

1.0 PROPOSED PROJECT

1.1 INTRODUCTION

The California Department of Transportation (Caltrans) is the lead agency under National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). Caltrans, in cooperation with the Contra Costa Transportation Authority (CCTA) and Concord proposes interchange and local road improvements along State Route (SR) 242 from 0.1 mile north of the Interstate 680 (I-680)/SR 242 separation to 0.6 mile north of Concord Avenue undercrossing, in Concord, in Contra Costa County. The SR 242/Clayton Road Ramps Project (project) would modify the existing partial interchanges at Clayton Road and Concord Avenue to relieve local street congestion. The SR 242/Clayton Road interchange would be reconfigured from a partial interchange to provide new northbound and southbound SR 242 on- and off-ramps. A new auxiliary lane would be constructed along southbound SR 242, between the Concord Avenue and the new southbound SR 242 off-ramp. New bridge structures would be constructed over Pine Creek to accommodate the new ramps. The existing northbound and southbound SR 242 ramps to and from Clayton Road would remain, with the northbound SR 242 off-ramp widened to two-lanes. Proposed local roadway improvements include a combination of additional travel lanes and the extension of left-turn pockets on Willow Pass Road, Concord Avenue, Franquette Avenue, Clayton Road, Market Street, and Commerce Avenue.

Figure 1-1 shows the location of the project, which is situated 29 miles east of San Francisco in the northcentral region of Contra Costa County, within Concord city limits. Freeways that provide access to Concord include Highway 4, SR 242, and I-680. Highway 4 runs east-west and provides connections between Interstate 80 (I-80), near the City of Hercules, and the cities of Antioch and Stockton. State Route 242 runs north-south, serving primarily as a connector between Highway 4 and I-680. Interstate 680 is a major regional freeway that connects Concord to Solano County to the north and cities such as Dublin and San Jose to the south. The SR 242/Clayton Road and SR 242/Concord Avenue interchanges provide primary access to important local destinations to the east such as the Concord Central Business District (CBD) and the Concord Bay Area Rapid Transit (BART) station; and to the Buchanan Field Airport and Waterworld to the west. The interchanges also provide access to local arterials including Concord Avenue, Clayton Road, and Willow Pass Road that connect Concord with adjacent cities.

The Metropolitan Transportation Commission (MTC) is the regional transportation planning agency in the San Francisco Bay Area that includes the project area. MTC is responsible for updating the Regional Transportation Plan (RTP), which is a comprehensive blueprint for the



Legend

- Project Limits
- Concord Central Business District

Project Location Map

Source: Circlepoint, 2015

development of mass transit, highway, freight, bicycle and pedestrian facilities. In 2013, MTC and the Association of Bay Area Governments (ABAG) adopted the RTP “Plan Bay Area 2040” and identified the proposed project under reference number ID 22388. The U.S. Department of Transportation (DOT) approved Plan Bay Area 2040 in 2013. The project is also included in the MTC 2015 Transportation Improvement Program (TIP) under reference number ID CC-070024. MTC adopted the TIP on September 24, 2014. Federal Highway Administration (FHWA) approved and incorporated the TIP into the Federal Statewide Transportation Improvement Program (FSTIP) on December 15, 2014.

The proposed project is identified in CCTA’s Measure J Strategic Plan as SR 242/Clayton Road Off-Ramp (Project No. 6002) and SR 242/Clayton Road On-Ramp (Project No. 6004). Additionally, the proposed project is identified in Concord’s Capital Improvement Program (CIP) as project number UF-102 and UF-101.

1.2 PURPOSE AND NEED

1.2.1 PURPOSE

The purpose of the project is to reduce congestion and improve traffic operations at the SR 242/Clayton Road and SR 242/Concord Avenue interchanges, thereby enhancing mobility in the area, and improving accessibility to key local destinations including the Concord CBD and the Concord BART station.

1.2.2 NEED

CONGESTION AND DELAY

Level of Service (LOS) is a measure of actual traffic conditions and the perception of such conditions by motorists. There are six LOS ratings, ranging from LOS A (free traffic flow with low traffic volumes and high speeds, resulting in low vehicle densities) to LOS F (traffic volumes exceeding the capacity of the infrastructure, resulting in forced flow traffic operations, slow speeds, and high vehicle densities). Refer to **Section 2.1.4, Traffic and Transportation/Pedestrian and Bicycle Facilities**, for a detailed discussion of the LOS thresholds. Regional growth and new local development in Concord has resulted in significant traffic increases on SR 242 and local streets serving both interchanges.

Growth trends predict a 43 percent increase in population within Concord by 2040. Future traffic projections at all of the study intersections show an increase in traffic congestion during the morning (AM) and evening (PM) peak commute hour due to the anticipated growth trends.¹ As shown in **Section 2.1.4**, by 2040, all of the study intersections are expected to operate at LOS D or better in both AM and PM peak hours with the following exceptions:

¹ Peak Hour: The part of the day during which traffic volumes are at their highest. Based on the data collected, local street peak traffic hours are between 7:30 – 8:30 AM and 4:45 – 5:45 PM; SR 242 mainline peak hours are between 7:00 – 8:00 AM and 4:00 – 5:00 PM.

- Concord Avenue/Commerce Avenue/SR 242 southbound ramps intersection is expected to operate at LOS E during the AM peak hour and LOS F during the PM peak hour
- The intersection at Clayton Road/Market Street/SR 242 ramps is expected to operate at LOS E during the AM and PM peak hours

The congestion at these intersections would translate into long vehicle queue lengths along the SR 242 off-ramps, some of which would spillback onto the SR 242 mainline. Similar conditions would occur during the PM peak hour.

Traffic congestion would continue to occur along southbound SR 242 during the AM peak hour. The majority of SR 242, within the project limits, would operate at LOS F by 2040. The existing southbound AM peak hour bottleneck is expected to worsen at the lane drop segment just north of the I-680 merge area.

ACCESSIBILITY TO LOCAL DESTINATIONS

The SR 242/Clayton Road and SR 242/Concord Avenue interchanges provide freeway access to important local destinations to the east such as the Concord CBD and the Concord BART station; and Buchanan Field Airport and Waterworld to the west. The Concord CBD contains the majority of the city's commercial, retail, and mixed-use development. It is generally defined as the area bound by Concord Avenue and Salvio Street to the north; Willow Pass Road, Clayton Road and Galindo Street to the south; Port Chicago Highway, Oakland Avenue and Mesa Street to the east; and I-680 to the west.

Under their current configuration, the SR 242/Clayton Road and SR 242/Concord Avenue interchanges provide limited access to and from the local arterial roadways that serve the Concord CBD. The SR 242/Clayton Road interchange is a partial interchange that provides one on-ramp to southbound SR 242 and one off-ramp from northbound SR 242. The SR 242/Concord Avenue interchange accommodates all ramp movements except a northbound SR 242 off-ramp. The current interchange configurations create long traffic queues of vehicles waiting to enter or exit the freeway. Congestion and delay in the study area also adversely affects efficient goods movement to and from the Concord CBD.

1.2.3 INDEPENDENT UTILITY AND LOGICAL TERMINI

Logical termini for a project are defined as rational end points for transportation improvements within the proposed project area. A project with independent utility is defined as improvements that are usable and provide a reasonable expenditure of funds even if no additional transportation improvements are made in the area.

As part of the traffic analysis conducted for this project, several operational improvements were evaluated in order to determine the project configuration that most effectively addressed the identified project needs to reduce traffic congestion and delay. Based on observations from the traffic analysis and the discussions at team workshops, it was determined that the current project limits, centering around improvements to the SR 242/Clayton Road and SR 242/Concord Avenue

interchanges, showed the most substantial benefits in future traffic operations along the local roadways and SR 242 ramp termini intersections in the design year 2040. It was determined that operational improvements must extend from 0.1 mile north of the I-680/SR 242 separation to 0.6 mile north of Concord Avenue undercrossing. The selection of these logical termini, or end points, will allow for a thorough review of environmental impacts as a result of construction and operation of the project, as demonstrated throughout this environmental document.

The project would result in reduced traffic congestion without the need for any additional improvements being made within or adjacent to the project study area to satisfy the project purpose. As such, the project is considered to have independent utility. Furthermore, the project would not restrict considerations of alternatives for other reasonably foreseeable transportation improvements in the area.

1.3 PROJECT DESCRIPTION

Caltrans, in cooperation with CCTA and Concord, proposes to provide interchange and local road improvements on SR 242 from 0.1 mile north of the I-680/SR 242 separation and 0.6 mile north of Concord Avenue undercrossing, in Concord, in Contra Costa County. The purpose of the project is to reduce congestion and improve traffic operations at the SR 242/Clayton Road and SR 242/Concord Avenue interchanges, thereby enhancing mobility in the area, and improving accessibility to key local destinations including the Concord CBD and the Concord BART station. The project would modify the existing partial interchanges at Clayton Road and Concord Avenue to relieve local street congestion and accommodate growth and future needs of the surrounding area. Regional growth and new local development in Concord has resulted in significant traffic increases on SR 242 and local streets serving both interchanges. The current interchange configurations create long traffic queues of vehicles waiting to enter or exit the freeway. Congestion and delay in the study area also adversely affects efficient goods movement to and from the Concord CBD.

1.3.1 PROJECT ALTERNATIVES

This section describes the proposed action and the design alternatives that were developed to meet the identified purpose and need of the project, while avoiding or minimizing environmental impacts. The alternatives are “Build Alternative 1”, “Build Alternative 2”, and the “No-Build Alternative”. **Figure 1-2** depicts the environmental study limits of Build Alternatives 1 and 2. An alternatives assessment study was conducted to identify viable alternatives for further study during the project initiation document (PID) phase of project development. A total of 17 conceptual alternatives were developed and a screening process was conducted to assess any fatal flaws associated with each alternative. With the exception of Build Alternatives 1 and 2, these alternatives were eliminated after they were deemed not viable because of physical constraints or because they did not meet the project’s purpose and need (see **Section 1.3.3, Alternatives Considered but Eliminated from Further Discussion**). **Appendix G** includes detailed project layout plans for Build Alternatives 1 and 2.

BUILD ALTERNATIVES

Build Alternative 1

The SR 242/Clayton Road interchange would be reconfigured from a partial interchange to provide new southbound SR 242 on- and off-ramps at Franquette Avenue, and a new northbound SR 242 on-ramp from Clayton Road. The existing northbound and southbound SR 242 ramps to and from Clayton Road would remain, with the northbound SR 242 off-ramp widened to two-lanes. The ramp termini for the new southbound SR 242 ramps at Franquette Avenue would be signalized.

Proposed local road improvements would occur on Willow Pass Road, Concord Avenue, Franquette Avenue, Clayton Road, Market Street, and Commerce Avenue. Franquette Avenue would be widened to add a lane between the new southbound SR 242 on- and off-ramps and Willow Pass Road. Several left-turn pockets are proposed to be lengthened through roadway widening in the existing median or restriping at the following locations:

- Northbound Market Street to SR 242 on-ramps
- Westbound Clayton Road to southbound Market Street
- Westbound Willow Pass Road to Franquette Avenue
- Northbound Market Street to westbound Concord Avenue
- Northbound Commerce Avenue to westbound Concord Avenue
- Westbound Concord Avenue to Commerce Avenue

Build Alternative 2

The SR 242/Clayton Road interchange would be reconfigured to provide new southbound SR 242 on- and off-ramps and a new northbound SR 242 on-ramp at Willow Pass Road. The ramp termini for the new southbound ramps would be signalized. Left-turn access from westbound Willow Pass Road to the new southbound SR 242 on-ramp connection would be prohibited. As with Build Alternative 1, the existing northbound and southbound SR 242 ramps to and from Clayton Road would remain, with the northbound SR 242 off-ramp widened to two-lanes. Proposed local roadway improvements would occur on Willow Pass Road, Concord Avenue, Clayton Road, Market Street, and Commerce Avenue. Eastbound Willow Pass Road would be widened to add an additional lane. Several left-turn pockets are proposed to be lengthened through roadway widening in the existing median or restriping at the following locations:

- Northbound Market Street to SR 242 on-ramps
- Westbound Clayton Road to southbound Market Street
- Northbound Market Street to westbound Concord Avenue
- Northbound Commerce Avenue to westbound Concord Avenue
- Westbound Concord Avenue to Commerce Avenue



Project Build Alternatives **Figure 1-2**

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Common Design Features of the Build Alternatives

The Build Alternatives would include the following design features:

- New southbound SR 242 on- and off-ramps
- Widen the existing northbound SR 242 off-ramp at Clayton Road to two lanes
- New northbound SR 242 on-ramp
- New auxiliary lane on southbound SR 242 between the Concord Avenue and the new southbound SR 242 off-ramp
- New bridge structures over Pine Creek to accommodate the new ramps
- Construction of retaining walls to accommodate the interchange improvements
- Local roadway widening (Franquette Avenue, Willow Pass Road, and Clayton Road)
- Intersection modifications (i.e., construction of islands, lane striping, etc.) and signalization improvements at various locations
- New pedestrian bridge along eastbound Willow Pass Road across Pine Creek
- Widened sidewalks (Franquette Avenue, Willow Pass Road, and Market Street)
- Additional directional guide signs on and off of the freeway
- Modification of existing ramp metering and Traffic Operations System (TOS) facilities (i.e., traffic monitoring devices and closed circuit televisions)

Differences between the Build Alternatives are generally related to the alignment of the new ramp structures and related components (i.e., ramp termini intersection improvements, retaining walls, and right-of-way acquisition), and are discussed in *Unique Features of the Build Alternatives*. Common design features to the Build Alternatives are discussed below.

Construct Auxiliary Lane

Within the project limits, there are existing auxiliary lanes on southbound SR 242 between Olivera Road and Concord Avenue, and on northbound SR 242 between Concord Avenue and Solano Way.² Construction of a new auxiliary lane is proposed along southbound SR 242 connecting the Concord Avenue loop on-ramp to the new off-ramp. The auxiliary lane would be provided by widening the freeway up to 12 feet to the outside adjacent to the existing general purpose lane of southbound SR 242.

² An auxiliary lane is a portion of the roadway for weaving, truck climbing, and speed change. The lane provides additional length for motorists entering and exiting the freeway to merge and weave into and out of the mainline traffic flow.

The widening would generally conform to the existing roadway alignment and involve excavation of up to 3 feet including removing the existing paved shoulder to prepare the subgrade and place pavement. The pavement for widening would consist of aggregate subbase, aggregate base and asphalt concrete for a total thickness of approximately 3 feet.

Local Roadway Widening

Eastbound Willow Pass Road would be widened to add an additional eastbound lane approaching the Market Street intersection. The additional lane along this segment of Willow Pass Road would be accomplished by widening the eastbound shoulder excavating up to 3 feet to remove the existing sidewalk, prepare the subgrade, and place pavement. The existing sidewalk would be reconstructed south of the widening and would consist of excavation of up to 3 feet to prepare the subgrade, place pavement and accommodate a new pedestrian bridge over Pine Creek.

Construct Pedestrian Facilities

As listed below, the Build Alternatives propose improvements that would implement safer mobility conditions for pedestrians, where feasible. The project would:

- construct a new pedestrian bridge over Pine Creek on the south side of eastbound Willow Pass Road
- upgrade existing pedestrian facilities to incorporate appropriate ADA elements such as directional curb ramps, pedestrian refuge islands, and audible pedestrian signals
- incorporate pavement delineation with enhanced crosswalk markings
- install pedestrian countdown signals
- realign ramp termini square to the cross street, where feasible
- add pedestrian-scale lighting upgrades at the SR 242 pedestrian undercrossing and the new pedestrian bridge over Pine Creek
- widen sidewalks to 10 feet minimum

The existing pedestrian bridge over Pine Creek on the north side of westbound Willow Pass Road would remain as is.

Storm Water Treatment

The Build Alternatives would include constructing biofiltration strips, biofiltration swales, and detention basins to collect and treat storm water runoff. Biofiltration is a pollution control technique using living material (vegetation) to capture sediment and pollutants from storm water runoff. Biofiltration strips are vegetated sections of land that capture sediment and pollutants as storm water passes over them in sheet flows. Biofiltration swales are vegetated ditches with a layer

of imported biofiltration soil underneath and a layer of permeable material with an underdrain further below. Storm water is directed into biofiltration swales by concentrated flow. Detention basins temporarily detain storm water, letting sediment in the storm water settle to the bottom of the basin, before discharging the water through an outlet.

In locations where biofiltration swales would not sufficiently treat storm water, such underground detention facilities would be proposed to temporarily detain storm water. The underground detention facilities would consist of oversized pipes, ranging from 30 to 60 inches in diameter, upstream of a water quality inlet. These facilities would provide storm water storage and would regulate the discharge to the collecting water bodies.

Lighting

The Build Alternatives would provide enhanced lighting to improve roadway visibility for drivers during nighttime hours. Lighting would be installed at ramp merges, diverges, the new auxiliary lane along the shoulders of SR 242 and on each side of the existing Clayton undercrossing. The electroliers would either be supported on a cast-in-drilled-hole concrete pile (with a typical diameter of 2.5 feet and depth of 5 feet), or mounted on a structure. New power-service connections would be required for lighting along the shoulders which would involve trenching to install conduit. Lighting upgrades would be made to the SR 242 pedestrian undercrossing. The proposed pedestrian bridge over Pine Creek on the south side of eastbound Willow Pass Road would also include lighting upgrades.

Traffic Operation Systems

Ramp metering equipment is currently installed and operational at all SR 242 on-ramps within the study area. The ramp meters operate along southbound SR 242 during the AM peak period and along northbound SR 242 during the PM peak period. As the ramps would be modified and realigned to accommodate the proposed improvements under the Build Alternatives, the affected ramp metering equipment would be modified or replaced, as necessary. The new SR 242 on-ramps that would be constructed by the project would also be metered. Other traffic operation system elements (i.e. closed circuit television and traffic monitoring stations) are also proposed at the new on-ramps under Build Alternatives 1 and 2.

Unique Features of the Build Alternatives

As previously discussed, the Build Alternatives contain similar design features; the main differences are related to the alignment of the proposed ramp structures. Detailed descriptions of each of the design features that would differ between the Build Alternatives are provided below.

Bridge Modifications

Within the project limits, the proposed improvements require the modification of the existing SR 242 pedestrian undercrossing and the construction of three new bridge structures for Build Alternative 1 and two new bridge structures for Build Alternative 2. **Table 1-1** lists the new and modified structures that would be included in the Build Alternatives.

Cast-in-drilled-hole concrete pile foundations are proposed for structures immediately adjacent to Pine Creek to minimize impacts to the existing U-shaped concrete channel walls during construction, and to ensure that new structures do not impart any additional loads on the existing channel walls. Localized dewatering may be required for foundation excavation. Groundwater conditions would be verified during the final design phase.

Table 1-1 New and Modified Structures

Structure	Build Alternative	Description/Modification	Foundation Type
SR 242 pedestrian undercrossing	1 and 2	Extend the northbound SR 242 off-ramp to Clayton Road approximately 40 feet; extend the southbound SR 242 on-ramp from Clayton Road approximately 40 feet. Existing reinforced concrete box structure has inner dimensions of 10 feet x 11 feet. Clayton Rd on-ramp requires modification to allow standard vertical clearance	Reinforced concrete box supported on slab foundation
Southbound SR 242 off-ramp/Willow Pass Road ramp separation	1	New 3-span cast-in-place / pre-stressed box girder structure (approx. 300 feet long x 28 feet wide)	Spread footing supported on 24-inch diameter driven piles, approx. 50 to 60 feet below ground surface
Southbound SR 242 off-ramp/Pine Creek bridge	2	New single-span cast-in-place / pre-stressed box girder structure (approx. 70 feet long x 40 feet wide)	Spread footing supported on 24-inch diameter driven piles, approx. 50 to 60 feet below ground surface
Northbound SR 242 on-ramp/Willow Pass Road ramp separation	1	New 3-span cast-in-place / pre-stressed box girder structure (approx. 300 feet long x 40 feet wide)	Spread footing supported on 24-inch diameter driven piles, approx. 50 to 60 feet below ground surface
Pine Creek multi-use path bridge	1 and 2	New prefabricated steel truss bridge, approx. 61 feet long	Spread footing supported on 24-inch diameter cast-in-drilled-hole concrete piles, approximately 25 feet below ground surface

Source: WMH, 2016

Signage

Overhead guide signs along northbound and southbound SR 242 would inform motorists of the approaching exit ramps associated with the new interchange improvements. A total of four overhead sign structures are proposed along SR 242 under Build Alternative 1, and three existing guide signs would be removed. A total of five overhead sign structures are proposed along SR 242 under Build Alternative 2, and four existing guide signs would be removed. All overhead sign structures would have a maximum height of approximately 34 feet and would be supported on a cast-in-drilled-hole concrete pile foundation with a typical diameter of 5 feet and length of 25 feet.

Up to 18 smaller guide signs along the local roadways surrounding the interchange would also be modified or replaced by the Build Alternatives. The local roadway signs would be mounted on wooden posts (embedded up to 6 feet below ground surface), traffic signal poles, and light poles.

Construct Retaining Walls

The proposed improvements would require construction of retaining walls to minimize impacts to private property. Retaining wall heights would vary from 5 feet to 28 feet. The combined length of retaining walls to be constructed under Build Alternatives 1 and 2 would vary from approximately 6,675 feet to 8,713 feet, respectively.

Caltrans standard retaining walls would be used with either a spread footing or cast-in-drilled-hole concrete pile foundations. Standard retaining walls supported by a spread footing up to 5 feet below ground surface would be generally used in locations where the retaining wall would be constructed at the base of a slope. In those locations, extra soil would be needed to fill in behind the wall. Standard retaining walls supported by cast-in-drilled-hole concrete pile foundations would require excavation (the removal of drilled material) of up to 25 feet.

Table 1-2 summarizes the potential locations of retaining walls for each Build Alternative. The detailed layout sheets in **Appendix G** illustrate the limits of the retaining walls that would be needed for the project.

Utility Relocations

Both Build Alternatives would require that some utilities be relocated in order to construct the proposed roadway improvements. The following utility relocations are expected:

Alternative 1

- PG&E 21 KV overhead electrical line along Franquette Avenue

Alternative 2

- Kinder Morgan oil pipeline along the east side of SR 242 on the north side of Willow Pass Road

Table 1-2 Retaining Wall Locations

Wall No.	Location	Height (feet)	Length (feet)
Build Alternative 1			
105	SB SR 242 on-ramp	5 to 6	2,005
124	NB SR 242 on-ramp	5 to 7	80
125	NB SR 242 off-ramp	5 to 7	500
126	SB SR 242 on-ramp	5 to 6	175
128	SB SR 242 on-ramp	5 to 6	45
131	SB SR 242 off-ramp	5 to 15	255
134	NB SR 242 on-ramp	5 to 10	320
135	NB SR 242 on-ramp	5 to 10	370
141	NB SR 242 on-ramp	5 to 22	710
142	SB SR 242 off-ramp and aux lane	5 to 28	2,215
Total Build Alternative 1			6,675
Build Alternative 2			
101	SB SR 242 on-ramp	5 to 6	2,315
124	NB SR 242 off-ramp	5 to 7	80
125	NB SR 242 off-ramp	5 to 7	500
126	SB SR 242 on-ramp	5 to 6	1,110
140	SB SR 242 off-ramp	5 to 6	680
141	NB SR 242 on-ramp	5 to 22	1,405
142	SB SR 242 off-ramp and aux lane	5 to 6	2,265
143	NB SR 242 on-ramp	5 to 6	358
Total Build Alternative 2			8,713

Source: WMH, 2016

Park-and-Ride Lot

A State-owned Park-and-Ride lot is located east of SR 242 between the southbound SR 242 on-ramp and Willow Pass Road. The Park-and-Ride lot has approximately 45 parking spaces, and provides patrons the option to park their cars for the day free of charge to connect to several County Connection bus lines. Under Build Alternative 1, two parking spaces at the Park-and-Ride lot would be displaced in order to accommodate the new northbound SR 242 on-ramp at Clayton Road.

Build Alternative 2 would not affect the Park-and-Ride lot.

Design Exceptions

Non-standard project features (Design Exceptions) would be implemented as part of the project in order to minimize environmental impacts. Build Alternatives 1 and 2 would require a similar number of design exceptions with 13 and 14 exceptions, respectively. Caltrans would need to approve the exceptions prior to the certification of the final environmental document and selection of a preferred alternative.

Construction Schedule

Construction of the project is anticipated to take approximately two years to complete. Construction could potentially commence in early 2020, if funding is secured in the near future.

Transportation System Management and Transportation Demand Management Alternatives

System management strategies increase the efficiency of existing transportation facilities without increasing the number of through lanes. Examples of system management strategies include ramp metering, auxiliary lanes, turning lanes, reversible lanes and traffic signal coordination. System management also encourages a unified urban transportation system that integrates multiple forms of transportation modes such as pedestrian, bicycle, automobile, rail, ferry, and mass transit. Although Transportation System Management measures alone could not satisfy the purpose and need of the project, the following Transportation System Management measures have been incorporated into the Build Alternatives for this project:

- construct a new auxiliary lane on southbound SR 242 connecting the Concord Avenue loop on-ramp to the new off-ramp to Franquette Avenue (Build Alternative 1) or Willow Pass Road (Build Alternative 2)
- install ramp metering equipment on new northbound on-ramp at Clayton Road (Build Alternative 1) or Willow Pass Road (Build Alternative 2) and new southbound loop on-ramp (Build Alternative 1)
- modify ramp metering equipment on southbound SR 242 on-ramp (Build Alternative 1)
- construct a new pedestrian bridge over Pine Creek on the south side of Willow Pass Road (Build Alternatives 1 and 2)
- upgrade existing pedestrian facilities to incorporate appropriate ADA elements (Build Alternatives 1 and 2)
- incorporate pavement delineation with crosswalk markings (Build Alternatives 1 and 2)
- install pedestrian countdown signals (Build Alternatives 1 and 2)

There are several Transportation Demand Management strategies within the San Francisco Bay Area that are used to reduce the number of vehicle trips within the SR 242 corridor. Rideshare offers carpoolers reduced bridge tolls as well as access to carpool lanes. There are also vanpools for

larger groups of commuters. Transportation demand management may also involve the provision of contract funds to regional agencies that are actively promoting ridesharing, maintaining rideshare databases, and providing limited rideshare services to employers and individuals. However, without the construction of the improvements described in the Build Alternatives, successful implementation of a transportation demand management alternative would not substantially improve the safety and operation of the freeway and local roadways within the project area. A Transportation Demand Management alternative by itself would not satisfy the purpose of the project.

NO-BUILD ALTERNATIVE

Under the No-Build Alternative, none of the improvements described under the Build Alternatives would occur. The No-Build Alternative is considered the environmental baseline against which potential environmental effects of the Build Alternatives are evaluated.

COMPARISON OF ALTERNATIVES

As previously discussed, the Build Alternatives contain similar design features with regards to the provision of new SR 242/Clayton Road Ramps. The differences between the Build Alternatives relate to the alignment of the proposed ramp structures and associated facilities. **Table 1-3** presents a summary of the differences between the Build Alternatives.

Table 1-3 Comparison of Build Alternatives

Major Design Component	Build Alternative 1	Build Alternative 2
Southbound SR 242 ramps	<ul style="list-style-type: none"> ▪ Existing southbound SR 242/Clayton Road on-ramp would remain ▪ New southbound SR 242 on- and off-ramps at Franquette Avenue 	<ul style="list-style-type: none"> ▪ Existing southbound SR 242/Clayton Road on-ramp would remain ▪ New southbound SR 242 on- and off-ramps at Willow Pass Road
Northbound SR 242 ramps	<ul style="list-style-type: none"> ▪ Existing northbound SR 242/Clayton Road off-ramp would remain; widened to two-lanes ▪ New northbound SR 242 on-ramp at Clayton Road 	<ul style="list-style-type: none"> ▪ Existing northbound SR 242/Clayton Road off-ramp would remain; widened to two-lanes ▪ New northbound SR 242 on-ramp at Willow Pass Road
Southbound SR 242 auxiliary lane	<ul style="list-style-type: none"> ▪ Between Concord Avenue and new off-ramp diverge to Franquette Avenue (2,000 feet) 	<ul style="list-style-type: none"> ▪ Between Concord Avenue and new off-ramp diverge at Willow Pass Road (1,303 feet); requires design exception for non-standard length
Pine Creek overhead ramp structures	Two	One

Major Design Component	Build Alternative 1	Build Alternative 2
Bike/pedestrian improvements	<ul style="list-style-type: none"> ▪ Extension of existing SR 242 pedestrian undercrossing ▪ New Pine Creek pedestrian bridge along eastbound Willow Pass Road 	Same
Local roadway widening/restriping	<ul style="list-style-type: none"> ▪ Northbound Market Street to SR 242 on-ramps ▪ Westbound Clayton Road to southbound Market Street ▪ Westbound Willow Pass Road to Franquette Avenue ▪ Northbound Market Street to westbound Concord Avenue ▪ Northbound Commerce Avenue to westbound Concord Avenue ▪ Westbound Concord Avenue to Commerce Avenue 	<ul style="list-style-type: none"> ▪ Northbound Market Street to SR 242 on-ramps ▪ Westbound Clayton Road to southbound Market Street ▪ Northbound Market Street to westbound Concord Avenue ▪ Northbound Commerce Avenue to westbound Concord Avenue ▪ Westbound Concord Avenue to Commerce Avenue

The No-Build Alternative would not include the proposed features of Build Alternatives 1 and 2. The No-Build Alternative would not address the needs described in **Section 1.2.2, Need**; therefore, the No-Build Alternative would not provide an immediate benefit to motorists by reducing congestion and delay on the local roadways in the project area.

Final Decision Making Process

After comparing and weighing the benefits and impacts of all of the feasible alternatives (e.g., improvements to traffic conditions, right-of-way needs, etc.) the project development team will select a preferred alternative, subject to public review. Final identification of a preferred alternative will occur after the public review and comment period, and all comments are considered. With the selection of a preferred alternative, Caltrans will make the final determination of the project's effect on the environment. Under CEQA, if no unmitigable significant adverse impacts are identified, Caltrans will prepare a Negative Declaration (ND) or Mitigated ND. Similarly, if Caltrans determines the action does not significantly impact the environment, Caltrans, as assigned by the Federal Highway Administration (FHWA), will issue a Finding of No Significant Impact (FONSI) in accordance with NEPA.

1.3.2 PROJECT COST AND FUNDING

CONSTRUCTION COST

The total project cost of the proposed improvements, in 2019 dollars, for Build Alternatives 1 and 2 are \$65,700,000 and \$51,200,000; respectively. The breakdown of project costs is provided in **Table 1-4**.

Table 1-4 Project Cost Estimate Summary

	Build Alternative 1	Build Alternative 2
Roadway	\$33,584,000	\$32,360,000
Structures	\$6,616,000	\$1,190,000
<i>Subtotal Construction Costs</i>	<i>\$40,200,000</i>	<i>\$33,550,000</i>
Right-of-Way	\$6,650,000	\$1,600,000
Utility Relocation	\$4,750,000	\$3,750,000
<i>Subtotal Other Capital Costs</i>	<i>\$11,400,000</i>	<i>\$5,350,000</i>
<i>Support Costs (PS&E, R/W Support and Construction Administration)</i>	<i>\$14,100,000</i>	<i>\$12,300,000</i>
TOTAL PROJECT COST	\$65,700,000	\$51,200,000

Source: WMH Corporation; 2016

FUNDING

In order for a project to obtain NEPA approval, the project must be in the current RTP and, if necessary, future RTPs. MTC is responsible for adopting the Bay Area's RTP. The current version is titled as the Plan Bay Area 2040. Adopted by MTC on July 18, 2013, the Plan Bay Area 2040 describes the strategies and investments required to maintain, manage, and improve the transportation network within the nine-county San Francisco Bay Area. MTC now updates the RTP every four years.

The SR 242/Clayton Ramps Project is included in the current RTP (reference No. 22388), in the Financially Constrained Element with a combination of programmed and planned local funds available over the long term of the Plan Bay Area 2040 and it has been determined that this project is eligible for Federal-aid funding. A total of \$34.7 million is programmed for this project as shown in **Table 1-5**. These funds include sources from the CCTA Strategic Plan, dated December 2013, which has committed \$5.8 million in local sales tax revenue (Measure J) funds to the Project. The remaining \$29 million is programmed from future funding sources as listed in **Table 1-6**.

Table 1-5 Project Funding

RTP Reference Number	Project Purpose	Funding Amount
22388	Construct on- and off-ramp for State Route 242 at Clayton Road to improve circulation and access; and to increase travel time savings by providing direct access to points to and from Route 242 with downtown Concord.	\$34.7 million

Source: WMH Corporation, 2016

Table 1-6 represents funding sources for the cost to complete Build Alternative 1. Build Alternative 2 would be slightly less expensive, but the funding sources would only deviate in the amount of dollars shown in the “to be determined” category. Once an alternative is chosen through the environmental process, CCTA will work with MTC to revise the current RTP funding amount to accommodate the completion of the chosen alternative and corresponding support costs.

Table 1-6 Funding Sources – Build Alternative 1

Funding Source	PA&ED	PS&E	Right-of-Way	Construction	Capital	Total
Local Funding	\$2,200,000	\$1,500,000	\$1,300,000	\$0	\$0	\$4,800,000
Regional Transportation Plan – Long Range Plan (RTP-LRP)	\$0	\$0	\$2,700,000	\$0	\$27,220,000	\$29,920,000
To be Determined (TBD)	\$0	\$4,200,000	\$7,900,000	\$5,700,000	\$12,980,000	\$30,810,000
Total	\$2,200,000	\$5,700,000	\$11,900,000	\$5,700,000	\$40,200,000	\$65,700,000

Source: WMH Corporation, 2016

1.3.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER DISCUSSION

PROJECT STUDY REPORT-PROJECT DEVELOPMENT SUPPORT (PSR-PDS) ELIMINATED ALTERNATIVES

An alternatives assessment study was conducted to identify viable alternatives for further study during the project initiation document (PID) phase of project development. A total of 17 conceptual alternatives were developed and a screening process was conducted to assess any fatal flaws associated with each alternative. Thirteen conceptual alternatives were eliminated from further discussion or consideration as summarized in **Table 1-7**.

The alternatives assessment study identified Alternatives 3, 4A, 6, 12A for further study in the project initiation document. These four alternatives were renamed to Alternatives A, B, C, and D, respectively.

Table 1-7 Alternatives Considered but Eliminated from Further Discussion

Alt	Description	Reason for Eliminating
1	SB Off-Ramp at Franquette/ NB On-Ramp at Clayton	<ul style="list-style-type: none"> ▪ Nonstandard interchange configuration ▪ Isolated off-ramp to Franquette ▪ Not supported by Concord
2	SB Off-Ramp at Franquette/ NB On-Ramp at Clayton	<ul style="list-style-type: none"> ▪ Nonstandard interchange configuration ▪ Isolated off-ramp to Franquette
4	Tight Diamond Interchange (Clayton)	<ul style="list-style-type: none"> ▪ Nonstandard intersection spacing ▪ Insufficient left-turn storage at ramp termini ▪ Not supported by Concord
5	Tight Diamond Interchange (Willow Pass)	<ul style="list-style-type: none"> ▪ SB On-Ramp and NB Off-Ramp traffic expected to exceed available capacity on Willow Pass ▪ Not support by Concord
5A	Tight Diamond Interchange (Willow Pass) w/ Connection to SB On- Ramp	<ul style="list-style-type: none"> ▪ NB Off-Ramp traffic expected to exceed available capacity on Willow Pass ▪ Not support by Concord
7	Split Diamond Interchange (Clayton/ Willow Pass)	<ul style="list-style-type: none"> ▪ Nonstandard interchange configuration ▪ Insufficient left-turn storage at ramp termini ▪ Not supported by Concord
8	SB Off-Ramp at Willow Pass/ NB On-Ramp at Clayton	<ul style="list-style-type: none"> ▪ Nonstandard interchange configuration ▪ Isolated off-ramp to Willow Pass ▪ SB Off-Ramp terminates opposite local street ▪ Not supported by Concord

Alt	Description	Reason for Eliminating
9	SB On-Ramp and Off-Ramp at Willow Pass/ NB On-Ramp at Clayton	<ul style="list-style-type: none"> ▪ SB Off-Ramp terminates opposite local street ▪ Significant property impact due to loss of driveway access ▪ Not supported by Concord
10	SB On-Ramp and Off-Ramp at Willow Pass/ NB On-Ramp at Clayton	<ul style="list-style-type: none"> ▪ SB Off-Ramp terminates opposite local street ▪ Not supported by Concord
11	Split Diamond Interchange (Clayton/ Willow Pass) With On-Way Couplet	<ul style="list-style-type: none"> ▪ Nonstandard interchange configuration ▪ Significant wayfinding concerns ▪ Not supported by Caltrans and Concord
11A	Diamond Interchange (Clayton) with One-Way Couplet	<ul style="list-style-type: none"> ▪ Significant wayfinding concerns ▪ Not supported by Concord
12	NB On-Ramp at Clayton/ TSM Improvements	<ul style="list-style-type: none"> ▪ NB On-Ramp would not be part of TSM Alt ▪ Level of improvements would need to be comparable to ramp modification alternatives
12B	Willow Pass Rd/ Market St/ Pine St Intersection Roundabout	<ul style="list-style-type: none"> ▪ Significant property/ business impacts (and R/W cost) to accommodate roundabout footprint ▪ Operational concerns ▪ Not supported by Concord

Note: SB= southbound; NB=northbound; Source: WMH Corporation, 2016

PROJECT APPROVAL/ENVIRONMENTAL DOCUMENT ELIMINATED ALTERNATIVES

Early in the project approval/environmental document (PA/ED) phase, the Project Development Team agreed to eliminate PID Alternative B and incorporate PID Alternative D improvements into the remaining build alternatives. PID Alternatives A and C were subsequently renamed to Build Alternatives 1 and 2, respectively. PID Alternative B proposed replacing the existing SR 242/Clayton Road interchange with a new Single Point Urban Interchange (SPUI) interchange. Clayton Road would be extended to connect with Franquette Avenue. The SPUI ramp termini and the new Clayton Road/Franquette Avenue intersection would be signalized. The southbound auxiliary lane proposed between Concord Avenue and Clayton Road would also be included in PID Alternative B. Enhanced bicycle and pedestrian facilities, and additional signage to improve wayfinding to and from SR 242 would be considered.

Eliminated Alternative B

PID Alternative B was eliminated due to constructability concerns and a disproportionate capital cost for a local interchange improvement project (\pm \$100 million). Furthermore, the high cost compared to the relative benefits would limit the ability to attract sufficient funding for this alternative. Major freeway detour construction to replace the Clayton Road undercrossing (including temporary bridge crossings at Willow Pass Road and Clayton Road) would be required. Traffic handling during construction to maintain an acceptable level of operation on the state highway system and on local streets would also be complex and costly. Significant nighttime work

involving full mainline and street closures could be expected due to high traffic volumes experienced during daytime hours (weekdays and weekends). Also, significant impacts to local businesses and residences would be expected. Lowering of Clayton Road under SR 242 would require lowering of EBMUD aqueducts. The utility owner is not expected to agree to this and it may not be feasible to relocate the aqueducts due to right-of-way constraints.

Eliminated Alternative D

PID Alternative D proposed no improvements to the existing Clayton Road and Concord Avenue interchanges leaving it as a partial interchanges with no new connections to or from SR 242. Potential improvements under this alternative included ramp and local street widening to provide additional storage for queuing vehicles, enhanced bicycle and pedestrian facilities, and additional signage to improve wayfinding to and from SR 242. PID Alternative D was eliminated from further study since it would not meet the project's purpose and need. The alternative only included local street improvements but no change in freeway access (i.e., no new connections to or from SR 242). However, design elements from Alternative D have been incorporated into the current Build Alternatives.

Eliminated Alternative C (*ramp extension*)

PID Alternative C (later renamed to Build Alternative 2) included the construction of an extension to the northbound SR 242 Clayton Road off-ramp to connect with Willow Pass Road. The ramp extension was originally proposed to create a diamond configuration with Willow Pass Road. As part of the alternative refinement process, the following issues were identified with the ramp extension:

- Would require closure of the State-owned Park-and-Ride lot
- An initial traffic operations assessment indicated a degradation of vehicle operations at the Willow Pass Road/Market Street intersection
- Would require approval of several nonstandard design features (i.e. profile grade, design speed, stopping sight distance, gore area grades, and intersection spacing)

Based on the environmental impacts as well as traffic operations and safety concerns identified, the extension of the northbound SR 242 off-ramp to Willow Pass Road was eliminated from Build Alternative 2.

Eliminated Build Alternative 1A

Build Alternative 1A was developed as a design variation of Build Alternative 1 to minimize right-of-way impacts to the commercial property just east of the new southbound SR 242 ramps intersection (APN 126-380-003). After further study, the configuration of the new southbound ramps intersection at Franquette Avenue was found to introduce the following motorists' turning movements that represent significant safety concerns for bicyclists and pedestrians:

- the skewed angle of the southbound SR 242 off-ramp approaching the intersection at Franquette Avenue would be confusing for vehicles to navigate and could encourage wrong way vehicular movement
- the new off-ramp would allow free right turns to occur

Since Franquette Avenue is a planned bicycle and pedestrian route for Concord, a fully signalized intersection at the southbound SR 242 ramps terminal with pedestrian and bicycle facilities on both sides of Franquette Avenue would be required. Because Build Alternative 1A introduces turning movements that raise significant safety concerns for bicyclists and pedestrians, and cannot provide continuous bicycle and pedestrian facilities on both sides of Franquette Avenue, this design option was officially withdrawn from further consideration in May 2015.

Roundabout Intersections

A project must consider various strategies, treatments, configurations, and countermeasures at intersections to identify the most effective and comprehensive access alternatives. This means that all proposals for intersection design should consider and perform a high-level evaluation of yield-controlled roundabouts as a potential method of intersection control. The following five locations were evaluated for potential roundabout control:³

1. Clayton Road/Market Street/SR 242 ramps (Build Alternatives 1 and 2)
2. Willow Pass Road/Market Street (Build Alternatives 1 and 2)
3. Proposed Franquette Avenue/ SR 242 southbound ramps (Build Alternative 1)
4. Proposed Willow Pass Road/ SR 242 northbound ramps (Build Alternative 2)
5. Proposed Willow Pass Road/ SR 242 southbound ramps (Build Alternative 2)

The *2010 Highway Capacity Manual (HCM)* methodology for roundabout capacity as presented in *NCHRP Report 672 – Roundabouts: An Informational Guide, Second Edition* (TRB, 2010) was applied to evaluate potential roundabout locations listed above. According to the methodology, a one-lane roundabout is potentially adequate for maximum circulating hourly volumes less than 1,000 vehicles per hour (vph), or less than 1,800 vph for a two-lane roundabout. Maximum circulating volumes greater than 1,800 vph generally require more than two circulating lanes within the roundabout to operate adequately. A two-lane roundabout would potentially provide adequate traffic control at the proposed Franquette Avenue/SR 242 southbound ramps intersection under Build Alternative 1; all other locations would require a roundabout of three lanes or more. A three-lane roundabout at any of these locations would result in substantial impacts to private properties, including potential displacement of commercial businesses. The roundabout would also result in highly complex traffic operational characteristics that would increase driver confusion and reduce safety at this intersection.

³ Fehr & Peers, 2013. *Intersection Control Evaluation*.

A one-lane roundabout would potentially operate adequately at the proposed Franquette Avenue/SR 242 southbound ramps intersection. However, even the one-lane roundabout would result in impacts to private property (approximately 12,000 square feet from two properties), including the closure of a one way access into a commercial parking garage and a partial demolition of a structure requiring business relocation. Concord was not in favor of this option because it would affect local businesses, and would also increase driver confusion with the addition of a non-characteristic roundabout. Since the major benefit of a roundabout is the allowance of free flow traffic not hindered by a traffic signal, signalization for bicycles/pedestrians contradicts these benefits, as it forces people to stop for longer periods of time and causes a back-up or queue in the roundabout. Additional nonstandard features that would be created at the on- and off-ramps include sight distance and minimum horizontal radius issues. The roundabout intersection options were withdrawn from further consideration for these reasons, as well as lack of support from Concord.

1.3.4 PERMITS AND APPROVALS NEEDED

Table 1-8 identifies permits and approvals that would be required for project construction.

Table 1-8 Permits and Approvals Needed

Agency	Permit/Approval	Status
State Historic Preservation Officer (SHPO)	Concurrence on Finding of No Historic Properties Affected	Concurrence issued August 7, 2015
Contra Costa County Flood Control and Water Quality District	Construction Permit (work within Pine Creek right-of-way)	Issued during the Final Design Phase
East Bay Municipal Utility District	Construction Permit (work within Mokelumne Aqueduct right-of-way)	Issued during the Final Design Phase
FHWA	Concurrence on Project-Level Air Quality Conformity	Air Quality Conformity Assessment will be submitted for FHWA concurrence after public review of the IS/EA