



MEMORANDUM - DRAFT

To: Leah Greenblat, Project Manager
WCCTAC

From: Adam Dankberg, P.E.
Kimley-Horn and Associates, Inc.

Re: **Capital Improvements Technical Memorandum, WCCTAC Express Bus Implementation Plan**

Date: October 16, 2019

1 INTRODUCTION

The Interstate-80 corridor is one of the most congested freeways in the Bay Area, with traffic jams occurring during all parts of the day, on both weekdays and weekends. The West Contra Costa County Express Bus Implementation Plan seeks to expand express bus service along this corridor to provide robust transit alternatives to driving for those living in West Contra Costa County and working in Alameda County or San Francisco. Though some of these trips could currently be made on transit, they would be two- or three-seat trips, requiring riders to transfer between several transit providers and modes. This plan aims to provide current and future riders with fast and direct transit service between home and work.

To convince riders to switch their commute from driving to transit it will not be enough simply to provide additional express service. Commuters must feel that the riding bus is the better option compared to driving alone. In service of this, a suite of capital improvements to enhance the competitiveness transit service along the project corridor will be a crucial part of the success of the service. A transit trip comprises access to the facilities on the origin and destination end of the trip, the wait for the vehicle's arrival, and the trip itself. The improvements in this memorandum address each of these aspects of the trip:

- Bus stop amenity improvements to make waiting more comfortable
- Signal and roadway improvements to aid express bus access to freeways and avoid surface street congestion
- Additional capacity at existing park & ride lots that are currently at, or near, capacity
- Potential locations for new park & ride lots to support added express bus service

In addition, this memo presents a summary of the existing and planned capacity for the relevant transit operators, AC Transit and WestCAT:

- Operator maintenance facility capacity and planned capacity upgrades
- Operator fleet type and vehicle characteristics

Lastly, the memorandum provides estimated costs for the recommended improvements. This memorandum serves as a listing of the full suite of capital improvements that are either necessary for express bus service or would enhance the effectiveness of that service. In conjunction with development of the project's funding plan, an action plan for service implementation will be provided in the Draft Plan with Implementation Steps.



2 PROPOSED ROUTES

The proposed express bus routes serve to connect West Contra Costa County with employment centers in the East Bay (i.e. Berkeley, Emeryville, and Oakland) as well as San Francisco. The routes avoid duplicating existing AC Transit or WestCAT Transbay service, aiming to provide a one-seat ride where riders currently only have access to a two- or three-seat ride, if any option exists at all.

Several proposed routes would primarily serve park & ride lots, while others would serve stops on surface arterial streets with stops spaced roughly ½ mile apart. All routes would travel along I-80 for a portion of their alignment. Frequency and span have not yet been fully determined. Nine routes have been identified serving a combination of origin and destination markets. In addition, three variations to those routes are identified for future service consideration that would expand service to additional origins and destinations. See **Figure 1** for the full map of the nine proposed routes.

2.1 Proposed Routes

Initial Routes

Route 1: Hercules Transit Center, Richmond Parkway Transit Center to Downtown Berkeley

This route would originate at Hercules Transit Center, stop at Richmond Parkway Transit Center, and serve Berkeley with stops on 6th Street, University Avenue, and Shattuck Avenue.

Route 2: Hercules Transit Center, Richmond Parkway Transit Center to Emeryville

This route would originate at Hercules Transit Center, stop at Richmond Parkway Transit Center, and serve Emeryville with stops on Hollis Street and 40th Street, and Oakland with stops at MacArthur BART and Kaiser Permanente Medical Center.

Route 3: Hercules Transit Center, Richmond Transit Center to Downtown Oakland

This route would originate at Hercules Transit Center, stop at Richmond Parkway Transit Center, and serve downtown Oakland on Broadway at 19th Street, 12th Street, 7th Street, and 2nd Street.

Route 4: San Pablo/San Pablo Dam Road Park & Ride to San Francisco Transbay Terminal

This route would originate at Contra Costa College, would stop at the proposed park & ride on San Pablo Dam Road, and serve the San Francisco Transbay Terminal.

Route 5: Hercules/Pinole via San Pablo Avenue, Tara Hills Drive Park & Ride, Richmond Parkway Transit Center to Downtown Oakland¹

This route would serve local stops on San Pablo Avenue between Willow Avenue and Richmond Parkway with a stop at the proposed park & ride at Tara Hills Drive and Richmond Parkway Transit Center, and serve Downtown Oakland on Broadway at 19th Street, 12th Street, 7th Street, and 2nd Street.

¹ As an alternate alignment, Route 5 could serve stops in Emeryville on Hollis Street and 40th Street before serving stops in Oakland on Broadway.



Route 6: Hercules/Pinole via San Pablo Avenue, Tara Hills Drive Park & Ride, Richmond Parkway Transit Center to San Francisco Transbay Terminal

This route would serve local stops on San Pablo Avenue between Willow Avenue and Richmond Parkway, stop at the proposed Tara Hills Drive park & ride, Richmond Parkway Transit Center, and serve the SF Transbay Terminal.

Route 7: San Pablo/Richmond via 23rd Street, Bissell Avenue Park & Ride to Downtown Oakland

This route would serve local stops on 23rd Street between Road 20 and Macdonald Avenue, local stops on Macdonald Avenue between 23rd Street and 44th Street, and the proposed Bissell Avenue park & ride. Destination stops in Downtown Oakland would be on Broadway at 19th Street, 12th Street, 7th Street, and 2nd Street.

Route 8: San Pablo/Richmond via 23rd Street, Bissell Avenue Park & Ride to Downtown Berkeley

This route would serve local stops on 23rd Street between Road 20 and Macdonald Avenue, local stops on Macdonald Avenue between 23rd Street and 44th Street, and the proposed Bissell Avenue park & ride. Destination stops in Berkeley would be on 6th Street, University Avenue, and Shattuck Avenue.

Route 9: San Pablo/Richmond via Rumrill Boulevard/13th Street/Harbour Way, Wright Avenue Park & Ride to Downtown Oakland²

This route would serve local stops on Rumrill Boulevard/13th Street/Harbour Way between Broadway Avenue and Cutting Boulevard and the proposed park & ride on Wright Avenue. Destination stops in Downtown Oakland would be on Broadway at 19th Street, 12th Street, 7th Street, and 2nd Street.

Alternate Routes

Route 1 (alternative): San Pablo Dam Road Park & Ride to Downtown Berkeley

This route would originate at the proposed park & ride on San Pablo Dam Road and serve Berkeley with stops on 6th Street, University Avenue, and Shattuck Avenue. This would serve the same destinations as Route 1, but would originate from the proposed San Pablo Dam Road Park & Ride instead of Hercules.

Route 3 (alternative): San Pablo Dam Road Park & Ride to Downtown Oakland

This route would originate at the proposed park & ride on San Pablo Dam Road and serve Downtown Oakland on Broadway at 19th Street, 12th Street, 7th Street, and 2nd Street. This would serve the same destinations as Route 3 but would originate from the proposed San Pablo Dam Road Park & Ride instead of Hercules.

Route 7 (alternative): San Pablo via 23rd Street, Bissell Avenue Park & Ride to Oakland and Emeryville

This route would serve local stops on 23rd Street between Road 20 and Macdonald Avenue, local stops on Macdonald Avenue between 23rd Street and 44th Street, and the proposed park & ride on Bissell Avenue. Destination stops in Emeryville would be on Hollis Street and 40th Street. Destination stops in Oakland would be at MacArthur BART, Kaiser Permanente Medical Center, and on Broadway at 19th Street, 12th Street, 7th Street, and 2nd Street. This serves as an alternative configuration to Route 7, which would bypass Emeryville and directly serve Oakland.

² As an alternate alignment, Route 9 could serve stops in Emeryville on Hollis Street and 40th Street before serving stops in Oakland on Broadway.



WEST CONTRA COSTA COUNTY EXPRESS BUS IMPLEMENTATION PLAN

WCCTAC

AC TRANSIT

WESTCAT

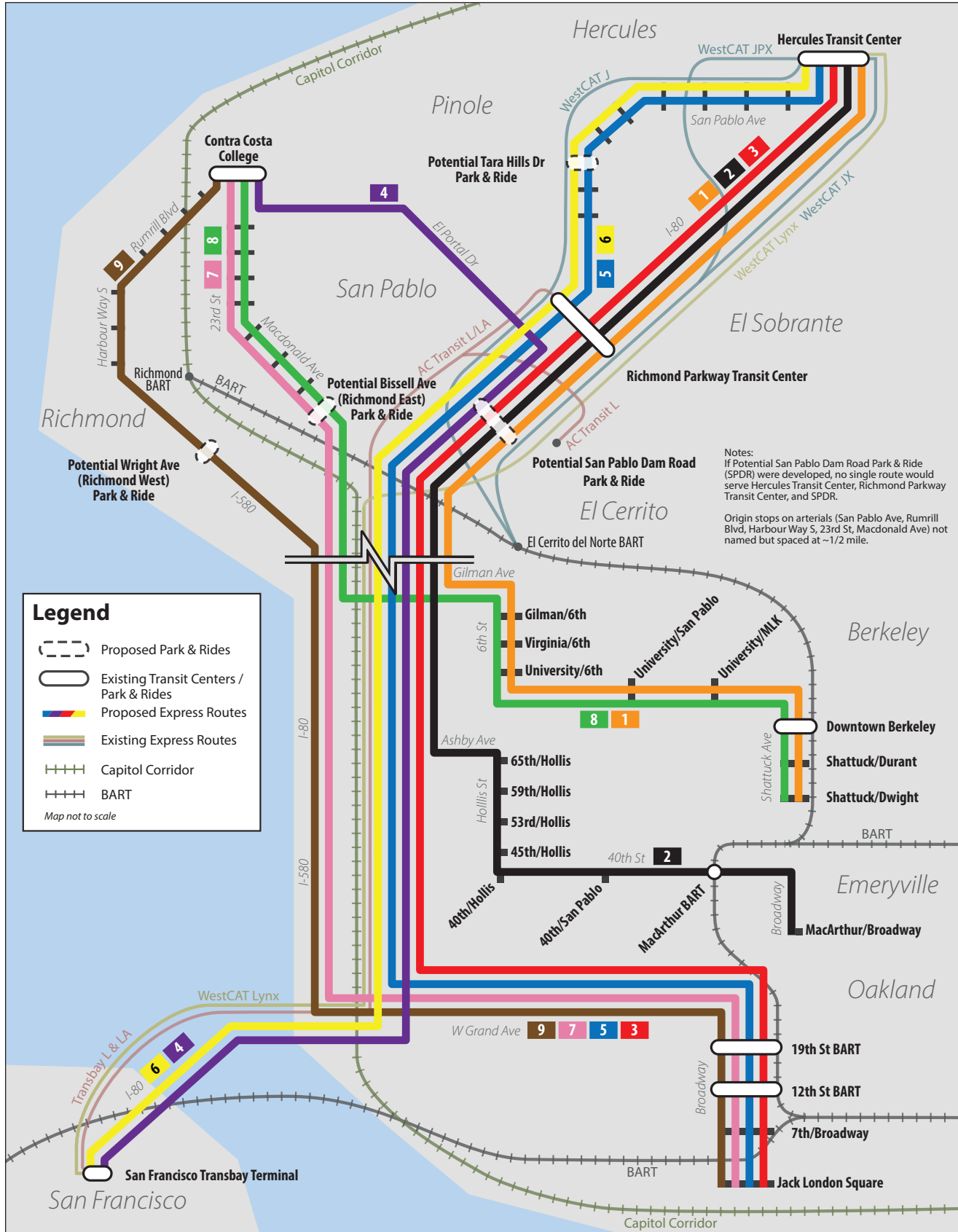


Figure 1 - Proposed System Map



3 CAPITAL IMPROVEMENTS

Section 3 describes all proposed capital improvements recommended to improve bus rider experience, reduce bus travel times, and increase the potential ridership for the routes proposed in Section 2. Steps needed and timeline for the implementation of these recommended improvements will be contained in a subsequent memorandum. Improvements required to be implemented prior to the start of corresponding service are identified.

3.1 Bus Stop Amenities

Every bus trip begins with a rider accessing a bus stop or transit center. If riders arrive early for their scheduled bus, they must then wait for some period at the stop. To ensure this waiting period is comfortable, especially during inclement weather, bus stops and transit centers possess amenities such as shelters, seating, real-time arrival information, bike parking, and other features. Riders are more likely to consider riding transit over driving if they know that their transit experience will be convenient, quick, and comfortable. The local stops in both West Contra Costa and Alameda Counties vary substantially in the quality and quantity of amenities provided. Many stops consist of only a bus stop pole with a sign and nothing else.

All existing and new stops to be served by the express bus routes were inventoried to determine which of the following amenities are present or could be added. Below is a description of the existing amenities present at the on-street stops that would be served by proposed routes, and the total number of improvements that would need to be made to provide a full suite of amenities at arterial stops (amenities at transit centers are discussed in Section 3.5). The priority and phasing of the improvements below will be described in more detail in the Implementation/Phasing Plan.

Stop improvements will need to be coordinated between the local jurisdiction and the service operator. In some cases (such as within the AC Transit operating area), amenities such as shelters are provided by the bus stop maintenance contractor. In others, coordination will be needed to extend utilities to the stop or to expand on sidewalk within the public right-of-way. Consideration will be needed for maintenance of bus stop facilities if not already included in a maintenance contract.

Recommended amenities are divided into tier 1 and tier 2. Tier 1 amenities are considered pre-requisites for stops for new express bus service. Tier 2 amenities are beneficial to stop access or the rider experience, but are expected to be limited to high ridership stops and are not a pre-requisite for service.

Tier 1 Amenities

ADA-Compliant Landing Zone

To maintain compliance with the Americans with Disabilities Act (ADA), and ensure accessibility to all users, bus stops should have a concrete landing zone adjacent to the curb. This landing zone, which should be a minimum of 5' wide and 8' deep and free of street furniture is necessary for a bus to deploy a ramp allowing wheelchair users to board.

Shelter

A shelter is two- or three-walled structure installed at the bus stop that allows waiting passengers to stand outside of direct sunlight or inclement weather. Shelters may come in different sizes and shapes, but typically require a larger footprint in the right-of-way than other stop amenities. Detailed stop design is needed to verify the feasibility of shelter placement at identified stop locations. If a shelter is not feasible within a constrained sidewalk space, then the stop could be relocated in a nearby location or a shelter may not be provided.



Bench

Bus stop benches are particularly important in places with higher expected wait times, routes that serve older populations, and locations with a higher volume of boardings. If the bus stop also has a shelter, the bench should generally be placed within the shelter. Busy stops or transfer points may require multiple benches to serve all passengers who want a place to sit.

Pedestrian-Scale Lighting

Standard street lamps are intended to illuminate the roadway for motorists and are not always suitable for providing ideal lighting for passengers waiting for the bus. Pedestrian-scale lighting is installed lower to the ground and with the intent of providing a well-lit place to stand or sit while waiting for the bus. This lighting can sometimes be provided from the bus stop shelters themselves.

Trash Receptacle

To help ensure that bus stops stay clean with as little maintenance as possible, trash receptacles should be installed close to, or at, the bus stop. Depending on the level of activity at the bus stops, trash receptacles must be emptied frequently to avoid overflow.

Tier 2 Amenities

System Map

A large, legible system map is a useful bus stop amenity. Passengers can plan trips without needing to access to the website of the service provider or a smartphone. The system map can also provide contact information so that passengers may contact a transit agency representative for further information.

Bicycle Parking

Bicycles can allow transit riders to reach stops from farther away than if they were walking, potentially increasing the number of riders. Secure bicycle parking, such as lockers and emerging technologies such as BIKEEP, allows riders to park their bicycle with greater confidence that it will not be stolen.

Table 1 describes the number of recommended bus stop amenity upgrades by municipality for all arterial stops.



Table 1 – Recommended Bus Stop Amenity Upgrades by Municipality

Stop Amenity	Berkeley	Contra Costa County	Emeryville	Hercules	Oakland	Pinole	Richmond	San Pablo	Total
Route #s	1, 8	5, 6	2	5, 6	3, 5, 7, 9	5, 6	7, 8, 9	7, 8, 9	-
Total Stops	16	4	11	4	14	8	20	10	86
New or Relocated Stops	1	1	0	1	0	0	5	4	12
Tier 1 Amenities									
ADA Landing Zone	1	1	0	1	0	0	1	2	6
Shelter	13	3	10	3	9	6	20	9	72
Bench	8	1	7	2	5	4	15	9	50
Lighting	14	4	8	4	7	7	19	10	72
Trash Receptacle	7	4	0	2	7	4	15	9	48
Tier 2 Amenities									
System Map	14	4	11	4	13	8	20	9	82
Bike Parking	11	4	9	4	11	8	20	10	76



3.2 Transit Signal Priority

Transit Signal Priority (TSP) describes technologies used to reduce transit vehicle delays at intersections by either holding lights green for an extended period or shortening the length of red light periods. To improve travel time along arterial-running segments of the proposed express routes, TSP is recommended at all traffic signals where it is not already in operation. TSP is a desired amenity for express bus service, but is not a pre-requisite for service operation. The proposed routes travel along streets within seven different cities, and part of unincorporated Contra Costa County. TSP requires technology both at the signal controller operated by the municipality or Caltrans and on-board the vehicle. Substantial coordination is necessary to implement and maintain TSP. **Table 2** describes the corridors along which new TSP treatments are recommended, as well as how many of the affected intersections fall within the boundaries of each municipality.

Table 2 - New Transit Signal Priority (TSP) Corridors by Municipality

Segment Extents	Route #s	Municipality	Signalized Intersections
Rumrill Blvd from San Pablo Ave to Sanford Ave	9	City of San Pablo	7
23 rd St from San Pablo Ave to Maricopa Ave	7, 8	City of San Pablo	2
San Pablo Dam Rd from El Portal Dr to I-80	4	Contra Costa County	2
13th St/Harbour Way S from Rheem Ave to Hoffman Blvd	9	City of Richmond	13
22nd/23rd St from Rheem Ave to Macdonald Ave Macdonald Ave from 22nd St to 44th St	7, 8	City of Richmond	16
6th St between Gilman St and University Ave	1, 8	City of Berkeley	3
Shattuck Ave between University Ave and Dwight Way	1, 8	City of Berkeley	8
Hollis St from 65th St to 40th St, 40th St from Hollis St to Adeline St	2, 5 (alt), 9 (alt)	City of Emeryville	10
40th St from Market St to Broadway	3, 5, 7, 9	City of Oakland	6
Grand Ave from Frontage Rd to Broadway	3, 5, 7, 9	City of Oakland	2

Implementation of expanded TSP will require coordination between the operator of the signal and the service operator. Both AC Transit and WestCAT have the capability to operate TSP. The fleet planned for this service will need to include the necessary equipment. Controller upgrades may be needed at some intersections to provide TSP functionality. TSP has already been installed and is currently functional on San Pablo Avenue and on several arterials that intersect with I-80. However, older-model signal controllers (model 170) are not capable of providing reporting data on TSP usage (number of calls, activation, etc.). This reporting functionality will continue to be limited in I-80 corridor until funding is secured to upgrade to the 2070 controller model, as the cities of Richmond and Berkeley have done.



3.3 Freeway Access Improvements

Each of the proposed express bus route uses I-80 for some part of its alignment. The interchanges between I-80 and the surface streets that would be used by the proposed bus routes are frequently congested with auto traffic attempting to merge onto the freeway. To reduce delay at these locations and improve overall travel times, a series of freeway access improvements are recommended the interchanges where the express bus accesses or egresses I-80. These improvements mostly consist of HOV lanes added to on-ramps and the addition of TSP to nearby signals. These improvements would benefit transit travel times, making the bus more time-competitive with the auto and reduce operating costs. However, they are not pre-requisites for service operations and can be implemented over time both before and after the start of service.

Each of the proposed access improvements will require the completion of a Caltrans approval process, as they involve state-owned freeways. This process will include environmental review and design. In some cases, such as the interchanges between I-80 and San Pablo Dam Road and Ashby Avenue, these improvements may be incorporated within an ongoing project to reconfigure the interchange.

I-80/SR-4 Interchange

Hercules Transit Center sits immediately southeast of the interchange between I-80 and SR-4. It consists of 422 parking stalls, secure bike parking, a pick-up/drop-off aisle, and 12 bus bays. It is served by several WestCAT local routes and acts as the northern terminus of the JX and JPX express routes. The transit center is also served by WestCAT's LYNX service to the Salesforce Transit Center in San Francisco.

Proposed express bus service traveling south from Hercules Transit Center would merge onto I-80 S via Willow Avenue, Sycamore Avenue, San Pablo Avenue, and John Muir Parkway. Existing express bus service (such as the WestCAT LYNX and JPX) running in the same alignment experience auto-based congestion on San Pablo Avenue and John Muir Parkway. Improvements are recommended to improve transit vehicle access to I-80 from the transit center, shown in **Figure 2** and **Figure 3**.

The right turn lane from northbound San Pablo Avenue onto John Muir Parkway is recommended to be widened with an HOV lane added. The HOV would extend east on John Muir Parkway to the I-80 S on-ramp. The roadway widening on John Muir Parkway would occur within Caltrans right-of-way. The I-80 S on-ramp is currently sufficiently wide for addition of an HOV lane, which would join the existing HOV lane on I-80 S. Additionally, TSP is recommended at the intersections of Willow Avenue and Sycamore Avenue, and Sycamore Avenue and San Pablo Avenue (not shown on graphic). A similar improvement to add a second right-turn lane onto John Muir Parkway is included in the City of Hercules Transportation Impact Fee program.³

Proposed routes 1, 2, and 3 would benefit from this improvement.

I-80/Richmond Parkway Interchange

The I-80/Richmond Parkway Interchange is used by buses traveling between the freeway and Richmond Parkway Transit Center. The interchange allows access to both I-80 N and I-80 S, including direct access ramps (DARs) to the HOV lane south of Richmond Parkway.

Improvements are recommended to improve transit vehicle access between both I-80 and the Transit Center and Richmond Parkway and the Transit Center, as shown in **Figure 4** and **Figure 5**. Improvements include restriping the lanes approaching Richmond Parkway from the I-80 S off-ramp and the lanes approaching Blume Drive from

³ City of Hercules Transportation Impact Fee 2019 Update - Nexus Study



eastbound Richmond Parkway. Additionally, an HOV lane is recommended on eastbound Richmond Parkway on the I-80 overpass, continuing onto the I-80 N on-ramp. Finally, TSP should be provided at the signals used by transit vehicles between I-80 and the Transit Center, namely the intersections of Richmond Parkway & Blume Drive, Richmond Parkway & I-80 DArS, and the proposed signal at Blume Drive & the entrance to the Transit Center.

Proposed routes 1, 2, 3, 5, and 6 would benefit from this improvement.

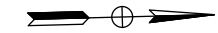
I-80/San Pablo Dam Road Interchange

To improve transit vehicle access between I-80 S and the proposed park & ride lot on San Pablo Dam Road (described in a subsequent section), improvements are recommended on the I-80 overpass and I-80 S on-ramp, shown in **Figure 6**. Recommended improvements include TSP between San Pablo Dam Road and the on-ramp, and widening on on-ramp to provide a bus-only lane. This interchange is slated for major reconstruction as part of a CCTA project which may negate the need for these improvements. CCTA is currently pursuing funding to construct the project.

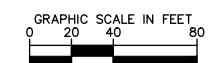
Proposed route 4, as well as the alternate alignments for routes 1 and 3 benefit from this improvement.

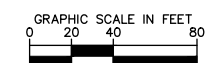
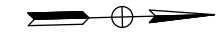
I-80/Ashby Avenue Interchange

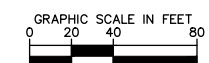
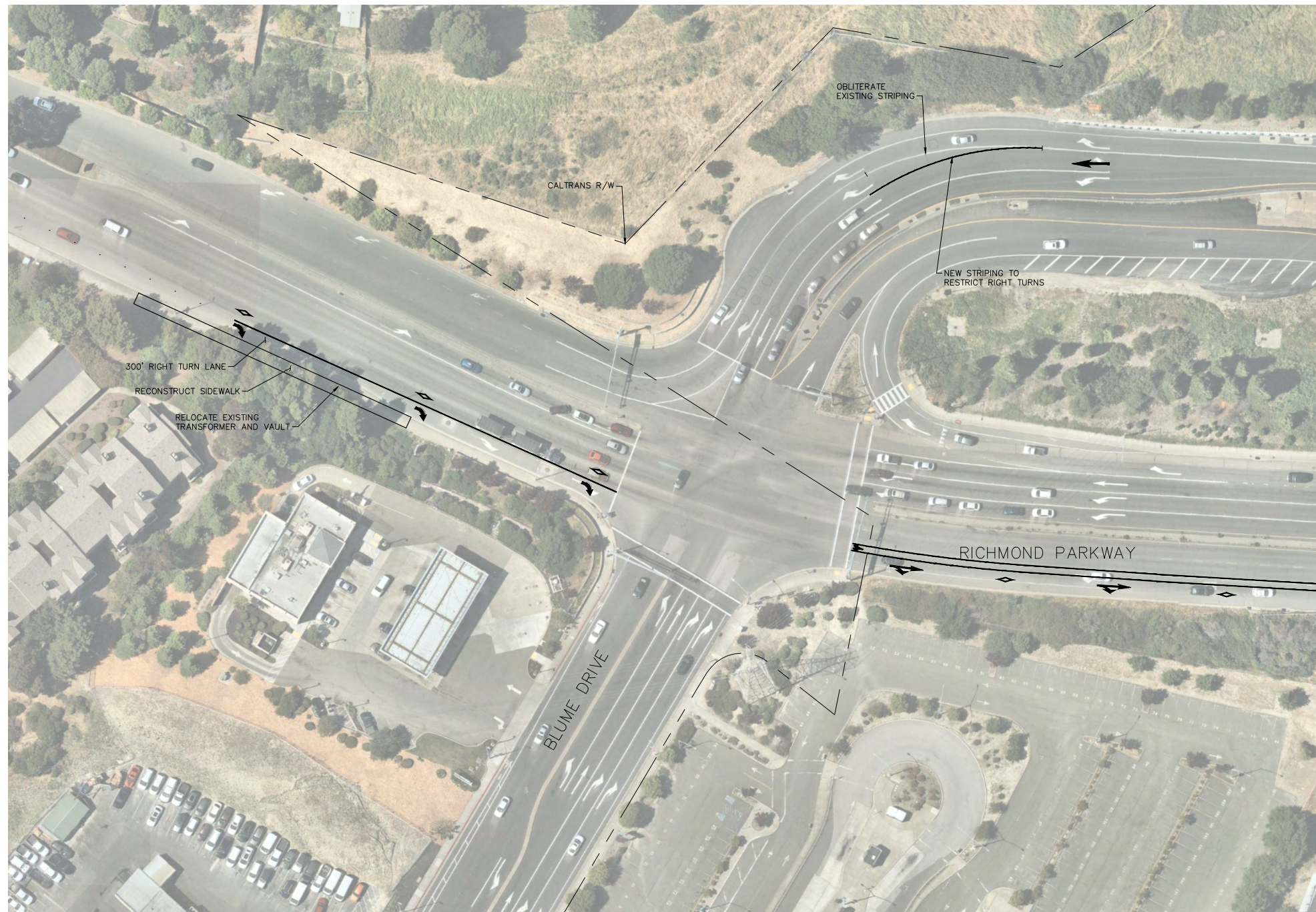
While there are opportunities to improve existing freeway access between I-80 N and westbound Ashby Avenue, Alameda County Transportation Commission and Caltrans plan a full reconfiguration of the interchange, with construction slated to begin in 2022. Final designs have not yet been determined, but it is recommended that transit-only, or HOV, lanes be implemented along the northbound on-ramp. Proposed route 2, as well as the alternate alignment for route 7, would benefit from this improvement.



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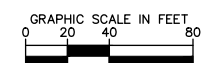
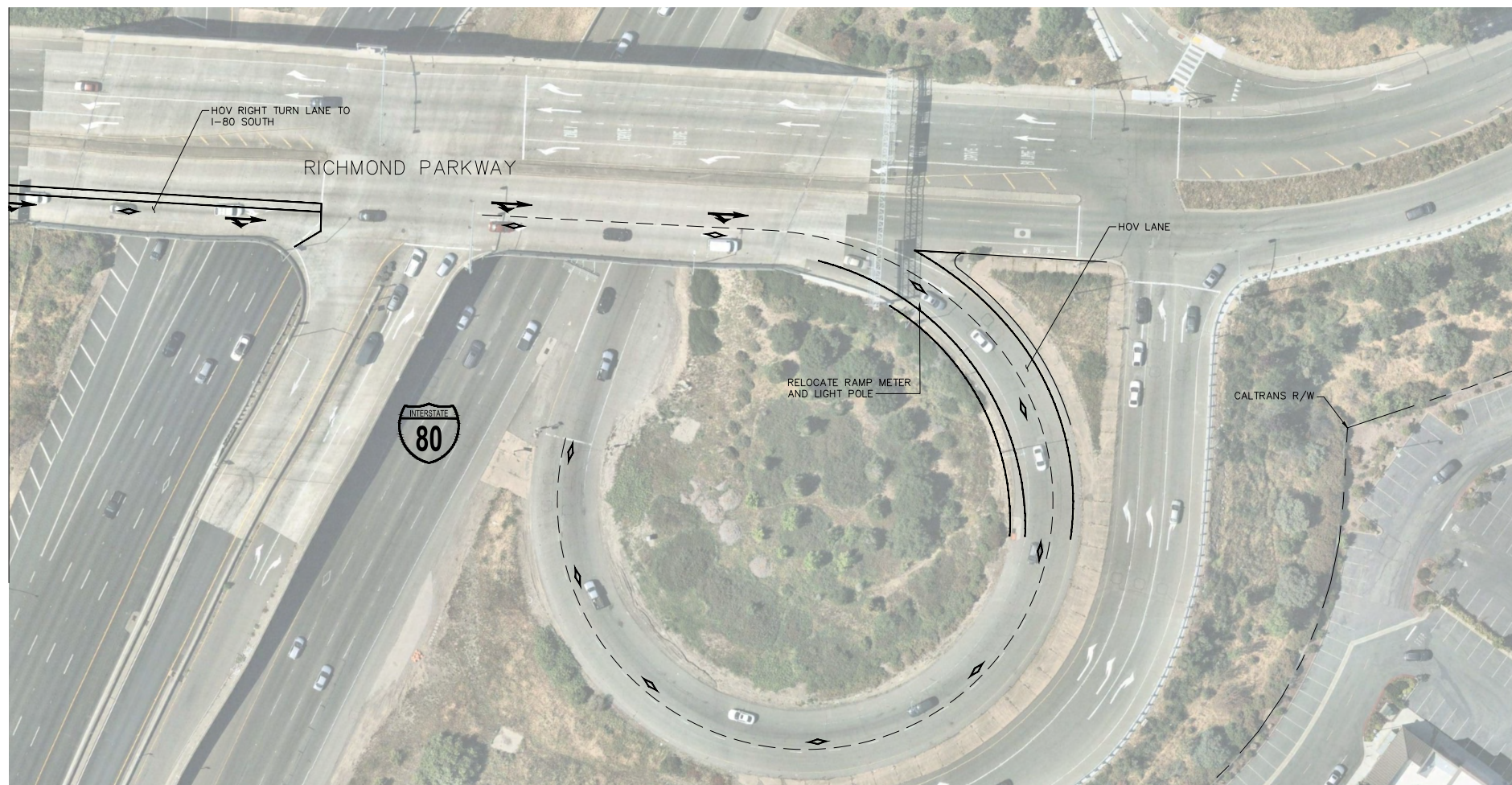




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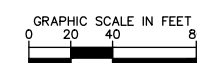


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3.4 Freeway Improvements

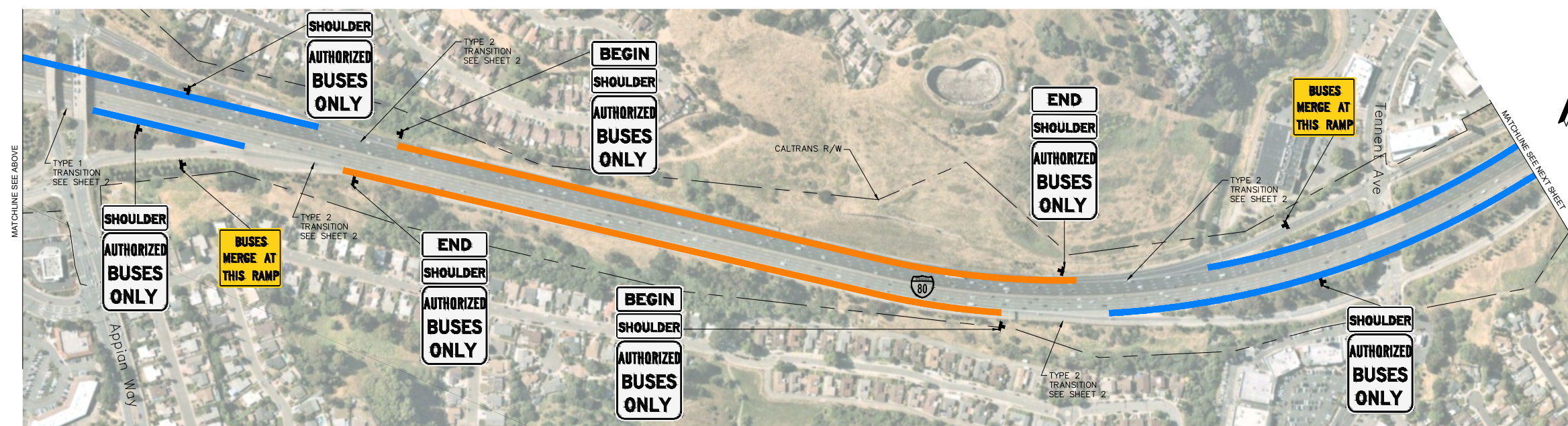
Part-Time Transit Lanes between Richmond Parkway & SR-4

Proposed routes 1, 2, and 3 would travel on I-80 between SR-4 and Richmond Parkway, a corridor that experiences significant congestion in the peak directions. Between these two points, I-80 is configured with three general purpose lanes, an HOV 3+ lane (requiring at least three riders in the vehicle), and an auxiliary lane in each direction. Buses may also use the HOV lane; WestCAT's LYNX route uses it to travel between Hercules Transit Center and San Francisco. However, for bus routes that would serve both Hercules Transit Center and Richmond Parkway Transit Center, the added benefit of traveling in the HOV lane for roughly three miles would not be worth the difficulty of crossing three lanes of traffic to reach the HOV before crossing once again to exit at Richmond Parkway.

To improve bus travel speeds and bus schedule reliability along this corridor, a system of buses using auxiliary lanes along with bus-on-shoulder operations is recommended. Rather than crossing to the HOV lane or traveling in the general-purpose lanes, buses would travel on the shoulder or use the auxiliary lanes between interchanges where they exist. At interchanges (Pinole Valley Road and Appian Way), buses would travel in the shoulder between the off-ramp and on-ramp, at which point they would re-join the auxiliary lane. Where buses are proposed to travel on shoulders, they would only do so when speeds fall below 35 mph and speeds would be limited to up to 15 mph faster than the adjacent general-purpose lane, not to exceed 35 mph (for safety purposes). CCTA is currently pursuing a Part-Time Transit Lane pilot project on I-680 for express buses in that corridor. SANDAG received approval for a similar project in San Diego on I-805 that is scheduled to be operational in 2019.

This treatment would require much less expense than adding an additional lane to the corridor, although it does require special legislative accommodation and approval from Caltrans and the California Highway Patrol. Recommended improvements include a minor amount of roadway widening, pavement improvements on the shoulder, additional signage, and signal control of the on-ramps to avoid conflict between private vehicles and transit vehicles. While this improvement would greatly benefit transit travel times for Routes 1, 2, and 3, it is not a pre-requisite for service operations.

Recommended improvements are shown in **Figure 7** and **Figure 8**.

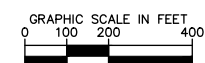


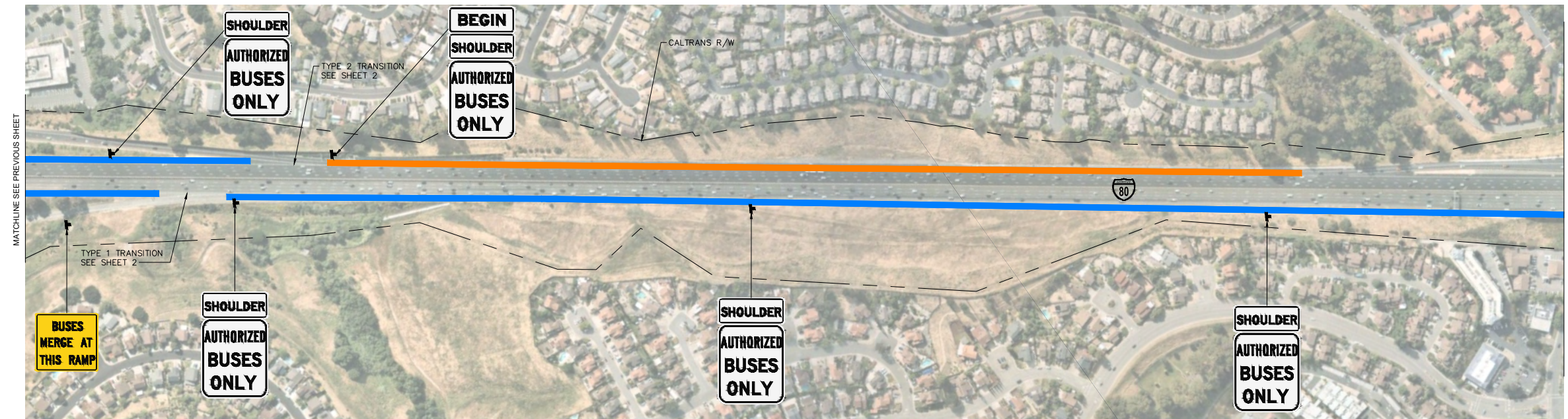
NOTE:

1. EXISTING 10' SHOULDER MAY NEED TO BE WIDENED WITHIN LIMITS OF BUS ON SHOULDER OPERATION.
2. POTENTIAL RESTRIPING AND LANE WIDTH REDUCTION ON BRIDGE STRUCTURE TO BE REQUIRED.

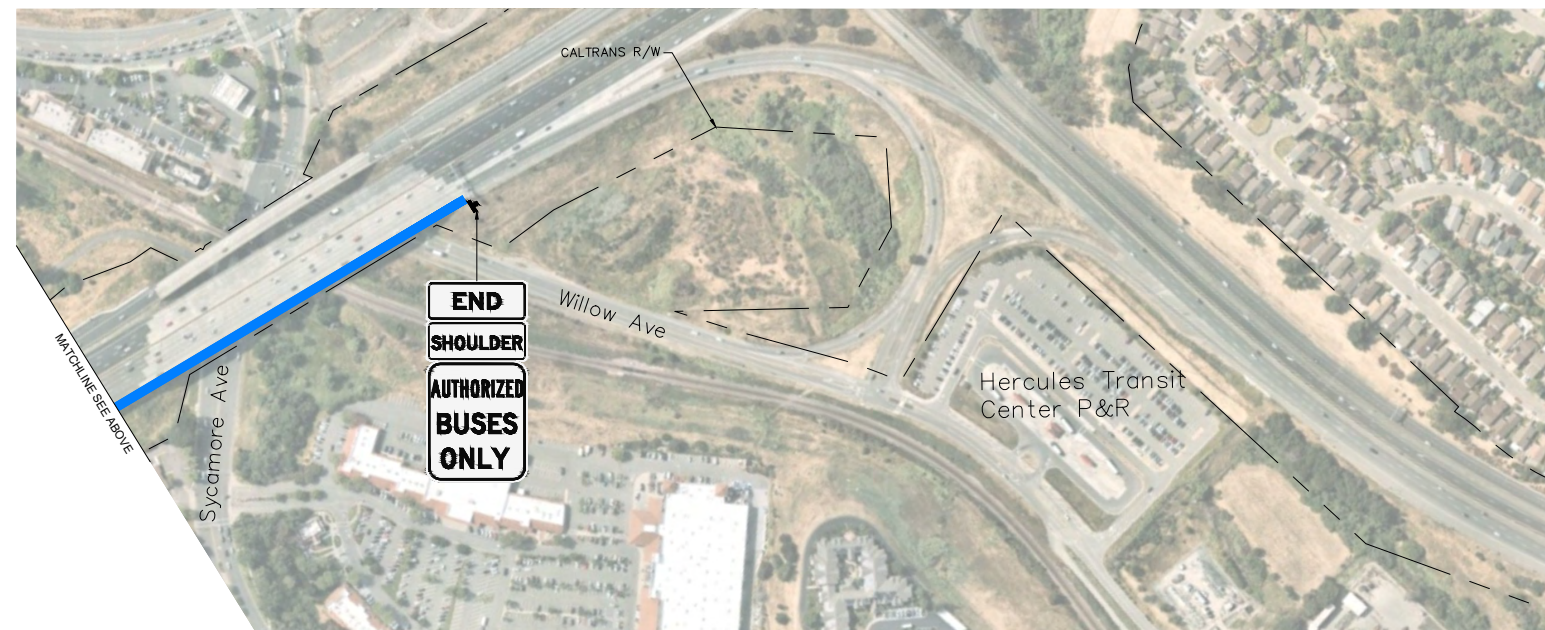
LEGEND:

- BUS USES AUXILIARY LANE
- BUS ON SHOULDER





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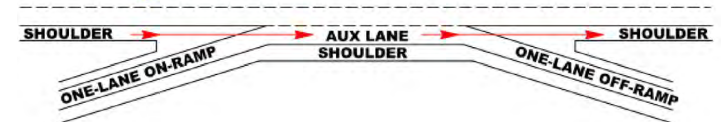


TYPICAL TRANSITION DETAILS AT ON/OFF-RAMP

TYPE 1: SHOULDER TO ON-RAMP TO SHOULDER

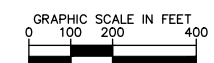


TYPE 2: SHOULDER TO AUXILIARY LANE / AUXILIARY LANE TO SHOULDER



LEGEND:

- BUS USES AUXILIARY LANE
- BUS ON SHOULDER





3.5 Park & Rides

Due to the generally lower-density character of northern West Contra Costa County, existing Transbay bus service is primarily accessed via park & rides. The parking lot at Richmond Parkway Transit Center regularly fills to capacity before 8:30 a.m. While the Hercules Transit Center Park & Ride doesn't quite fill up, there is little excess capacity; the amount of available parking is much less than the projected demand for the proposed new express bus routes. As such, additional express bus routes serving the transit centers would not reach ridership potential without further improvements to increase capacity.

All proposed park & rides should include a full suite of tier 1 and tier 2 transit stop amenities (described in Section 3.1) as part of initial construction. Beyond those amenities, all park & rides should include Class 1 secure bicycle parking, encouraging riders who live within a relatively short distance to ride a bike rather than drive, increasing the number of potential users of the express bus. The recommended amount of Class 1 bicycle parking that should be provided is 5 percent of auto parking stalls at that site. As part of their recommended capacity increases at the Hercules Transit Center and Richmond Parkway Transit Centers, real-time arrival displays should be installed to improve waiting conditions for riders.

Improvements to Existing Park & Rides

Hercules Transit Center

Owned and operated by BART, the Hercules Transit Center currently consists of 422 auto parking spaces, six secure bicycle parking spaces, and 12 bus bays. Parking is currently priced at \$3 per day. The lot was formerly located on San Pablo Avenue on the west side of I-80 but was moved in 2009, allowing it to expand from 250 parking stalls to the current 422. Despite the expansion, parking demand is nearing the available supply, with few spaces available on a typical day.

Proposed routes 1, 2, and 3 would serve the transit center. With additional transit service planned through this project, parking demand is expected to increase further. To accommodate additional vehicles, a 308-stall parking structure is proposed on the BART-owned parcel immediately to the east of the existing transit center, bringing the transit center to a total of 730 parking spaces. **Figure 9** shows the proposed parking structure. The grade of the unimproved parcel to the east is approximately one story below that of the existing surface parking lot, allowing direct access between the existing lot and the second story of the proposed structure. Drivers would reach the first floor of the structure via a ramp.

The West Contra Costa High-Capacity Transit Study (WSP, 2017) included a new 500-space, three-story parking structure on this site. The location of the parking garage identified in that study would significantly impact parking supply during construction. In addition, more detailed analysis has indicated that a smaller structure may be sufficient. As a result, this study has modified the recommendation to the two-story structure at the east end of the property.

The WSP Study also included several recommendations for improving access between I-80 and the Hercules Transit Center, which may be found in Section 7. The recommendations made in this memorandum have the potential to conflict with proposed relocation of the SR-4 on-ramp made in the High-Capacity Transit Study. Further engineering development will be needed to determine whether both sets of improvements are feasible or if modifications to the recommendations are needed to meet the objectives of both studies.

One constraint on the proposed parking structure is associated with the electrical substation located immediately to the south of the expansion parcel. A utility line travels between the substation and the development north of SR-4, passing directly over the proposed parking structure. In its current condition, the utility line would preclude a



two-story structure due to clearance requirements. However, if a taller utility pole were used or if the utility line was re-routed, the conflict could potentially be avoided. Cost complexity of this improvement will depend on the access rights agreement between BART and PG&E. Further coordination with BART will be necessary to determine ultimate feasibility of the proposed parking structure.

Increased parking capacity at the Hercules Transit Center is not a pre-requisite to new express bus service; however, the ridership of new express bus service will be limited until parking capacity can be expanded or other programs implemented to encourage non-drive alone access.

Richmond Parkway Transit Center

The Richmond Parkway Transit Center, located immediately west of the I-80/Richmond Parkway interchange, is owned by Caltrans but operated and maintained by AC Transit. The Transit Center consists of a 206-stall park & ride and six bus bays. It is served by several WestCAT and AC Transit local routes, as well as WestCAT's JR and JPX express routes and AC Transit's LA Transbay route. The parking lot is currently oversubscribed and is regularly filled by 7:00 a.m. Parking is currently priced at \$4 per day.

Given the constrained footprint of the site and nearby topography, additional auto parking capacity may only be added through construction of structured parking. The addition of a large (600 space) garage was considered in the Richmond Parkway Transit Center Reassessment (AC Transit & ARUP, 2013). The report concluded the following:

The individual technical analyses prepared for this study yielded fairly consistent conclusions indicating that the large garage is not feasible at the current time. Specifically:

- The Demand Analysis showed that long-term parking daily volume at the facility is unlikely to exceed 400 vehicles, which would fill less than two thirds of the proposed large garage facility. Aside from poor utilization of the investment, this also indicates that additional revenue would definitely be required in order to sustain the facility, particularly in the short- to medium-term.
- The Retail Assessment showed that current market conditions are not favorable for constructing retail at the site. The site could be a favourable (sic) retail location in the future, but only after lease rates improve and in-fill development increases the surrounding customer base.
- The Financial Analysis showed that the large garage was infeasible under the most optimistic of scenario assumptions, including strong demand growth, aggressive pricing increases, and changes to AC Transit's policies regarding recapitalization costs. Under these assumptions, the large garage could eventually operate with positive annual net revenues, but this would only occur after prolonged periods of large deficits.

Based on consultation with AC Transit and the RPTC Task Force, the large garage has been deemed inappropriate for the RPTC site.

Due to additional demand from the proposed express bus service that would far exceed existing supply, this memorandum recommends the construction of a parking structure to provide capacity to accommodate future demand. Routes 1, 2, 3, 5, and 6 would serve this Transit Center. **Figure 10** shows the recommended parking structure, which would increase total capacity from 206 to approximately 610 parking spaces via a four-level structure.

The improvements would add a stop with three bus bays on the south side of eastbound Richmond Parkway in front of the proposed parking structure, level with the structure's second floor. This would allow southbound buses to pick up riders without needing to circulate within the Transit Center, greatly improving travel times from existing conditions. Relocating the southbound through buses to Richmond Parkway also frees up bus bay capacity within the Transit Center. Northbound buses would still be required to enter the Transit Center and would use the

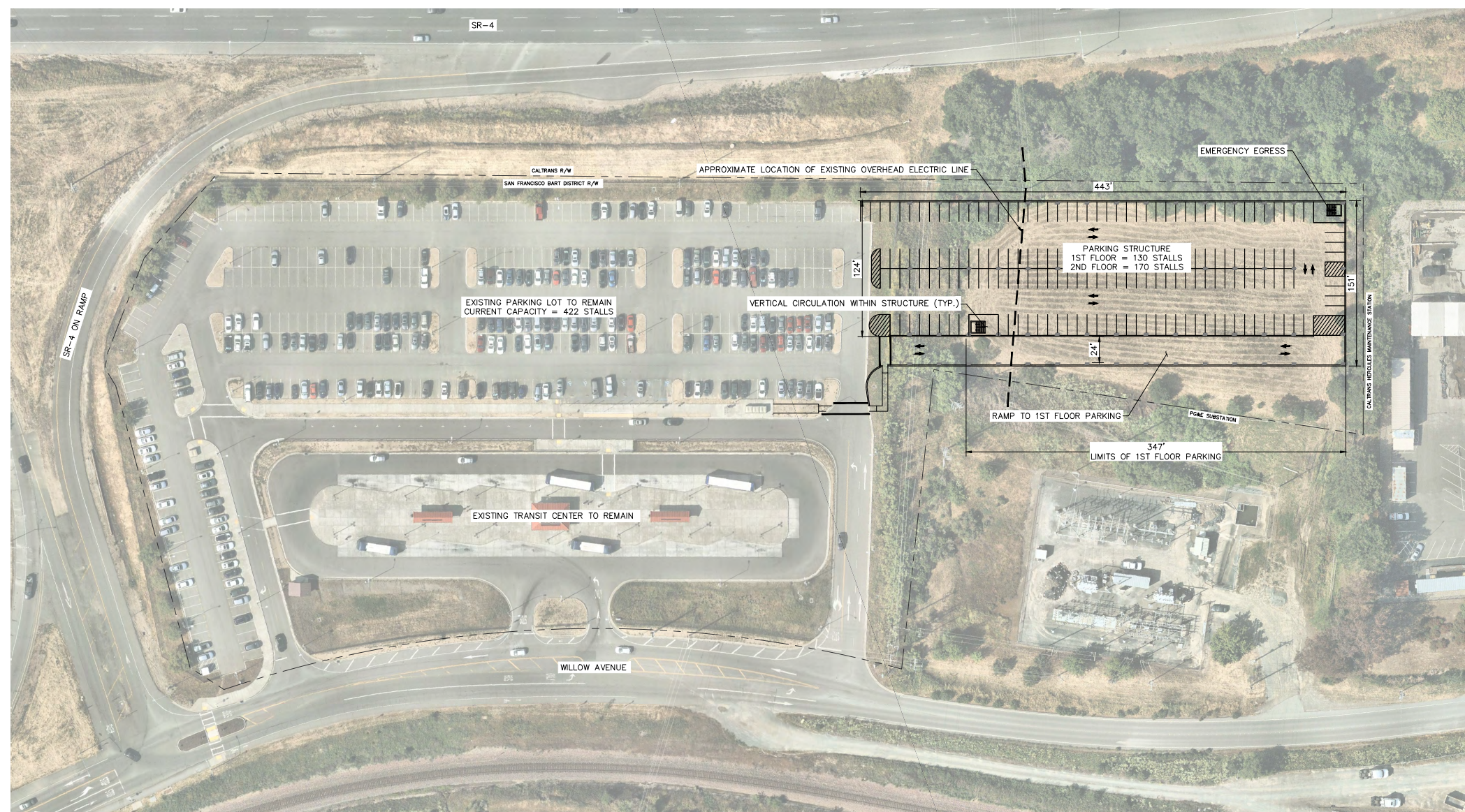


realigned bus bays south of the parking structure. A pick-up/drop-off area would be added between the remaining at-grade lot and the new parking structure.

The configuration of the proposed Transit Center improvements would require that much of the existing surface parking be replaced by either the realigned bus bays or structured parking. This would present staging challenges, given that a substantial amount of parking would be unavailable during the period of construction. During the period of construction, replacement nearby parking should be considered to reduce the impact of parking loss at the Transit Center, such as existing surface lots at Hilltop Mall or along Blume Drive.

There is an existing transmission line and electrical tower on the northwest corner of the parcel, but given its location and height, it is not expected to present a constraint to the proposal described above.

With the Richmond Parkway Transit Center currently reaching capacity in the middle of the AM peak period, there would be minimal additional ridership potential without expanding parking capacity or implementing other programs to encourage non-drive alone access.



LEGEND:

- APPROXIMATE PROPERTY LINE
- OVERHEAD ELECTRIC LINE CONFLICT

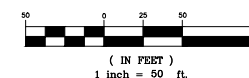
SUMMARY OF PARKING:

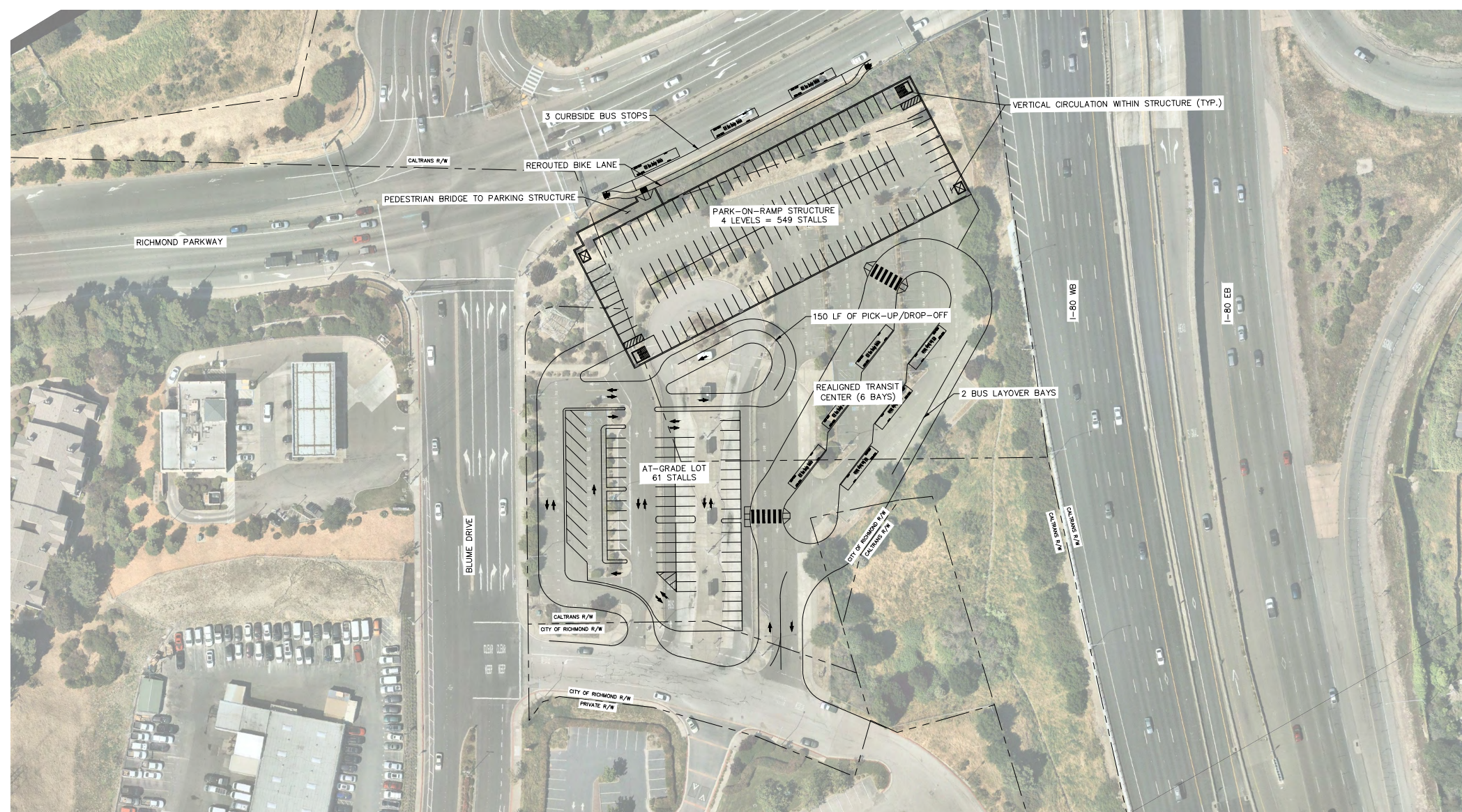
TARGET STALLS	700
EXISTING STALLS TO REMAIN	422
PROPOSED PARKING STRUCTURE STALLS	300
TOTAL	722

NOTE:
PARKING CAPACITY MAY CHANGE DUE TO ADDITIONAL SPACE REQUIRED FOR BIKE PARKING, STORM WATER MANAGEMENT, AND PEDESTRIAN TREATMENTS.



GRAPHIC SCALE





LEGEND:

--- APPROXIMATE PROPERTY LINE

SUMMARY OF PARKING:

TARGET STALLS	600
PROPOSED PARKING STRUCTURE STALLS	549
AT-GRADE STALLS	61
TOTAL	610

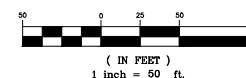
SUMMARY OF TRANSIT:

TRANSIT CENTER BUS BAYS	6
CURBSIDE BUS BAYS	3
BUS LAYOVER BAYS	2
PICK-UP/DROP-OFF (LF)	150

NOTE:
PARKING CAPACITY MAY CHANGE DUE TO ADDITIONAL SPACE REQUIRED FOR BIKE PARKING, STORM WATER MANAGEMENT, AND PEDESTRIAN TREATMENTS.



GRAPHIC SCALE





Proposed Park & Rides

Tara Hills Drive

Two potential locations for a park & ride serving the Pinole and unincorporated Contra Costa County communities have been identified, both at the intersection of San Pablo Avenue and Tara Hills Drive. Site 1 is on the west side of Tara Hills Drive immediately south of the existing Valero gas station. The 1.2-acre parcel is privately owned by James Belford and Bonnie Paulson and is currently partially paved. As part of the General Plan 2040 update, Contra Costa County is meeting with the community to discuss what uses they want on this site. There is interest in community-serving retail, but the timeline for such a project is unknown.

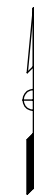
The parcel could accommodate approximately 60 parking spaces within the existing lot while maintaining access through the lot to the Spectrum Center School immediately to the southwest. Existing bus stops are along San Pablo Avenue west of Tara Hills Drive, which would be used if Site 1 were selected.

Figure 11 shows the proposed park & ride on Site 1.

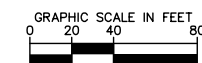
Site 2 is on the north side of Tara Hills Drive north of San Pablo Avenue, opposite the housing development. The 13.4-acre unimproved parcel (2.3 acres of which would be used for the proposed park & ride) is owned by Pacific Mobile IV. If fully developed, the lot would have a maximum capacity of approximately 210 spaces. Stops serving the lot would remain along San Pablo Avenue. A northbound stop could be provided along the sidewalk of the southeast corner of the intersection as a part of a proposed and entitled development there.

Figure 12 shows the proposed park & ride on Site 2.

Both park & rides would be served by proposed routes 5 and 6. These routes would provide service to a number of stops along San Pablo Avenue. Therefore, provision of a park & ride at Tara Hills Drive would not be considered a pre-requisite for service; however, provision of the park & ride would provide a significant boost to ridership by providing access to the numerous residents who live outside of walking distance of proposed stops.



PARKING CAPACITY MAY CHANGE DUE TO ADDITIONAL SPACE REQUIRED FOR BIKE PARKING, STORMWATER MANAGEMENT, AND PEDESTRIAN TREATMENTS.





PARKING CAPACITY MAY CHANGE DUE TO ADDITIONAL SPACE REQUIRED FOR BIKE PARKING, STORMWATER MANAGEMENT, AND PEDESTRIAN TREATMENTS.



San Pablo Dam Road

The El Sobrante community is currently not well served by transit to reach San Francisco and employment centers in the East Bay. The largest park & rides, Hercules and Richmond Parkway Transit Centers, are north of the community (and require counter-direction travel), likely a factor in many residents' choice to drive. Route 4 (as well as the alternate alignments for Routes 1 and 3) aims to fill this gap, providing service along San Pablo Dam Road. Due to the low-density nature of the community, it is recommended that a park & ride be built to connect residents to proposed express bus service.

A parcel was identified east of the I-80/San Pablo Dam Road interchange for a park & ride. However, CCTA/Caltrans project currently pursuing funding aims to reconstruct the interchange, potentially encompassing the parcel shown in **Figure 13** and precluding the proposed park & ride. Consideration is currently being given to another Caltrans-opened parcel immediately to the north. **Figure 13** shows both parcels under consideration. Further coordination is needed with CCTA/Caltrans to identify a preferred park & ride location.

Due to the lack of other park & ride options and the lower density nature of El Sobrante, this park & ride serves as a pre-requisite to the start of service on Routes 4 and alternate alignments for Routes 1 and 3.

Wright Avenue (Richmond West)

A park & ride is proposed on the south side of I-580 between Marina Way S and Marina Bay Parkway. Route 9 would serve this park & ride. The park & ride would be constructed in the Caltrans right-of-way between Wright Avenue and I-580. The lot would have a maximum capacity of approximately 220 parking spaces. Re-grading of the site and a retaining wall are likely required to reach that capacity. A smaller park & ride may be constructed with less modification to the existing topography and thus lower cost.

Bus stops serving the park & ride would be installed on the north and south sides of Wright Avenue between 17th Street and 19th Street. **Figure 14** and **Figure 15** show the proposed park & ride on Wright Avenue. This route would provide service to a number of stops along Rumrill Boulevard/Harbour Way. Therefore, provision of a park & ride at Wright Avenue would not be considered a pre-requisite for service; however, provision of the park & ride would provide a significant boost to ridership by providing access to the numerous residents who live outside of walking distance of proposed stops, including those commuting from Point Richmond and across the Richmond-San Rafael Bridge.

Bissell Avenue (Richmond East)

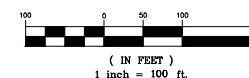
A park & ride is proposed on the surface parking lot of the (now vacated) Richmond Health Center on the south side of Bissell Avenue in Richmond between 37th Street and 42nd Street. Routes 7 and 8 would serve this park & ride. A park & ride on this parcel would have capacity for approximately 120 vehicles. Bus stops serving the lot would be on the north and south sides of Bissell Avenue.

The parcel is owned by Contra Costa County and is currently being considered for sale by the Real Estate Division. Further diligence will determine whether a park & ride lot is feasible at this location given County plans for the parcel. **Figure 16** shows the proposed park & ride on Bissell Avenue.

This route would provide service to a number of stops along 23rd Street/Macdonald Avenue. Therefore, provision of a park & ride at Bissell Avenue would not be considered a pre-requisite for service; however, provision of the park & ride would provide a significant boost to ridership by providing access to the numerous residents who live outside of walking distance of proposed stops.

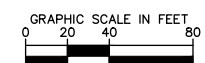


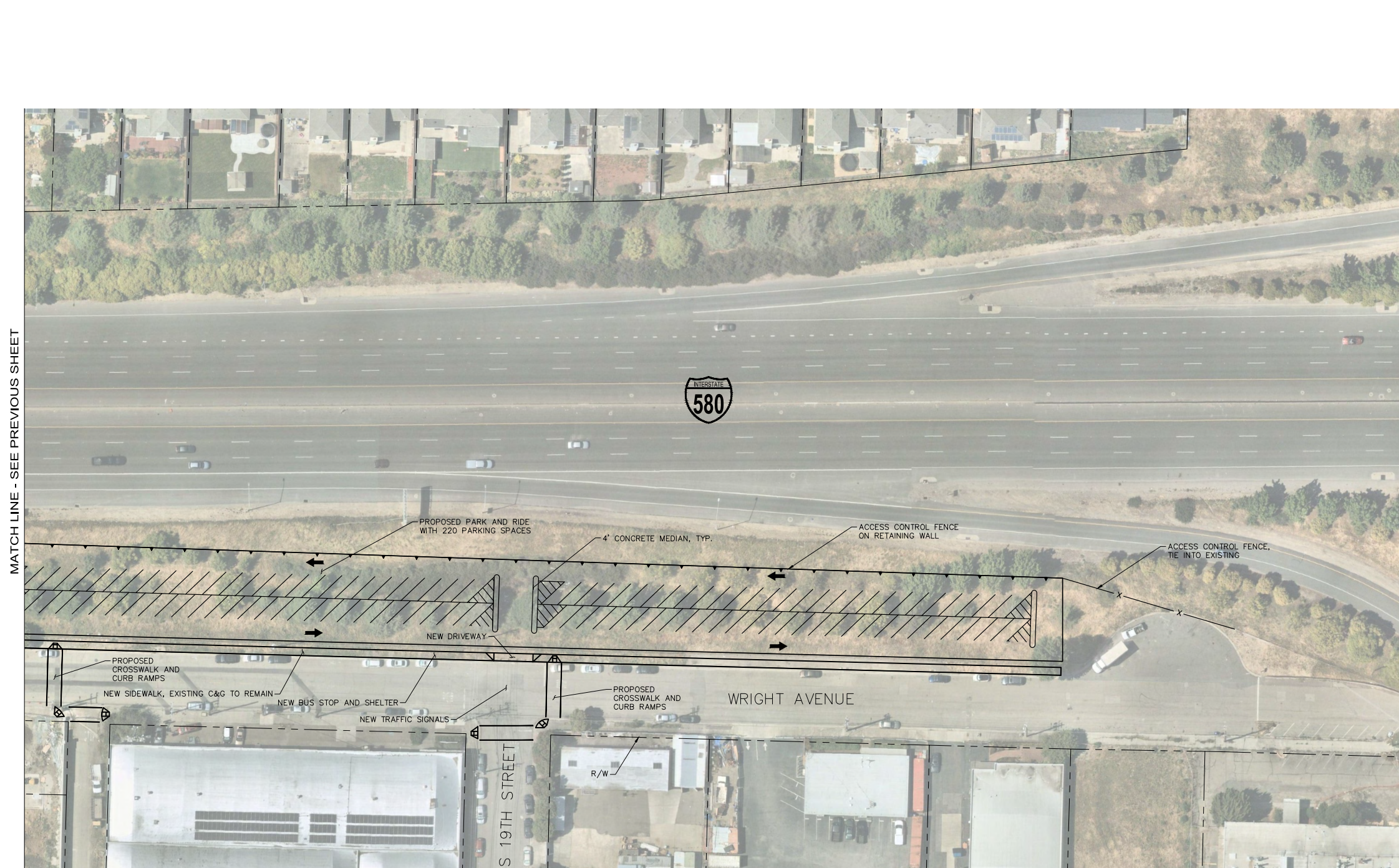
GRAPHIC SCALE





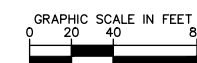
PARKING CAPACITY MAY CHANGE DUE TO ADDITIONAL SPACE REQUIRED FOR BIKE PARKING, STORMWATER MANAGEMENT, AND PEDESTRIAN TREATMENTS.

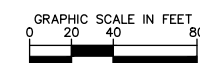




MATCH LINE - SEE PREVIOUS SHEET

PARKING CAPACITY MAY CHANGE DUE TO ADDITIONAL SPACE REQUIRED FOR BIKE PARKING, STORMWATER MANAGEMENT, AND PEDESTRIAN TREATMENTS.







4 FLEET AND OPERATIONS

4.1 Fleet Types and Service Characteristics

For the proposed express bus service to be implemented, buses would need to be allocated to the new routes and space must be identified at maintenance facilities for them to be maintained and stored. Neither of the two transit operators involved in this project, AC Transit and WestCAT, currently possess a sufficient number of unused express bus vehicles to operate even the near-term routes. To provide expanded express bus service, new vehicles will need to be purchased prior to the start of service.

Table 3 below shows the number of peak pullouts required for each of the proposed routes, assuming 15-minute peak frequencies and limited mid-day service. Additional buses may be required to meet spare ratio requirements (typically 20 percent spare ratio desired). The determination of spare requirements will be based on overall fleet sizes associated with each operator and the combination of routes selected for service. Double-decker buses, which both WestCAT and AC Transit are currently using for Transbay routes, cost between \$1M and \$1.1M⁴. All buses should be equipped with TSP as well as systems to measure performance and to provide rider information, such as Computer-Aided Dispatch/Automatic Vehicle Location (CAD/AVL) and Automated Passenger Counters (APC).

Table 3 - Buses Required by Route

Route	Peak Pullouts
1	8
2	8
3	8
4	8
5	10
6	10
7	11
8	8
9	8
Total Pullouts	79
Spares Required	16
Total Required Buses	95

Below is a summary, by operator, of the existing fleet size and technology, as well as any characteristics of service required by the organization's board.

⁴ Estimates provided via email by WestCAT and AC Transit on 8/15/2019 and 8/20/2019 respectively



AC Transit

Vehicles

AC Transit operates the following vehicle types and quantities on its existing Transbay routes:

- 56 Gillig Commuter Coach
- 36 MCI Coach
- 15 Alexander Dennis double decker
- 40 Gillig Local

AC Transit plans to switch to two-door MCIs and Alexander Dennis double deckers for their Transbay fleet and is acquiring new stock as funding allows.

All Transbay buses are equipped with CAD/AVL and TSP technology, and onboard Wi-Fi. To accommodate bicycles, each bus has a three-position bike rack.

Service Standards

AC Transit's Transbay service has the following service requirements:

- Commute hours only, 5am-9am and 3pm-7pm
- Minimum 30-minute frequency
- Stop spacing 1/3-1/2 miles

These requirements are being considered for this service but may not be directly applied as this service would have a somewhat different ridership characteristic than the existing Transbay service.

WestCAT

Vehicles

WestCAT operates the following vehicle types and quantities on its existing LYNX and express routes:

- 3 Double decker buses
- 7 Gillig Commuter Coach (2 are used for contingency)
- 2 Gillig Suburban Heavy-Duty buses
- 16 Gillig Local

WestCAT has no plans to change its current fleet. All buses are equipped with CAD/AVL, Wi-Fi, and older TSP technology. Buses have a mix of one-, two-, and three-position bicycle racks.

Service Standards

WestCAT does not have service requirements for the proposed routes. Any requirements will be by WestCAT Board discretion.

4.2 Maintenance Facility Capacity Needs

Both AC Transit and WestCAT operate maintenance facilities in the project area, servicing and storing their existing fleet of Transbay buses. However, due to existing limitations in operator maintenance capacity, described below, additional expansion would be necessary to accommodate the proposed express bus service. The location and



extent of that expansion would be determined based on the additional bus fleet needed, to be determined in the operating plan.

AC Transit

AC Transit manages four operating divisions which are supported by the Central Maintenance Facility. Of these facilities, Division 2 (D2) in Emeryville and Division 3 (D3) in Richmond are the most proximate to the alignments proposed in this plan. AC Transit is currently pursuing funding to improve both facilities, as well as the other divisions.

As shown in **Table 4**, both D2 and D3 are currently operating above capacity, in both cases due to limited bus parking. Additionally, all of AC Transit's facilities, aside from D3, are more than 25 years old and in need of repair or replacement.

Table 4 - AC Transit Current Maintenance Facility Capacity⁵

Facility	CAPACITY				Actual Buses Assigned (January, 2019)	Over / (Under) Capacity
	Maintenance	Fuel & Wash	Bus Parking (14' wide)	OVERALL		
D2 *	180	300	147	147	171	24
D3	130	300	90	90	109	19
D4	160	300	262	160	202	42
D6	170	300	200	170	155	(15)
Total	640	1,200	699	567	637	70
CMF	650			650	637	(13)

* D2 would be operating at capacity if bus parking spaces were at 12-feet wide.

In 2018, AC Transit prepared a Facilities Utilization Plan. It makes several recommendations for each of the maintenance facilities, summarized. **Table 5**, also from the Facilities Utilization Plan, describes the estimated project cost of improving each AC Transit maintenance site.

Division 2 (Emeryville)

This facility is already operating at 16% over capacity and sits on a very constrained site, making expansion difficult without closing the facility. Due to these facts and its age, WSP recommended that D2 be replaced on a new site in the Emeryville/Bay Bridge area of at least 28 acres, to accommodate 250 to 300 buses. With the provision of a new, larger D2 site, it is assumed that AC Transit would have sufficient capacity for the storage and maintenance of the vehicles necessary to operate the new express bus service. Actual fleet assignment would be determined by AC Transit.

⁵ AC Transit Facilities Utilization Plan, 2018



Table 5 - AC Transit Facility Upgrade Cost Estimates⁶

	Construction \$	Soft Cost\$	Land Acquisition	Escalation	Total	Move-In
D4 (300 bus)	\$ 225,772,239	\$ 102,623,745		\$ 78,100,711	\$ 406,496,695	2025 / 2028
D2 Replacement + TEC (300 buses)	\$ 241,327,770	\$ 109,694,441	\$ 49,000,000	\$ 76,230,659	\$ 476,252,870	2026
D5 (Expansion of D4 to 500 buses)	\$ 191,702,378	\$ 87,137,445	\$ 13,328,000	\$ 110,239,838	\$ 402,407,661	2031
D6 - Phase 1 (Demo Garage + New Surface Parking)	\$ 7,659,699	\$ 3,481,682		\$ 764,900	\$ 11,906,281	2021
D6 - Phase 2 (165 buses)	\$ 139,058,965	\$ 63,208,621		\$ 90,312,141	\$ 292,579,727	2033
D6 - Phase 3 (CMF + Warehouse)	\$ 113,247,010	\$ 51,475,914		\$ 93,388,724	\$ 258,111,648	2035
D3 Replacement (150 buses)	\$ 111,764,336	\$ 50,801,971	\$ 31,360,000	\$ 127,436,008	\$ 321,362,315	2037
General Office (GO)	\$ 79,902,076	\$ 36,319,126		\$ 24,251,466	\$ 140,472,668	2026 with D2 Replacement
TOTAL	\$ 1,110,434,474	\$ 504,742,945	\$ 93,688,000	\$ 600,724,447	\$ 2,309,589,866	

Division 3 (Richmond)

This facility was recently reopened with renovated maintenance, operations, fuel, and wash facilities. It too sits on a very constrained site, in this case due to the triangular parcel shape. The Facilities Utilization Plan recommended continuing operations but converting to stacked bus parking, and to determine whether additional capacity is needed.

WestCAT

WestCAT has a single maintenance facility at the organization's operations facility, where there is currently no additional capacity to store buses beyond the existing fleet. They are currently pursuing funding to expand the facility's parking capacity by an additional 15 buses within the next two years. The plans for expanding the existing facility are estimated to cost \$5 million.

⁶ Ibid.



5 ROUTE PHASING

Due to funding constraints and implementation feasibility, it is expected that implementation of the new express bus service will be phased. Numerous factors will affect phased implementation, including funding availability, fleet availability, and maintenance and storage capacity. The proposed routes have been organized into three phasing groups, those recommended to be implemented in the near, medium, and long term, defined here as 1-3 years, 3-7 years, and 7-10 years. Near-term routes are shown in **Figure 17**, medium-term routes in **Figure 18**, and long-term routes in **Figure 19**.

Route Phasing

The following criteria were used to determine phasing.

Potential Market

To estimate potential market size, the U.S Census's 2017 Longitudinal Employer-Household Dynamics (LEHD) data was used to determine the number of people who live within 0.5 mile walking distance (in the case of on-street stops) or 2.5 mile driving distance (in the case of park & ride lots) of each route's origin alignment and work within a short walking distance of the destination alignment. See **Table 6** for an estimate of market size by route.

Table 6 - Estimated Commute Market Size by Route

Route	Description	Market Size (potential riders)
1	Hercules TC, Richmond Pkwy TC -> Berkeley	1210
2	Hercules TC, Richmond Pkwy TC -> Emeryville	890
3	Hercules TC, Richmond Pkwy TC -> Oakland	1770
4	SPDR P&R -> SF Transbay	370
5	Hercules/Pinole via SPA, Tara Hills Dr P&R, Richmond Pkwy TC -> Oakland	1250
6	Hercules/Pinole via SPA, Tara Hills Dr P&R, Richmond Pkwy TC -> SF Transbay	1470
7	23 rd St, Macdonald Ave, Bissell Ave P&R (Richmond East) -> Oakland	1590
8	23 rd St, Macdonald Ave, Bissell Ave P&R (Richmond East) -> Berkeley	1720
9	Rumrill Blvd, Harbour Way, Wright Ave P&R (Richmond West) -> Oakland	1230
1 (alt)	SPDR P&R -> Berkeley	240
3 (alt)	SPDR P&R -> Oakland	350
7 (alt)	23 rd St, Macdonald Ave, Bissell Ave P&R (Richmond East) -> Oakland & Emeryville	2470

Travel time

Travel time for key origin-destination pairs for each route were estimated for peak period conditions (assuming use of the HOV lane on I-80) and compared with existing transit options and a similar solo auto trip. Travel time estimates were built using Waze for auto and proposed bus routes, and Google Maps for existing transit options. All estimates assumed a 7:30 a.m. departure time. See **Table 7** for a comparison of origin-destination travel time between auto, existing transit, and with express bus conditions.

Readiness

Routes that rely on infrastructure not yet constructed or available were held until a time period when the infrastructure can be reasonably assumed to be implemented. This applied in particular to routes relying on ridership at park & ride facilities not yet constructed.



WEST CONTRA COSTA COUNTY

EXPRESS BUS IMPLEMENTATION PLAN

WCCTAC

AC TRANSIT

WESTCAT

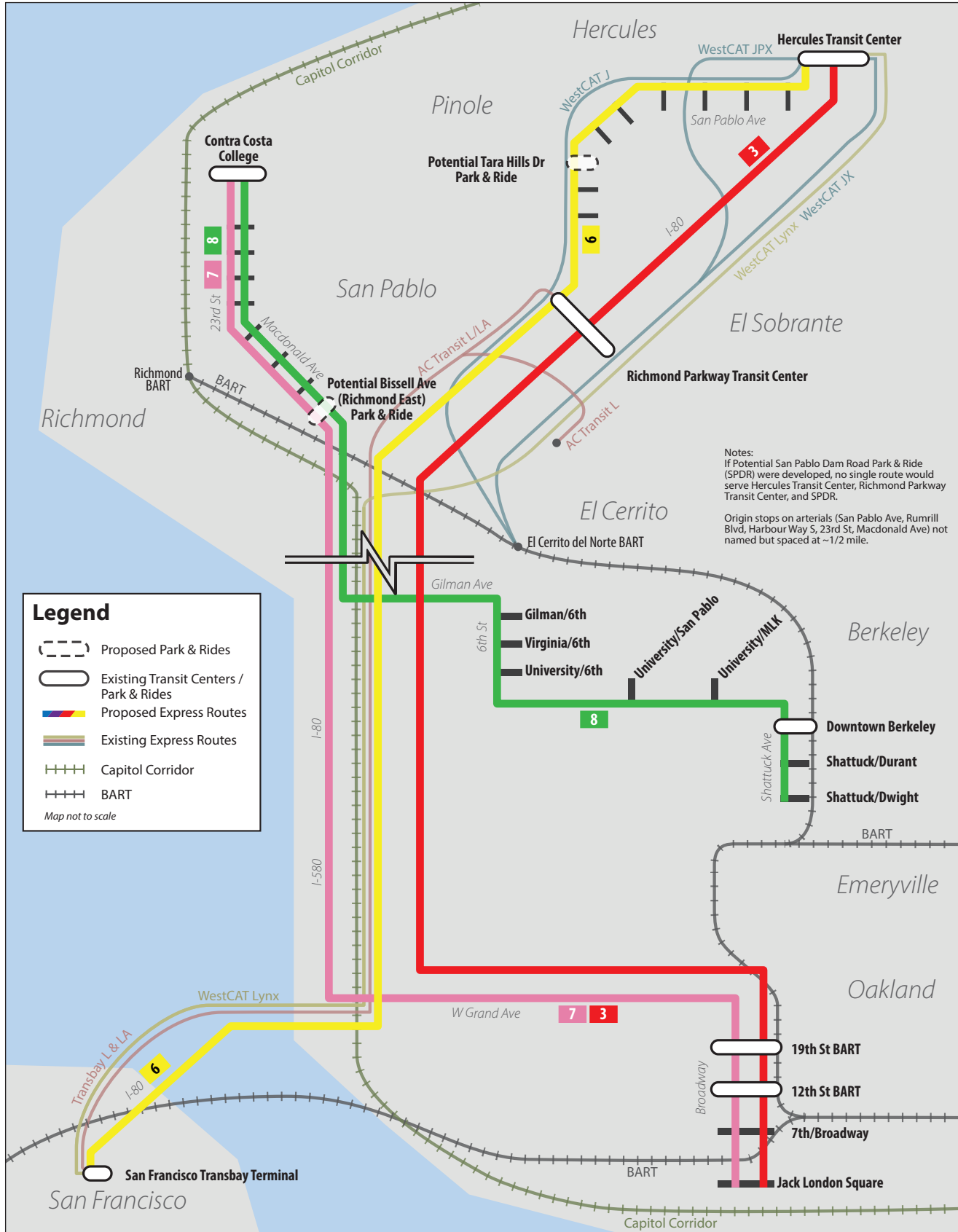


Figure 17 - Near-Term Routes



WEST CONTRA COSTA COUNTY EXPRESS BUS IMPLEMENTATION PLAN

WCCTAC

AC TRANSIT

WESTCAT

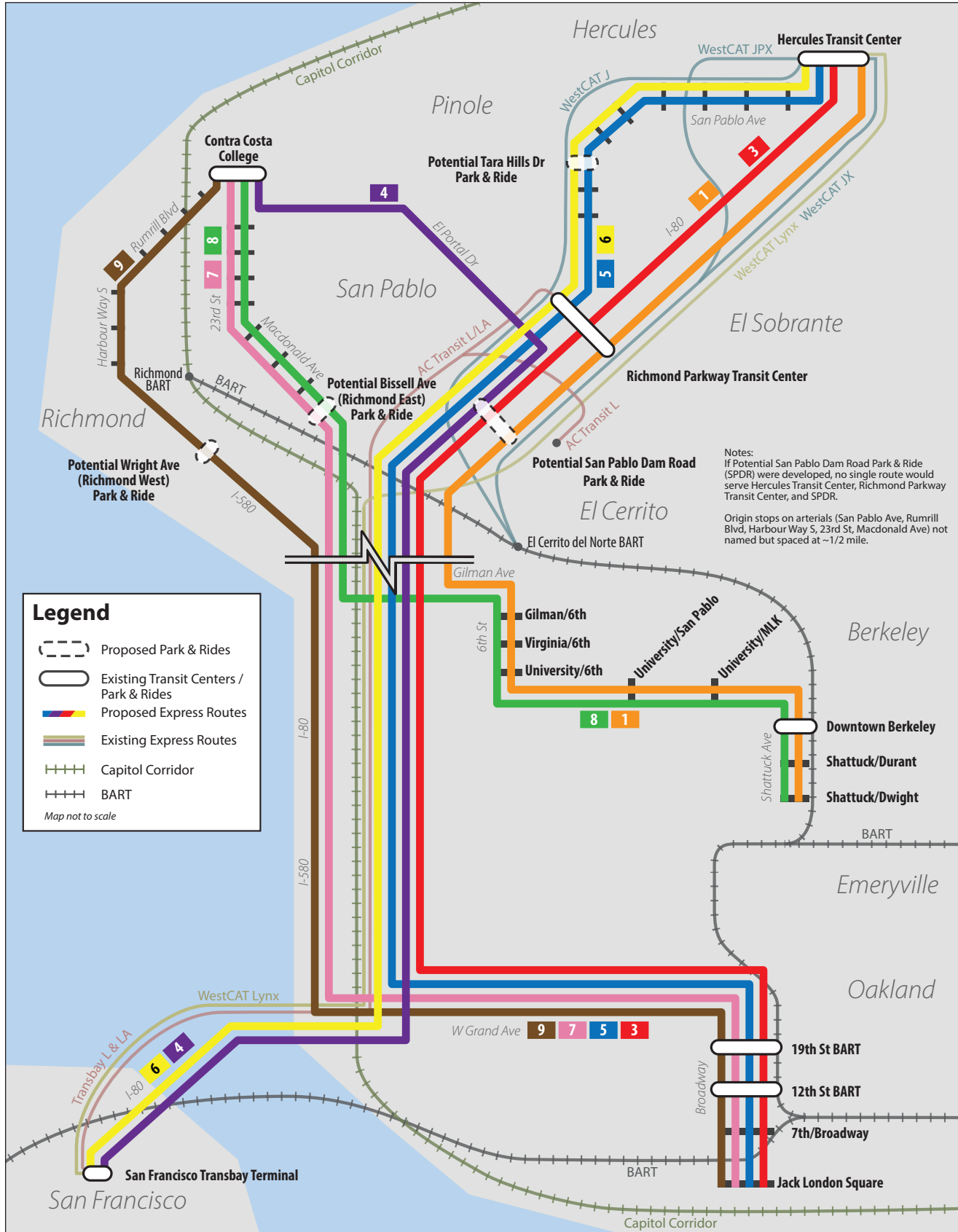


Figure 18 - Near and Medium-Term Routes



WEST CONTRA COSTA COUNTY EXPRESS BUS IMPLEMENTATION PLAN

WCCTAC

AC TRANSIT

WESTCAT

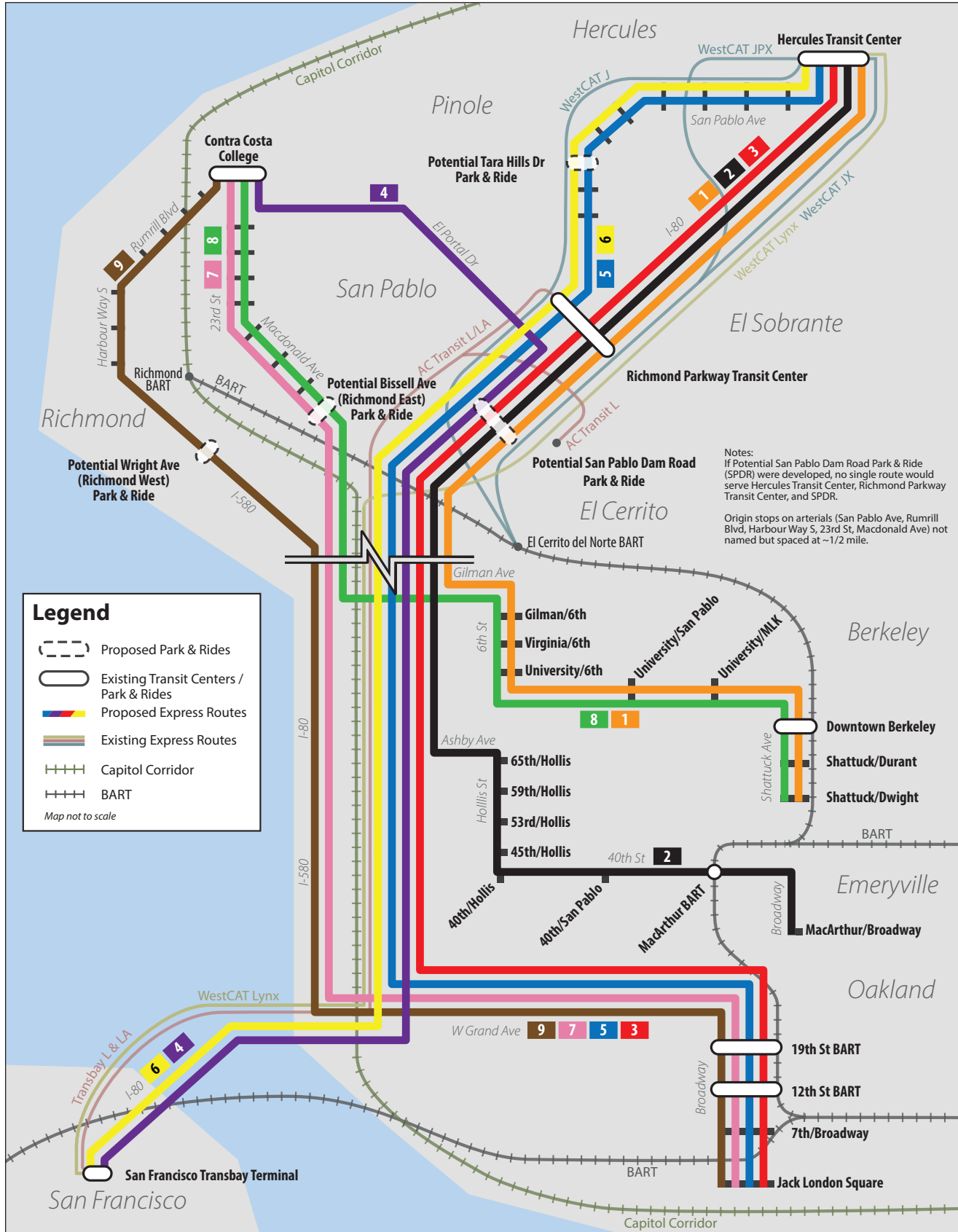


Figure 19 - Near, Medium, and Long-Term Routes



WEST CONTRA COSTA COUNTY

EXPRESS BUS IMPLEMENTATION PLAN

WCCTAC

AC TRANSIT

WESTCAT



Route	Description	Origin	Destination	Average Auto Travel Time	Existing Transit Travel time	Existing Transit Transfers	Estimated Express Bus Travel Time	Express Bus vs. Auto Differential	Express Bus vs. Ext. Transit Differential	Phasing
3	Hercules TC, Richmond Pkwy TC -> Oakland	Hercules Transit Center	12th Street/City Center BART	50	43	1	42.5	-7.5	-0.5	Near
		Richmond Parkway Transit Center	12th Street/City Center BART	41	38	2	36.5	-4.5	-1.5	
6	Hercules/Pinole via SPA, Tara Hills Dr P&R, Richmond Pkwy TC -> SF Transbay	San Pablo Ave & Appian Way	SF Salesforce Transit Center	73	64	1	62.5	-10.5	-1.5	Near
		San Pablo Ave & Tara Hills Avenue	SF Salesforce Transit Center	72	67	1	58	-14	-9.0	
		Richmond Parkway Transit Center	SF Salesforce Transit Center	56	57	0	44	-12	-13.0	
7	San Pablo/23rd St Local, Bissell Ave P&R (Richmond East) -> Oakland	23rd Street & Rheem Avenue	12th Street/City Center BART	33	44	2	49.5	16.5	+5.5	Near
		Macdonald Avenue & 39th Street	12th Street/City Center BART	29	36	2	36.5	7.5	+0.5	
8	San Pablo/23rd St Local, Bissell Ave P&R (Richmond East) -> Berkeley	23rd Street & Rheem Avenue	Downtown Berkeley BART	27	33	1	41.5	14.5	+8.5	Near
		Macdonald Avenue & 39th Street	Downtown Berkeley BART	22	24	1	28.5	6.5	+4.5	
1	Hercules TC, Richmond Pkwy TC -> Berkeley	Hercules Transit Center	Downtown Berkeley BART	41	32	1	39.5	-1.5	+7.5	Medium
		Richmond Parkway Transit Center	Downtown Berkeley BART	33	26	1	33.5	0.5	+7.5	
4	San Pablo/SPDR P&R -> SF Transbay	San Pablo Dam Road P&R	SF Salesforce Transit Center	63	70	0	56	-7	-14.0	Medium
5	Hercules/Pinole via SPA, Tara Hills Dr P&R, Richmond Pkwy TC -> Oakland	San Pablo Ave & Appian Way	12th Street/City Center BART	44	56	2	55	11	-1.0	Medium
		San Pablo Ave & Tara Hills Avenue	12th Street/City Center BART	43	50	1	50.5	7.5	+0.5	
		Richmond Parkway Transit Center	12th Street/City Center BART	41	38	2	36.5	-4.5	-1.5	
9	San Pablo/Richmond Rumrill Blvd, Wright Ave P&R (Richmond West) -> Oakland	Rumrill Blvd & Market St	12th Street/City Center BART	35	47	2	52	17	+5.0	Medium
		Harbour Way & Macdonald Ave	12th Street/City Center BART	33	36	0	43.5	10.5	+7.5	
		Wright Ave P&R	12th Street/City Center BART	30	58	1	37.5	7.5	-20.5	
7 (alt)	San Pablo/23rd St Local, Bissell Ave P&R (Richmond East) -> Oakland & Emeryville	23rd Street & Rheem Avenue	Hollis St & 40th St	27	51	2	44	17	-7.0	Medium
		Macdonald Avenue & 39th Street	Hollis St & 40th St	22	56	0	31	9	-25.0	
		23rd Street & Rheem Avenue	12th Street/City Center BART via Emeryville	33	44	2	64.5	31.5	+20.5	
		Macdonald Avenue & 39th Street	12th Street/City Center BART via Emeryville	29	36	2	51.5	22.5	+15.5	
1 (alt)	SPDR P&R -> Berkeley	San Pablo Dam Road P&R	Downtown Berkeley BART	30	47	1	29.5	-0.5	-17.5	Long
2	Hercules TC, Richmond Pkwy TC -> Emeryville	Hercules Transit Center	Hollis St & 40th St	44	56	2	42	-2	-14.0	Long
		Richmond Parkway Transit Center	Hollis St & 40th St	36	49	2	35	-1	-14.0	
3 (alt)	SPDR P&R -> Oakland	San Pablo Dam Road P&R	12th Street/City Center BART	36	59	2	37.5	1.5	-21.5	Long

Table 7 - Origin-Destination Travel Time Estimates



6 COSTS SUMMARY

Cost estimates for all capital improvements recommended in this memorandum were developed on a per-project basis (in the case of park & rides, freeway access improvements, and the part-time transit lanes) or by multiplying a standard cost across the number of proposed improvements (as in the case of on-street bus stop amenity upgrades or transit signal priority). Cost estimates include both construction cost and soft costs such as administration, design, and environmental clearance. Costs also include right-of-way acquisition costs, estimated based on readily available information on current property values.

A summary of cost estimates may be found in **Table 8**. Detailed cost estimates may be found in Appendix C.

Capital Improvement Phasing

Capital improvements were organized by the corresponding phase of the route that the improvements would benefit. As noted in Chapter 3, several of the capital improvements are not pre-requisites to begin service on the routes they would serve. For example, freeway access improvements and transit signal priority will benefit transit reliability and travel time, but are not pre-requisites for operation. The timing of capital improvements and the steps needed to implement those improvements will be further explored in the funding plan and the Draft Plan with Implementation Steps.



WEST CONTRA COSTA COUNTY

EXPRESS BUS IMPLEMENTATION PLAN

WCCTAC

AC TRANSIT

WESTCAT



Improvement ID #	Figure	Improvement Type	Improvement	Description of Proposed Improvement	Quantity	Relevant Routes	Cost
Near Term							
1	N/A	Bus Stop Amenities	San Pablo Avenue within cities of Hercules, Pinole, Richmond, and Unincorporated Contra Costa County	Install/improve bus stop amenities	18 Stops	5, 6	\$ 710,800
2	N/A	Bus Stop Amenities	23rd Street/Macdonald Avenue within the cities of San Pablo and Richmond	Install/improve bus stop amenities	14 Stops	7, 7 (alt), 8	\$ 626,300
3	N/A	Bus Stop Amenities	6th Street/University Blvd/Shattuck Avenue within City of Berkeley	Install/improve bus stop amenities	16 Stops	1, 1 (alt), 8	\$ 463,700
4	N/A	Bus Stop Amenities	Grand Avenue/Broadway within City of Oakland	Install/improve bus stop amenities	10 Stops	3, 3 (alt), 5, 7, 7 (alt), 9	\$ 332,500
5	7 and 8	Freeway	I-80 Part-Time Transit Lanes	Bus-only lane between SR-4 and Richmond Pkwy Allow use of aux lane between interchanges Allow use of shoulder through interchanges	N/A	1, 2, 3	\$ 6,000,000
6	4 and 5	Freeway Access	Richmond Parkway/I-80 Interchange	Restripe I-80 S off-ramp and Richmond Parkway E/B Extend WB right-turn lane from Richmond Pkwy to Blume Dr Add HOV right-turn lane to I-80 S Add HOV lane on I-80 N on-ramp	N/A	1, 2, 3, 5, 6	\$ 900,000
7	2 and 3	Freeway Access	SR-4/I-80 Interchange	Add HOV right-turn lane from San Pablo Avenue to I-80 S	N/A	1, 2, 3	\$ 3,600,000
8	16	Proposed Park & Ride	Bissell Avenue Park & Ride (Richmond east)	Rehabilitate pavement Provide transit shelters with amenities Strip crosswalk and provide new curb ramps	120 Stalls	7, 7 (alt), 8	\$ 3,000,000
9	11	Proposed Park & Ride	Tara Hills Drive Park & Ride (option 1)	Rehabilitate pavement Provide transit stop amenities	60 Stalls	5, 6	\$ 3,300,000
10	12	Proposed Park & Ride	Tara Hills Drive Park & Ride (option 2)	Clear, grade and pave site Provide parking lot lighting Provide sidewalk and stripe crosswalks Provide transit stop amenities	210 Stalls	5, 6	\$ 12,800,000
11	N/A	Transit Signal Priority	23rd Street/Macdonald Avenue within the cities of San Pablo and Richmond	Provide transit signal priority (TSP) at all signalized intersections	18 Intersections	7, 7 (alt), 8	\$ 360,000
12	N/A	Transit Signal Priority	6th Street/Shattuck Avenue within City of Berkeley	Provide transit signal priority (TSP) at all signalized intersections	11 Intersections	1, 1 (alt), 8	\$ 220,000
13	N/A	Transit Signal Priority	Grand Avenue within City of Oakland	Provide transit signal priority (TSP) at all signalized intersections	2 Intersection	3, 3 (alt), 5, 7, 7 (alt), 9	\$ 40,000

Costs include construction costs, design, permitting, administration, and a 35% contingency. Cost estimates are in 2019 dollars and are subject to change based on availability of materials, cost of labor, ROW acquisition, etc



WEST CONTRA COSTA COUNTY

EXPRESS BUS IMPLEMENTATION PLAN

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WESTCAT



Improvement ID #	Figure	Improvement Type	Improvement	Description of Proposed Improvement	Quantity	Relevant Routes	Cost
14	N/A	Buses	Buses for Near-Term Routes	Purchase 37 buses, 19 for AC Transit-operated routes and 18 for WestCAT-operated routes	37 Buses	3, 6, 7, 8	\$ 37,000,000
Medium Term							
15	14 and 15	Proposed Park & Ride	Wright Avenue Park & Ride (Richmond west)	Clear, grade and pave site Provide parking lot lighting Provide sidewalk and stripe crosswalks Provide transit shelter	220 Stalls	9	\$ 12,200,000
16	N/A	Bus Stop Amenities	Rumrill Boulevard/13th Street/Harbour Way within cities of San Pablo and Richmond	Install/improve bus stop amenities	14 Stops	9	\$ 692,800
17	N/A	Bus Stop Amenities	Hollis Street/40th Street/Broadway within the cities of Emeryville and Oakland	Install/improve bus stop amenities	14 Stops	2, 7 (alt)	\$ 517,200
18	N/A	Freeway Access	I-80/Ashby Avenue Interchange	Provide bus-only lane on I-80 N on-ramp	N/A	2, 7 (alt)	Pending selection of preferred alternative
19	6	Freeway Access	San Pablo Dam Road/I-80 Interchange	Provide bus-only lane on I-80 S on-ramp Add TSP to on- and off-ramp signal	N/A	1 (alt), 3 (alt), 4	\$ 4,600,000
20	13	Proposed Park & Ride	San Pablo Dam Road Park & Ride	Clear, grade, pave, and stripe P&R site Provide signal at P&R entrance Provide lot lighting	Pending further design	1 (alt), 3 (alt), 4	\$ 11,800,000
21	N/A	Transit Signal Priority	Rumrill Boulevard/13th Street/Harbour Way within cities of San Pablo and Richmond	Provide transit signal priority (TSP) at all signalized intersections	20 Intersections	9	\$ 400,000
22	N/A	Transit Signal Priority	Hollis Street/40th Street within the cities of Emeryville and Oakland	Provide transit signal priority (TSP) at all signalized intersections	16 Intersections	2, 7 (alt)	\$ 320,000
23	N/A	Transit Signal Priority	El Portal Dr/San Pablo Dam Road within City of San Pablo and Unincorporated Contra Costa County	Provide transit signal priority (TSP) at all signalized intersections	3 Intersections	4	\$ 60,000
24	N/A	Buses	Buses for Medium-Term Routes	Purchase 34 buses, 16 for AC Transit-operated routes and 18 for WestCAT-operated routes	34 Buses	1, 4, 5, 9, 7 (alt)	\$ 34,000,000
Long Term							
25	9	Transit Center Capacity Enhancement	Hercules Transit Center Parking Structure	Provide parking structure east of existing lot	300 Stalls	1, 2, 3	\$ 18,218,000
26	10	Transit Center Capacity Enhancement	Richmond Parkway Transit Center Parking Structure	Provide parking structure Provide bus pull-out area on EB Richmond Parkway for use by SB bus routes	386 Stalls	1, 2, 3, 5, 6	\$ 45,356,000
27	N/A	Buses	Buses for Long-Term Routes	Purchase 8 buses for WestCAT-operated routes	8 Buses	1 (alt), 2, 3 (alt)	\$ 8,000,000

Costs include construction costs, design, permitting, administration, and a 35% contingency. Cost estimates are in 2019 dollars and are subject to change based on availability of materials, cost of labor, ROW acquisition, etc.



Table 9 provides the total cost of capital improvements and fleet requirements by implementation timeframe.

Table 9 - Summary of Costs by Improvement Type and Implementation Phase

Implementation Term	Near	Medium	Long
<i>Freeway Improvements</i>	\$ 6,000,000	\$ -	\$ -
<i>Bus Acquisition</i>	\$ 37,000,000	\$ 34,000,000	\$ 8,000,000
<i>Freeway Access Improvements</i>	\$ 4,500,000	\$ 4,600,000	\$ -
<i>New Park & Rides</i>	\$ 19,100,000	\$ 20,700,000	\$ -
<i>Transit Center Capacity Improvements</i>	\$ -	\$ -	\$ 63,574,000
<i>Bus Stop Improvements</i>	\$ 2,133,300	\$ 1,210,000	\$ -
<i>Transit Signal Priority</i>	\$ 620,000	\$ 780,000	\$ -
<i>Total</i>	\$ 69,353,300	\$ 61,290,000	\$ 71,574,000

Costs include construction costs, design, permitting, administration, and a 35% contingency. Cost estimates are in 2019 dollars and are subject to change based on availability of materials, cost of labor, ROW acquisition, etc.

Near term: 1-3 years

Medium term: 3-7 years

Long term: 7+ years

Because only one of the two Tara Hills Drive sites would be developed, the cost of Site 2 is not included in the cost estimate above



7 LONGER-TERM CAPITAL IMPROVEMENTS

There are a number of other capital improvements that would benefit Express Bus service in this corridor but are beyond the 10-year horizon of this study due to significantly more complexity in project approvals, reliance on other agencies or projects, and/or beyond currently envisioned budgets. These projects would be beneficial to pursue but are not assumed for the purposes of this project.

Richmond Parkway/I-80 Direct Access Ramps (DARs)

The Richmond Parkway/I-80 interchange currently has direct access ramps that connect to the HOV lanes south of Richmond Parkway. This allows southbound travelers (including transit vehicles) coming from Richmond Parkway to join the HOV lane without having to merge and cross traffic. Likewise, northbound HOV lane users can access Richmond Parkway directly without having to use the off-ramp on the right side of the roadway.

A long-term improvement would be to install DARs between Richmond Parkway and I-80 north of the interchange. This would be particularly useful for transit vehicles traveling between Richmond Parkway Transit Center and Hercules Transit Center. To preclude the need for transit vehicles to circulate within the Transit Center, the feasibility of a bus boarding platform on the DARs should be examined. See **Figure 20**, excerpted from the West Contra Costa High-Capacity Transit Study (WSP, 2017).

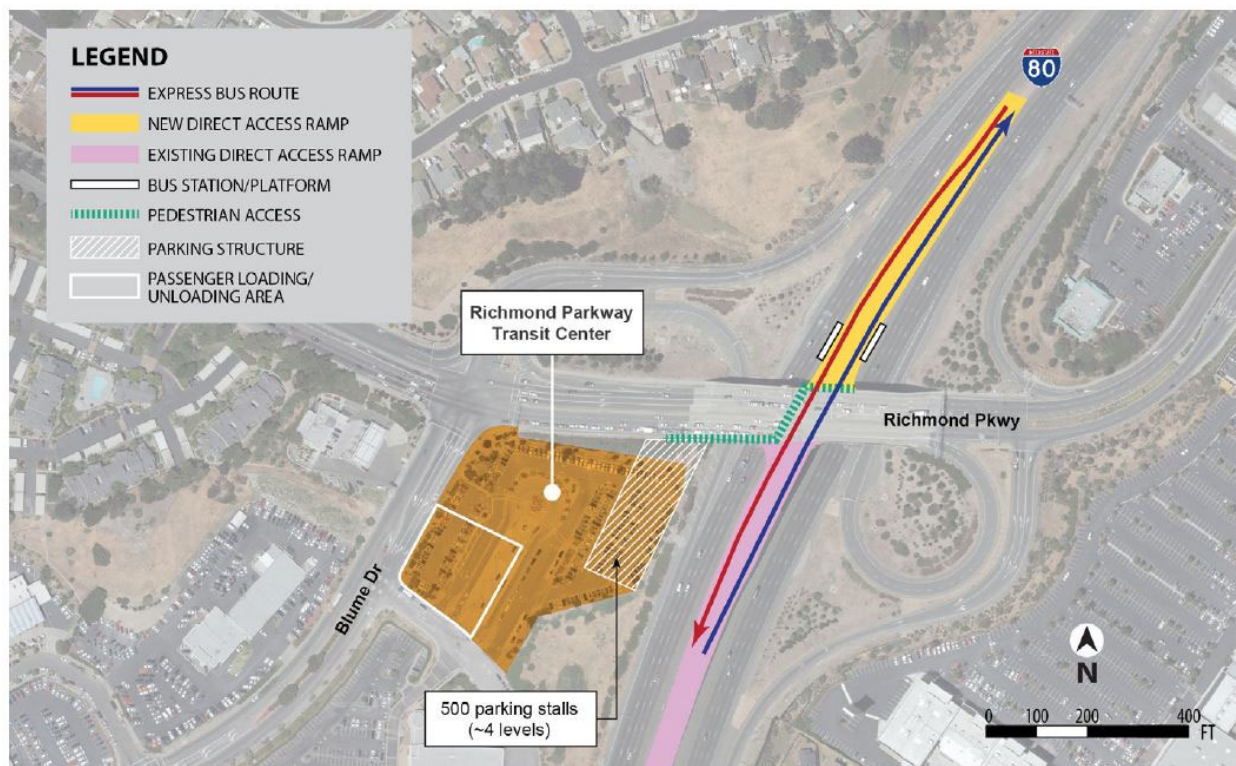


Figure 20 - Richmond Parkway Transit Center Direct Access Ramps



I-80 HOV Lane Enhancement

The existing HOV lane on I-80 requires three or more people per vehicle between 5:00 a.m. to 10:00 a.m. and 3:00 p.m. to 7:00 p.m. WCCTAC is currently pursuing a study to investigate potential changes to improve HOV lane operations, including extended hours, additional days of the week, and improved delineation. One of the biggest challenges with the operation of the existing HOV lane is the lack of effective enforcement of the 3+ occupant requirement. MTC is currently funding a pilot program to deploy more California Highway Patrol officers along the I-80 corridor during peak periods to enforce the HOV lanes. WCCTAC has requested MTC select the I-80 corridor for a demonstration project for the next automated enforcement technology. WCCTAC is strategically taking a multi-pronged approach to address congestion in the HOV lane by pursuing these multiple approaches.

Hercules Transit Center/I-80 Direct Access

Transit vehicles departing from the Hercules Transit Center must pass through three signalized intersections to reach the I-80 southbound on-ramps. While this memorandum includes recommendations to reduce delay experienced on this segment of the trip, the I-80 access delay could be further reduced by the construction of direct access from the Hercules Transit Center to I-80. Identified in the West Contra Costa High-Capacity Transit Study, an underpass traveling north and then west beneath SR-4 from the Transit Center to join I-80 southbound could be constructed. See **Figure 21**, also excerpted from the *West Contra Costa High-Capacity Transit Study*.

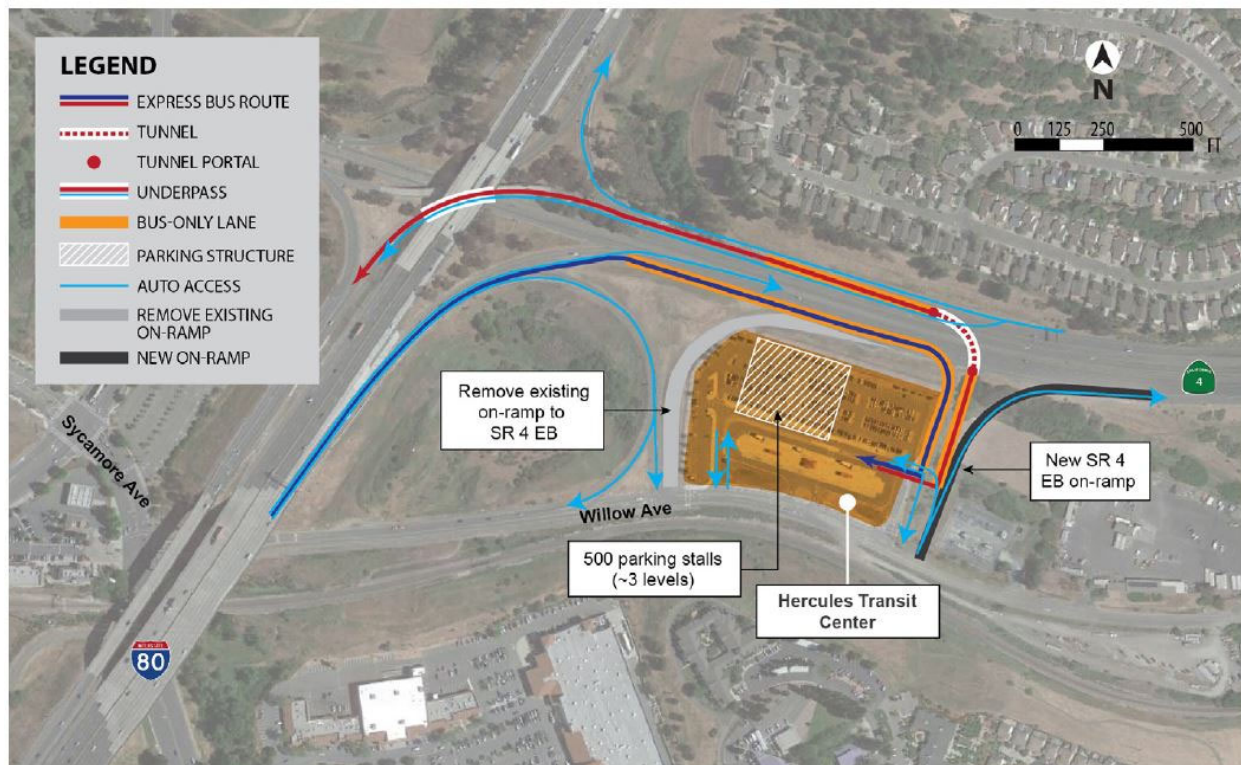


Figure 21 - Hercules Transit Center Direct Access Ramps and Underpass



APPENDIX

A. Bus Stop Locations

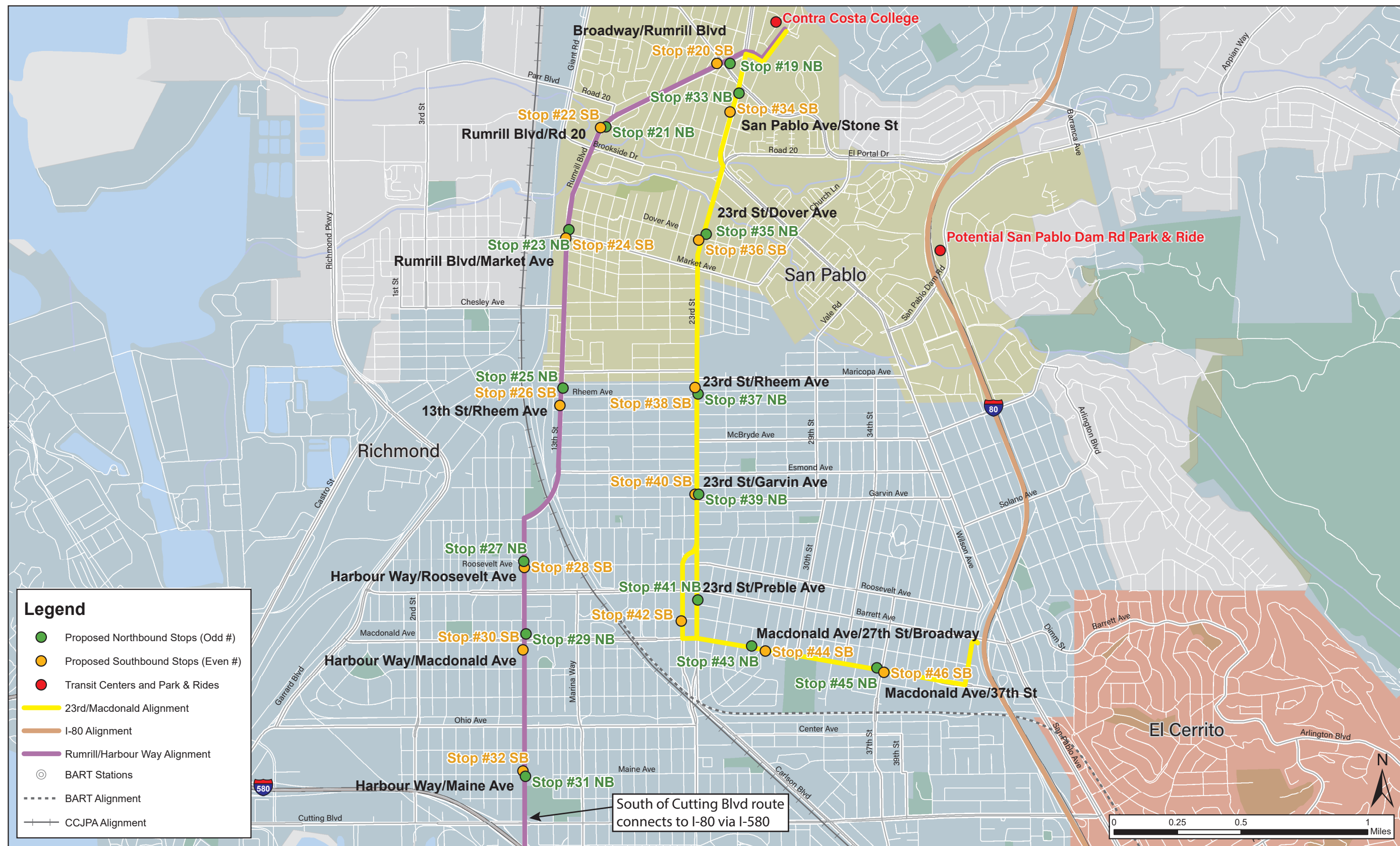
B. Bus Stop Amenity Improvements

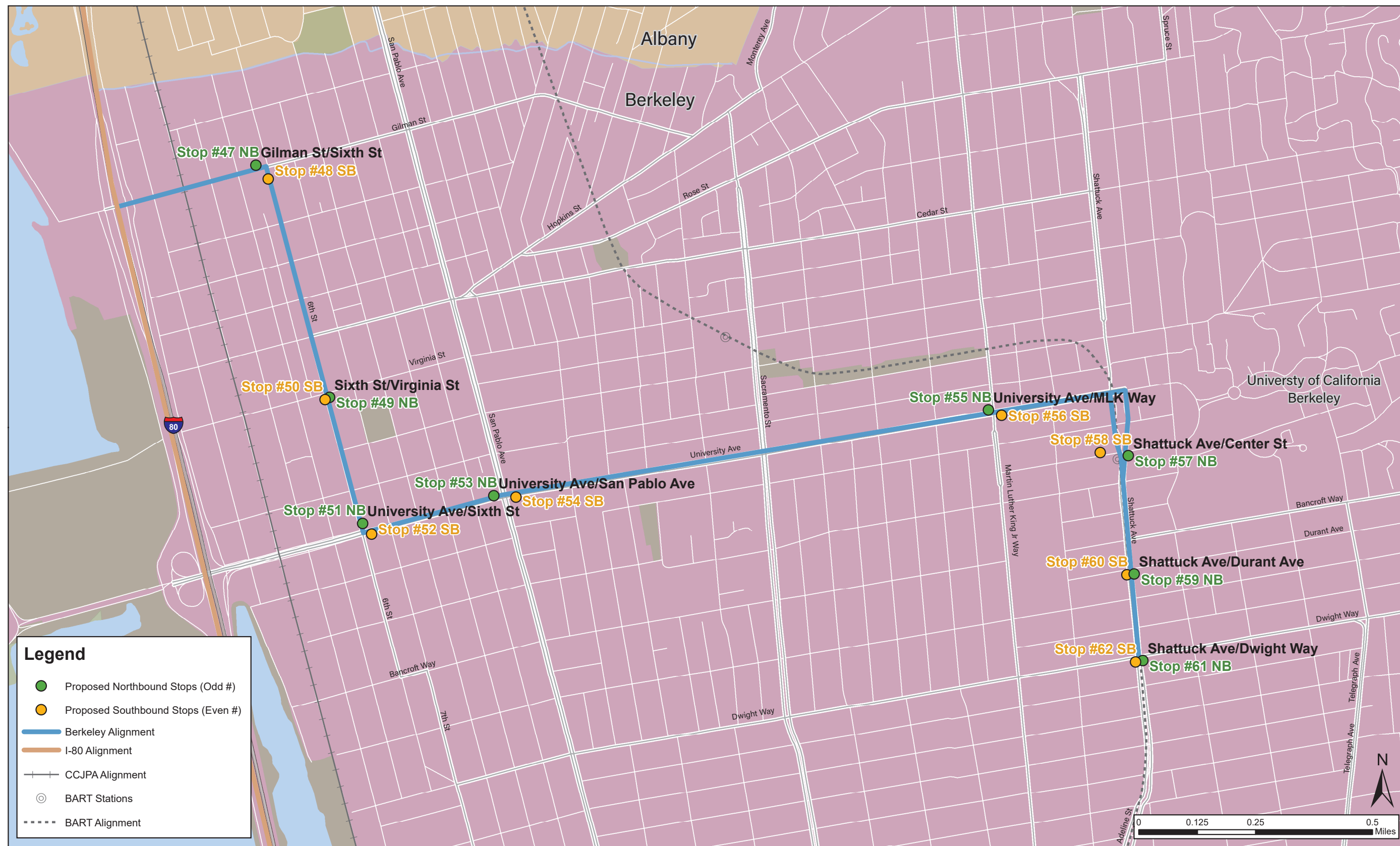
C. Detailed Cost Estimates

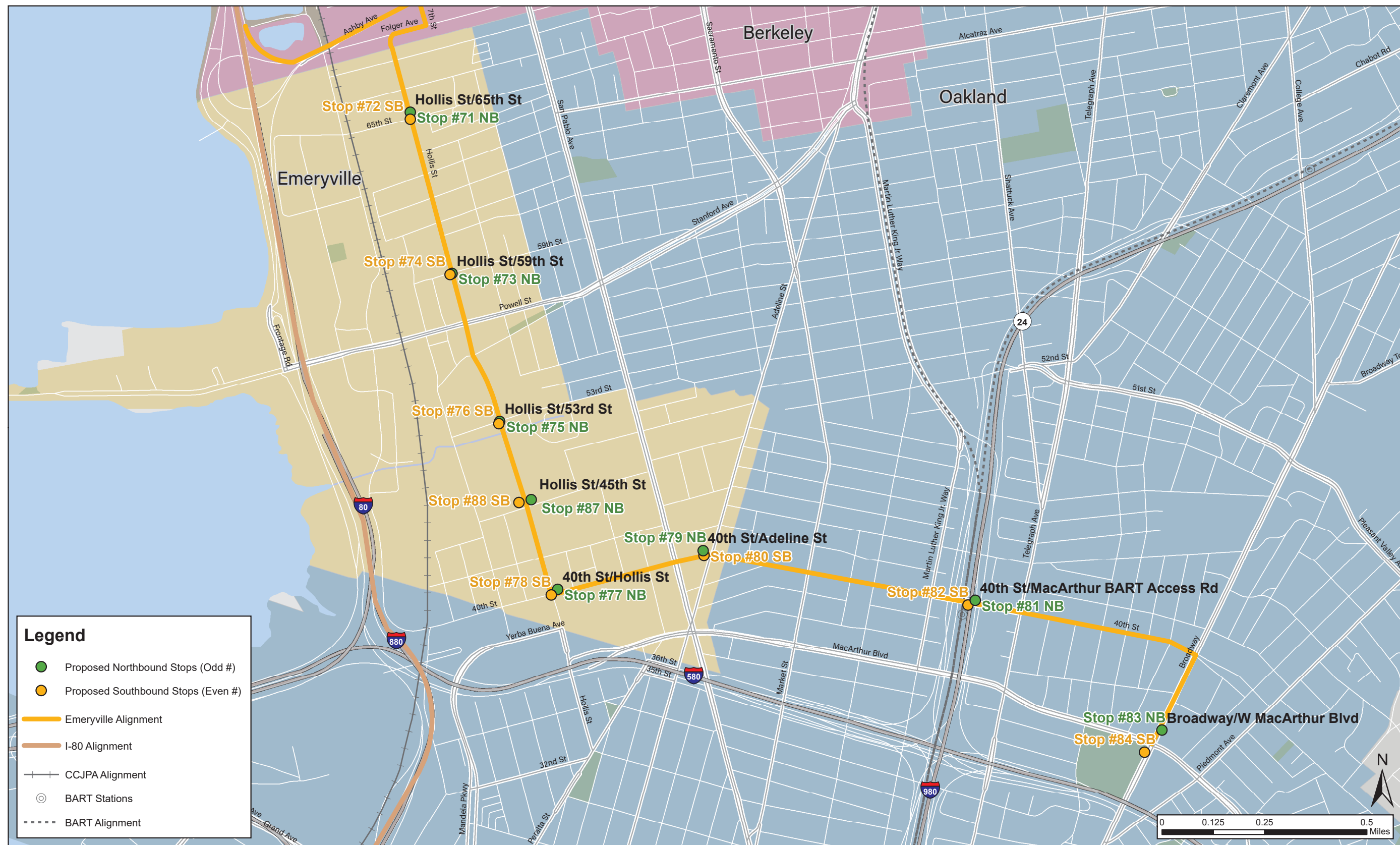


APPENDIX A - BUS STOP LOCATIONS













APPENDIX B - BUS STOP AMENITY IMPROVEMENTS



WEST CONTRA COSTA COUNTY

EXPRESS BUS IMPLEMENTATION PLAN

WCCTAC

A TRANSIT

WESTCAT



StopID	Intersection Name	Jurisdiction	Direction	Existing Stop Side	Proposed Improvement	ADA Landing Zone	Shelter	Bench	Light	Trash Receptacle	System Map	Bike Parking
1	San Pablo Ave/Tsushima St	Hercules	NB	Near Side	-	-	Install	Install	Install	Install	Install	Install
2	San Pablo Ave/Tsushima St	Hercules	SB	N/A	New Stop - Far Side	Install	Install	Install	Install	Install	Install	Install
3	San Pablo Ave/Hercules Ave	Hercules	NB	Far Side	-	-	Install	-	Install	-	Install	Install
4	San Pablo Ave/Hercules Ave	Hercules	SB	Far Side	-	-	-	-	Install	-	Install	Install
5	San Pablo Ave/John St	Pinole	NB	Near Side	-	-	Install	Install	Install	-	Install	Install
6	San Pablo Ave/John St	Pinole	SB	Far Side	-	-	Install	Install	Install	-	Install	Install
7	San Pablo Ave/Oak Ridge Rd	Pinole	NB	Far Side	-	-	Install	Install	-	Install	Install	Install
8	San Pablo Ave/Oak Ridge Rd	Pinole	SB	Near Side	-	-	Install	-	Install	-	Install	Install
9	San Pablo Ave/Sunnyview Dr	Pinole	NB	Far Side	-	-	-	-	Install	Install	Install	Install
10	San Pablo Ave/Sunnyview Dr	Pinole	SB	Far Side	-	-	-	-	Install	-	Install	Install
11	San Pablo Ave/Del Monte Dr	Pinole	NB	Far Side	-	-	Install	-	Install	Install	Install	Install
12	San Pablo Ave/Del Monte Dr	Pinole	SB	Near Side	-	-	Install	Install	Install	Install	Install	Install
13	San Pablo Ave/Tara Hills Dr	Unincorporated CC County	NB	Near Side	-	-	Install	-	Install	Install	Install	Install
14	San Pablo Ave/Tara Hills Dr	Unincorporated CC County	SB	Far Side	-	-	Install	-	Install	Install	Install	Install
15	San Pablo Ave/Shamrock Dr	Unincorporated CC County	NB	Near Side	Relocate to Far Side	Install	Install	Install	Install	Install	Install	Install
16	San Pablo Ave/Shamrock Dr	Unincorporated CC County	SB	Far Side	-	-	-	-	Install	Install	Install	Install
17	Richmond Pkwy/Bella Vista Apartments	Richmond	NB	Far Side	-	-	Install	Install	-	Install	Install	Install
18	Richmond Pkwy/Bella Vista Apartments	Richmond	SB	Far Side	-	-	Install	-	Install	Install	Install	Install
19	Broadway/Rumrill Blvd	San Pablo	NB	N/A	New Stop - Far Side	Install	Install	Install	Install	Install	Install	Install
20	Broadway/Rumrill Blvd	San Pablo	SB	N/A	New Stop - Far Side	Install	Install	Install	Install	Install	Install	Install
21	Rumrill Blvd/Rd 20	San Pablo	NB	Near Side	-	-	Install	Install	Install	Install	Install	Install
22	Rumrill Blvd/Rd 20	San Pablo	SB	Far Side	-	-	Install	Install	Install	Install	Install	Install
23	Rumrill Blvd/Market Ave	San Pablo	NB	Far Side	-	-	Install	Install	Install	Install	Install	Install
24	Rumrill Blvd/Market Ave	San Pablo	SB	Far Side	-	-	Install	Install	Install	Install	Install	Install
25	13th St/Rheem Ave	Richmond	NB	Far Side	-	-	Install	Install	Install	Install	Install	Install
26	13th St/Rheem Ave	Richmond	SB	Far Side	-	-	Install	Install	Install	Install	Install	Install
27	Harbour Way/Roosevelt Ave	Richmond	NB	Near Side	Relocate to Far Side	-	Install	Install	Install	Install	Install	Install
28	Harbour Way/Roosevelt Ave	Richmond	SB	Near Side	-	Install	Install	Install	Install	Install	Install	Install
29	Harbour Way/Macdonald Ave	Richmond	NB	N/A	New Stop - Far Side	-	Install	Install	Install	Install	Install	Install
30	Harbour Way/Macdonald Ave	Richmond	SB	Far Side	-	-	Install	Install	Install	Install	Install	Install
31	Harbour Way/Maine Ave	Richmond	NB	N/A	New Stop - Far Side	-	Install	Install	Install	Install	Install	Install
32	Harbour Way/Maine Ave	Richmond	SB	Near Side	-	-	Install	Install	Install	-	Install	Install
33	San Pablo Ave/Stone St	San Pablo	NB	Midblock	-	-	Install	Install	Install	Install	Install	Install
34	San Pablo Ave/Stone St	San Pablo	SB	Midblock	-	-	-	-	Install	-	-	Install
35	23rd St/Dover Ave	San Pablo	NB	Near Side	Relocate to Far Side	-	Install	Install	Install	Install	Install	Install
36	23rd St/Dover Ave	San Pablo	SB	Near Side	Relocate to Far Side	-	Install	Install	Install	Install	Install	Install
37	23rd St/Rheem Ave	Richmond	NB	Near Side	-	-	Install	Install	Install	Install	Install	Install
38	23rd St/Rheem Ave	Richmond	SB	Near Side	-	-	Install	Install	Install	Install	Install	Install
39	23rd St/Garvin Ave	Richmond	NB	N/A	New Stop - Far Side	-	Install	Install	Install	Install	Install	Install
40	23rd St/Garvin Ave	Richmond	SB	Near Side	-	-	Install	-	Install	Install	Install	Install
41	23rd St/Preble Ave	Richmond	NB	Far Side	-	-	Install	-	Install	-	Install	Install
42	22nd St/Nevin Ave	Richmond	SB	Far Side	-	-	Install	Install	Install	Install	Install	Install
43	Macdonald Ave/27th St/Broadway	Richmond	NB	Far Side	-	-	Install	-	Install	-	Install	Install
44	Macdonald Ave/27th St/Broadway	Richmond	SB	Far Side	-	-	Install	-	Install	-	Install	Install
45	Macdonald Ave/37th St	Richmond	NB	Far Side	-	-	Install	Install	Install	-	Install	Install
46	Macdonald Ave/37th St	Richmond	SB	Near Side	Relocate to Far Side	-	Install	Install	Install	Install	Install	Install
47	Gilman St/Sixth St	Berkeley	NB	Far Side	-	-	Install	Install	Install	Install	Install	-
48	Gilman St/Sixth St	Berkeley	SB	Far Side	-	Install	Install	Install	Install	Install	Install	Install
49	Sixth St/Virginia St	Berkeley	NB	Near Side	-	-	Install	Install	Install	Install	Install	Install
50	Sixth St/Virginia St	Berkeley	SB	Far Side	-	-	Install	Install	Install	Install	Install	Install
51	University Ave/Sixth St	Berkeley	NB	Far Side	-	-	Install	Install	Install	-	Install	Install
52	University Ave/Sixth St	Berkeley	SB	Far Side	-	-	Install	-	Install	-	Install	-
53	University Ave/San Pablo Ave	Berkeley	NB	Far Side	-	-	Install	Install	Install	Install	Install	Install
54	University Ave/San Pablo Ave	Berkeley	SB	Far Side	-	-	Install	Install	Install	-	Install	Install
55	University Ave/MLK Way	Berkeley	NB	Near Side	Relocate to Far Side	-	Install	Install	Install	Install	Install	Install



WEST CONTRA COSTA COUNTY

EXPRESS BUS IMPLEMENTATION PLAN

WCCTAC

AC TRANSIT

WESTCAT



StopID	Intersection Name	Jurisdiction	Direction	Existing Stop Side	Proposed Improvement	ADA Landing Zone	Shelter	Bench	Light	Trash Receptacle	System Map	Bike Parking
56	University Ave/MLK Way	Berkeley	SB	Far Side	-	-	Install	-	Install	Install	Install	Install
57	Shattuck Ave/Center St	Berkeley	NB	Near Side	-	-	-	-	-	-	-	Install
58	Shattuck Ave/Center St	Berkeley	SB	Near Side	-	-	-	-	-	-	Install	-
59	Shattuck Ave/Durant Ave	Berkeley	NB	Near Side	-	-	Install	-	Install	-	Install	-
60	Shattuck Ave/Durant Ave	Berkeley	SB	Far Side	-	-	Install	-	Install	-	Install	-
61	Shattuck Ave/Dwight Way	Berkeley	NB	Near Side	-	-	Install	-	Install	-	Install	Install
62	Shattuck Ave/Dwight Way	Berkeley	SB	Far Side	-	-	-	-	Install	-	-	Install
63	Broadway/20th St	Oakland	NB	Far Side	-	-	Install	-	-	-	Install	Install
64	Broadway/20th St	Oakland	SB	Far Side	-	-	Install	-	Install	-	Install	-
65	Broadway/13th St	Oakland	NB	Far Side	-	-	-	-	-	-	Install	Install
66	Broadway/13th St	Oakland	SB	Near Side	-	-	-	-	-	-	-	-
67	Broadway/7th St	Oakland	NB	Far Side	-	-	-	-	-	-	Install	Install
68	Broadway/7th St	Oakland	SB	Far Side	-	-	Install	Install	-	Install	Install	Install
69	Broadway/3rd St	Oakland	NB	Near Side	-	-	Install	Install	Install	Install	Install	Install
70	Broadway/3rd St	Oakland	SB	Near Side	-	-	Install	Install	-	Install	Install	Install
71	Hollis St/65th St	Emeryville	NB	Far Side	-	-	Install	-	Install	-	Install	-
72	Hollis St/65th St	Emeryville	SB	Far Side	-	-	Install	Install	Install	-	Install	-
73	Hollis St/59th St	Emeryville	NB	Far Side	-	-	Install	Install	Install	-	Install	Install
74	Hollis St/59th St	Emeryville	SB	Far Side	-	-	Install	-	-	-	Install	Install
75	Hollis St/53rd St	Emeryville	NB	Far Side	-	-	Install	Install	Install	-	Install	Install
76	Hollis St/53rd St	Emeryville	SB	Far Side	-	-	-	Install	Install	-	Install	Install
77	40th St/Hollis St	Emeryville	NB	Near Side	-	-	Install	Install	Install	-	Install	Install
78	40th St/Hollis St	Emeryville	SB	Far Side	-	-	Install	Install	Install	-	Install	Install
79	40th St/Adeline St	Emeryville	NB	Near Side	-	-	Install	-	-	-	Install	Install
80	40th St/Adeline St	Emeryville	SB	Far Side	-	-	Install	-	-	-	Install	Install
81	40th St/MacArthur BART Access Rd	Oakland	NB	Far Side	-	-	Install	-	Install	Install	Install	Install
82	40th St/MacArthur BART Access Rd	Oakland	SB	Near Side	-	-	-	-	-	-	Install	-
83	Broadway/W MacArthur Blvd	Oakland	NB	Far Side	-	-	Install	-	Install	Install	Install	Install
84	Broadway/W MacArthur Blvd	Oakland	SB	Far Side	-	-	-	-	Install	-	Install	Install
85	2nd St/Washington St	Oakland	NB	Near Side	-	-	Install	Install	Install	Install	Install	Install
86	2nd St/Washington St	Oakland	SB	Near Side	-	-	Install	Install	Install	Install	Install	Install
87	Hollis St/45th St	Emeryville	NB	Far Side	-	-	Install	Install	Install	-	Install	Install
88	Hollis St/45th St	Emeryville	SB	Near Side	-	-	Install	Install	Install	-	Install	Install



DESCRIPTION	QUANTITY	COST / UNIT	TOTAL COST
<i>San Pablo Avenue/Richmond Parkway in Hercules, Pinole, CC County</i>			\$ 710,800
Install concrete stop pad	2	\$ 400	\$ 800
Install bus shelter	14	\$ 30,000	\$ 420,000
Install bus bench	8	\$ 3,500	\$ 28,000
Install pedestrian-scale lighting	16	\$ 5,500	\$ 88,000
Install trash receptacle	12	\$ 2,800	\$ 33,600
Provide system map	18	\$ 6,600	\$ 118,800
Install bicycle parking	18	\$ 1,200	\$ 21,600
<i>Rumrill Rd/13th St/Harbour Way in San Pablo and Richmond</i>			\$ 692,800
Install concrete stop pad	3	\$ 400	\$ 1,200
Install bus shelter	14	\$ 30,000	\$ 420,000
Install bus bench	14	\$ 3,500	\$ 49,000
Install pedestrian-scale lighting	14	\$ 5,500	\$ 77,000
Install trash receptacle	13	\$ 2,800	\$ 36,400
Provide system map	14	\$ 6,600	\$ 92,400
Install bicycle parking	14	\$ 1,200	\$ 16,800
<i>23rd St/Macdonald Ave in San Pablo and Richmond</i>			\$ 626,300
Install concrete stop pad	0	\$ 400	\$ -
Install bus shelter	13	\$ 30,000	\$ 390,000
Install bus bench	9	\$ 3,500	\$ 31,500
Install pedestrian-scale lighting	14	\$ 5,500	\$ 77,000
Install trash receptacle	9	\$ 2,800	\$ 25,200
Provide system map	13	\$ 6,600	\$ 85,800
Install bicycle parking	14	\$ 1,200	\$ 16,800
<i>6th St/University Ave/Shattuck Ave in Berkeley</i>			\$ 463,700
Install concrete stop pad	13	\$ 400	\$ 5,200
Install bus shelter	8	\$ 30,000	\$ 240,000
Install bus bench	14	\$ 3,500	\$ 49,000
Install pedestrian-scale lighting	7	\$ 5,500	\$ 38,500
Install trash receptacle	14	\$ 2,800	\$ 39,200
Provide system map	11	\$ 6,600	\$ 72,600
Install bicycle parking	16	\$ 1,200	\$ 19,200
<i>Hollis St/40th St/Broadway in Emeryville and Oakland</i>			\$ 517,200
Install concrete stop pad	0	\$ 400	\$ -
Install bus shelter	11	\$ 30,000	\$ 330,000
Install bus bench	6	\$ 3,500	\$ 21,000
Install pedestrian-scale lighting	10	\$ 5,500	\$ 55,000
Install trash receptacle	2	\$ 2,800	\$ 5,600
Provide system map	14	\$ 6,600	\$ 92,400
Install bicycle parking	11	\$ 1,200	\$ 13,200
<i>Broadway in Oakland</i>			\$ 332,500
Install concrete stop pad	0	\$ 400	\$ -
Install bus shelter	7	\$ 30,000	\$ 210,000
Install bus bench	5	\$ 3,500	\$ 17,500
Install pedestrian-scale lighting	4	\$ 5,500	\$ 22,000
Install trash receptacle	5	\$ 2,800	\$ 14,000
Provide system map	9	\$ 6,600	\$ 59,400
Install bicycle parking	8	\$ 1,200	\$ 9,600



APPENDIX C - DETAILED COST ESTIMATES

WCCTAC - Transit Freeway Access Improvements

PLANNING COST ESTIMATE SUMMARY

Date of Estimates: 8/2019							
Location:	Project Number	Roadway	Structural	Electrical	ROW	Support Costs	Total
I-80 Bus on Shoulder/Part-Time Transit Lane	5	\$ 4,540,000				\$ 1,500,000	\$ 6,000,000
Richmond Parkway Access Improvement	6	\$ 590,000		\$ 30,000		\$ 210,000	\$ 900,000
Hercules Access Improvement	7	\$ 2,460,000		\$ 60,000	\$ 220,000	\$ 860,000	\$ 3,600,000
Bissell Avenue (Richmond East) Park and Ride	8	\$ 2,220,000		\$ 19,500		\$ 740,000	\$ 3,000,000
Tara Hills Road Park and Ride Option 1	9	\$ 1,840,000		\$ 80,000	\$ 700,000	\$ 710,000	\$ 3,300,000
Tara Hills Road Park and Ride Option 2	10	\$ 7,370,000		\$ 300,000	\$ 2,320,000	\$ 2,780,000	\$ 12,800,000
Wright Avenue (Richmond West) Park and Ride	15	\$ 7,170,000	\$ 1,700,000	\$ 300,000		\$ 3,040,000	\$ 12,200,000
San Pablo Dam Road Freeway Access Improvement	19	\$ 2,200,000	\$ 1,250,000		\$ 20,000	\$ 1,150,000	\$ 4,600,000
San Pablo Dam Road Park and Ride	20	\$ 8,890,000				\$ 2,940,000	\$ 11,800,000

Location:	Project Number	Transit Center Items	Contingency	Soft Costs	Total
Hercules Transit Center Addition	25	\$ 12,140,000	\$ 2,428,000	\$ 3,650,000	\$ 18,218,000
Richmond Parkway Transit Center Reconfiguration	26	\$ 30,230,000	\$ 6,046,000	\$ 9,080,000	\$ 45,356,000

General Notes for all estimates within this package:

Unit costs were obtained from Caltrans Cost Database (2017-2019 Year)

ROW costs were determined from average \$/SF within the project area

All values are in 2019 dollars

Engineer's opinion of probable cost are for programmatic purposes only.

Estimates are based on current available information and do not include field verification and survey.

Utility verification and coordination not included in cost.

WCCTAC - Transit Freeway Access Improvements

PLANNING COST ESTIMATE SUMMARY

Description Project #5

Bus On Shoulder On I-80 from Richmond Parkway to Willow Ave

Date of Estimate: 8/2019

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	1	LS	\$ 50,000	\$ 50,000	
Roadway Excavation	5,738	CY	\$ 80	\$ 460,000	
Pavement	51,644	SF	\$ 18	\$ 930,000	
Cold Plane and Overlay	1	LS	\$ 270,000	\$ 270,000	
Dike	12,911	LF	\$ 5	\$ 65,000	
Striping	1	LS	\$ 50,000	\$ 50,000	
Roadside Sign - One Post	50	EA	\$ 300	\$ 15,000	
Guardrail	3,475	LF	\$ 60	\$ 209,000	
Lighting Relocation	2	EA	\$ 5,000	\$ 10,000	
Temporary Traffic Control System/Staging	1	LS	\$ 200,000	\$ 200,000	
WPC / Treatment / SWPPP	1	LS	\$ 300,000	\$ 300,000	
Drainage	5	EA	\$ 23,200	\$ 116,000	
Roadway Additions (10%)	1	LS	\$ 267,500	\$ 268,000	
Mobilization (10%)	1	LS	\$ 294,300	\$ 295,000	
Contingency (40%)	1	LS	\$ 1,295,200	\$ 1,296,000	
Roadway Subtotal					\$ 4,540,000
SUBTOTAL CONSTRUCTION COSTS (2019 YEAR)					\$ 4,540,000
TOTAL CAPITAL OUTLAY COSTS (2019 YEAR)					\$ 4,540,000
Support Costs	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (6%)	1	LS	\$ 273,000	\$ 273,000	
Final Design (15%)	1	LS	\$ 681,000	\$ 681,000	
Construction Administration (12%)	1	LS	\$ 545,000	\$ 545,000	
Subtotal "Support Costs"					\$ 1,500,000
GRAND TOTAL					\$ 6,000,000

1. New Pavement cost includes base, subbase and roadway excavation cost for pavement section.
2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.
3. This estimate does not include ramp metering or other communication technology.

WCCTAC - Transit Freeway Access Improvements

PLANNING COST ESTIMATE SUMMARY

Description Project #6 Richmond Parkway HOV lane to I-80
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Date of Estimate: 7/31/2019

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	1	LS	\$ 15,000	\$ 15,000	
Roadway Excavation	100	CY	\$ 80	\$ 8,000	
Remove concrete (Curb & Gutter, Sidewalk)	150	CY	\$ 400	\$ 60,000	
Pavement	1,700	SF	\$ 18	\$ 31,000	
Curb & Gutter	450	LF	\$ 65	\$ 30,000	
Remove striping	150	SF	\$ 4	\$ 1,000	
Roadside Sign - One Post	6	EA	\$ 300	\$ 2,000	
Traffic Signal	1	LS	\$ 25,000	\$ 25,000	
Striping	3,100	LF	\$ 3	\$ 8,000	
Utility Relocation	2	EA	\$ 50,000	\$ 100,000	
Concrete Sidewalk	1,850	SF	\$ 20	\$ 37,000	
WPC / Treatment / SWPPP (10%)	1	LS	\$ 31,700	\$ 32,000	
Roadway Additions (10%)	1	LS	\$ 31,700	\$ 32,000	
Mobilization (10%)	1	LS	\$ 38,100	\$ 39,000	
Contingency (40%)	1	LS	\$ 168,000	\$ 168,000	
Roadway Subtotal					\$ 590,000
Electrical Items:					
Relocate Lighting	1	EA	\$ 20,000	\$ 20,000	
Mobilization (10%)	1	LS	\$ 2,000	\$ 2,000	
Contingency (40%)	1	LS	\$ 8,000	\$ 8,000	
Electrical Subtotal					\$ 30,000
SUBTOTAL CONSTRUCTION COSTS					\$ 620,000
TOTAL CAPITAL OUTLAY COSTS					\$ 620,000
Support Costs	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (6%)	1	LS	\$ 38,000	\$ 38,000	
Final Design (15%)	1	LS	\$ 93,000	\$ 93,000	
Construction Administration (12%)	1	LS	\$ 75,000	\$ 75,000	
Subtotal "Support Costs"					\$ 210,000
GRAND TOTAL					\$ 900,000

1. New Pavement cost includes base, subbase and roadway excavation cost for pavement section.
2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

WCCTAC - Transit Freeway Access Improvements

PLANNING COST ESTIMATE SUMMARY

Description Project #7 Hercules HOV Lane Addition

Date of Estimate: 8/2019

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	1	LS	\$ 15,000	\$ 15,000	
Roadway Excavation	5,900	CY	\$ 80	\$ 472,000	
Remove Concrete Sidewalk	250	SY	\$ 35	\$ 9,000	
Pavement	15,500	SF	\$ 18	\$ 279,000	
Curb & Gutter	600	LF	\$ 65	\$ 39,000	
Remove striping	1,650	SF	\$ 4	\$ 7,000	
Striping	3,250	LF	\$ 3	\$ 9,000	
Wayfinding/Signage	1	LS	\$ 30,000	\$ 30,000	
Security/Communications	1	LS	\$ 200,000	\$ 200,000	
Concrete Sidewalk	1,300	SF	\$ 15	\$ 20,000	
Traffic Signal Modification	1	LS	\$ 50,000	\$ 50,000	
Utility Relocation	2	EA	\$ 10,000	\$ 20,000	
Drainage	1	LS	\$ 230,000	\$ 230,000	
WPC / Treatment / SWPPP (10%)	1	LS	\$ 108,000	\$ 108,000	
Roadway Additions (10%)	1	LS	\$ 108,000	\$ 108,000	
Mobilization (10%)	1	LS	\$ 159,600	\$ 160,000	
Contingency (40%)	1	LS	\$ 702,400	\$ 703,000	
Roadway Subtotal					\$ 2,460,000
Electrical Items:					
Relocate Lighting	2	EA	\$ 20,000	\$ 40,000	
Mobilization (10%)	1	LS	\$ 4,000	\$ 4,000	
Contingency (40%)	1	LS	\$ 16,000	\$ 16,000	
Electrical Subtotal					\$ 60,000
Right of way Items:	Quantity	Unit	Unit Cost	Item Total	Total
Acquisition costs	3,900	SF	\$ 55	\$ 215,000	
Right of way Subtotal					\$ 220,000
SUBTOTAL CONSTRUCTION COSTS (2019 YEAR)					\$ 2,520,000
TOTAL RIGHT OF WAY COST					\$ 220,000
TOTAL CAPITAL OUTLAY COSTS (2019 YEAR)					\$ 2,740,000
Support Costs	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (6%)	1	LS	\$ 152,000	\$ 152,000	
Final Design (15%)	1	LS	\$ 378,000	\$ 378,000	
Construction Administration (12%)	1	LS	\$ 303,000	\$ 303,000	
R/W Engineering/Acquisition (10% of ROW Costs)	1	LS	\$ 22,000	\$ 22,000	
Subtotal "Support Costs"					\$ 860,000
GRAND TOTAL					\$ 3,600,000

1. New Pavement cost includes base, subbase and roadway excavation cost for pavement section.

2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

WCCTAC - Transit Freeway Access Improvements

PLANNING COST ESTIMATE SUMMARY

<u>Description</u>	<u>Project #8</u>
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Bissell Avenue (Richmond East) Park and Ride at Bissell Avenue and 39th Street

Date of Estimate: 8/2019

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	1	LS	\$ 10,000	\$ 10,000	
Remove AC Pavement	39,900	SF	\$ 2	\$ 80,000	
Pavement	39,900	SF	\$ 18	\$ 719,000	
Secure Bike Lockers (includes concrete pedestal)	6	EA	\$ 5,000	\$ 30,000	
Curb & Gutter	100	LF	\$ 65	\$ 7,000	
Striping	2,950	LF	\$ 3	\$ 8,000	
Remove striping	1,500	SF	\$ 4	\$ 6,000	
Wayfinding/Signage	1	LS	\$ 30,000	\$ 30,000	
Security/Communications	1	LS	\$ 200,000	\$ 200,000	
Concrete (Sidewalk, Island, Curb Ramp)	2,800	SF	\$ 20	\$ 56,000	
Remove concrete (Curb & Gutter, Sidewalk)	100	CY	\$ 400	\$ 40,000	
WPC / Treatment / SWPPP (10%)	1	LS	\$ 118,600	\$ 119,000	
Roadway Additions (10%)	1	LS	\$ 118,600	\$ 119,000	
Mobilization (10%)	1	LS	\$ 142,400	\$ 143,000	
Contingency (40%)	1	LS	\$ 626,800	\$ 627,000	
Roadway Subtotal					\$ 2,200,000
Electrical Items:					
Light Pole and Foundation	1	EA	\$ 12,500	\$ 12,500	
Mobilization (10%)	1	LS	\$ 2,000	\$ 2,000	
Contingency (40%)	1	LS	\$ 5,000	\$ 5,000	
Electrical Subtotal					\$ 19,500
SUBTOTAL CONSTRUCTION COSTS 2019 YEAR)					\$ 2,220,000
TOTAL CAPITAL OUTLAY COSTS (2019 YEAR)					\$ 2,220,000
Support Costs	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (6%)	1	LS	\$ 134,000	\$ 134,000	
Final Design (15%)	1	LS	\$ 333,000	\$ 333,000	
Construction Administration (12%)	1	LS	\$ 267,000	\$ 267,000	
Subtotal "Support Costs"					\$ 740,000
GRAND TOTAL					\$ 3,000,000

1. New Pavement cost includes base, subbase and roadway excavation cost for pavement section.
2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.
3. R/W costs are not included in this estimate. Assumed County will release property at no cost. Further coordination required.

WCCTAC - Transit Freeway Access Improvements

PLANNING COST ESTIMATE SUMMARY

Description Project #9

Tara Hills Park and Ride Option 1

located southwest of Tara Hills Drive and San Pablo Avenue

Date of Estimate: 8/2019

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Remove AC Pavement	34,800	SF	\$ 2	\$ 70,000	
Pavement	34,800	SF	\$ 18	\$ 627,000	
Striping	1,850	LF	\$ 3	\$ 5,000	
Chainlink Fence	750	LF	\$ 40	\$ 30,000	
Secure Bike Lockers (includes concrete pedestal)	2	EA	\$ 5,000	\$ 10,000	
Wayfinding/Signage	1	LS	\$ 30,000	\$ 30,000	
Security/Communications	1	LS	\$ 200,000	\$ 200,000	
Drainage	1	LS	\$ 146,400	\$ 147,000	
Roadway Additions (10%)	1	LS	\$ 73,200	\$ 74,000	
Mobilization (10%)	1	LS	\$ 119,300	\$ 120,000	
Contingency (40%)	1	LS	\$ 525,200	\$ 526,000	
Roadway Subtotal					\$ 1,840,000
Electrical Items:					
Lighting	1	LS	\$ 50,000	\$ 50,000	
Mobilization (10%)	1	LS	\$ 5,000	\$ 5,000	
Contingency (40%)	1	LS	\$ 20,000	\$ 20,000	
Electrical Subtotal					\$ 80,000
Right of way Items:	Quantity	Unit	Unit Cost	Item Total	Total
Acquisition costs	34,800	SF	\$ 20	\$ 696,000	
Right of way Subtotal					\$ 700,000
Total Right of Way Cost (Escalated Value)					\$ -
SUBTOTAL CONSTRUCTION COSTS (2019 YEAR)					\$ 1,920,000
TOTAL RIGHT OF WAY COST					\$ 700,000
TOTAL CAPITAL OUTLAY COSTS (2019 YEAR)					\$ 2,620,000
Support Costs	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (6%)	1	LS	\$ 116,000	\$ 116,000	
Final Design (15%)	1	LS	\$ 288,000	\$ 288,000	
Construction Administration (12%)	1	LS	\$ 231,000	\$ 231,000	
R/W Engineering/Acquisition (10% of ROW Costs)	1	LS	\$ 70,000	\$ 70,000	
Subtotal "Support Costs"					\$ 710,000
GRAND TOTAL					\$ 3,300,000

1. New Pavement cost includes base, subbase and roadway excavation cost for pavement section.

2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

WCCTAC - Transit Freeway Access Improvements

PLANNING COST ESTIMATE SUMMARY

Description Project #10

Tara Hills Park and Ride Option 2

located northeast of Tara Hills Drive and San Pablo Avenue

Date of Estimate: 8/2019

Roadway Items:

	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	1	LS	\$ 50,000	\$ 50,000	
Earthwork Excavation	8,600	CY	\$ 85	\$ 731,000	
Pavement	115,900	SF	\$ 18	\$ 2,087,000	
Curb & Gutter	750	LF	\$ 65	\$ 49,000	
Striping	6,650	LF	\$ 3	\$ 17,000	
Concrete (Sidewalk, Curb Ramp)	4,700	SF	\$ 15	\$ 71,000	
Remove Concrete (Curb & Gutter, Sidewalk)	300	CY	\$ 400	\$ 120,000	
Wayfinding/Signage	1	LS	\$ 30,000	\$ 30,000	
Security/Communications	1	LS	\$ 200,000	\$ 200,000	
Chainlink Fence	1,000	LF	\$ 40	\$ 40,000	
Secure Bike Lockers (includes concrete pedestal)	6	EA	\$ 5,000	\$ 30,000	
Drainage	1	LS	\$ 679,000	\$ 679,000	
WPC / Treatment / SWPPP (10%)	1	LS	\$ 339,500	\$ 340,000	
Roadway Additions (10%)	1	LS	\$ 339,500	\$ 340,000	
Mobilization (10%)	1	LS	\$ 478,400	\$ 479,000	
Contingency (40%)	1	LS	\$ 2,105,200	\$ 2,106,000	
Roadway Subtotal					\$ 7,370,000

Electrical Items:

Lighting	1	LS	\$ 200,000	\$ 200,000	
Mobilization (10%)	1	LS	\$ 20,000	\$ 20,000	
Contingency (40%)	1	LS	\$ 80,000	\$ 80,000	
Electrical Subtotal					\$ 300,000

Right of way Items:

	Quantity	Unit	Unit Cost	Item Total	Total
Acquisition costs	115,900	SF	\$ 20	\$ 2,318,000	
Right of way Subtotal					\$ 2,320,000
Total Right of Way Cost (Escalated Value)					\$ -

SUBTOTAL CONSTRUCTION COSTS (2019 YEAR)

\$ 7,670,000

TOTAL RIGHT OF WAY COST

\$ 2,320,000

TOTAL CAPITAL OUTLAY COSTS (2019 YEAR)

\$ 9,990,000

Support Costs

	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (6%)	1	LS	\$ 461,000	\$ 461,000	
Final Design (15%)	1	LS	\$ 1,151,000	\$ 1,151,000	
Construction Administration (12%)	1	LS	\$ 921,000	\$ 921,000	
R/W Engineering/Acquisition (10% of ROW Costs)	1	LS	\$ 232,000	\$ 232,000	
Subtotal "Support Costs"					\$ 2,770,000

GRAND TOTAL

\$ 12,800,000

1. New Pavement cost includes base, subbase and roadway excavation cost for pavement section.

2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

WCCTAC - Transit Freeway Access Improvements

PLANNING COST ESTIMATE SUMMARY

Description Project #15

Wright Avenue (Richmond West) Park and Ride
located on Wright Avenue east of Marina Way South

Date of Estimate: 8/2019

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	1	LS	\$ 50,000	\$ 50,000	
Earthwork Excavation	8,500	CY	\$ 85	\$ 723,000	
Pavement	114,700	SF	\$ 18	\$ 2,065,000	
Curb & Gutter	1,650	LF	\$ 65	\$ 108,000	
Striping	7,950	LF	\$ 3	\$ 20,000	
Concrete (Sidewalk, Curb Ramp)	14,400	SF	\$ 15	\$ 216,000	
Remove Concrete (Curb & Gutter, Sidewalk)	300	CY	\$ 400	\$ 120,000	
Roadside Sign - One Post	4	EA	\$ 300	\$ 2,000	
Chainlink Fence	1,850	LF	\$ 40	\$ 74,000	
Secure Bike Lockers (includes concrete pedestal)	6	EA	\$ 5,000	\$ 30,000	
Wayfinding/Signage	1	LS	\$ 30,000	\$ 30,000	
Security/Communications	1	LS	\$ 200,000	\$ 200,000	
Drainage	1	LS	\$ 337,800	\$ 338,000	
WPC / Treatment / SWPPP (10%)	1	LS	\$ 337,800	\$ 338,000	
Roadway Additions (10%)	1	LS	\$ 337,800	\$ 338,000	
Mobilization (10%)	1	LS	\$ 465,200	\$ 466,000	
Contingency (40%)	1	LS	\$ 2,047,200	\$ 2,048,000	
Roadway Subtotal					\$ 7,170,000
Electrical Items:					
Lighting	1	EA	\$ 200,000	\$ 200,000	
Mobilization (10%)	1	LS	\$ 20,000	\$ 20,000	
Contingency (40%)	1	LS	\$ 80,000	\$ 80,000	
Electrical Subtotal					\$ 300,000
Structure items:	Quantity	Unit	Unit Cost	Item Total	Total
Retaining wall	9,400	SF	\$ 120	\$ 1,128,000	
Mobilization (10%)	1	LS	\$ 113,000	\$ 113,000	
Contingency (40%)	1	LS	\$ 452,000	\$ 452,000	
Structure Subtotal					\$ 1,700,000
SUBTOTAL CONSTRUCTION COSTS (2019 YEAR)					\$ 9,170,000
TOTAL CAPITAL OUTLAY COSTS (2019 YEAR)					\$ 9,170,000
Support Costs	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (6%)	1	LS	\$ 551,000	\$ 551,000	
Final Design (15%)	1	LS	\$ 1,376,000	\$ 1,376,000	
Construction Administration (12%)	1	LS	\$ 1,101,000	\$ 1,101,000	
Subtotal "Support Costs"					\$ 3,030,000
GRAND TOTAL					\$ 12,200,000

1. New Pavement cost includes base, subbase and roadway excavation cost for pavement section.

2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

WCCTAC - Transit Freeway Access Improvements

PLANNING COST ESTIMATE SUMMARY

Description Project #19

San Pablo Dam Rd / WB I-80 On-Ramp Transit Lane

Date of Estimate: 8/2019

Roadway Items:	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	1	LS	\$ 10,000	\$ 10,000	
Roadway Excavation	2,200	CY	\$ 80	\$ 176,000	
Pavement	7,297	SF	\$ 18	\$ 132,000	
Curb & Gutter	221	LF	\$ 65	\$ 15,000	
Striping	1	LS	\$ 7,000	\$ 7,000	
Roadside Sign - One Post	5	EA	\$ 300	\$ 2,000	
Lighting	2	EA	\$ 16,000	\$ 32,000	
Temporary Traffic Control System/Staging	1	LS	\$ 150,000	\$ 150,000	
Traffic Electrical	1	LS	\$ 450,000	\$ 450,000	
Concrete (Sidewalk, Island, Curb Ramp)	1,211	SF	\$ 15	\$ 19,000	
Drainage	1	LS	\$ 198,600	\$ 199,000	
Removal	1	LS	\$ 10,000	\$ 10,000	
WPC / Treatment / SWPPP (10%)	1	LS	\$ 99,300	\$ 100,000	
Roadway Additions (10%)	1	LS	\$ 120,200	\$ 121,000	
Mobilization (10%)	1	LS	\$ 142,300	\$ 143,000	
Contingency (40%)	1	LS	\$ 626,400	\$ 627,000	
Roadway Subtotal					\$ 2,200,000
Structure items:	Quantity	Unit	Unit Cost	Item Total	Total
Retaining wall	5,000	SF	\$ 150	\$ 750,000	
Soundwall	1,920	SF	\$ 60	\$ 116,000	
Mobilization (10%)	1	LS	\$ 75,000	\$ 75,000	
Contingency (40%)	1	LS	\$ 300,000	\$ 300,000	
Structure Subtotal					\$ 1,250,000
Right of way Items:	Quantity	Unit	Unit Cost	Item Total	Total
Acquisition costs	150	SF	\$ 85	\$ 13,000	
Right of way Subtotal					\$ 20,000
SUBTOTAL CONSTRUCTION COSTS (2019 YEAR)					\$ 3,450,000
TOTAL RIGHT OF WAY COST					\$ 20,000
TOTAL CAPITAL OUTLAY COSTS (2019 YEAR)					\$ 3,470,000
Support Costs	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (6%)	1	LS	\$ 207,000	\$ 207,000	
Final Design (15%)	1	LS	\$ 518,000	\$ 518,000	
Construction Administration (12%)	1	LS	\$ 414,000	\$ 414,000	
R/W Engineering/Acquisition (10% of ROW Costs)	1	LS	\$ 2,000	\$ 2,000	
Subtotal "Support Costs"					\$ 1,150,000
GRAND TOTAL					\$ 4,600,000

1. New Pavement cost includes base, subbase and roadway excavation cost for pavement section.

2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

WCCTAC - Transit Freeway Access Improvements

PLANNING COST ESTIMATE SUMMARY

Description Project #20

San Pablo Dam Rd Park & Ride

Date of Estimate: 8/2019

Roadway Items:

	Quantity	Unit	Unit Cost	Item Total	Total
Clearing and Grubbing	1	LS	\$ 10,000	\$ 10,000	
Roadway Excavation	5,584	CY	\$ 80	\$ 447,000	
Pavement	119,865	SF	\$ 18	\$ 2,158,000	
Curb & Gutter	428	LF	\$ 65	\$ 28,000	
Secure Bike Lockers (includes concrete pedestal)	8	EA	\$ 5,000	\$ 40,000	
Striping	1	LS	\$ 40,750	\$ 41,000	
Wayfinding/Signage	1	LS	\$ 30,000	\$ 30,000	
Security/Communications	1	LS	\$ 200,000	\$ 200,000	
Lighting	23	EA	\$ 16,000	\$ 368,000	
Temporary Traffic Control System/Staging	1	LS	\$ 150,000	\$ 150,000	
Traffic Electrical	1	LS	\$ 500,000	\$ 500,000	
Chain Link Fence	1,600	LF	\$ 40	\$ 64,000	
Concrete (Sidewalk, Island, Curb Ramp)	1,010	SF	\$ 15	\$ 16,000	
Drainage	1	LS	\$ 810,400	\$ 811,000	
Removal	1	LS	\$ 10,000	\$ 10,000	
WPC / Treatment / SWPPP (10%)	1	LS	\$ 405,200	\$ 406,000	
Roadway Additions (10%)	1	LS	\$ 487,300	\$ 488,000	
Mobilization (10%)	1	LS	\$ 576,700	\$ 577,000	
Contingency (40%)	1	LS	\$ 2,537,600	\$ 2,538,000	
Roadway Subtotal					\$ 8,890,000

SUBTOTAL CONSTRUCTION COSTS (2019 YEAR)

\$ 8,890,000

TOTAL CAPITAL OUTLAY COSTS (2019 YEAR)

\$ 8,890,000

Support Costs

	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (6%)	1	LS	\$ 534,000	\$ 534,000	
Final Design (15%)	1	LS	\$ 1,334,000	\$ 1,334,000	
Construction Administration (12%)	1	LS	\$ 1,067,000	\$ 1,067,000	
Subtotal "Support Costs"					\$ 2,940,000

GRAND TOTAL

\$ 11,800,000

1. New Pavement cost includes base, subbase and roadway excavation cost for pavement section.

2. Soft cost is percentage of Roadway and Structure Items except R/W Engineering which is 10% of R/W Items.

WCCTAC - Transit Freeway Access Improvements

PLANNING COST ESTIMATE SUMMARY

Description Project #25 Hercules Transit Center Addition
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Date of Estimate: 8/2019

Transit Center Items:	Quantity	Unit	Unit Cost	Item Total	Total
Mobilization (10%)	1	LS	\$ 1,210,000	\$ 1,210,000	
WPC / Treatment / SWPPP (2%)	1	LS	\$ 242,000	\$ 242,000	
Site Preparation	74,080	SF	\$ 10	\$ 741,000	
Remove concrete (Curb & Gutter)	750	LF	\$ 15	\$ 12,000	
Landscape & Irrigation/MS4 Requirements	50	SF	\$ 40	\$ 2,000	
Concrete Pavement	700	SF	\$ 20	\$ 14,000	
Striping	150	LF	\$ 3	\$ 1,000	
Parking Structure (Includes Ramp)	109,100	SF	\$ 90	\$ 9,819,000	
Class I Bike Parking (Double Bike Lockers)	18	EA	\$ 5,000	\$ 90,000	
Real-Time Arrival Displays	2	EA	\$ 3,500	\$ 7,000	
SUBTOTAL					\$ 12,140,000
CONTINGENCY (20%)					\$ 2,428,000
TOTAL CAPITAL OUTLAY COSTS (2019 YEAR)					\$ 14,568,000
Soft Costs	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (3%)	1	LS	\$ 438,000	\$ 438,000	
Final Design (12%)	1	LS	\$ 1,749,000	\$ 1,749,000	
Construction Administration (10%)	1	LS	\$ 1,457,000	\$ 1,457,000	
Subtotal "Soft Costs"					\$ 3,650,000
Grand Total					\$ 18,218,000

WCCTAC - Transit Freeway Access Improvements

PLANNING COST ESTIMATE SUMMARY

Description **Project #26**
Richmond Parkway
Transit Center Reconfiguration/Retrofit

Date of Estimate: 8/2019

Transit Center Items:	Quantity	Unit	Unit Cost	Item Total	Total
Mobilization (10%)	1	LS	\$ 3,030,000	\$ 3,030,000	
Traffic Control (5%)	1	LS	\$ 1,515,000	\$ 1,515,000	
WPC / Treatment / SWPPP (2%)	1	LS	\$ 606,000	\$ 606,000	
Site Preparation	167,200	SF	\$ 10	\$ 1,672,000	
Pavement Excavation	11,250	CY	\$ 80	\$ 900,000	
Remove concrete (Curb & Gutter)	5,850	LF	\$ 15	\$ 88,000	
Remove concrete (Sidewalk, Bus Bays)	2,000	CY	\$ 35	\$ 70,000	
Asphalt Pavement	44,150	SF	\$ 18	\$ 795,000	
Curb & Gutter	5,000	LF	\$ 65	\$ 325,000	
Concrete Pavement	65,200	SF	\$ 20	\$ 1,304,000	
Striping	3,150	LF	\$ 3	\$ 8,000	
MTS Standard Shelter (lighting, solar, bench, trash can)	9	EA	\$ 55,000	\$ 495,000	
Landscape & Irrigation/MS4 Requirements	5,500	SF	\$ 40	\$ 220,000	
Parking Structure	169,350	SF	\$ 110	\$ 18,629,000	
Bridge to Parking Structure	1,200	SF	\$ 400	\$ 480,000	
Class I Bike Parking (Double Bike Lockers)	16	EA	\$ 5,000	\$ 80,000	
Real-Time Arrival Display	2	EA	\$ 3,500	\$ 7,000	
SUBTOTAL					\$ 30,230,000
CONTINGENCY (20%)					\$ 6,046,000
TOTAL CAPITAL OUTLAY COSTS					\$ 36,276,000
Soft Costs	Quantity	Unit	Unit Cost	Item Total	Total
Preliminary Eng/Envir (3%)	1	LS	\$ 1,089,000	\$ 1,089,000	
Final Design (12%)	1	LS	\$ 4,354,000	\$ 4,354,000	
Construction Administration (10%)	1	LS	\$ 3,628,000	\$ 3,628,000	
Subtotal "Soft Costs"					\$ 9,080,000
Grand Total					\$ 45,356,000