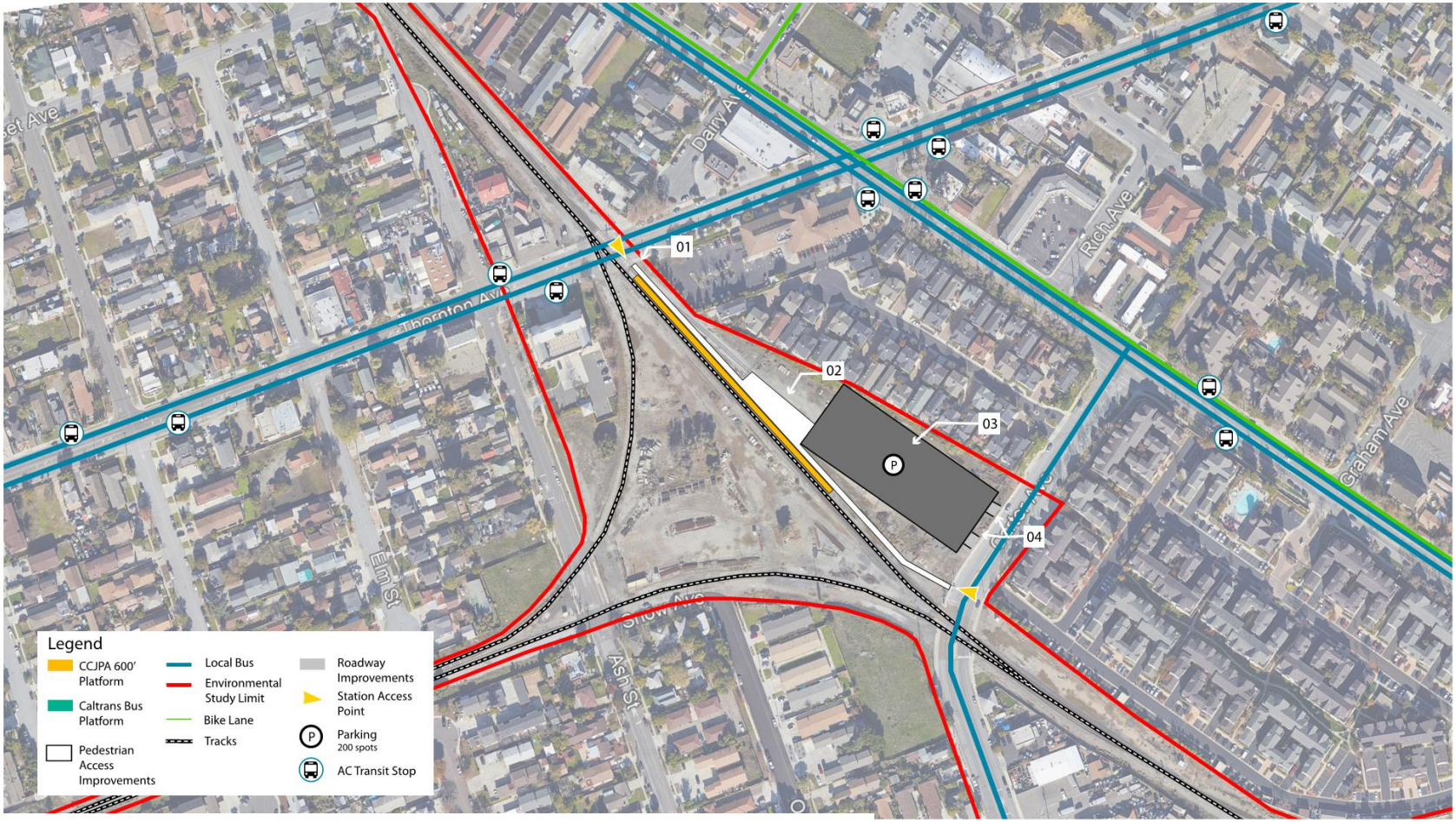


Figure 17: Newark Junction Station Area Conceptual Plan



The following elements are shown on the map above:

1. Access from Thornton Avenue.
2. Station Entry Area.
3. Station on ground level. Parking on second floor of structure.
4. Access to station and parking.

3.4. Evaluation of Potential Station Locations

The three potential station locations were evaluated across the following criteria:

1. TIRCP Benefits
    - Reduce GHG Emissions and Improve Air Quality
    - Increase Ridership Based on System and Efficiency Improvements
    - Coordinate and Integrate with State Rail and Transit Operations
    - Improve Safety
2. Design Feasibility
    - Constructability
    - CCJPA Station Standards
    - UPRR Acceptability
    - Stakeholder Approval
    - Non-Rail ROW Required
    - Cost
    - Schedule
3. Environmental
    - Land Use Consistency
    - Sensitive Air Quality and Noise Receptors
    - Community Cohesion
    - Visual and Aesthetic Resources
    - Natural Resources
    - Protected Section 4(f) Public Parks, Refuges, and Historic Properties
    - Access and Circulation
    - Environmental Justice
4. Station Area
    - Bicycle and Pedestrian Accessibility
    - Existing Parking
    - Local Traffic Impacts
    - Priority Development Area (PDA) Designation
    - Service Optimization
    - State and Local Plan Consistency

The criteria were evaluated using the following scale.

- **Unfavorable (1):** Does not yield benefits and/or could impede project implementation.
- **Neutral (2):** Yields moderate benefits and/or is not expected to impede project implementation.
- **Favorable (3):** Yields significant benefits and/or would not impede project implementation.

In the following subsections, the criteria for each evaluation category are described and defined along the 1 to 3 scale defined above.

3.4.1 TIRCP Benefits Criteria

Each station location was evaluated for its ability to achieve the four primary benefits claimed in CCJPA's 2018 TIRCP application, detailed below. The primary and secondary benefits were defined by the California State Transportation Agency (CalSTA). The methodology for the evaluation and results are detailed below and summarized in Table 9.

Reduce GHG Emissions and Improve Air Quality

SBC is anticipated to reduce GHG and particulate matter emissions and improve air quality by eliminating 289,390 metric tons of carbon dioxide emissions over 50 years.[26] This was based on a 2% annual ridership increase over 50 years. The GHG emissions reduction comparison factored in projected ridership as well as existing and planned sustainable transit connections.

Increase Ridership Based on System and Efficiency Improvements

Increased ridership is anticipated based on three key factors:

- Reducing travel times by up to13-minutes.
- Enhancing connections from Capitol Corridor to transbay transit options, including both public buses and private shuttles.
- Servicing higher-density land uses near stations.

A ridership analysis of the three potential station locations was conducted to determine the location with the highest potential for increasing Capitol Corridor ridership and transfer potential to public and private services. The ridership analysis assumes that each alternative includes one station. It cannot be assumed that ridership benefits from multiple stations would result if multiple stations were implemented along the Coast Subdivision, as ridership sensitivity in this scenario was not modeled. Details on the ridership methodology and results are in Appendix E.

The results of the ridership analysis (Table 5) show that Ardenwood has the highest ridership potential of the three stations. Ardenwood's potential ridership could be higher as well if a future Dumbarton Rail service connects with CCJPA there. Conversely, Newark Junction's ridership could be lower if a future Dumbarton Rail service connects to CCJPA at Ardenwood, since the model placed this nexus in Newark.

The modeling exercise also determined important temporal characteristics about the station locations. While 70% and 50% respectively of riders projected at Hayward and Newark Junction use the station as their morning commute origin ("home station"), a majority of boardings at Ardenwood are projected to occur outside of morning peak hours ("jobs station").[27] This finding has important implications for operations at the stations and station area planning. For example, Ardenwood may require less parking than Hayward or Newark Junction since most riders there are projected to begin their commutes elsewhere. Connections to high-quality active and mass transportation options at Ardenwood will therefore also be critical to get riders to their ultimate destination.

[26] CCJPA TIRCP application
[27] Appendix E

Table 5: Updated Daily Ridership Forecast[28]

Year 2025	New Station			Systemwide		
	Average	Range Low	Range High	Average	Range Low	Range High
No Project	-	-	-	8,365	7,530	9,200
Ardenwood	520	470	570	9,155	8,240	10,070
Hayward	400	360	440	8,855	7,970	9,740
Newark Junction	420	380	460	9,045	8,140	9,950
Year 2040	**New Station**			**Systemwide**		
	Average	Range Low	Range High	Average	Range Low	Range High
No Project	-	-	-	12,570	11,310	13,830
Ardenwood	860	770	950	12,835	11,550	14,120
Hayward	650	590	720	12,350	11,120	13,590
Newark Junction	700	630	770	12,670	11,400	13,940

Note: New Station accounts for boardings and alightings. Systemwide accounts for boardings.

Coordinate and Integrate with State Rail and Transit Operations

An analysis of existing and proposed local and transbay transit connections at the three sites determined the transit connectivity potential. The results of this study are shown in Table 6.

LOCAL CONNECTIONS

Local connections were defined as transit options within Alameda County. All locations have two existing fixed route local bus routes serving the area:[29]

- Ardenwood: AC Transit 200 (20-30-minute frequency) and 232 (31-minute or more frequency), Newark Flex (dial-a-ride, 30-minute frequency at Union City BART).
- Hayward: AC Transit 83 (20-30-minute frequency) and 86 (20-30-minute frequency).
- Newark Junction: AC Transit 200 (20-30-minute frequency) and 251 (31-minute or more frequency), Newark Flex (dial-a-ride, 30-minute frequency at Union City BART).

Given the flexible nature of bus routes, the creation of a new Capitol Corridor station could precipitate the arrival of new or realigned local routes. Local connections were therefore considered a smaller factor than transbay connections, which can be more difficult to reroute from the highway to local streets.

[28] Appendix E
[29] Frequency of bus service by line

Table 6: Existing and Planned Transit Connectivity Options

	Ardenwood	Hayward	Newark Junction
Existing Local Connections			
Existing Public Transbay Connections			
Existing Private Transbay Connections			
Planned Public Transbay Connections			

*Icons represent the transportation mode and number of lines
Grey Icons = Existing connections
Gold Icons = Proposed connections

EXISTING PUBLIC TRANSBAY CONNECTIONS

Transbay connections were defined as transit routes from Alameda County to San Mateo County or western Santa Clara County. Ardenwood is the only station location that currently offers transbay public transportation connections. The routes serving Ardenwood take riders to different job centers on the mid-Peninsula, as shown in Table 7.[30] On the average weekday, 125 public buses stop at the Park & Ride.[31] The Stanford Marguerite shuttle is open to the public.[32]

Table 7: Existing Transbay Destinations from Ardenwood

Destination	Route
Menlo Park	Dumbarton Express, Dumbarton Express 1
Palo Alto	AC Transit U, Dumbarton Express, Dumbarton Express 1, Stanford AE-F, Stanford East Bay Express
Stanford	AC Transit Line U, Dumbarton Express, Stanford AE-F, Stanford East Bay Express

[30] Lists of DB and DB 1 Stops, Line U, and Marguerite Shuttle
[31] Lists of DB and DB 1 Stops, Line U, and Marguerite Shuttle
[32] Marguerite Shuttle

EXISTING PRIVATE TRANSBAY CONNECTIONS

Numerous private shuttle operators serve the Ardenwood Park & Ride. Over 420 shuttles a day cross SR 84. No shuttles stop at the Hayward or Newark Junction sites, but about 168 private shuttles pass by the Hayward site along SR 92.

FUTURE TRANSBAY CONNECTIONS

Ardenwood

Ardenwood is the only study area where transbay improvements have been approved. MTC's Dumbarton Forward Project seeks to implement recommendations from SamTrans' 2017 Dumbarton Transportation Corridor Study (DTCS), including a peak period bus-on-shoulder pilot and signal, ramp, and toll plaza improvements by 2022.[33] As of November 2019, Dumbarton Forward is in the Caltrans Project Approval/Environmental Document phase.

The DTCS proposes additional transbay transit improvements at Ardenwood that have yet to move beyond the planning phase, such as reversible or permanent express lanes on SR 84 and increased bus frequency.[34]

Cross Bay Transit Partners, a public-private partnership studying the reopening of rail service on the Dumbarton Rail Bridge, has also publicly indicated that it is considering Ardenwood as a potential rail station location.[35]

Hayward

There are no current plans to significantly enhance transbay transit at Hayward over SR 92 to Foster City and the Upper Peninsula. The Peninsula's dense job centers are further south, in Palo Alto and Redwood City.

Newark Junction

Capitol Corridor and ACE currently travel through Newark Junction, and there is potential for future service on the Dumbarton Rail Corridor to pass through the area as well.[36] Though current plans for ACE and the Dumbarton Rail Corridor do not call for stations directly at Newark Junction, the creation of a unified East Bay rail hub would accomplish a significant piece of the state rail network. Due to the geometric constraints in the area and potentially extensive cost of reorganizing the junction to connect operators, further feasibility analysis is needed to validate the hub concept. CCJPA's work on SBC will not preclude a potential future Newark Junction hub station.

Improve Safety

SBC will effectively separate passenger rail service and freight rail operations between Oakland and Newark for all station alternatives. Therefore, the proposed safety benefits discussed previously in Section 3.2 are applied to all alternatives. Ridership and transit connectivity will exert a further positive safety impact by reducing vehicle miles traveled.

[33] Dumbarton Forward Operational Improvements
[34] Dumbarton Transportation Corridor Study
[35] Dumbarton Rail Corridor Project Fact Sheet July 23, 2019
[36] Dumbarton Rail Corridor: Project Benefits

Secondary TIRCP Benefits

The secondary benefits listed in the TIRCP application are accounted for in criteria in the Design Feasibility, Environmental, and Station Area sections. Table 8 details how the TIRCP secondary benefits align with criteria analyzed in Section 3.4.

Table 8: Evaluation of Secondary TIRCP Benefits.

SBC Secondary TIRCP Benefit	Related Evaluation Criteria
Implementation of Sustainable Communities Strategies	• State and Local Plan Consistency
Benefits to Disadvantaged Communities, Low-Income Communities, and Low-Income Households	• Environmental Justice
Project Priorities	• Stakeholder Approval • State and Local Plan Consistency
Geographic Equity	• Service Optimization
Consistency with Sustainable Communities Strategy	• State and Local Plan Consistency
Freight Benefits	• Improve Safety • UPRR Acceptability
Non-State Supplemental Funding Commitments	• PDA Designation
Multi-Modal Integration	• Coordinate and Integrate with State Rail and Transit Operations • Bicycle and Pedestrian Access
Financial Plan for Expansion of Service	• Cost

Table 9: TIRCP Benefits Criteria Evaluation

Criteria	Unfavorable *1 - Red*	Neutral *2 - Yellow*	Favorable *3- Green*	Ardenwood	Hayward	Newark Junction
Reduce GHG Emissions and Improve Air Quality	Little or no GHG emissions reductions due to low ridership increases and/or few sustainable transportation connections.	Moderate GHG emissions reductions due to moderate ridership increases and/or moderate sustainable transportation connections.	High GHG emissions reductions due to large ridership increases and extensive sustainable transportation connections.	• High GHG emissions reductions due to large ridership increase and high transit connections.	• Moderate GHG emissions reductions due to moderate ridership increase and low transit connections.	• Moderate GHG emissions reductions due to moderate ridership increase and low transit connections.
Increase Ridership Based on System and Efficiency Improvements	Daily ridership increases of fewer than 250 by 2025 and fewer than 500 by 2040.	Daily ridership increases of between 250-499 by 2025 and 500-749 by 2040.	Daily ridership increases of over 500 by 2025 and 750 by 2040.	• Projected daily ridership increase of 520 by 2025 and 860 by 2040.	• Projected daily ridership increase of 400 by 2025 and 650 by 2040.	• Projected daily ridership increase of 420 by 2025 and 700 by 2040.
Coordinate and Integrate with State Rail and Transit Operations	Provides minimal transit connections and no transbay routes.	Provides moderate transit connections, including up to one transbay route.	Provides several transit connections, including at least two transbay routes.	• More than two transbay connections.	• No existing transbay connections.	• No existing transbay connections.
Improve Safety	Little or no safety improvements from the separation of freight and passenger rail services.	Moderate safety improvements from the separation of freight and passenger rail services.	Large safety improvements from the separation of freight and passenger rail services.	• Large benefit from the separation of freight and passenger rail.	• Large benefit from the separation of freight and passenger rail.	• Large benefit from the separation of freight and passenger rail.
SUBTOTAL (Out of 12 Possible Points)				**12**	**8**	**8**

3.4.2 Design Feasibility Criteria

Design feasibility includes constructability, CCJPA station standards, UPRR acceptability, stakeholder approval, non-rail ROW requirements, cost, and schedule - each of which is further defined below. Table 10 evaluates each proposed station location's favorability based on these criteria.

Constructability

Constructability refers to the anticipated complexity of the design and construction process. It factors in any potential challenges or risks prior to construction. To keep the preliminary cost estimate and schedule in line with efforts to begin service on the Coast Subdivision in the near-term, CCJPA would only consider placing platforms in areas that meet the following basic station design requirements:

- Located on straight portions of track that are at least 800 feet long.
- Located on the Coast Subdivision.

Other factors that could impact constructability include proximity to other UPRR subdivisions and spurs, interaction with the road network, and environmental factors.

CCJPA Station Standards

In February 2019, the CCJPA Board approved a Policy on Train Stations (Appendix F) that established design guidelines for new and existing Capitol Corridor stations. Key elements of the guidelines include: [37]

- 800-foot long platforms with eight-inch top of rail clearance.
- Passenger access that does not cross a mainline track at-grade.
- Americans with Disabilities Act (ADA) access and egress standards.

UPRR Acceptability

CCJPA's station must meet UPRR standards for acceptance and approval. All project elements, including station location, are pending coordination with UPRR.

Stakeholder Approval

Local jurisdictions maintain CCJPA stations within their borders. CCJPA's Policy on Train Stations states that for a new station to be eligible for potential service, the jurisdiction must reach a consensus on the candidate station location. The new station location must also be acceptable to Amtrak, the operator of the Capitol Corridor service.

Non-Rail ROW Required

The station is anticipated to need approximately 10- to 12-acres of land to accommodate minimum elements including the platform and access, transit center, and potentially parking. CCJPA will attempt to constrain construction to within the existing rail ROW, but additional non-rail ROW would likely be required at each location studied. Extensive ROW needs have the potential to adversely impact the project cost and schedule. This criterion evaluates the ROW needs for the station, potential parking area, and surface level transit connections.

[37] Appendix F

Cost

The main cost differentiators between the station locations are the amount of ROW required and the existing land use at the required parcels. Undeveloped parcels are likely less expensive to acquire than developed commercial, residential, or industrial parcels. Additionally, developed parcels may take longer to acquire than undeveloped parcels, resulting in inflation-based cost increases. The cost criterion accounts for station construction, parking area construction, and surface level transit connections. Service expansion is not a part of SBC, so there is no projected increase in operational cost associated with the project.

Schedule

The proposed project schedule in the TIRCP application intended revenue service to begin in 2023. Revised estimates (Section 5.2) anticipate project completion in FY 2026. The amount of ROW required and the complexity of the environmental, design, and construction phases will impact the anticipated project schedule.

Table 10: Design Feasibility Criteria Evaluation

Criteria	Unfavorable *1 - Red*	Neutral *2 - Yellow*	Favorable *3- Green*	Ardenwood	Hayward	Newark Junction
Construct-ability	Design and construction are projected to be highly complex.	Design and construction are projected to be of average complexity.	Design and construction are projected to be of lower than average complexity.	• Existing track configuration does not pose significant construction challenges for a standard-length platform. • No intersecting rail lines, spurs, or at-grade crossings would need consideration.	• Existing track configuration does not pose significant construction challenges for a standard-length platform. • Multiple industrial spurs in the area would need consideration. • The at-grade crossings at Clawiter Road and Depot Road would require consideration.	• Existing track configuration has limited straight track alignments for a standard-length platform. • Intersecting rail lines and industrial spurs would need consideration. • Impact to service on other rail lines would need consideration. • The at-grade crossings at Thornton Avenue and Carter Avenue would require consideration. • The area's geometry complicates station design.
CCJPA Station Standards	Basic station design and facility standards cannot be met.	Some basic station design and facility standards exceptions may be required.	All basic station design and facility standards can be met.	• Should be able to meet all standards.	• Should be able to meet all standards.	• 600-foot platform is below standard length.

Criteria	Unfavorable *1 - Red*	Neutral *2 - Yellow*	Favorable *3- Green*	Ardenwood	Hayward	Newark Junction
UPRR Accept-ability	Location is anticipated or known to be opposed by UPRR.	Location is anticipated to require complex mitigation for UPRR approval.	Location is anticipated to require simple or no mitigation for UPRR approval.	• No anticipated issues that would require complex mitigation.	• UPRR may have concerns about the operational impact of the platform's proximity to spurs.	• UPRR may have concerns about the operational impact of the platform's proximity to spurs and other rail lines.
Stake-holder Approval	Local jurisdiction and/or Amtrak has expressed that the station location is unfavorable.	Local jurisdiction and/or Amtrak has not expressed a station location preference.	Local jurisdiction and/or Amtrak has expressed that the station location is favorable.	• Cities of Fremont and Newark have both expressed interest in an Ardenwood station. • Amtrak is expected to approve of the location.	• City of Hayward has expressed interest in a Hayward station. • Amtrak has not expressed a preference on the location.	• City of Newark has expressed interest in a station at this location but sees this as a longer-term project. • Amtrak has not expressed a preference on the location.
Non-Rail ROW Required	Large non-rail ROW acquisitions would likely be required.	Moderate non-rail ROW acquisitions would likely be required.	Minimal non-rail ROW acquisitions would likely be required.	• Station elements are anticipated to be predominantly within the existing rail or publicly owned ROW at the Park & Ride. • Additional ROW acquisitions may still be required.	• ROW acquisitions will be required for all improvements outside of the rail ROW. • ROW acquisitions needed would likely be developed industrial parcels. • There may be opportunity to coordinate ROW needs with adjacent redevelopment plans.	• ROW acquisitions will be required for all improvements outside of the rail ROW. • No undeveloped parcels are geometrically suitable to support a station. • A combination of residential and commercial parcels would likely need to be acquired.

Criteria	Unfavorable *1 - Red*	Neutral *2 - Yellow*	Favorable *3- Green*	Ardenwood	Hayward	Newark Junction
Cost	High projected costs.	Moderate projected costs.	Low projected costs.	• Leveraging the Park & Ride could keep ROW needs and costs low. • Multiple undeveloped parcels in the area could support additional station elements.	• ROW acquisition could result in significant project costs. • Acquired parcels would require structure demolition. • There is potential to negotiate station elements with the developer. • The proximity of at-grade crossings to the platform could necessitate grade separations.	• ROW acquisition could result in significant project costs. • Acquired parcels would require structure demolition. • The proximity of at-grade crossings to the platform could necessitate grade separations.
Schedule	Many challenges to 2026 project completion.	Moderate challenges to 2026 project completion.	Few challenges to 2026 project completion.	• Construction anticipated to conclude in FY 2026.	• Complex ROW acquisition could impact the project schedule.	• Complex ROW acquisition and design challenges could impact the project schedule.
SUBTOTAL (Out of 21 Possible Points)				**21**	**12**	**9**

3.4.3 Environmental Criteria

GIS data for each environmental resource area included under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) were analyzed in order to determine the potential for impacts based on both quantitative and qualitative considerations around the three station locations. Environmental constraints within the preliminary station environmental footprint and station area were weighted more heavily than those that were simply near the station focus area.

The primary resource areas evaluated at this level of review included public services and utilities, socioeconomics and environmental justice, land use and planning, access and circulation, air quality, noise and vibration, parks and recreation, cultural resources, hazardous materials and waste, geology and soils, biological resources, and water resources. The following section defines how these environmental resource areas were analyzed, and Table 11 compares the projected environmental impacts of each station location. Some impacts, such as presence of hazardous materials (due to the existing rail line), occur uniformly across the three stations and thus were not included. Specific impacts would be determined through subsequent detailed analysis once a project footprint and project elements are finalized.

Land Use Consistency

This criterion evaluates if the new station would be consistent with existing adjacent land uses. Inconsistent land uses are more likely to result in significant impacts.

Sensitive Air Quality and Noise Receptors

Sensitive receptors are facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include schools, hospitals, and residential areas. Exposing sensitive receptors to substantial pollutant concentrations would be a significant impact requiring mitigation.

Land uses that are sensitive to noise and vibration could also result in significant impacts if the station results in additional noise or vibration beyond existing standards.

Community Cohesion

Each station presents challenges and opportunities for greater connectedness and access within the transportation system network, based on proximity to existing communities and facilities.

Visual and Aesthetic Resources

This criterion evaluates if the proposed stations would be visually and aesthetically consistent with their surroundings. Inconsistency with zoning or degrading existing visual character or quality could result in a significant impact.

Protected Section 4(f) Public Parks, Refuges, and Historic Properties

Parks, refuges, and historic properties are subject to multiple regulations. Section 4(f) of the U.S. Department of Transportation Act protects publicly owned public parks, recreation areas, and wildlife and waterfowl refuges, as well as historic sites, whether they are publicly

or privately owned. Station locations with additional potential to impact these facilities would require additional evaluation and potentially mitigation.

Natural Resources

This criterion examines existing biological, hydrological and geological natural resources that may be affected by the station.

Access and Circulation

The access and circulation criterion evaluates how well the station integrates with existing transit, roadway, bicycle, and pedestrian facilities.

Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations directs Federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law.

This criterion examines the impact of the project on Communities of Concern (CoCs)- census tracts with a concentration of 70% minority population and 30% low-income households or census tracts that have a concentration of 4 or more of the following disadvantage factors:

1. Minority (70% threshold),
2. Low-Income (less than 200% of Federal poverty level, 30% threshold),
3. Level of English Proficiency (12% threshold),
4. Elderly (10% threshold),
5. Zero-Vehicle Households (10% threshold),
6. Single Parent Households (20% threshold),
7. Disabled (12% threshold), or
8. Rent-Burdened Households (15% threshold).

Table 11: Environmental Criteria Evaluation

Criteria	Unfavorable *1 - Red*	Neutral *2 - Yellow*	Favorable *3- Green*	Ardenwood	Hayward	Newark Junction
Land Use Consistency	Existing land use is inconsistent with a new station.	Existing land use is mostly consistent with a new station.	Existing land use is consistent with a new station.	• The station would be consistent with existing light industrial/office park, residential, parks and trails, commercial/retail, and education/ public/semi-public land use in the area.	• The station would be consistent with existing industrial, residential, parks/open space, and education/ public land use in the area.	• The station would be consistent with existing residential, parks and open space, education, public, semi-public, and industrial land use in the area.
Sensitive Air Quality and Noise Receptors	Considerable projected impact.	Moderate projected impact.	Little or no projected impact.	• One air, noise, and vibration sensitive receptor, a preschool, is located inside of the preliminary environmental footprint. • Temporary noise and air quality impacts may occur during operation of construction vehicles and equipment.	• Air, noise, and vibration sensitive receptors are located outside of the preliminary environmental footprint. • Sensitive receptors are in residential areas just outside the footprint, east of Industrial Boulevard. • Temporary noise and air quality impacts may occur during operation of construction vehicles and equipment.	• Air, noise, and vibration sensitive receptors are in proximity, with residential neighborhoods, schools, parks, and other community facilities on both sides of the rail line. • Temporary noise and air quality impacts may result during operation of construction vehicles and equipment. Noise impacts during operations would be consistent with current noise levels.

Criteria	Unfavorable *1 - Red*	Neutral *2 - Yellow*	Favorable *3- Green*	Ardenwood	Hayward	Newark Junction
Community Cohesion	Considerable projected impact.	Moderate projected impact.	Little or no projected impact.	• Proximity to nearby communities could present opportunities for greater connectedness and access within the transportation system network.	• There are moderate benefits to cohesiveness given the mixed industrial/ commercial land uses.	• Proximity to nearby communities could present opportunities for greater connectedness and access within the transportation system network.
Visual and Aesthetic Resources	Considerable projected impact.	Moderate projected impact.	Little or no projected impact.	• Given the existing bus facility and Park & Ride, and elevated SR 84, a new station is unlikely to result in visual and aesthetic impacts to the nearby community.	• Given the industrial nature of the area, a new station is unlikely to result in visual and aesthetic impacts to the nearby community.	• Residential communities adjacent to the tracks could potentially experience adverse visual and aesthetic impacts with a new rail station.
Protected Section 4(f) Public Parks, Refuges, and Historic Properties	Considerable projected impact.	Moderate projected impact.	Little or no projected impact.	• Parks and the Ardenwood Historic Farm are immediately outside of the preliminary environmental footprint. • No previously recorded cultural resources are within the preliminary footprint for Ardenwood. *(Continued next page)*	• No previously recorded cultural resources are within the preliminary footprint for Hayward. • Four previously recorded cultural resources are within the Hayward Station area. *(Continued next page)*	• Parks are near the preliminary footprint area. • Four previously recorded cultural resources are within the Newark Junction area. *(Continued next page)*

Criteria	Unfavorable 1 - Red	Neutral 2 - Yellow	Favorable 3- Green	Ardenwood	Hayward	Newark Junction
Protected Section 4(f) Public Parks, Refuges, and Historic Properties *(continued)*	Considerable projected impact.	Moderate projected impact.	Little or no projected impact.	• Seven previously recorded cultural resources are within the Ardenwood Station area. • Any potential uses of the cultural properties or parks protected by Section 4(f) would require consultation and coordination.	• Any potential uses of the cultural properties or parks protected by Section 4(f) would require consultation and coordination.	• Any potential uses of the cultural properties or parks protected by Section 4(f) would require consultation and coordination.
Natural Resources	Considerable projected impact.	Moderate projected impact.	Little or no projected impact.	• The nearest fault is 4 miles from the Ardenwood site. • Seismic hazards exist as soils that underlie the site have a high to moderate liquefaction potential, but soils are not prone to subsidence. • No critical habitat is within the preliminary environmental footprint or station area. • Rare and sensitive bird species are present within the preliminary environmental footprint. *(Continued next page)*	• The nearest fault is approximately 3 miles from the Hayward site. • Seismic hazards are considered low at the site given the soil's moderate liquefaction potential and lack of subsidence potential. • No critical habitat is within the preliminary environmental footprint or station area. • Rare and sensitive mammal and dicot species are present in the preliminary environmental footprint. *(Continued next page)*	• The nearest fault is approximately 4 miles from the Newark Junction site. • Seismic hazards exist as soils that underlie the site have subsidence potential and a moderate potential for liquefaction. • No critical habitat is within the station area. • Rare and sensitive species, particularly bird species, are present in the preliminary environmental footprint. *(Continued next page)*

Criteria	Unfavorable *1 - Red*	Neutral *2 - Yellow*	Favorable *3- Green*	Ardenwood	Hayward	Newark Junction
Natural Resources *(continued)*	Considerable projected impact.	Moderate projected impact.	Little or no projected impact.	• Rare and sensitive insect species are present in the greater station area. • The area in which rare and sensitive species are present is smaller than it is at the other station areas, so there is less potential for biological resources impacts. • Proper permitting, monitoring, and agency coordination would be required during the construction phase to minimize or prevent impacts to rare and sensitive species. • A river runs parallel to SR 84 within the preliminary environmental footprint; however, the Ardenwood station area is not located within a floodzone.	• Rare and sensitive bird species are present in the greater station area. • Proper permitting, monitoring, and agency coordination would be required during the construction phase to minimize or prevent impacts to rare and sensitive species. • A freshwater wetland area is adjacent to the rail line in the southern portion of the preliminary environmental footprint area. • Additional wetlands area and the Eden Landing Ecological Reserve are in the southwestern edge of the station area. • There are no floodzones in the station area.	• Proper permitting, monitoring, and agency coordination would be required during the construction phase to avoid or minimize adverse effects on rare and sensitive species. • Plummer Creek crosses under the southeastern end Newark Junction; however, the Newark Junction station area is not located within a floodzone.

Criteria	Unfavorable 1 - Red	Neutral 2 - Yellow	Favorable 3- Green	Ardenwood	Hayward	Newark Junction
Access and Circulation	Considerable projected impact.	Moderate projected impact.	Little or no projected impact.	• The existing Park & Ride provides transbay buses and carpoolers with easy access to the Dumbarton corridor. • Current access would help to provide access to and from the potential station. • A potential bus transfer facility within or adjacent to the grade-separated SR 84 would facilitate convenient access and connectivity between modes with no anticipated adverse effects on SR 84 operations.	• Access to the area is constrained. • New roadway infrastructure from SR 92 would be needed for highway connectivity. • Few buses currently operate in the area, but there is potential to increase service and include a bus transfer facility. • There may be impacts to Clawiter and Depot Roads, major arterials that cross the Coast Subdivision at-grade, due to trains stopping and slowing.	• Access to the area is constrained by the surrounding residential communities. • Impacts to Thornton Avenue, a major arterial, and Filbert Street, which both cross the Coast Subdivision at-grade, may result due to trains stopping and slowing.
Environmental Justice	Considerable projected negative impact.	Projected mixed impact.	No projected negative impact.	• There is no CoC in the station area.	• Part of the station area is in a CoC. • Station could result in adverse air quality, noise, and access impacts during construction. • The completed station could result in greater connectivity and access to transportation systems, public services, and facilities.	• Part of the station area is in a CoC. • Station could result in adverse air quality, noise, and access impacts during construction. • The completed station could result in greater connectivity and access to transportation systems, public services, and facilities.
SUBTOTAL (Out of 24 Possible Points)				**23**	**18**	**17**

3.4.4 Station Area Criteria

Station area criteria include bicycle and pedestrian accessibility, existing parking, local traffic impacts, Priority Development Areas (PDA), service optimization, and consistency with state and local plans - each of which is further defined below. Table 12 evaluates each proposed station location's favorability based on these criteria.

Bicycle and Pedestrian Accessibility

Bicycle and pedestrian facilities are important for access and circulation to and from Capitol Corridor stations. In 2018, 10% of Capitol Corridor riders reached the station by bike, and 15% reached the station by walking.[38] Existing bicycle and pedestrian networks around the station area and reaching the station site are beneficial.

Existing Parking

Depending on the results of future ridership analysis, parking facilities may be needed for riders who reach the station by automobile. The presence of existing transit parking is beneficial, because even if facilities are already near capacity, improvements to existing parking could alleviate the need to use additional land for parking.

Local Traffic Impacts

A new Capitol Corridor station could impact congestion on local roads in the project area both during construction and once operational. Unlike the access and circulation environmental criterion, the local traffic impacts criterion focuses only on the impact to local traffic conditions. Elements that factored into the local traffic impact analysis include:

- Proximity to the highway: This allows buses and cars to avoid the local road network.
- Existing congestion on local roads during peak hours: Additional vehicles going to and from the station could exacerbate this.
- Projected construction impacts on local roads: Rail improvements could result in changes to road structures.
- At-grade crossings: As trains slow to enter a station, gate down time could increase at nearby at-grade crossings.

Priority Development Area Designation

MTC-designated PDAs as areas within existing communities that local city or county governments have identified and approved for future growth.[39] PDAs typically are accessible by transit service, and they are often located near established job centers, shopping districts, and other services. PDA status makes acquiring funding for improvements in the area easier. It also signals that there is high demand for access and high transit-oriented development potential. A Capitol Corridor station in a PDA has the potential to leverage investments and to increase ridership.

Service Optimization

In addition to improving service with faster travel times and better transit connectivity, SBC provides Capitol Corridor with the opportunity to better serve southern Alameda County

[38] Capitol Corridor Performance Report FY18
[39] Priority Development Areas

and the Mid-Peninsula. Most residential and community development in Hayward, Fremont, and Newark originally occurred to the east, with industrial development to the west. Major passenger rail providers like BART and Capitol Corridor were aligned to serve these higher-density residential and commercial areas. In recent years, western portions of these cities have seen increased housing and job growth, but they are still unserved by passenger rail.

Since BART is extending into San Jose and Santa Clara, SBC also provides CCJPA with an opportunity to distinguish its intercity passenger rail service from BART. It can do this by providing convenient connections to popular Mid-Peninsula destinations, serving a different geographic area in southern Alameda County, and offering a more express oriented service.

State and Local Plan Consistency

A variety of planning efforts guide the investment of resources into California's rail system. Aligning with these plans, which were previously detailed in Section 2.1, helps CCJPA design projects that address established needs. Each station location was evaluated based on its consistency with state and local policies and planning efforts. Since the project's consistency with freight rail plans is independent of station location, goods movement objectives did not factor into this portion of the analysis.

Table 12: Station Area Criteria Evaluation

Criteria	Unfavorable *Red*	Neutral *Yellow*	Favorable *Green*	Ardenwood	Hayward	Newark Junction
Bicycle and Pedestrian Accessibility	Limited or no bicycle and pedestrian network in station area.	Basic bicycle and pedestrian network in station area.	Extensive bicycle and pedestrian network in station area.	• There are bicycle facilities leading to site from both sides. • The City of Fremont is planning a new bike/pedestrian facility through the Ardenwood Technology Park to the Park & Ride.[40] • Most surrounding streets have sidewalks except for some streets in the Technology Park.	• Bicycle facilities leading to site from both sides. • Streets around the station location all have sidewalks.	• Bicycle facilities on streets leading to Newark Junction. • Streets leading to Newark Junction all have sidewalks.
Existing Parking	None	Existing parking that is capacity constrained.	Existing parking without capacity constraints.	• The existing Park & Ride has 300 free and 50 paid reserved spaces.[41] • The lot often reaches capacity by 7 AM.[42] • Additional parking may be required. • Parking demands may be low since it is a "jobs" station.[43]	• No existing parking.	• No existing parking.

[40] Five-Year Project List
[41] East Bay Park & Ride Lots
[42] Appendix E
[43] Appendix E

Criteria	Unfavorable *Red*	Neutral *Yellow*	Favorable *Green*	Ardenwood	Hayward	Newark Junction
Local Traffic Impacts	High impact to local traffic circulation.	Moderate impact to local traffic circulation.	Low impact to local traffic circulation.	• Assumed to be low since highway ramps are within a quarter-mile. • There are no nearby at-grade crossings that could experience increased congestion due to potentially longer grade down times.	• Assumed to be moderate since highway ramps are more than ½ mile from the station. • At-grade crossings in the area at Clawiter Road and Depot Road could result in increased gate down time as trains slow near the station. • Construction to grade separate Clawiter Road and Depot Road could impact traffic.	• Expected to have local traffic impacts since the nearest highway is over a mile away. • At-grade crossings in the area at Thornton Avenue and Filbert Street could result in increased gate down time as trains slow near the station. • Construction to grade separate Thornton Avenue and Filbert Street could impact traffic.
Priority Develop-ment Area (PDA) Designation	Location is not anticipated to become eligible for PDA status in the next 10 years, based on local plans.	Location is anticipated to become eligible for PDA status in the next 10 years, based on local plans.	Located in an existing or eligible PDA.	• Area became eligible for designation as a new connected community PDA in 2019.	• Area became eligible for designation as a new connected community PDA in 2019.	• A portion of the Newark Junction area is in the Old Town Mixed-use Area PDA. • City of Newark must coordinate with MTC for this area to keep its PDA designation past 2019.
Service Optimization	Location is currently served by passenger rail.	Location is not currently served by passenger rail.	Location is not currently served by passenger rail and is experiencing rapid growth.	• The area is currently unserved by passenger rail. • The closest BART station is about 3.5 miles away. *(Continued next page)*	• The area is currently unserved by passenger rail. • The closest BART station is about three miles away. *(Continued next page)*	• The area is currently unserved by passenger rail. ACE currently passes through Newark Junction. *(Continued next page)*

Criteria	Unfavorable *Red*	Neutral *Yellow*	Favorable *Green*	Ardenwood	Hayward	Newark Junction
Service Optimization *(Continued)*	Location is currently served by passenger rail.	Location is not currently served by passenger rail.	Location is not currently served by passenger rail and is experiencing rapid growth.	• 7,500 new jobs are projected to come to the upzoned Ardenwood Technology Park.[44] • From 2010 to 2040, population and jobs are projected to increase by 6,100 and 30,900 respectively in the surrounding census tracts.[45]	• From 2010 to 2040 population and jobs are expected to increase by about 2,600 and 3,500 respectively in the surrounding census tracts.[46]	• Closest BART station is about 3.8 miles away. • From 2010 to 2040, population and jobs are expected to increase by about 2,000 and 2,200 respectively in the surrounding census tracts.[47]
State and Local Plan Consistency	Station location is mostly inconsistent with state and local plans.	Station location is consistent with most state and local plans, dependent of improve-ments outside of SBC.	Station location is consistent with most or all state and local plans, independent of improve-ments outside of SBC.	• Would be fully consistent with the 2018 *State Rail Plan's* goals for the Oakland to San Jose corridor. • Station location is named in CCJPA planning documents and the *Dumbarton Transportation Corridor Study*. • Could provide transfer potential as detailed in *Plan Bay Area 2040*.	• Would be consistent with the 2018 *State Rail Plan's* goals to increase service speed between Oakland and San Jose and extend service to Salinas. • Not identified as a future Capitol Corridor station in regional or local plans. *(Continued next page)*	• Potential to provide many of the benefits described in state and local plans, but additional investments beyond the SBC scope would be needed to realize this.

[44] Fremont business park is bought in wake of Tesla, Facebook leases (Mercury News)
[45] Projections 2040 by Census Tract: Household and Population and Projections 2040 by Census Tract: Jobs
[46] Projections 2040 by Census Tract: Household and Population and Projections 2040 by Census Tract: Jobs
[47] Projections 2040 by Census Tract: Household and Population and Projections 2040 by Census Tract: Jobs

Criteria	Unfavorable *Red*	Neutral *Yellow*	Favorable *Green*	Ardenwood	Hayward	Newark Junction
State and Local Plan Consistency *(continued)*	Station location is mostly inconsistent with state and local plans.	Station location is consistent with most state and local plans, dependent on improve-ments outside of SBC.	Station location is consistent with most or all state and local plans, independent of improve-ments outside of SBC.		• Would fail to provide *State Rail Plan* benefits such as connecting to the Dumbarton Corridor and facilitating east-west connections. • Due to its lack of connectivity to other rail systems, this location would not provide transfer potential as detailed in *Plan Bay Area 2040*.	
SUBTOTAL (Out of 18 Possible Points)				**17**	**13**	**11**

3.5. Analysis of Results

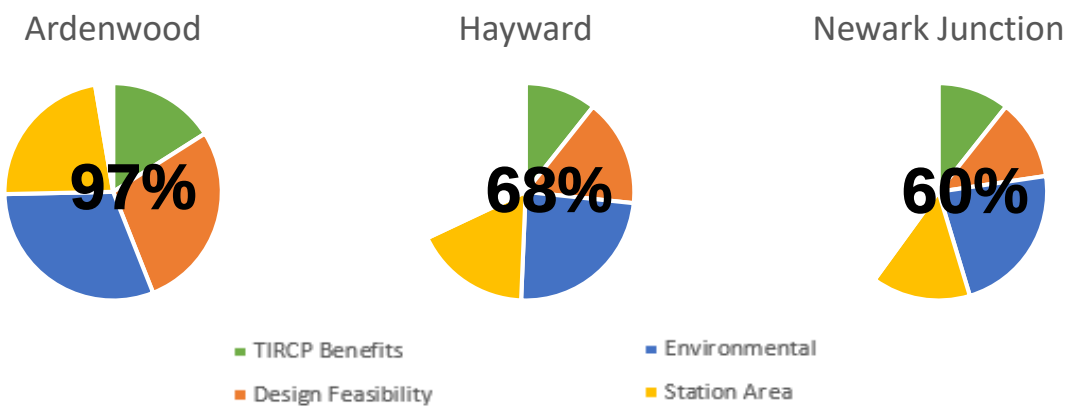
Each of the three proposed station areas was evaluated against the criteria described in Section 3.3. As shown in Table 13 and Figure 18 below, Ardenwood scored the highest and is the preferred station location as the project advances. Scores are out of a total 75 possible points.

Table 13: Station Location Evaluation Scores

Criteria Group		Maximum Possible Score	Ardenwood	Hayward	Newark Junction
TIRCP Benefits	Reduce GHG Emissions and Improve Air Quality	*3*	3	2	2
	Increase Ridership Based on System and Efficiency Improvements	*3*	3	2	2
	Coordinate and Integrate with State Rail and Transit Operations	*3*	3	1	1
	Improve Safety	*3*	3	3	3
TIRCP Benefits Subtotal		*12*	12	8	8
Design Feasibility	Constructability	*3*	3	2	1
	CCJPA Station Standards	*3*	3	3	1
	UPRR Acceptability	*3*	3	2	2
	Stakeholder Approval	*3*	3	2	2
	Non-Rail ROW Required	*3*	3	1	1
	Cost	*3*	3	1	1
	Schedule	*3*	3	1	1
Design Feasibility Subtotal		*21*	21	12	9
Environmental	Land Use Consistency	*3*	3	3	3
	Sensitive Air Quality and Noise Receptors	*3*	2	2	1
	Community Cohesion	*3*	3	2	3
	Visual and Aesthetic Resources	*3*	3	3	2
	Natural Resources	*3*	3	3	3

Criteria Group		Maximum Possible Score	Ardenwood	Hayward	Newark Junction
Environmental	Protected Section 4(f) Public Parks, Refuges, and Historic Properties	*3*	3	2	2
	Access and Circulation	*3*	3	1	1
	Environmental Justice	*3*	3	2	2
Environmental Subtotal		*24*	23	18	17
Station Area	Bicycle and Pedestrian Accessibility	*3*	3	3	3
	Existing Parking	*3*	2	1	1
	Local Traffic Impacts	*3*	3	2	1
	Priority Development Area (PDA) Designation	*3*	3	3	2
	Service Optimization	*3*	3	2	2
	State and Local Plan Consistency	*3*	3	2	2
Station Area Subtotal		*18*	17	13	11
TOTAL		***75***	**73**	**51**	**45**
Percentage		*100%*	*97%*	*68%*	*60%*

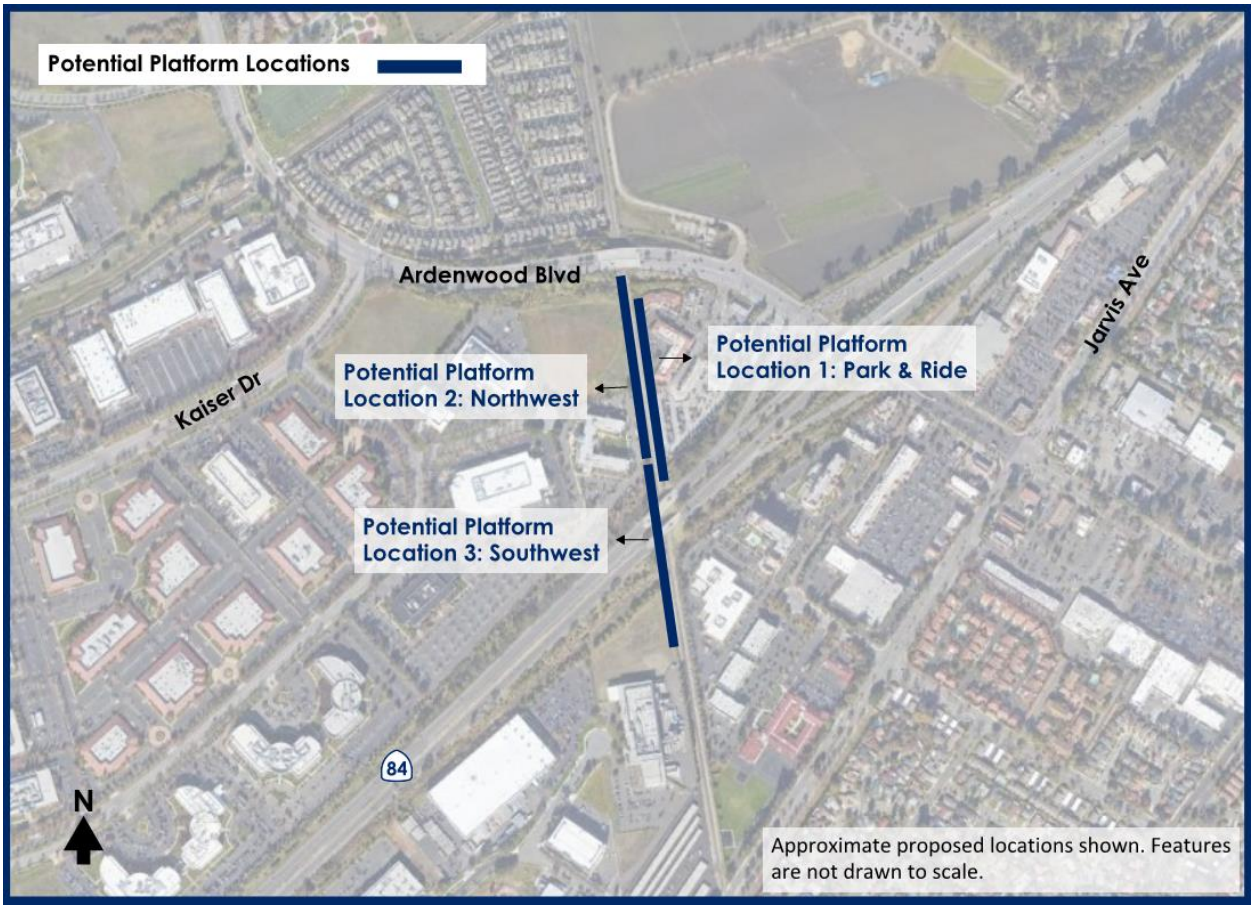
Figure 18: Station Location Summary Scores



Section 4. Design Options

With Ardenwood identified as the recommended station location, further analysis was performed on the conceptual site plan, in line with UPRR and CCJPA design standards and with consideration for phased delivery of the rail and potential future transit elements. Three potential 800-foot platform locations at Ardenwood were analyzed to determine the preferred platform placement. These locations were chosen due to their potential project benefits. The three locations are shown in Figure 19. Their advantages and disadvantages are summarized at the end of this section, in Table 14.

Figure 19: Proposed Ardenwood Station Platform Locations



Integrated Services

The Ardenwood station offers the potential to enhance network connectivity between north-south rail service and east-west bus service, allowing passengers to transfer from Capitol Corridor to other transit services and reach destinations on the Peninsula. Ardenwood could also serve as a transfer point for future Dumbarton Rail service.[48]

MTC's Dumbarton Forward project is exploring relocating the existing Ardenwood Park & Ride bus stop to the on-ramps of SR 84. The project also includes a bus on shoulder pilot,

[48] Dumbarton Rail Corridor Project Fact Sheet July 23, 2019

which would allow buses on SR 84 to bypass congestion by using the shoulder lane during peak periods. CCJPA and project partners will coordinate with MTC to provide convenient transfers for riders if bus stops are relocated.

A highway transbay bus stop on SR 84 has also been considered to improve bus travel time and maintain easy connections from the Ardenwood Park & Ride. As detailed in Section 3.3.1, however, this project would complex, and it is beyond the scope of SBC.

Parking Options

The Ardenwood Park & Ride currently has 300 first-come, first-served parking spots and 50 reserved spots and is at capacity with a waiting list for the reserved spaces.[49] The existing stations at Hayward and Fremont-Centerville have approximately 250 parking spots between them.[50] Though parking spaces to accommodate existing riders who use the Hayward and Fremont-Centerville stations could be necessary, overall parking demands at Ardenwood could be low, as the ridership study found that it will primarily be a jobs station. Further coordination and ridership studies will be required to determine the exact number of parking spaces required for Capitol Corridor riders at Ardenwood.

POTENTIAL ARDENWOOD STATION PLATFORM LOCATION 1 – EAST AT THE PARK & RIDE

The first potential platform location (Figure 20) extends from the current Ardenwood Park & Ride to just north of SR 84. It is the closest platform location to the existing bus stop at the Park & Ride.

To the west of the proposed platform is the Ardenwood Technology Park, a commercial area that was upzoned by the City of Fremont in 2016.[51] There is an undeveloped parcel at the northeastern corner of the Technology Park that could potentially be used for parking if necessary. Riders using this potential future parking facility would use a pedestrian overcrossing to reach the platform.

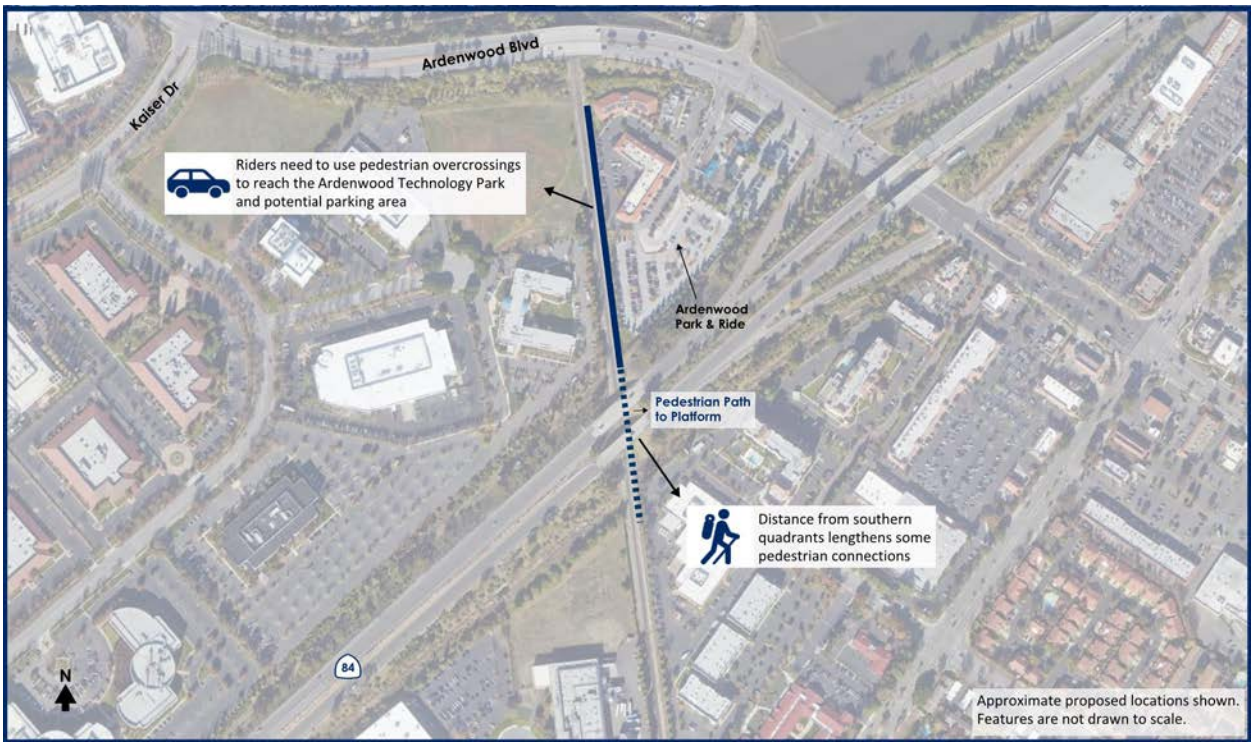
East of the proposed platform is the Ardenwood Park & Ride and a small commercial center. Since the Ardenwood Park & Ride is publicly owned, a majority of project work would be anticipated to remain within either the existing rail or public right-of-way. Though MTC is studying relocating bus stops to highway on-ramps, as of November 2019, no decision had been made to permanently move the bus stop, and buses and shuttles continue to use the Park & Ride. Proximity to the Park & Ride therefore makes this platform location ideal for quick intermodal transfers. The existing buffered bicycle facilities on Ardenwood Boulevard also make the Park & Ride platform convenient for riders who arrive to the station via active transportation.

Riders coming from south of SR 84 would need to use an approximately 400-foot pedestrian path to cross under the highway and reach the platform. A pedestrian overcrossing would allow riders from the southeast and southwest to use the path to the platform.

[49] East Bay Park & Ride Lots
[50] Capitol Corridor Stations
[51] Fremont business park is bought in wake of Tesla, Facebook leases (Mercury News)

Most of the construction would likely be constrained to the existing rail and public ROW. Limited ROW acquisitions or easements may be necessary for the pedestrian paths.

Figure 20: Issues at Proposed Ardenwood Station Platform Location 1



POTENTIAL ARDENWOOD STATION PLATFORM LOCATION 2 – NORTHWEST

The second potential location for a platform (Figure 21) is adjacent to the undeveloped parcel northwest of the intersection of SR 84 and the Coast Subdivision. The parcel could potentially be converted into a parking area for rail passengers. Acquiring the undeveloped parcel adjacent to the platform could be necessary for station access and potentially parking.

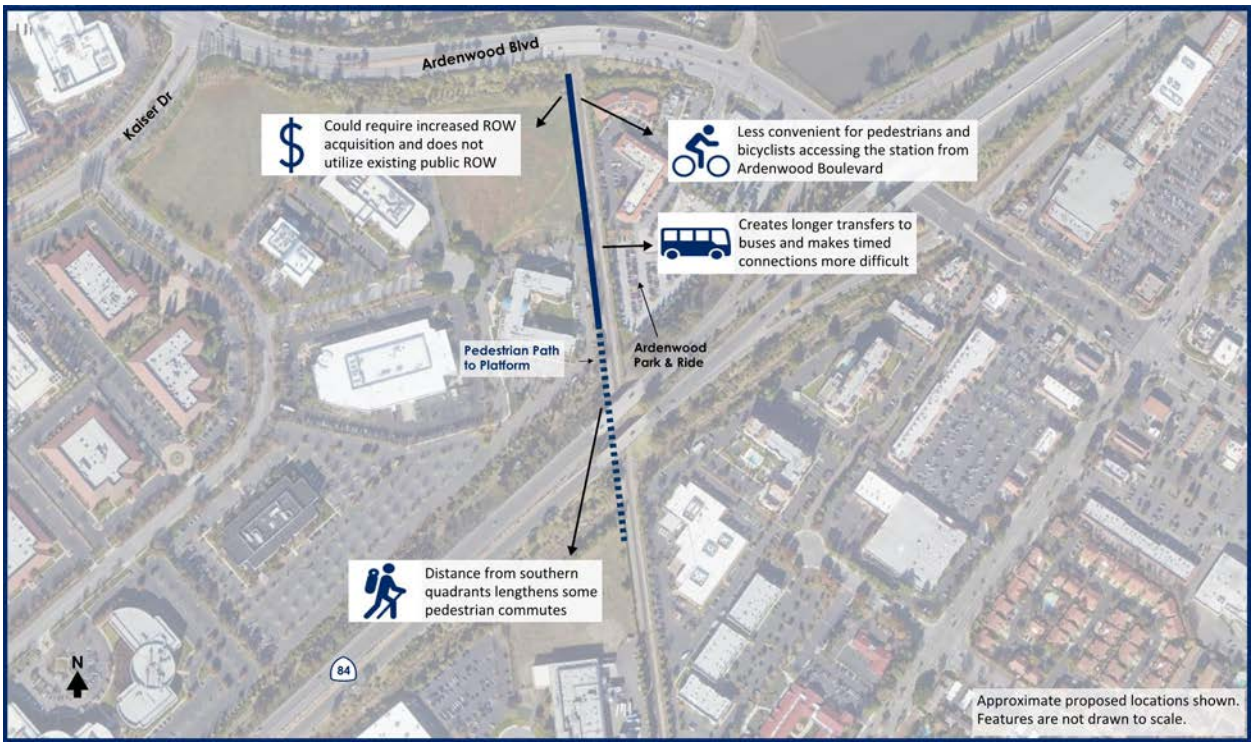
Though this location would facilitate convenient access from the potential parking area and Ardenwood Technology Park, riders transferring to and from transbay buses and shuttles in the Park & Ride and local buses on Ardenwood Boulevard would need to use the pedestrian overcrossings to connect. This added distance could make establishing timed connections more difficult. This location is not as convenient for riders arriving to the station via the high-quality active transportation facilities on Ardenwood Boulevard, but planned projects through the Ardenwood Technology Park could improve conditions for pedestrians and cyclists there.[52]

Riders coming from the southern quadrants would reach the platform via an approximately 725-foot long path. A pedestrian overcrossing would connect the southern quadrants. Due to the platform's more northern position relative to platform one, connections to areas

[52] Five-Year Project List

south of SR 84 will take longer. ROW acquisition or easements could be necessary for pedestrian access. This location does not utilize the existing public ROW at the Park & Ride.

Figure 21: Issues at Proposed Ardenwood Station Platform Location 2



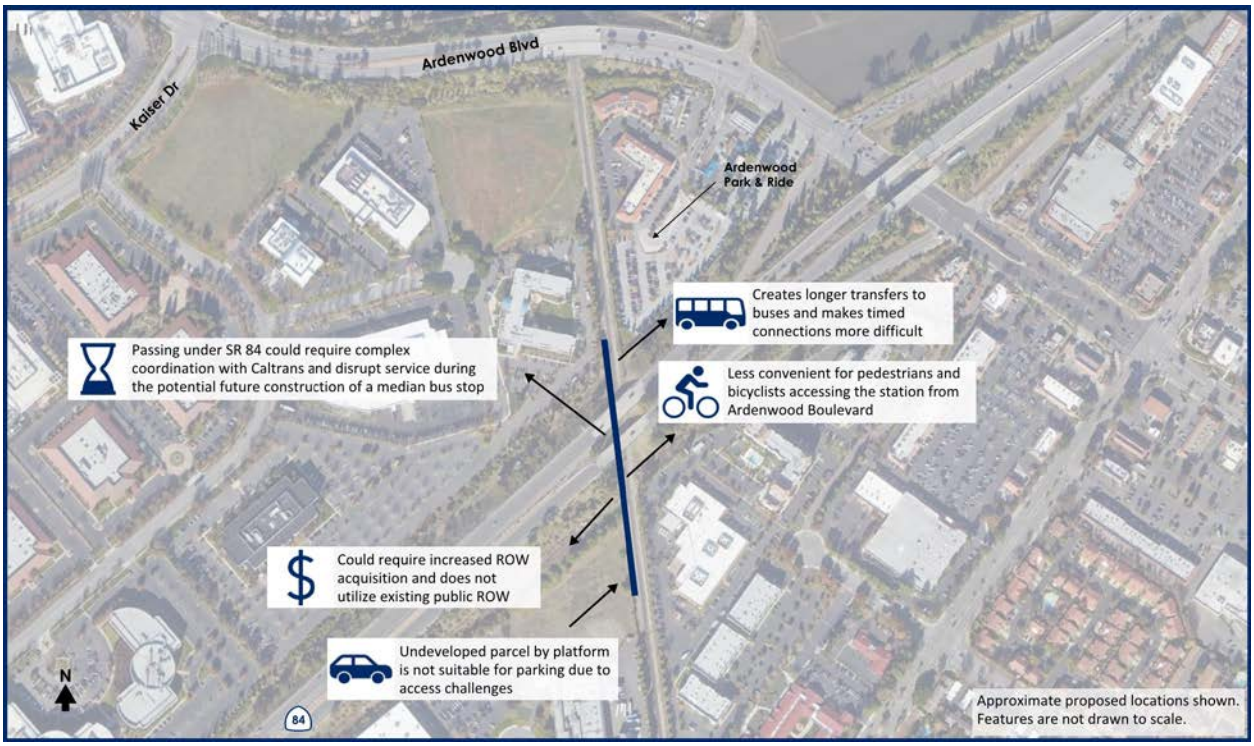
POTENTIAL ARDENWOOD STATION PLATFORM LOCATION 3 – SOUTHWEST

The third potential platform location (Figure 22) stretches from the undeveloped parcel directly southwest of the intersection of SR 84 and the Coast Subdivision to the Ardenwood Technology Park. Although passing under SR 84 could provide access to a potential future highway bus and promote four-quadrant pedestrian access, undertaking intensive capital work near Caltrans ROW at the outset of the project could complicate delivery. Another disadvantage to having the platform cross under SR 84 is that maintaining access to the platform during the potential construction of a highway bus stop later would be difficult.

As with the potential northwest platform location, the southwest location is less convenient for intermodal transfers and active transportation. Riders would need to use pedestrian overcrossings to reach the Park & Ride and the southeast quadrant.

ROW acquisition or easements would likely be required for station access at the Ardenwood Technology Park and southwest quadrant. Though the undeveloped parcel at the platform's southern end could potentially be a parking area, it is 1.5 miles from the nearest SR 84 ramps. This platform does not utilize the existing public ROW at the Park & Ride. Though placing the station entirely south of SR 84 could address these ROW issues, this location would not serve as a convenient connection to either transbay transit or jobs in the area.

Figure 22: Issues at Proposed Ardenwood Station Platform Location 3



PREFERRED ALTERNATIVE

As detailed in Table 14, Platform Location 1 emerged as the preferred alternative due to its advantages over the other potential platform locations. One of the main benefits of Platform Location 1 is its proximity to the existing bus stop at the Ardenwood Park & Ride, which allows passengers an easy transfer to transbay transit services. Capitol Corridor riders would have a 2-minute walk to the Dumbarton Express, AC Transit U Line, Stanford shuttles, and numerous tech company shuttles at their current bus stop location. If these services transition to using a highway bus stop on SR 84, vertical circulation could lead directly from a platform extension to the bus stop. Additionally, if future Dumbarton Rail service operates on the Coast Subdivision and serves Ardenwood, this platform could be shared and offer a direct connection to trains heading to the Peninsula.

Table 14: Advantages and Disadvantages of Proposed Platform Locations at Ardenwood

	1- Park & Ride	2- Northwest	3- Southwest
Advantages	• Close to existing transbay transit. • Utilizes existing public ROW and reduces ROW costs. • Provides four-quadrant pedestrian access with pedestrian paths and overcrossings. • Would likely be less impacted by potential highway bus stop construction. • Provides simple connection for pedestrians and bicyclists accessing the station from Ardenwood Boulevard.	• Provides a direct connection to the proposed parking lot and Ardenwood Technology Park. • Provides four-quadrant pedestrian access with pedestrian paths and overcrossings. • Would likely be less impacted by potential highway bus stop construction.	• Could provide a direct connection from the platform to a potential highway bus stop. • Provides four-quadrant pedestrian access with pedestrian overcrossings. • Provides a direct connection to the Ardenwood Technology Park.
Disadvantages	• Requires a walk of about 400-feet to access the southern quadrants. • Requires use of pedestrian overcrossings to reach the Ardenwood Technology Park and potential parking area.	• Requires undeveloped parcel acquisition. • Increases transfers times for bus riders using the Park & Ride or a potential future highway bus stop. • Lengthens first-mile, last-mile commutes for pedestrians and bicyclists. • Requires a walk of about 725-feet to reach the southern quadrants.	• Requires undeveloped parcel acquisition. • Requires long circulation from SR 84 to reach the potential parking area in the southwest, off Overlake Place. • Increases transfers times for bus riders using the Park & Ride • Lengthens first-mile, last-mile commutes for pedestrians and bicyclists. • Requires complex coordination with Caltrans, because it passes under SR 84. • Would likely need to close the platform for potential highway bus stop construction.

Section 5. Project Delivery Plan

While CCJPA will take the lead to environmentally clear, design, and fund SBC, the construction of the project will be divided amongst the appropriate project sponsors based on which agency owns, operates, and maintains each element. Each organization will take the lead to construct specific project elements that fall under their jurisdiction or ownership. This will require coordination between multiple local jurisdictions, several different agencies, and UPRR. Table 15 shows the construction delivery leads for each of the major project elements. The information included in the table is preliminary and subject to change as additional project details emerge.

Table 15: Construction Delivery Leads

Major Project Element	Construction Delivery Lead
Rail subdivision upgrades	UPRR/CC Contractor
Platforms	UPRR/Amtrak/CC Contractor
Freight mitigation (Shinn & Hayward connections)	UPRR/CC Contractor
Station access improvements	Local City
Parking facilities	Local City
Station facilities	Local City
SR 84 bus stop	Caltrans, District 4/AC Transit

Note: Table is preliminary and subject to change as additional project details emerge.

5.1. Project Phasing

To deliver South Bay Connect's benefits to riders as early as possible, CCJPA is considering a phased approach to station construction. While partner-led project elements, such as the potential SR 84 highway bus stop, may be a future complement to South Bay Connect, CCJPA's immediate priority is to switch trains to the Coast Subdivision and serve a station at Ardenwood with transit connections to the Peninsula. Therefore, the delivery plan proposes to phase in SBC's essential project elements to deliver immediate benefits, such as faster travel times, while still pursuing longer-term regional mobility goals.

Executing a phased implementation of the station elements requires forecasting future levels of operations to accommodate planned phases during early design. For example, if a highway bus stop is built after the platforms are constructed in the initial phase, the platform will also serve as the only pedestrian access to buses that use the highway stop. The platform would need to be designed for the total number of people using it, not just the number of Capitol Corridor riders accessing the highway bus stop.

Phase 1 – Passenger Rail Service & Access

To begin operations as quickly as possible, Phase 1 (Figure 23) would construct all station features that are required by CCJPA's Station Policy (Appendix F) for service. This would be a full build out of the station elements featured in the preferred conceptual site plan (except for a potential parking area with vehicle access and proposed bike

improvements). Facilities constructed would include a platform, lighting, Passenger Information Display System, Ticket Vending Machine, canopy shelters, ADA facilities, two pedestrian and bicycle overcrossings of the Coast Subdivision, pedestrian and bicycle access to the southern quadrants, and pedestrian and bicycle access from the Ardenwood Park & Ride to the train platform. Parking would also be added in this phase should a parking demand analysis deem it necessary. Given the status of Ardenwood as a "jobs station", however, there may not be a need for this.[53] There is a potential to integrate Coast Subdivision overcrossings with other local projects as well, including the City of Fremont's Dumbarton Bridge to Quarry Lakes Trail project.[54] CCJPA and its project partners would collaborate with the connected commercial areas to prevent Capitol Corridor station access from negatively impacting parking for local businesses.

Phase 2 – Parking (if needed)

Phase 2 (Figure 24) would, if necessary, expand parking options. If ridership patterns require it, a multi-story parking structure could be constructed on the undeveloped parcel northwest of the platform. Riders using the parking structure could use the existing pedestrian overcrossing to reach the platform. Adjustments to parking design in the Park & Ride could also be explored to provide more parking access.

Phase 3 – Future Transit Facilities (if desired)

The most complex potential phase would be creating a highway-level bus facility (Figure 25). The challenges to implementing a bus stop on SR 84 are detailed in Section 3.3.1. Design would be undertaken later, and careful efforts would be needed to minimize disruptions to both Capitol Corridor service and SR 84 during construction.

Additional Benefits of Phasing

By phasing the project as described above, CCJPA and its project partners would realize benefits from each individual phase of the Ardenwood station's development. Each phase has independent utility and no phase is dependent on future phases to become a useful asset. This helps protect the intial investments should future phases be delayed, altered, or cancelled.

Project phasing also allows CCJPA the flexibility to react to future developments and investments elsewhere along the Coast Subdivision. For example, if enough support and funding is secured by others to overhaul the Newark Junction area into an intermodal hub connecting Capitol Corridor, ACE, and future Dumbarton Rail, the early phase investments at Ardenwood would not preclude a Capitol Corridor station at Newark Junction. The phasing also proposes pursuing the construction of a parking structure and highway bus stop in later phases, allowing time for early operations to shape additional improvements at Ardenwood.

Phasing improvements at the Ardenwood Station would also benefit CCJPA and its partners from a funding perspective. Since additional station elements will be pursued over time, CCJPA and its partners could apply for funds over multiple application cycles, making funding shortfalls less likely.

[53] Appendix E
[54] Five-Year Project List

Figure 23: Ardenwood Station Phase 1 – Passenger Rail Service & Access

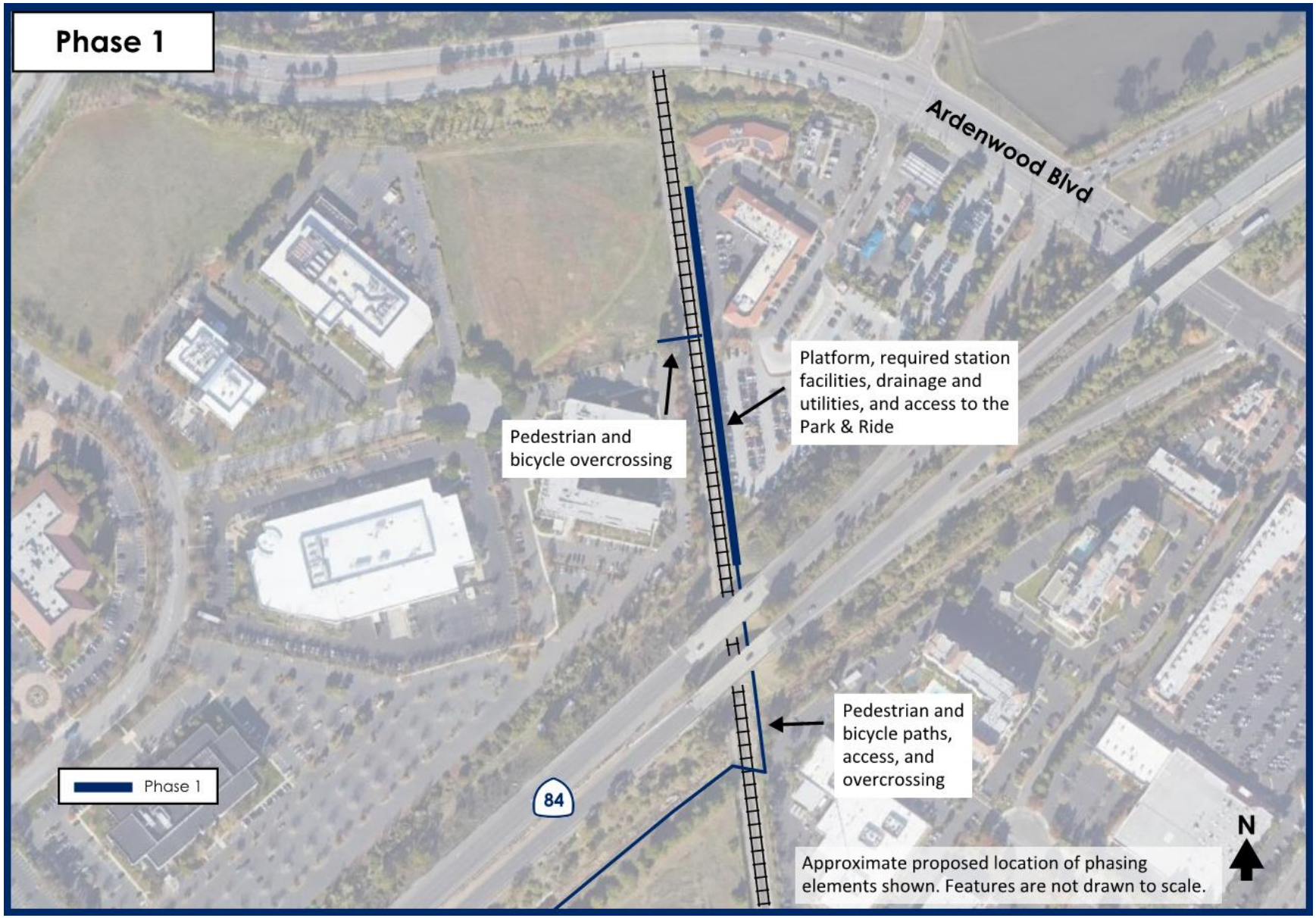


Figure 24: Ardenwood Station Phase 2 – Parking (pending parking demand analysis)

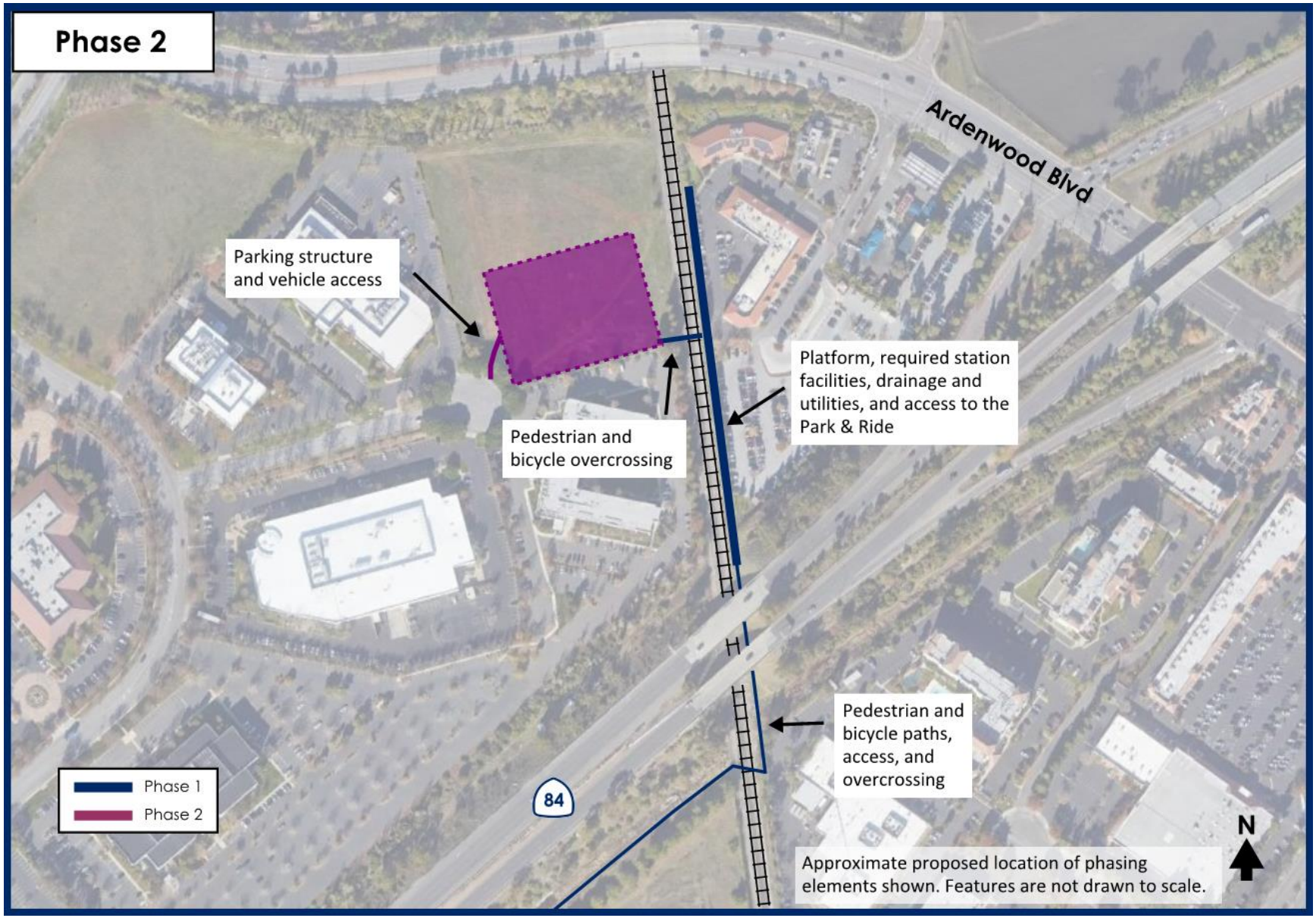
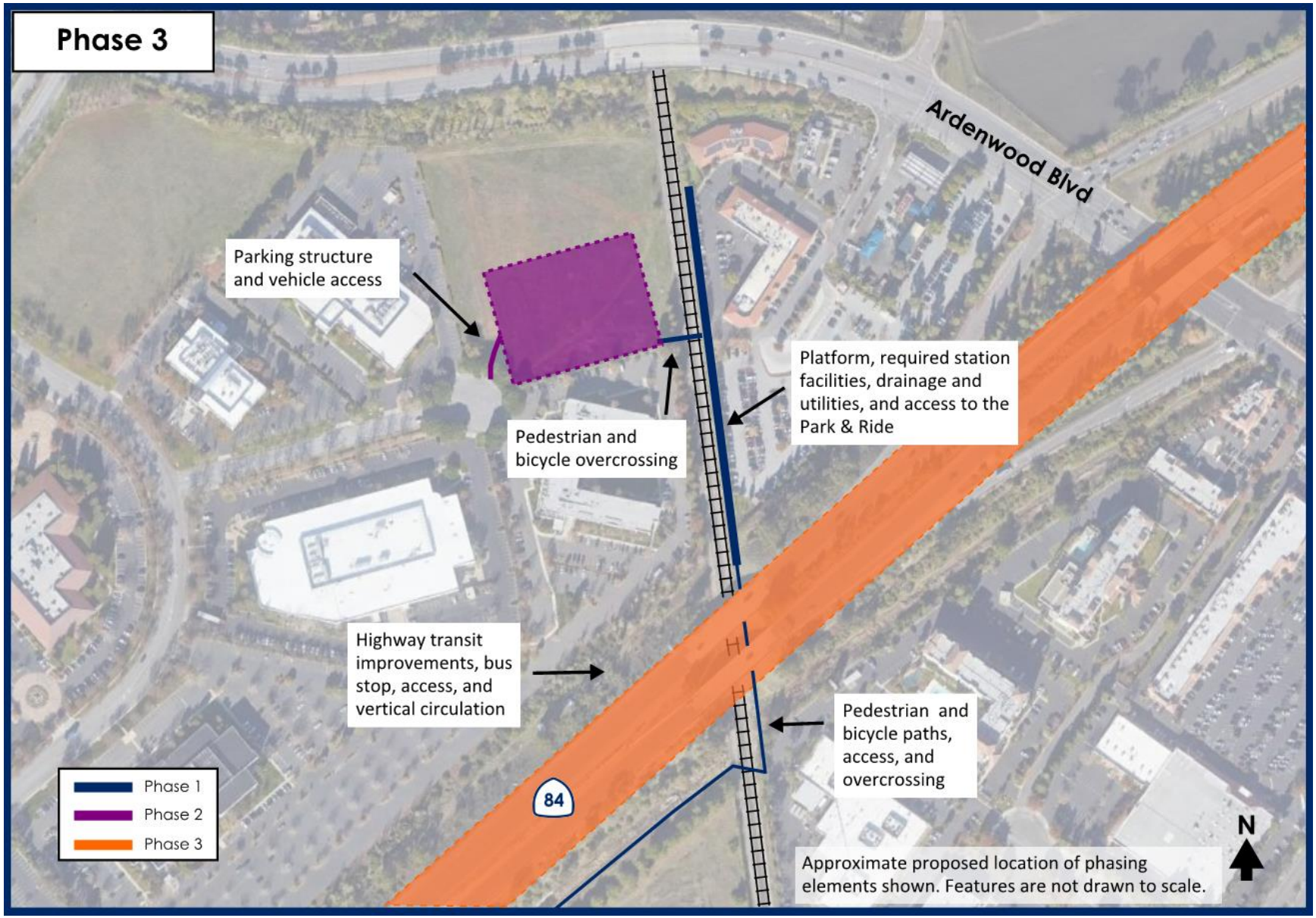


Figure 25: Ardenwood Station Phase 3 – Future Transit Facilities (pending future study)



5.2. Updated 2019 Preliminary Cost Estimate and Funding Plan

A rough order-of-magnitude capital preliminary cost estimate has been prepared based on the conceptual engineering drawings and station plans (Appendix D) that were developed for the PDR. This conceptual engineering work informs the data in Table 16, Table 17, and Table 18 and Appendix G.

A summary of project costs by element of SBC is listed in Table 16. Ardenwood Station costs are based on the planned Phase 1 improvements, including a platform, basic station furnishing and safety features, drainage and utilities, and pedestrian access. Some of these features may funded and delivered by project partners. Since the Fremont-Centerville station will still be served by ACE trains, its removal is not a part of project costs. An itemized potential project cost list is included in Appendix G.

Table 16: Conceptual Project Cost by Element

Project Element	Cost (in millions)
Newark to Elmhurst Coast Subdivision Track Upgrade	$160
Ardenwood Station	$26
Freight Mitigation	$76
Hayward Niles Subdivision Station Removal/Modification	$2
TOTAL	**$264**

Note: Numbers are rounded to the nearest million and reflect YOE dollars. Annual 3% escalation is assumed to apply proportionally across the project elements.

The projected cost of potential partner-led improvements is shown in Table 17. Additional partner-led station area improvements may be undertaken as well. The timing of potential partner-led efforts has not been determined, so the figures in Table 17 do not account for inflation.

Table 17: Conceptual Project Cost for Partner-Led Elements

Project Element	Cost (in millions)
Parking Lot	$2
Highway Median Bus Stop	$50
Highway Split Bus Stop	$57
TOTAL	**$52-$59**

Note: Numbers are rounded to the nearest million and are listed in 2019 dollars.

Table 18 shows the preliminary cost estimate and funding plan for CCJPA-led project elements. It does not include the cost or funding plan for the partner-led elements in Table 17, including a potential future highway bus stop on SR 84 and a new parking area.

Given the high level of competition for state and federal funding sources, CCJPA plans to apply for more than the $68 million needed to fill the existing funding gap. Success in

securing more than this amount will also allow CCJPA to apply already-secured funding with flexible timely use criteria, such as Measure BB and RM 3, to future Capitol Corridor improvements in Alameda County and the Bay Area.

In addition to the potential sources listed in Table 18, CCJPA plans to track calls for projects and potentially apply for funding from additional state and federal sources. CCJPA may also seek to apply future programmatic funds to SBC. For a list and description of committed and potential funding sources, see Appendix H**.**

Table 18: 2019 Conceptual Preliminary Cost Estimate and Funding Plan (in thousands)

		FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	Total
Preliminary Cost Estimate by Phase										
Environmental		$871	$5,922	$6,971						$13,764
Design			$1,527	$6,293	$4,861	$6,676				$19,357
Right-of-Way (ROW)						$3,377				$3,377
Construction						$54,470	$56,104	$57,787	$59,521	$227,882
Total Project Costs		**$817**	**$7,449**	**$13,264**	**$4,861**	**$64,523**	**$56,104**	**$57,787**	**$59,521**	**$264,380**
Funding by Source										
Committed Funding	STIP: ITIP					$15,363				$15,363
	TIRCP	$3,200		$7,000		$40,800				$51,000
	RM 3					$90,000				$90,000
	Measure BB		$14,800		$10,000	$15,200				$40,000
	Subtotal: Committed Funding	*$3,200*	*$14,800*	*$7,000*	*$10,000*	*$161,363*				*$196,363*
Prospective Funding	SCCP						TBD			TBD
	TCEP						TBD			TBD
	Subtotal: Prospective Funding						*$68,017*			*$68,017*
Total Identified Funding		**$3,200**	**$14,800**	**$7,000**	**$10,000**	**$161,363**	**$68,017**			**$264,380**

Note: Annual 3% inflation is assumed. Preliminary cost estimate is in YOE dollars. Preliminary cost estimate is listed in projected fiscal year of expenditure. Funding sources are listed in projected fiscal year of allocation.

Section 6. Conclusion

The project elements analyzed in this study represent a preliminary assessment of CCJPA's SBC project and the preferred station location and conceptual design to be carried forward. Further analysis of the station and track and freight improvements will be required as the project proceeds into the environmental and design phases.

Based on the analysis, Ardenwood is the recommended station location as it would yield the highest operational, ridership, congestion, and environmental benefits. It also requires the least ROW acquisition, allowing for lower project costs and a faster introduction of passenger service along the Coast Subdivision. Ardenwood also has the highest potential to fulfill SBC's goal to improve intermodal connections to the Peninsula due to the high number of existing and planned transbay connections. This result holds regardless of the potential addition of a highway bus stop or other scalable elements.

CCJPA and its project partners plan to pursue a phased implementation approach to the Ardenwood station. The initial priority will be constructing the station elements shown in Figure 26. Construction of the station, freight improvements, and Coast Subdivision track improvements are expected to cost approximately $264 million and be complete by 2026.

Future improvements in the station area could include parking, if necessary, and changes to the bus stop. Details on these efforts would be determined through future further analysis.

Figure 26: Ardenwood Station Preferred Conceptual Plan

The following elements are shown on the map above:

1. Pedestrian and bicycle crossing to northwest access and parking.
2. Pedestrian and bicycle crossing to pedestrian and bicycle pathway.
3. Pedestrian and bicycle pathway.

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