

TRANSPLAN Technical Advisory Committee

Participating entities: Cities of Antioch, Brentwood, Oakley and Pittsburg • Contra Costa County
Tri Delta Transit • 511 Contra Costa • Contra Costa Transportation Authority (CCTA) • Caltrans District 4 • BART
TRANSPLAN • State Route 4 Bypass Authority • East Contra Costa Regional Fee & Financing Authority (ECCRFFA)

Special Meeting

July 28, 2022 – 9:00 a.m. to 12:00 p.m.

Virtual meeting call-in/log-in information:

Please join my meeting from your computer, tablet or smartphone.

<https://cccouny-us.zoom.us/j/87493548551>

Or Telephone:

Dial:

USA 214 765 0478 US Toll

USA 888 278 0254 US Toll-free

Conference code: 841892

AGENDA

NOTE: The Technical Advisory Committee ("TAC") agenda/packet is only distributed digitally, no paper copies will be sent. If you need a printed copy, please contact TRANSPLAN staff.

Action/Discussion Items (see attachments where noted [♦])

Item 1: Public Comment: The public will have an opportunity to comment on items not on the agenda.

Item 2: East County Action Plan Update. Contra Costa Transportation Authority (CCTA) and consultant staff will lead a discussion on the following topics related to the East County Action Plan for Routes of Regional Significance and the Contra Costa Countywide Transportation Plan (CTP):

- A. proposed Regional Transportation Objectives (RTOs),
- B. proposed Actions, and
- C. draft Corridor Maps.

CCTA and consultant staff seek input from TRANSPLAN TAC on these topics. ♦ **Page 2**

Item 3: Other Business

Item 4: Adjourn to Tuesday, August 16, 2022, at 1:30 p.m. or other day/time as deemed appropriate by the Committee.

The TAC will meet on the third Tuesday of each month, 1:30 p.m. Meetings are currently held via video conference in response to Contra Costa County Health Services Health Orders related to the COVID-19 pandemic: <https://www.coronavirus.cchealth.org/health-orders>. Otherwise, the TAC meets at the third floor conference room at Antioch City Hall. The TAC serves the TRANSPLAN Committee, the East Contra Costa Regional Fee & Financing Authority, and the State Route 4 Bypass Authority.

Persons needing a disability-related accommodation should contact Robert Sarmiento, TRANSPLAN staff person, at least 48 hours prior to the starting time of the meeting.

Consistent with TRANSPLAN Committee Resolution. 22-02 (AB 361 compliance) the TAC is authorized to hold virtual meetings.

ITEM 2

EAST COUNTY ACTION PLAN UPDATE.

ATTACHMENTS:

1. DRAFT CORRIDOR MAPS
2. DRAFT RTO METHODOLOGY MEMORANDUM
3. DRAFT RTO ANALYSIS MEMORANDUM
4. DRAFT ACTIONS MEMORANDUM
5. OUTREACH SUMMARY



MEMORANDUM

DATE June 27, 2022
TO RTPC TAC members
FROM John Hoang and Matt Kelly, CCTA
David Early and Torina Wilson, PlaceWorks
SUBJECT Mapping of Routes of Regional Significance

An ongoing component of the Action Plan updates is revising the existing Routes of Regional Significance (RRS) to create new maps that show multi-modal RRS in Contra Costa County and the Alameda County portion of the Tri-Valley area.

RRS's are transportation facilities that meet certain qualifying criteria and were nominated by local staff. The maps will help CCTA itself, local jurisdictions, and the general public know which roadway, transit, and active transportation facilities are important to the region, and will serve as the basis for monitoring and maintenance by CCTA and the Regional Transportation Planning Committees (RTPCs).

After extensive discussions with RTPC Technical Advisory Committees (TACs) and various community stakeholders, CCTA and the PlaceWorks team have created a series of maps that will show Routes of Regional Significance both as a multimodal network of travel corridors, and for individual modes. These maps are described below.

Overall Corridor Maps

PlaceWorks has created multimodal RRS "Corridor Maps" that show five different transportation modes (bus, rail, bike, freeway, and surface roadway) on a single map. The maps are intended to illustrate the multimodal nature of the transportation network, and to also show that multiple facilities exist in any given generalized transportation corridor.

There are six Corridor Maps included in this memorandum: one countywide and one for each RTPC subregion. These maps show the location, generalized routing, and modes of each corridor. They are not intended to be exact, but rather to show travel corridors of the multimodal transportation network, as dictated by our hilly geography and Bay coastline. There are several critical notes to these Corridor Maps:

- The Corridor Maps show desired future conditions, meaning some facilities and routes shown are planned but not yet constructed.
- The corridors shown on the maps are highly generalized to show multimodal conditions where they exist or may someday exist, and therefore include multiple facilities and routes within one corridor.

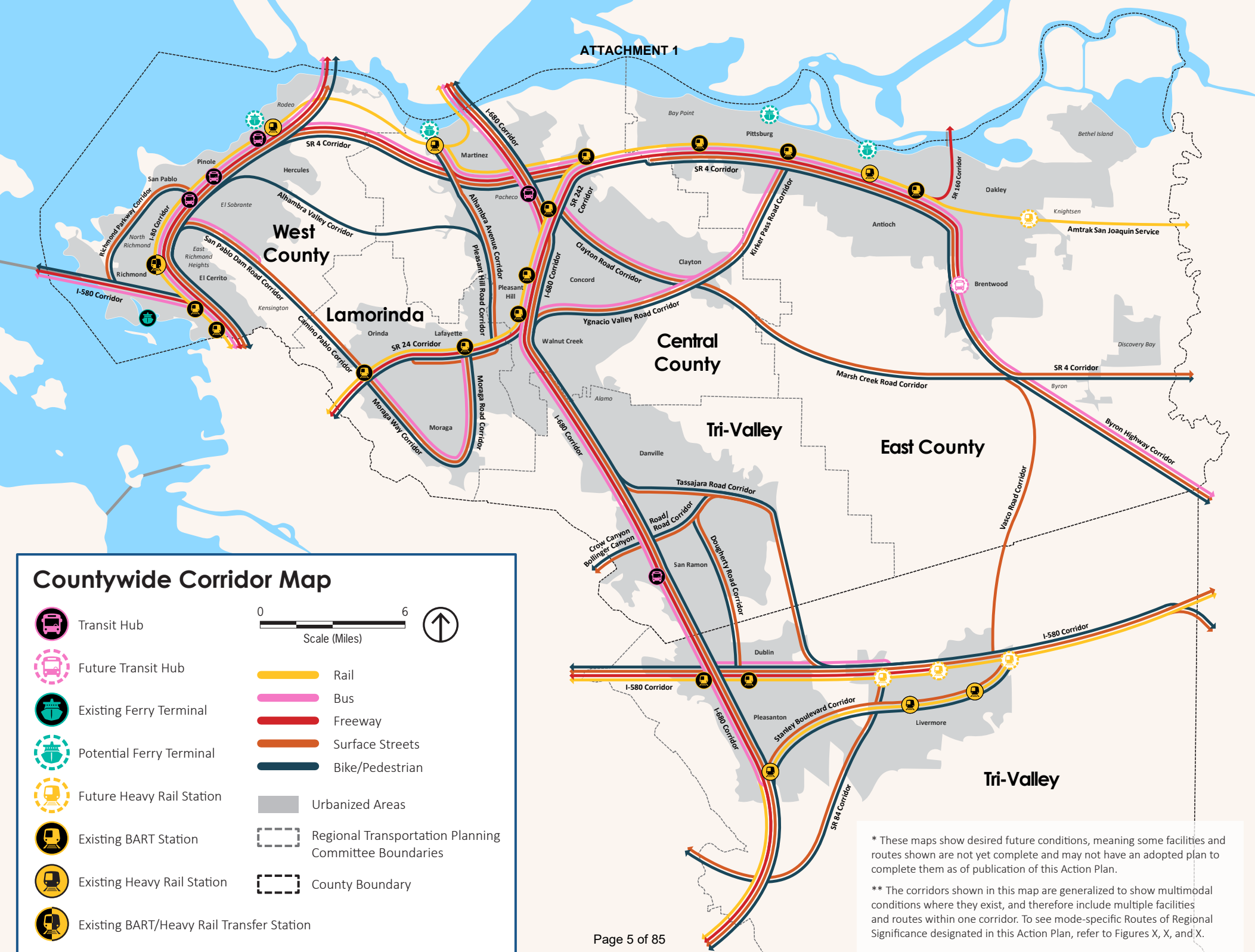


The draft Corridor Maps are attached to this memo. CCTA welcomes comment on them at future meetings, via email, or when the Action Plans themselves are published for review and adoption.

Mode Specific Maps

In addition to the Corridor Maps, each Action Plan will also include three mode-specific maps that will be tied to specific Regional Transportation Objectives (RTOs). Readers will be able to refer to these maps for a detailed depiction of existing and desired facilities:

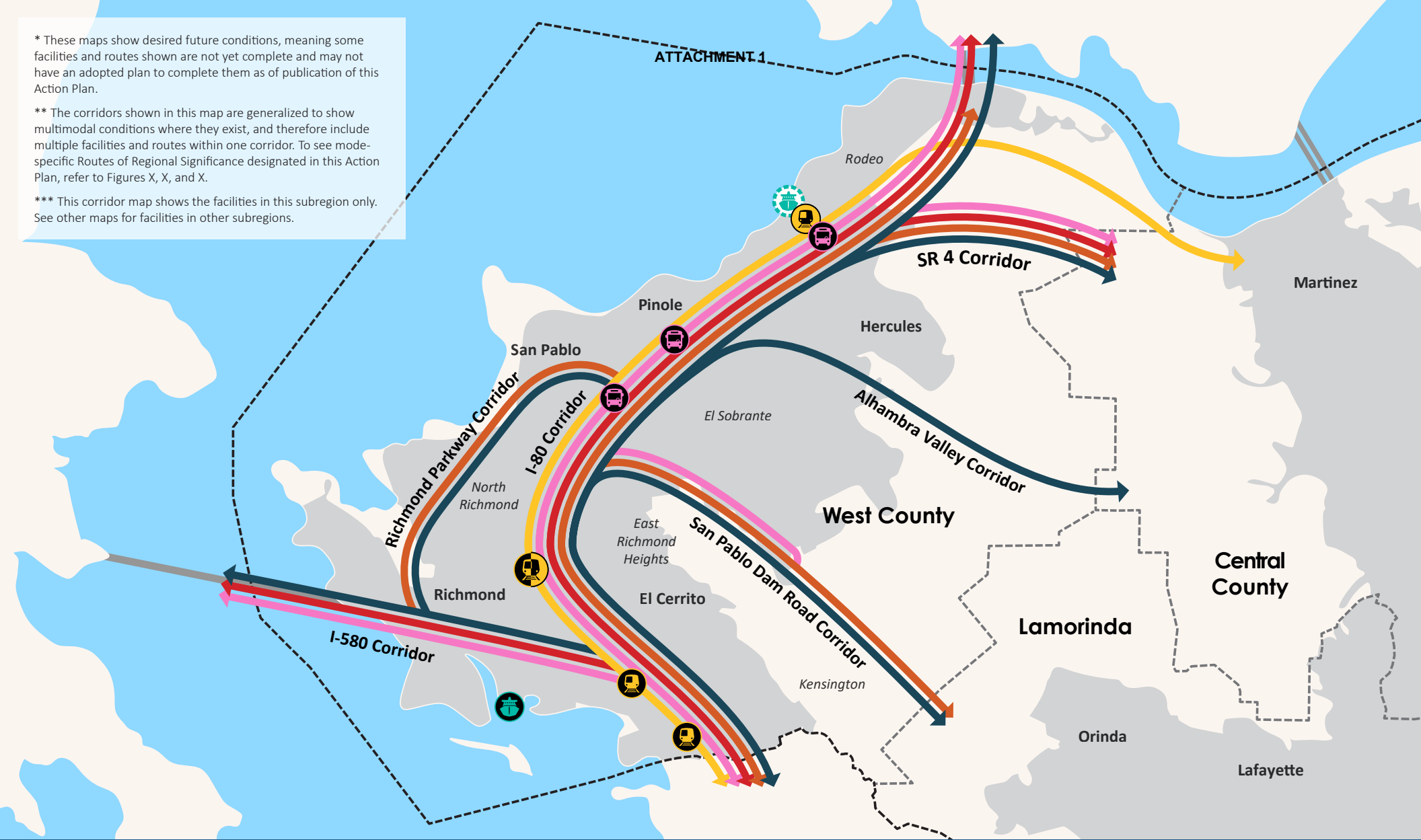
- **Vehicular Routes.** One or more maps in each Action Plan will show locations of key freeway and roadway segments and intersections that are to be monitored and maintained as part of the Action Plan process.
- **Low Stress Bike Network.** The Action Plans will contain one or more RTOs to move towards completion of CCTA's already-designated Low Stress Bike Network (LSBN) described in the 2018 Countywide Bicycle and Pedestrian Plan. Therefore, the Action Plans will include a map showing completed and yet-to-be-completed facilities on the LSBN.
- **Key Existing Transit Facilities.** Each Action Plan will include a map showing key transit routes that has been developed in conjunction with the TACs and local transit providers.

















* These maps show desired future conditions, meaning some facilities and routes shown are not yet complete and may not have an adopted plan to complete them as of publication of this Action Plan.

** The corridors shown in this map are generalized to show multimodal conditions where they exist, and therefore include multiple facilities and routes within one corridor. To see mode-specific Routes of Regional Significance designated in this Action Plan, refer to Figures X, X, and X.

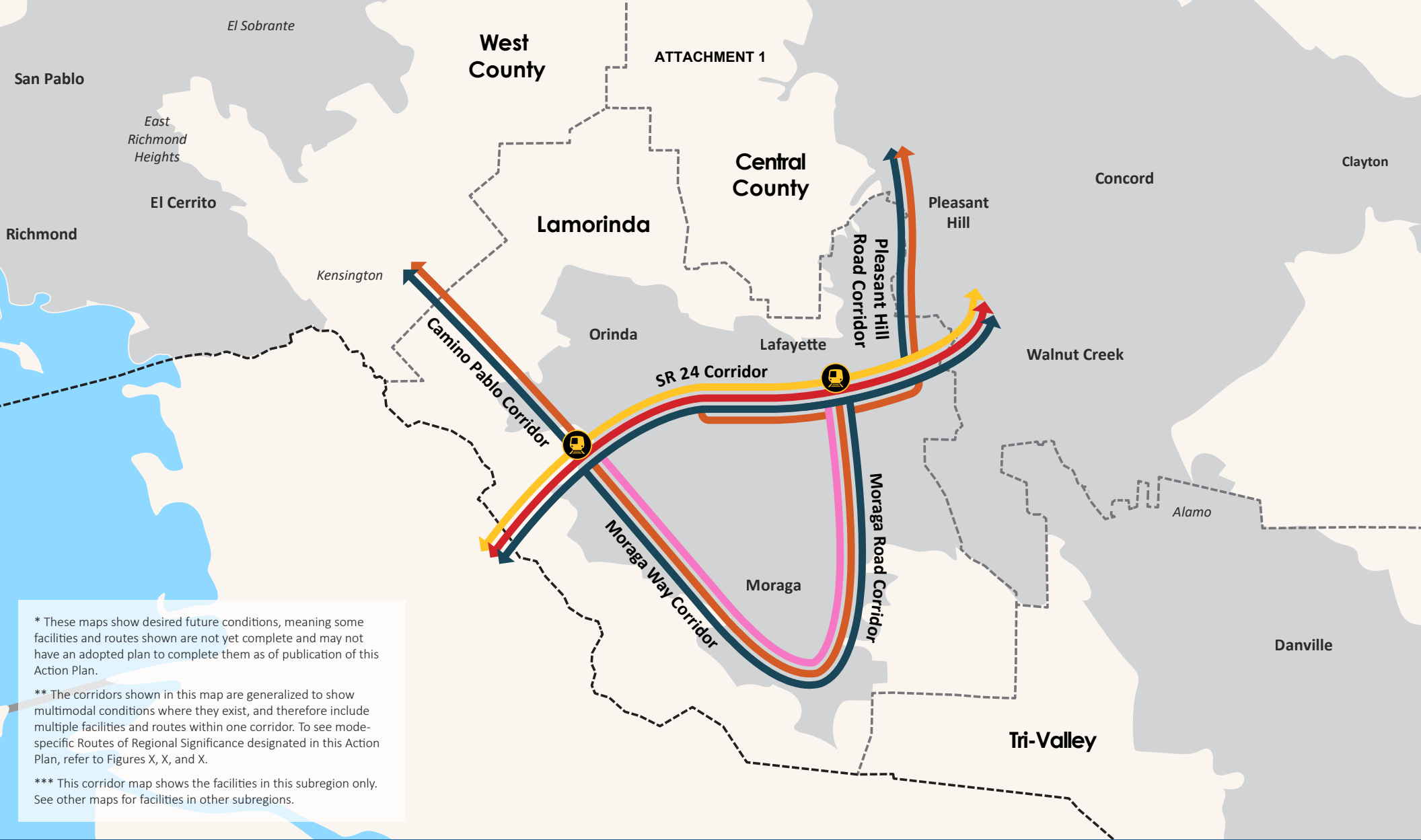
*** This corridor map shows the facilities in this subregion only. See other maps for facilities in other subregions.



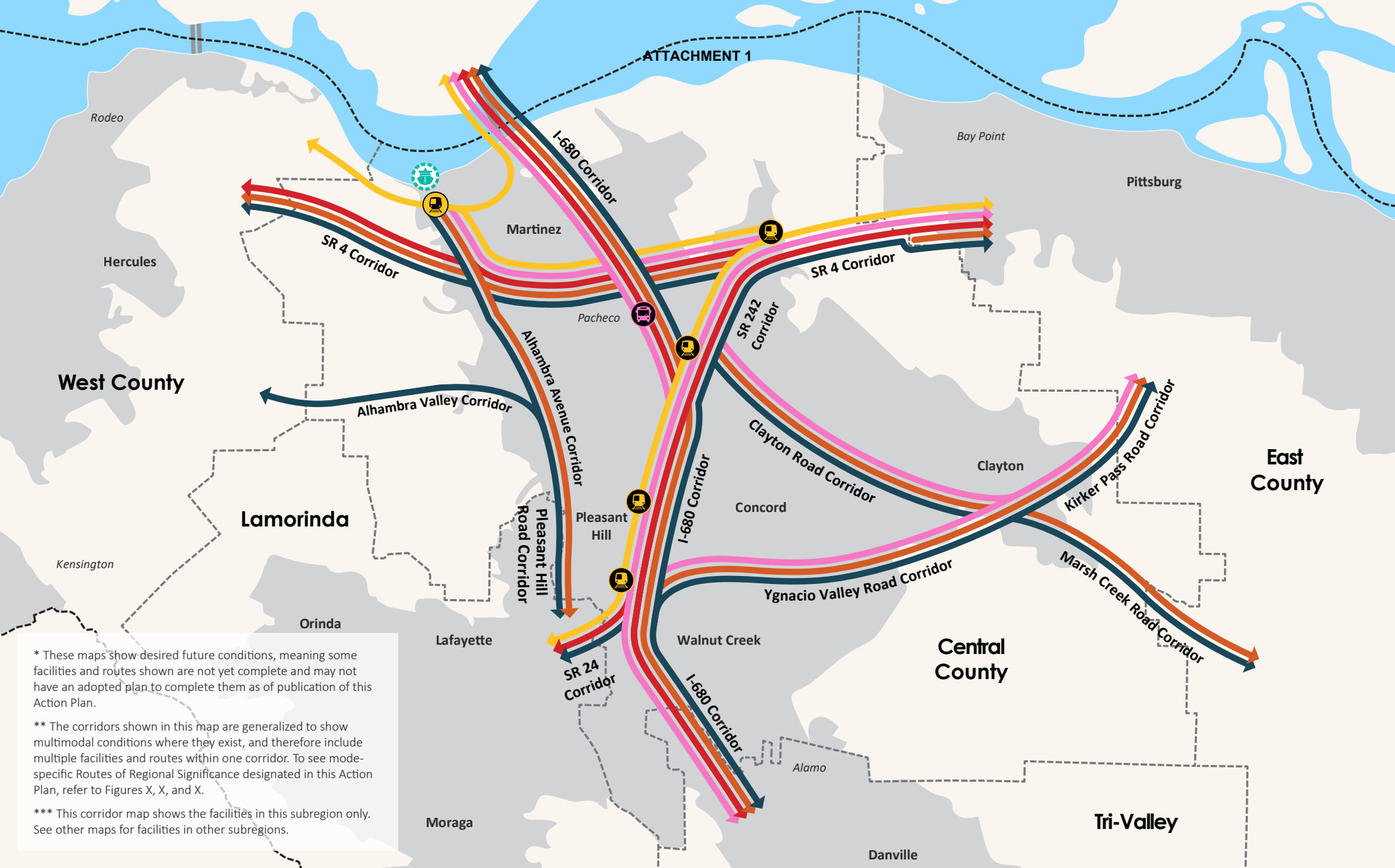
West Contra Costa County Corridor Map

- | | | | | | | | |
|--|-----------------|---|--------------------------|---|---|---|---|
|  | Rail |  | Existing Ferry Terminal |  | Existing BART Station |  | Urbanized Areas |
|  | Bus |  | Potential Ferry Terminal |  | Existing Heavy Rail Station |  | Regional Transportation Planning Committee Boundaries |
|  | Freeway |  | Transit Hub |  | Existing BART/Heavy Rail Transfer Station |  | County Boundary |
|  | Surface Streets | | | | | | |
|  | Bike/Pedestrian | | | | | | |





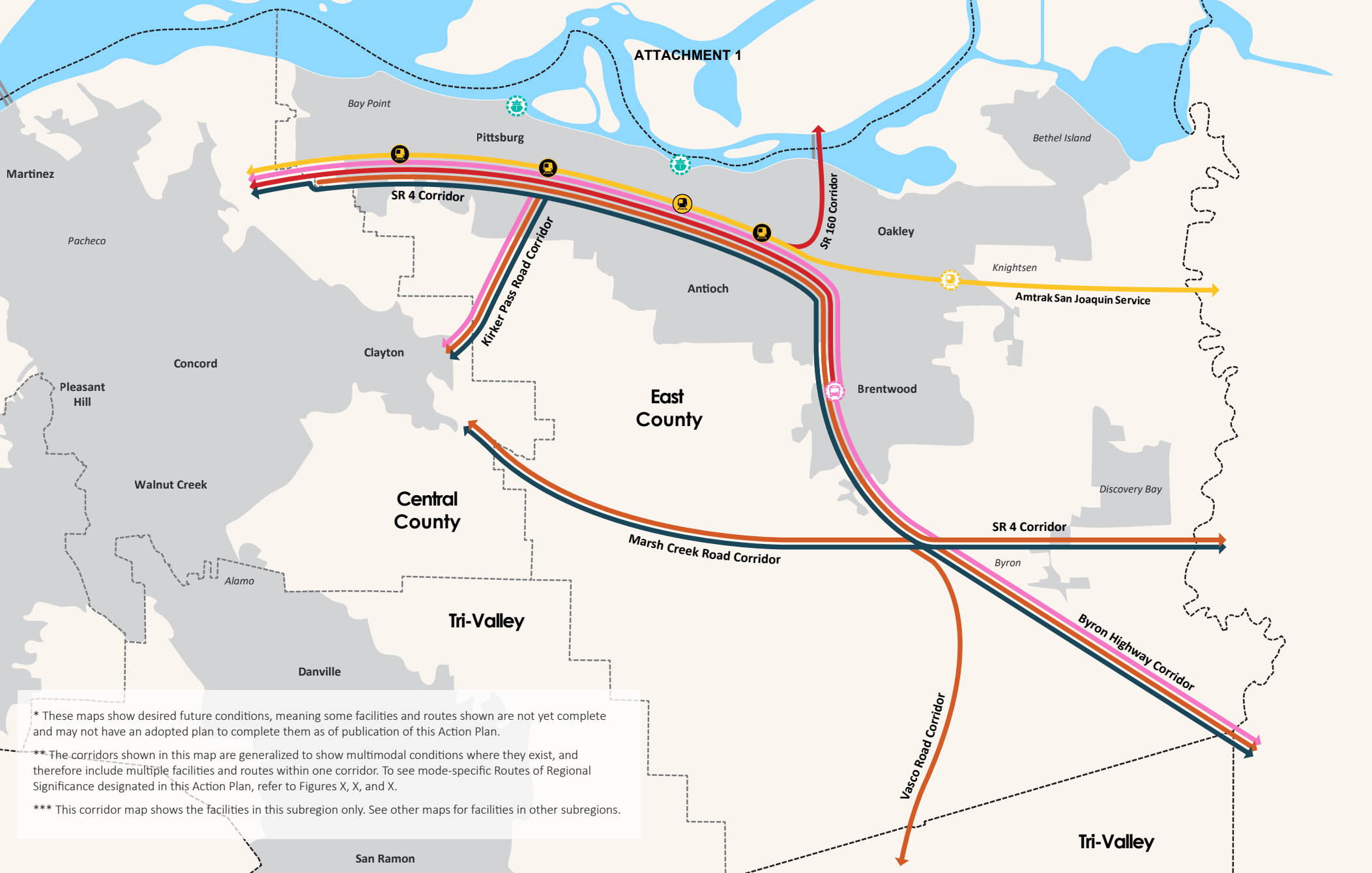
Lamorinda Area Corridor Map



* These maps show desired future conditions, meaning some facilities and routes shown are not yet complete and may not have an adopted plan to complete them as of publication of this Action Plan.

** The corridors shown in this map are generalized to show multimodal conditions where they exist, and therefore include multiple facilities and routes within one corridor. To see mode-specific Routes of Regional Significance designated in this Action Plan, refer to Figures X, X, and X.

*** This corridor map shows the facilities in this subregion only. See other maps for facilities in other subregions.



East Contra Costa County Corridor Map

- Rail
- Bus
- Freeway
- Surface Streets
- Bike/Pedestrian



Existing BART Station



Existing Heavy Rail Station



Future Heavy Rail Station



Potential Ferry Terminal



Future Transit Hub



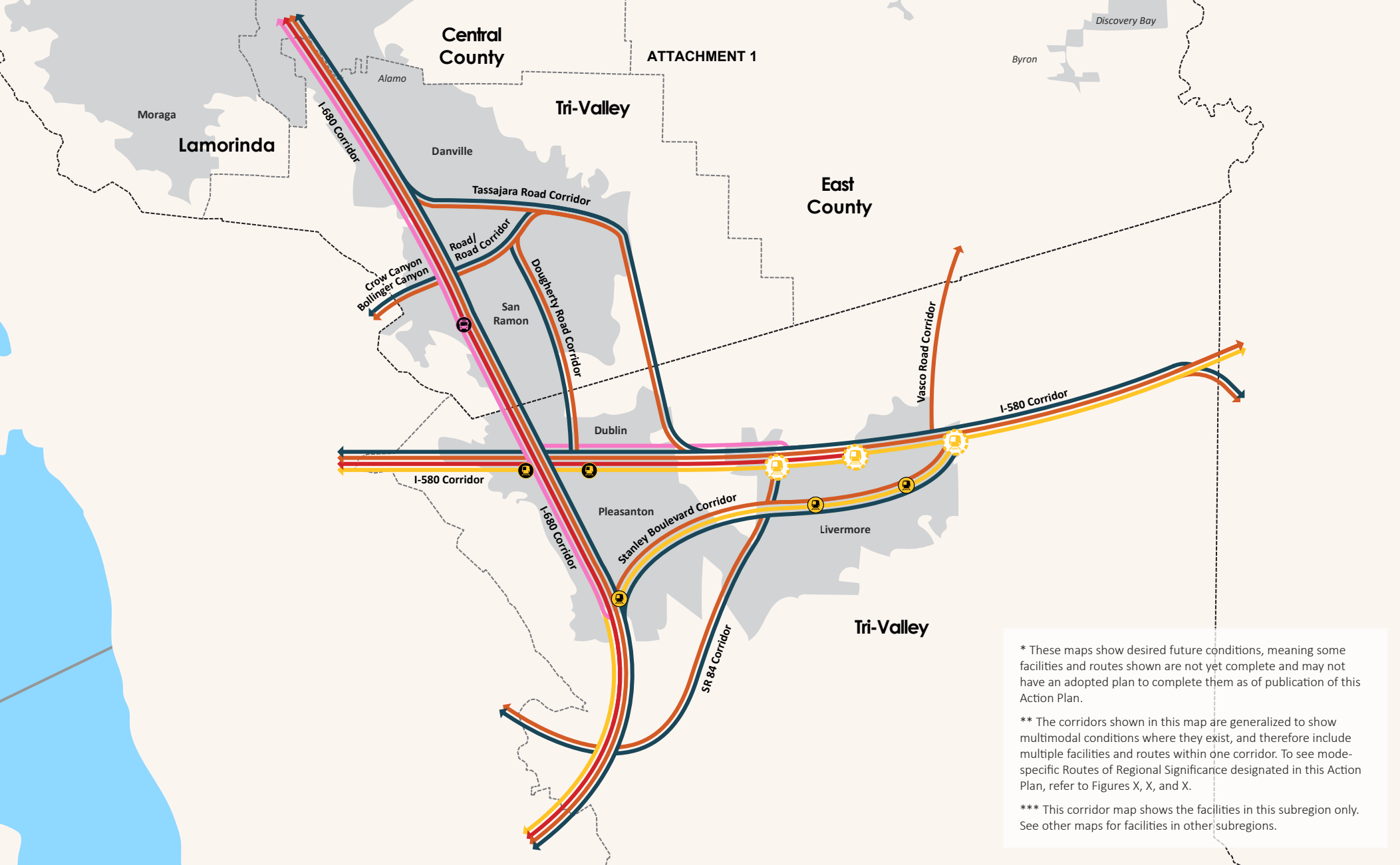
Urbanized Areas



Regional Transportation Planning Committee Boundaries



County Boundary



Tri Valley Area Corridor Map



MEMORANDUM

DATE July 7, 2022

TO John Hoang and Matt Kelly, CCTA

FROM David Early and Torina Wilson, PlaceWorks
Erin Vaca, DKS Associates
Julie Morgan and Terence Zhao, Fehr & Peers

SUBJECT Regional Transportation Objectives Methodology Memorandum

This memorandum outlines the preliminary Regional Transportation Objectives (RTOs) and the methodology behind them that PlaceWorks and its technical consultants (DKS and Fehr & Peers) plan to model in preparation of the Contra Costa Transportation Authority (CCTA) Action Plan Updates. These RTOs cover all Action Plan and Countywide Transportation Plan (CTP) topics and will be used to evaluate success in achieving the goals of each Action Plan. These RTOs could also be carried forward into the CTP to define the outcomes of that plan.

Historically, each Regional Transportation Planning Committee (RTPC) has had latitude to select a set of Multimodal Transportation Service Objectives (MTSOs) of its own choosing, and the various Action Plans have had differing MTSOs. In this round of Action Plan preparation, each RTPC continues to have the authority to craft its own RTOs. However, PlaceWorks is working with CCTA and the RTPCs to ensure that the new RTOs are as consistent as possible across the Action Plans to ensure they are largely internally consistent and to ultimately be combined and consolidated into the future CTP. At this time, PlaceWorks anticipates only minor variations among the RTOs adopted by each RTPC.

The preliminary list of RTOs, and their relevant chapter topics, are:

- Freeway RTOs
 - Peak-hour delay index on select freeway segments.
 - Buffer index on select freeway segments.
- Surface Roadway RTOs
 - Peak-hour Level of Service (LOS) at selected intersections in urban areas.
 - Peak-hour segment LOS on selected two-lane roadways outside of urban areas.
- Transit RTOs
 - Mode share of transit trips.
 - Ratio of travel time for transit as compared to automobile travel time for select trips.
- Bicycle and Pedestrian RTOs
 - Mode share of bicycling and walking.



- Proportion of the countywide low-stress bike network (LSBN) that has been completed.
- Number of locations where the LSBN makes an unprotected crossing over a heavily traveled vehicle route.
- Safety RTOs
 - Number of Killed or Seriously Injured (KSI) collisions.
 - Number of bike- or pedestrian-involved collisions.
 - Number of bike- or pedestrian-involved collisions within 500 feet of a school.
- Equity RTOs
 - Proportion of KSI and bike- or pedestrian-involved collisions that occur in Equity Priority Communities (EPCs), compared to the county as a whole.
 - Share of county jobs that can be reached by EPC residents within a 30-minute drive, as compared to county residents as a whole.
 - Share of county jobs that can be reached by EPC residents within a 45-minute transit trip, as compared to county residents as a whole.
 - Proportion of EPC acres that are not within a quarter-mile distance of a transit stop served by high-quality transit.
- Climate Change RTOs
 - Single-occupant vehicle mode share.
 - Vehicle miles traveled (VMT) per capita.
 - Transportation greenhouse gas (GHG) emissions per capita.
 - Zero-emission vehicle ownership in the subregion.
- Technology RTOs
 - Level of ethernet-based signal interconnection.

This memo ends with a discussion of several potential RTOs that were explored but are not recommended to move forward. They are:

- Wait time for paratransit
- Speed reduction
- Use of shared (pooled) Transportation Network Companies (TNCs)
- Number of shared scooters, shared bicycles, and public autonomous shared vehicles that are deployed
- Pavement condition on the countywide low-stress bike network
- Average commute time for low-income residents as compared to county residents as a whole
- Miles of Routes of Regional Significance (RRS) estimated to be vulnerable to sea-level rise.
- Percentage of vulnerable RRS for which remediation plans or a mitigation approach have been created.



The remainder of this memo explains the methodologies that the PlaceWorks team will use to measure each of these RTOs. These same methodologies will be documented in a revision to CCTA's Technical Procedures and will be available for ongoing assessment of attainment of the RTOs. An explanation of RTOs that were considered and not recommended to move forward are also included.

The modelling work described in this memo will be completed by DKS using the CCTA Countywide Travel Demand Model. This four-step, trip-based model was most recently revalidated to a 2018 base year. The standard CCTA travel demand model incorporates land use (population and employment) forecasts for 2020, 2030, and 2040 and can interpolate these inputs for interim years. Because the standard model cannot produce scenarios beyond 2040, a special version of the model script will be developed for the Action Plan analyses. In addition to accommodating a year 2050 horizon, the revised version will incorporate enhanced traffic assignment procedures for express lanes.

For the Action Plan updates, land use inputs for the horizon year of 2050 will be developed based on the Metropolitan Transportation Commission (MTC) Plan Bay Area 2050 projections for Contra Costa County. The transportation network assumed the Baseline 2050 scenario will be derived from the CCTA Transportation Expenditure Plan (TEP) No Build scenario, to reflect only already programmed improvements. In addition to the TEP projects, some additional express lanes will be assumed on Interstate (I-) 680 and the extension of the Bay Area Rapid Transit (BART) service to Livermore will be removed.

For existing conditions, the project team will use 2018 data to reflect pre-pandemic conditions, as it is not possible to predict how traffic conditions might stabilize as the post-pandemic "new normal" continues to evolve.

Freeways RTOs

PEAK-HOUR DELAY INDEX ON SELECT FREEWAY SEGMENTS

The delay index is a measure of delay experienced by motorists on a roadway segment during a peak commute hour in a single direction. The delay index is calculated by measuring the time it takes to travel a segment of road during average peak-period congested conditions and comparing it to the time it takes to travel the same segment during uncongested, free-flow conditions. A delay index may also be calculated as the ratio of congested speed to uncongested speed, given that the distance is fixed on any given corridor.

All previous CCTA Action Plans used delay index as MTSOs for freeway facilities. Table 1 lists the specific facilities to be evaluated with this metric for the current Action Plan updates; these segments are mapped in Figure 1. The performance targets used in the previous round of Action Plans are provided for reference, although these will be revisited as part of the current planning process.



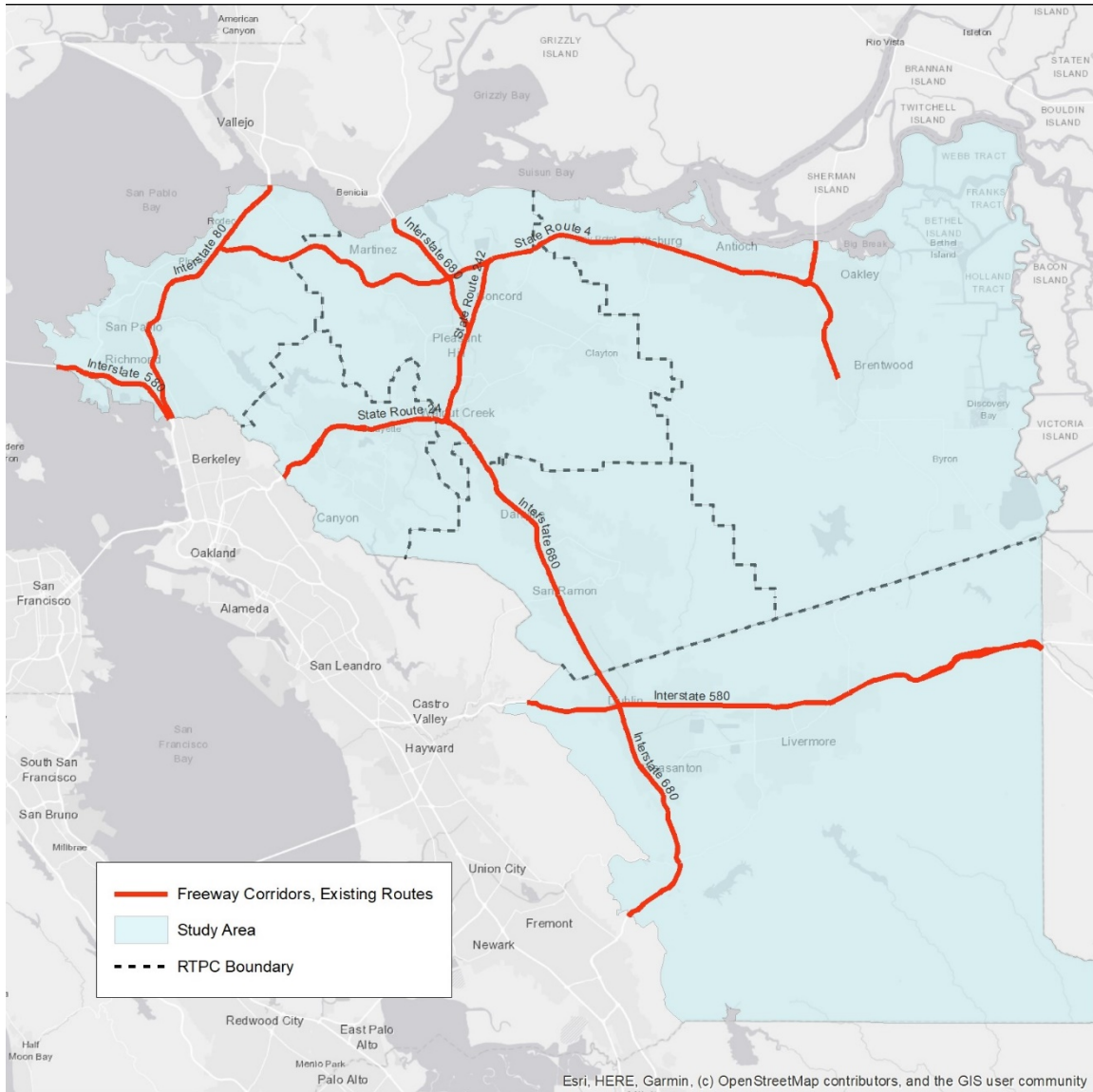
TABLE 1. FREEWAY FACILITIES AND PREVIOUS PERFORMANCE TARGETS

RTPC	Facility	From	To	Previous Performance Target
WCCTAC (West County)	Interstate 80	Carquinez Bridge	Solano County Line	DI*≤3.0
	Interstate 580	I-80	Marin County Line	DI≤2.5
	State Route 4	I-80	Cummings Skyway	DI≤2.0
TRANSPAC (Central County)	Interstate 680	Benicia Martinez Bridge	I-680/SR-24 Interchange	DI≤ 4.0 (I-680)
	Interstate 680	I-680/SR-24 Interchange	Livorna Road	DI≤ 4.0 (I-680)
	State Route 242	SR-4/WO Port Chicago Highway	I-680/SO Willow Pass Road	DI≤ 3.0 (SR-242)
	State Route 4	Cummings Skyway	Willow Pass Road/Evora Road	DI≤ 5.0 (SR-4)
TRANSPLAN (East County)	State Route 4	Willow Pass Grade	Balfour Road	DI≤2.5
	State Route 160	SR-4	Sacramento County Line	DI≤2.5
Lamorinda (Southwest County)	State Route 24	Caldecott Tunnel	I-680	DI≤2.0
	Interstate 680	Livorna Road	I-580	DI≤2.0
Tri-Valley (Southwest County)	Interstate 680	I-580	SR-80	DI≤2.0
	Interstate 580	Eden Canyon Road	I-680	DI≤2.0
	Interstate 580	I-680	N Midway Road	DI≤2.0

* DI = Delay index
Source: RTPC Action Plans.



FIGURE 1. FREEWAY FACILITIES





The delay index (and the related average speed) will be calculated for both the 2019 Base Year and 2050 Baseline scenarios, pivoting from observed data. The source of observed data for this RTO will be speed data from INRIX Roadway Analytics, which was also used in the 2017 MTSO monitoring¹ and 2021 Congestion Management Plan (CMP) monitoring.² DKS will first calculate observed 2019 speed with INRIX data using April 2019 as a baseline. DKS will pull one-minute interval data that includes travel time, use a Python program to excerpt defined study areas from Table 1 and Figure 1, and ultimately filter holidays, defined peak hours, defined days of the week, and data points affected by construction and special events, or with low INRIX quality scores. Delay indices will be calculated by estimating the additional congested travel time that is expected to occur on the link using the CCTA Countywide Travel Demand Model during peak hours. Components of this work include:

- Average congested speed for 2019 will be speed data derived from INRIX Roadway Analytics, which was also used in the 2017 MTSO monitoring and 2021 CMP monitoring.
- For 2050, DKS will take average congested speed data from the model.
- Free-flow speed will be the posted speed limit.
- The delay indices will be calculated by dividing the free flow speed by the observed or modeled average congested speed.

These calculations will yield existing and future delay index ratings for the segments of freeways listed in Table 1. Existing delay index ratings will be compared to adopted MTSO delay index thresholds and the project team will suggest any revisions to the existing delay index thresholds for consideration by the RTPCs.

BUFFER INDEX ON SELECT FREEWAY SEGMENTS

RTPC Technical Advisory Committee (TAC) members expressed interest in tracking the reliability of freeway segments. The project team recommends moving forward with the “buffer index” to measure reliability because it will rely on the same data pulled for the delay index RTO. The buffer index represents the extra buffer time (or time cushion) that most travelers add to their average travel time when planning trips to ensure on-time arrival. This extra time is added to account for any unexpected delay. The buffer index is expressed as a percentage and its value increases as reliability gets worse. For example, a buffer index of 40 percent means that, for a 20-minute average travel time, a traveler should budget an additional 8 minutes (20 minutes × 40 percent = 8 minutes) to ensure on-time arrival most of the time. In this example, the 8 extra minutes is called the buffer time. The buffer index is computed as the difference between the 95th percentile travel time over a corridor and average travel time, divided by the average travel time.

¹ Contra Costa Sub-regional Action Plans for the Routes of Regional Significance Multimodal Traffic Service Objectives (MTSO) Draft 2017 Monitoring Report (March 2018).

² 2021 Update of the Contra Costa Congestion Management Program (Draft Final Report).



The CCTA Countywide Travel Demand Model can output only average congested speeds and not 95th percentile speeds, so the buffer index will be a monitoring metric, compiled for existing and observed conditions but not forecasted. The buffer index for each freeway corridor listed in Table 1 will be calculated from the same INRIX data used to calculate the delay index.

Surface Roadway RTOs

PEAK-HOUR LOS AT SELECTED INTERSECTIONS IN URBAN AREAS

Peak-hour intersection LOS will be calculated for specified signalized intersections along the defined RRS in urban areas. Signalized LOS is a delay-based qualitative measure of traffic conditions. LOS is expressed in ratings from “A” through “F,” with “A” meaning that all traffic clears the intersection in every cycle and “F” meaning that drivers must wait through multiple cycles to clear the intersection.

Signalized intersection LOS is determined based on intersection turning movement counts (also called turning/traffic volumes), intersection geometry, and signal timing data. The CCTA Technical Procedures specify that methods documented in the latest edition of the Highway Capacity Manual be used to measure signalized intersection LOS.³ The relationship between average delay and LOS is shown in Table 2.

TABLE 2. INTERSECTION LOS DEFINITIONS

Delay (Second/Vehicle)	Level of Service
≤10	A
> 10-20	B
> 20-35	C
> 35-55	D
> 55-80	E
> 80	F

Source: Highway Capacity Manual, 6th Edition, Exhibit 19-8.

The facilities evaluated using signalized intersection LOS or other intersection operational metrics in the previous round of Action Plans are listed in Table 3. The performance of these Action Plan intersections and some additional locations was monitored in 2017. In addition, a subset of these intersections is regularly monitored as part of the Congestion Management Program, which was most recently conducted in 2021. For all previously monitored intersections, intersection operational models have been built, and peak hour turning movement counts were collected to represent 2013, 2017, or 2021 conditions. Table 4 summarizes the available data for intersection analysis.

³ The Highway Capacity Manual 6th Edition was published by the Transportation Research Board in January 2022.



Since the previous rounds of Action Plans and monitoring, some previously rural highway segments have been developed into signalized arterial corridors and some roadways have been newly designated as RRS, potentially adding numerous additional signalized intersection locations to be analyzed. A small number of previously monitored intersections appear to fall on roadway facilities that are no longer proposed as RRS for this round of Action Plan updates.

For this analysis of 2019 and 2050 baseline conditions, the project team proposes to report on only key locations, such as at the intersections of two RRS facilities, freeway ramp terminals, and intersections of local concern, as depicted in Figure 2 through Figure 6. In total, 355 intersections will be analyzed for 2019 and 2050.

TABLE 3. SIGNALIZED INTERSECTION LEVEL OF SERVICE – PREVIOUS ACTION PLANS

RTPC	Arterial Facility	Previously Used Performance Target and Number of Intersections
WCCTAC (West County)	<ul style="list-style-type: none"> • Appian Way • Carlson Boulevard • Central Avenue • Cummings Skyway • Interstate 580 (I-580) • Richmond Parkway • San Pablo Avenue • San Pablo Dam Road • State Route 4 (SR-4) • 23rd Street 	LOS D on all intersections except for San Pablo Avenue and San Pablo Dam Road where LOS E is acceptable.
	<ul style="list-style-type: none"> • Alhambra Avenue • Bailey Road • Clayton Road • Contra Costa Boulevard • Geary Road • North Main Street • Pacheco Boulevard • Pleasant Hill Road • Taylor Boulevard • Treat Boulevard • Ygnacio Valley Road/Kirker Pass Road 	LOS F on all intersections. ^a
TRANSPAC (Central County)	<ul style="list-style-type: none"> • Auto Center Drive • Bailey Road • Balfour Road • Brentwood Boulevard/Main Street • Buchanan Road • Deer Valley Road (improved portion) • East 10th Street/Harbor Street (in Pittsburg) • East 18th Street • Fairview Avenue • Hillcrest Avenue • James Donlon Boulevard (including future extension) • Laurel Road 	LOS D on all intersections except for Bailey Road where LOS E is acceptable.
TRANSPAC (Central County)	<ul style="list-style-type: none"> • Auto Center Drive • Bailey Road • Balfour Road • Brentwood Boulevard/Main Street • Buchanan Road • Deer Valley Road (improved portion) • East 10th Street/Harbor Street (in Pittsburg) • East 18th Street • Fairview Avenue • Hillcrest Avenue • James Donlon Boulevard (including future extension) • Laurel Road 	LOS D on all intersections except for Bailey Road where LOS E is acceptable.
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TABLE 3. SIGNALIZED INTERSECTION LEVEL OF SERVICE – PREVIOUS ACTION PLANS

RTPC	Arterial Facility	Previously Used Performance Target and Number of Intersections
	<ul style="list-style-type: none"> • Leland Road (both West and East)/Delta Fair Boulevard • Lone Tree Way/A Street • Oak Street/Walnut Boulevard (within Brentwood) • Ninth Street/Tenth Street (in Antioch) • Pittsburg-Antioch Highway • Railroad Avenue/Kirker Pass Road • Sand Creek Road/Dallas Ranch Road • Somersville Road • Wilbur Avenue • Willow Pass Road 	
Lamorinda (LPMC and Southwest County)	<ul style="list-style-type: none"> • Camino Pablo/San Pablo Dam Road • Pleasant Hill Road 	Side Street Delay, no LOS rating.
Tri-Valley (TVTC and Southwest County)	<ul style="list-style-type: none"> • Alcosta Boulevard • Bernal Avenue • Bollinger Canyon Road • Camino Tassajara • Danville Boulevard • Dougherty Road • Dublin Boulevard • Fallon Road • First Street/Railroad Avenue • Hopyard Road • Iron Horse Trail • Jack London Boulevard • San Ramon Road • San Ramon Valley Boulevard • Santa Rita Road • Stanley Boulevard • Stoneridge Drive • Sunol Boulevard • Sycamore Valley Road • Tassajara Road • Vasco Road 	LOS E on all intersections except no standard for intersections in downtown areas and those exempt by General Plans.

a. Other TRANSPAC intersection performance targets are defined by volume to capacity (V/C) ratios or the number of cycles.

Source: RTPC Action Plans



TABLE 4. SIGNALIZED INTERSECTIONS AND AVAILABLE INTERSECTION DATA

Region	Previous Action Plans	2017 Monitoring	2021 CMP	Total Signalized Intersections on RRS	Total Proposed for Existing and Baseline Scenarios
West County	55	30	29	174	84
Central County	41	41	9	233	83
East County	151	29		301	93
Lamorinda	13	12	1	47	12
Tri-Valley	39	51	22	163	83
Total	299	163	61	918	355



FIGURE 2. ARTERIAL INTERSECTIONS AND ROADWAY RRS (WEST COUNTY)

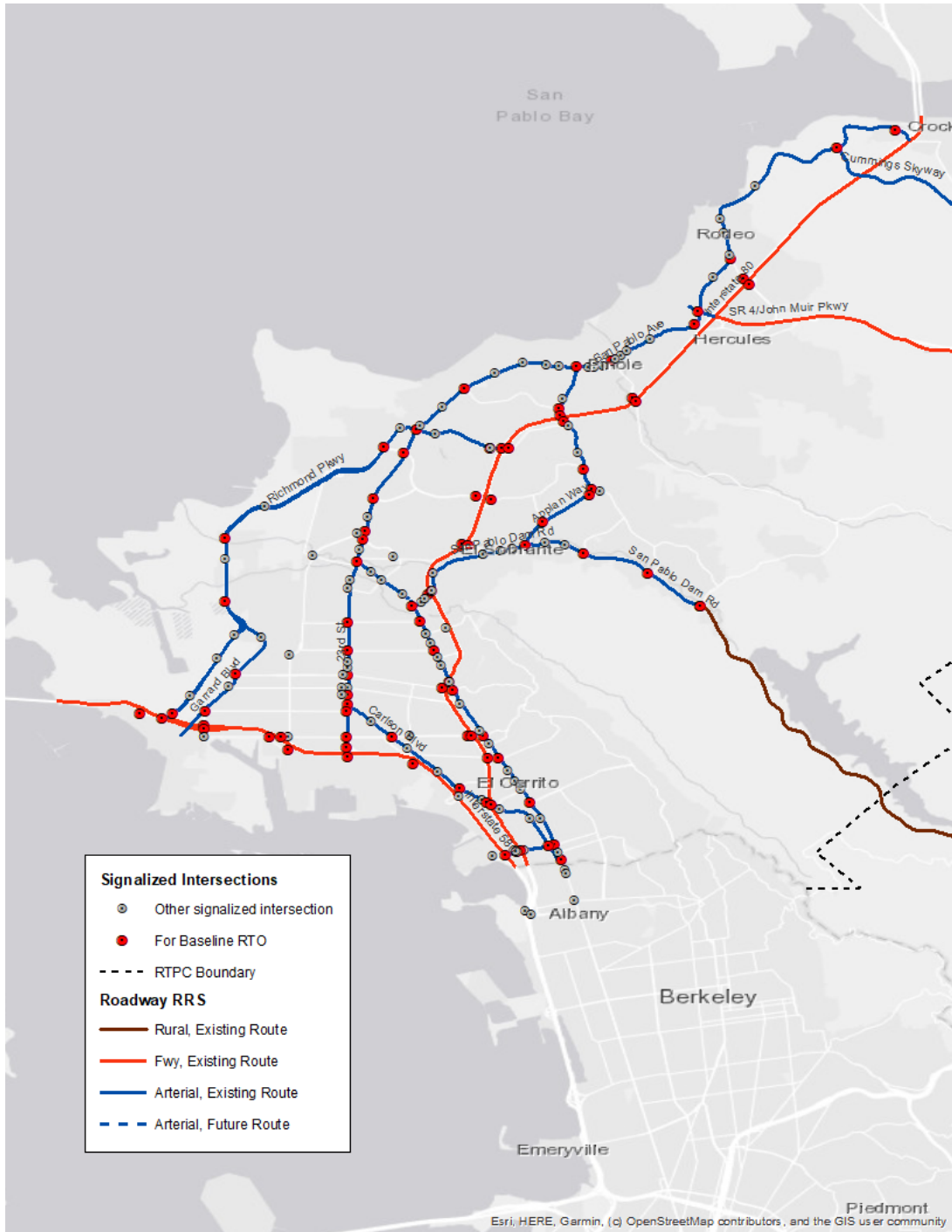




FIGURE 3. ARTERIAL INTERSECTIONS AND ROADWAY RRS (CENTRAL COUNTY)

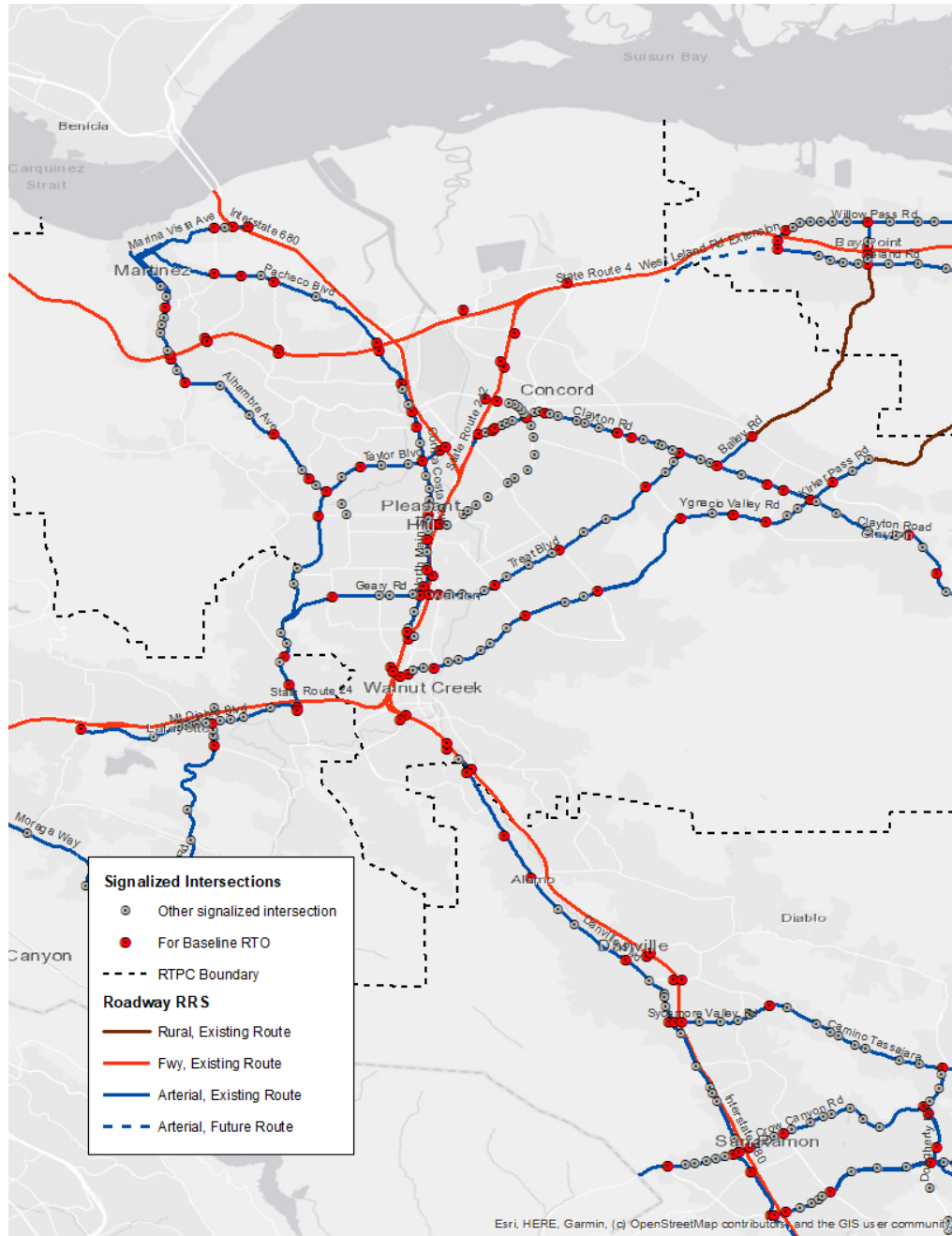


FIGURE 4. ARTERIAL INTERSECTIONS AND ROADWAY RRS (EAST COUNTY)

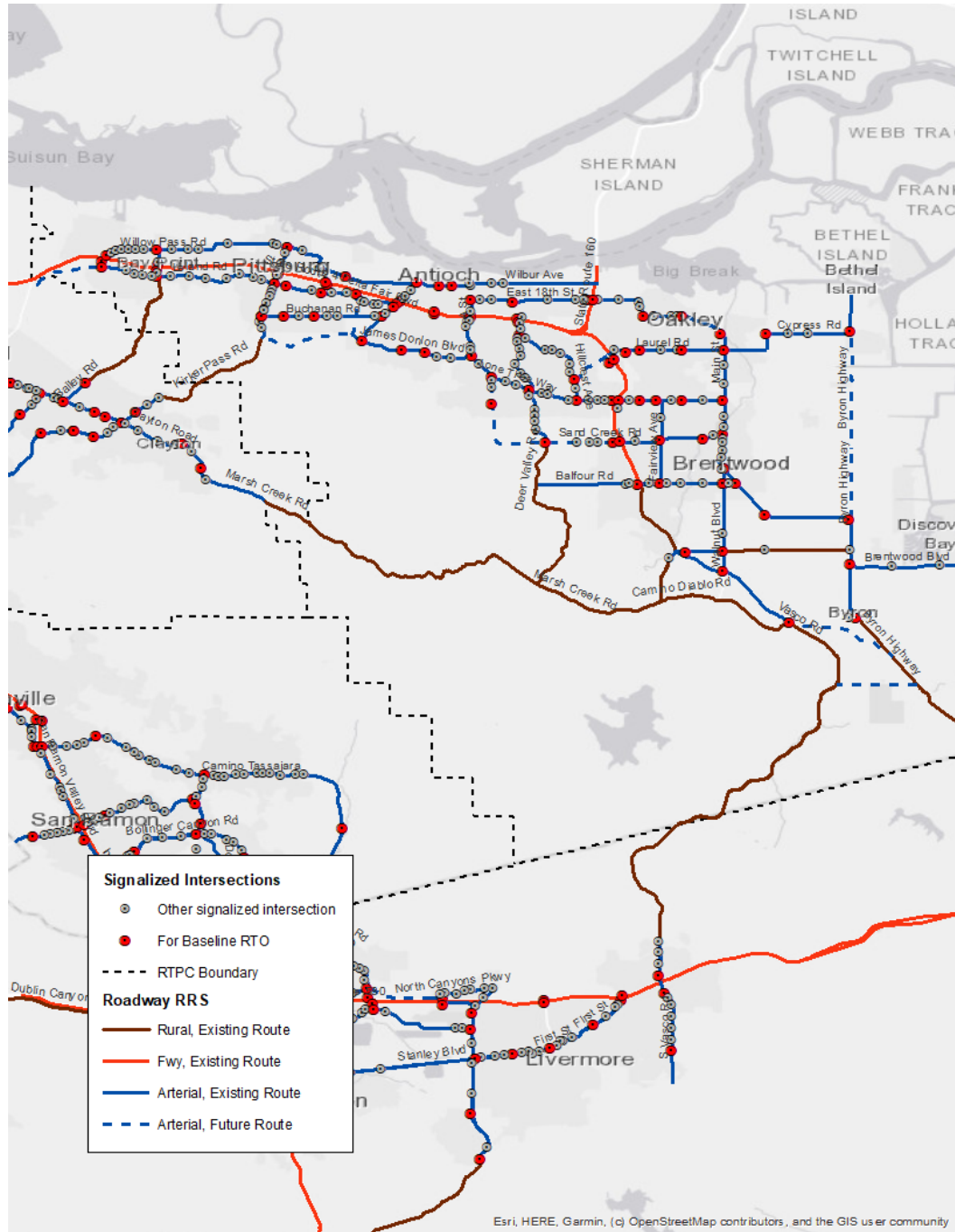




FIGURE 5. ARTERIAL INTERSECTIONS AND ROADWAY RRS (SOUTHWEST COUNTY – LAMORINDA)

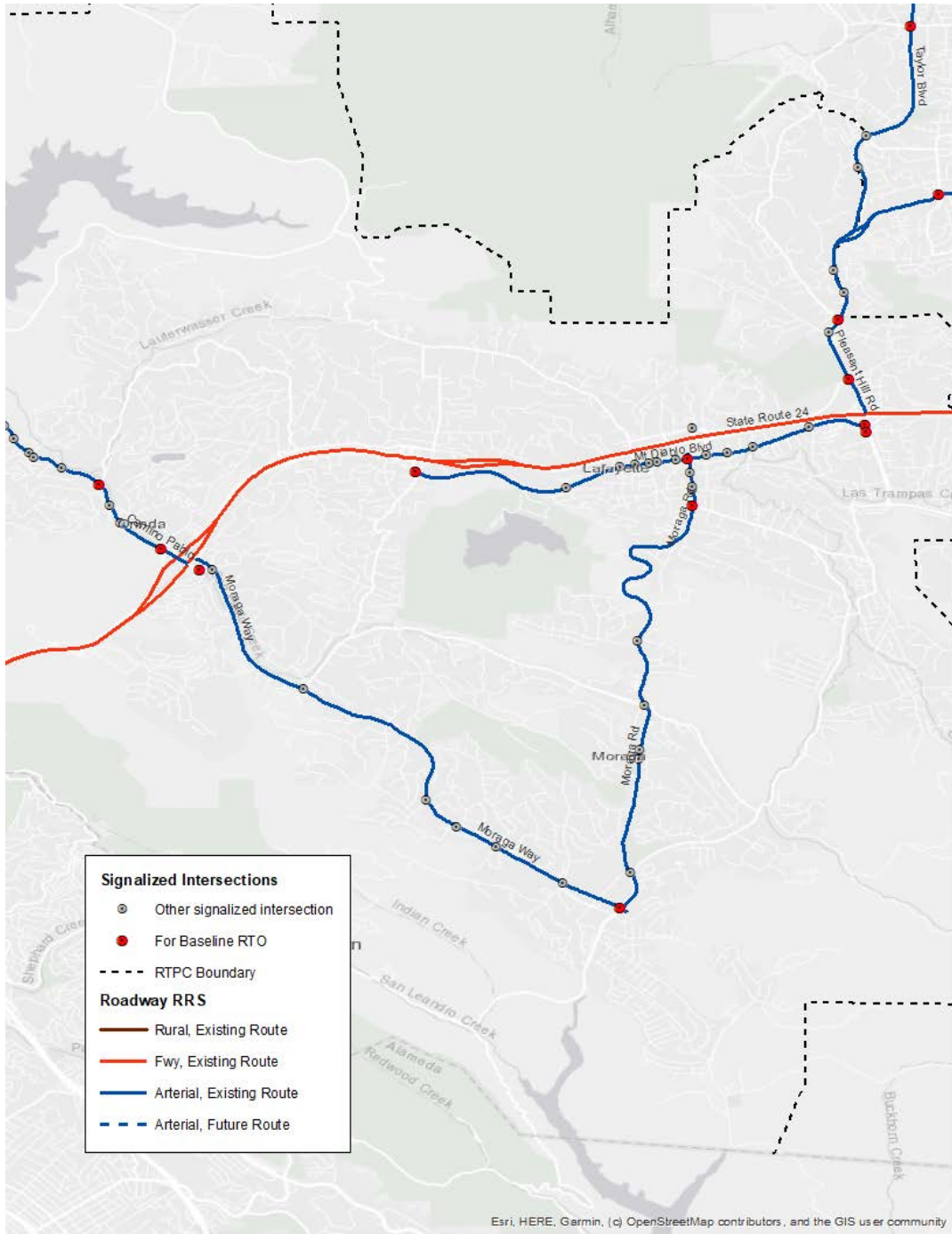
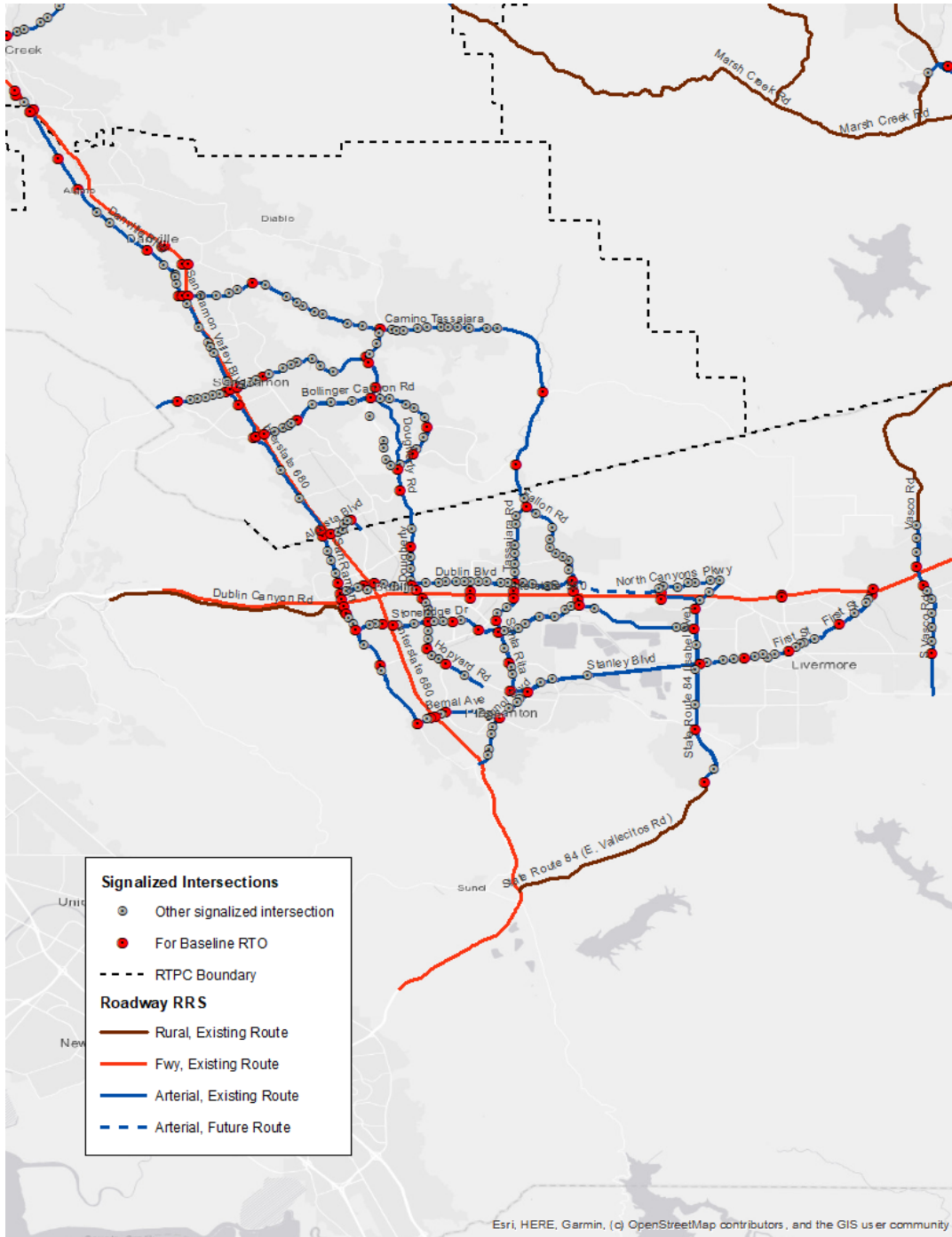




FIGURE 6. ARTERIAL INTERSECTIONS AND ROADWAY RRS (SOUTHWEST COUNTY – TRI-VALLEY)





The methodology for calculating signalized intersection LOS will follow standard practice.

Observed counts will largely be obtained from those collected for the 2017 MTSO monitoring and the 2021 CMP monitoring. For any additional intersections added to the list for this round of Action Plans, historical turning volume estimates will be obtained from the Streetlight data subscription maintained by CCTA.

Peak-hour traffic volumes for the base year and future year will be estimated using the Furness process specified in the CCTA Technical Procedures and summarized here. This process develops intersection turning movement forecasts using observed counts and model outputs, as follows:

- Calculate the Model Correction Volume for each network link (i.e., the difference between the projected peak-hour volume for the validation (base year) run and actual peak-hour traffic volumes).
- Determine the forecast peak-hour approach and departure volumes for each study intersection by adding the Model Correction Volume to the model output.
- Develop intersection turning movement volumes that are consistent with the approach and departure volumes by balancing projected intersection turning movements with actual turning movement volumes using an iterative process.
- Check reasonableness by comparing adjusted intersection turning movement volumes with both the existing count data and the raw model output.
- Review volume adjustments that do not appear reasonable and, if appropriate, revise adjustments.

Prior to modeling the LOS that will result from the calculated volumes, DKS will double-check intersection geometry using Google Earth to ensure that the modeling reflects current intersection configurations. DKS will reach out to the local jurisdictions to request timing plans for any newly added intersection locations. In the absence of local timing plans, optimized timing settings will be applied.

Once the estimated 2019 Base Year and 2050 Baseline turning volumes, intersection geometries, and signal timings are in place, signalized intersection LOS will be assessed by implementing the latest Highway Capacity Model (HCM) methods in the Trafficware Synchro ("Synchro") software package. The latest HCM 7th Edition was released in February 2022 and is not yet implemented in Synchro, so Synchro reports signalized intersection delay and LOS based on the HCM 6th Edition (there is no significant difference for the analysis of signalized intersections).

The outcome of this modeling will yield a list of all intersections and their baseline 2019 and projected 2050 LOS rating. These ratings will be compared to the existing Action Plan MTSOs, if applicable, and DKS will assist the RTPCs in revising the MTSOs to create new RTOs as appropriate.

There may be a data gap for turning movement counts for newly identified intersections in Alameda County. Since the CCTA Streetlight subscription will not provide data for these locations, local jurisdictions will be contacted to provide any available recent counts. In some cases, it may be necessary



to use turning volumes directly from the CCTA Countywide Travel Demand Model outputs to estimate existing conditions operational performance.

PEAK-HOUR SEGMENT LOS ON SELECTED TWO-LANE HIGHWAYS OUTSIDE OF URBAN AREAS

LOS will be analyzed for specific segments on rural roadways. Roadway segment LOS is a measure of traffic efficiency and smoothness of flow along roadway segments that are not constrained by a nearby traffic signal. This has previously been calculated for the East County in accordance with the methods specified in the 2010 HCM using average speed for Class I highways, which are two-lane facilities in largely rural areas that motorists expect to traverse at relatively high speed.

DKS will run LOS analysis for the roadway segments as listed in Table 5 and shown in Figures 2 through 6.

TABLE 5. RURAL ROADWAY CORRIDORS

Subarea	Facility	From	To
West County	San Pablo Dam Road	Castro Ranch Road	RTPC Boundary
		RTPC Boundary	Wildcat Canyon
Central County	Bailey Road	Concord Boulevard	RTPC Boundary
	Kirker Pass Road	RTPC Boundary	James Donlon Boulevard
	Kirker Pass Road	Clearbrook Drive	RTPC Boundary
	Byron Highway	State Route 4	Alameda County
	Camino Diablo Road	Marsh Creek Road	Vasco Road
	Marsh Creek Road	Deer Valley Road	Vineyard Parkway
	Vasco Road	Walnut Boulevard	Alameda County
East County	Vasco Road	Alameda County	Dalton Avenue
	Bailey Road	Leland Avenue	RTPC Boundary
	State Route 4 Bypass	Balfour Road	Marsh Creek Road
	Deer Valley Road	Sand Creek Road	Marsh Creek Road
	Marsh Creek Road	RTPC Boundary	Deer Valley Road
Lamorinda	San Pablo Dam Road	RTPC Boundary	Wildcat Canyon
Tri-Valley	State Route 84 (E. Vallecitos Road)	Interstate 680	Ruby Hill Drive
	Dublin Canyon Road	Palo Verde Road	Foothill Road



The latest edition of HCM (7th Edition) specifies a new version for calculating segment LOS, which requires substantially more data than the previous HCM 6th edition/2010 approach. The new approach requires information on passing constraint condition (none, passing lane, or passing constrained), flow rate (vehicles per hour), percentage heavy vehicles, vertical slope (five classifications based on segment length and slope), and horizontal curvature (five classifications based on curve radius and superelevation). This data is not available for the segments to be studied, the Action Plan updates will retain this HCM 6th Edition approach, which simply relates LOS to average speed, as shown in Table 6. For this analysis, DKS will use the model to predict average speed for all segments to be analyzed.

TABLE 6. LOS FOR TWO-LANE RURAL ROADWAYS

Level of Service	Average Speed (Miles per Hour)
A	>55
B	>50-55
C	>45-50
D	>40-45
E	≤40

Source: Highway Capacity Manual, 2010, Exhibit 15-3.

Transit RTOs

MODE SHARE OF TRANSIT TRIPS

Mode share will be estimated for the Action Plan updates, both for transit (which is the focus of this section) and for the bike/pedestrian and climate change topics (as explained in later sections of this memo).

For the Action Plan analysis, mode share in each subregion will be estimated using data collected by the American Community Survey (ACS), as published by the Census Bureau, and model results.

For current conditions, the PlaceWorks team will use ACS data, which gives data for work commute trips for workers 16 years of age and over. The current data release includes one-year estimates for 2019, which will be used for the Action Plan analysis. Mode share for all trips and all modes will be modeled using outputs from the CCTA Countywide Travel Demand Model. Specifically, the person trip tables from the mode choice step of the model will be aggregated to calculate mode share by geographic subarea. The trip tables are in “production-attraction” format, meaning that trips are tabulated based on the zone of production (location of residence for all home-based trip purposes) and zone of attraction (work or other location) rather than representing directional trips.



The CCTA Countywide Travel Demand Model produces person trip matrices by mode by Traffic Analysis Zone (TAZ) for each trip purpose and income quartile. DKS will develop scripts to summarize this data by RTPC and mode. Most mode share RTOs will be summarized by the geographic area of production, but some metrics based on the attraction zone may be of interest as well. Thus, mode share can be reported based on the zone of residence (“X percent of work trips made by East County residents are by auto”) or the attraction zone (“Y percent of work trips for jobs in Central County are by transit”).

Mode shares will be calculated for the 2019 base year and 2050 baseline scenarios. The mode alternatives specified in CCTA Countywide Travel Demand Model include:

- Drive Alone
- Shared Ride 2 Occupants
- Shared Ride 3+ occupants
- Transit with Walk Access
- Transit with Drive Access
- Bicycle
- Walk

The summary tables and charts for these modes will report mode share for the subregion of production (all trips), for commute mode share by subregion of production (home-based work trips only), and for commute mode share by subregion of attraction or job location (home-based work trips only).

RATIO OF TRAVEL TIME FOR TRANSIT AS COMPARED TO AUTOMOBILE TRAVEL TIME FOR SELECT TRIPS

This RTO is intended to measure the difference in travel time for a motorist as compared to a transit user. The origin destination pairs shown in Table 7 are proposed for this metric. Travel times will be developed for each mode based on both the peak-commute and reverse-commute directions of travel for the morning and afternoon peak periods.

TABLE 7. CORRIDORS FOR TRANSIT-AUTO TRAVEL TIME COMPARISON

Subarea	Origin-Destination Pairs
West County	North Richmond BART and Contra Costa Center (Pleasant Hill BART station) Hercules Transit Center and Salesforce Transit Center in San Francisco
Central County	Walnut Creek BART station and Montgomery Street BART station Orinda BART station and 12th Street (Oakland) BART station
East County	Antioch BART station and 12th Street (Oakland) BART station
Lamorinda	Orinda BART station and Montgomery Street (San Francisco) BART station
Tri-Valley	Vasco Station (Altamont Corridor Express) and San Jose Diridon station Dublin-Pleasanton BART station and Montgomery Street (San Francisco) BART station



Transit travel times along key routes will be based on published transit schedules. Bus schedules are assumed to account for expected roadway congestion that would impact bus routes. Driving travel times will be derived from INRIX roadway analytics for weekdays (Tuesday – Thursday) for April 2019.

Baseline 2050 conditions will be modeled using the CCTA Countywide Travel Demand Model. The model outputs used for this purpose will be the peak period transportation “skim” matrices, representing transit wait time, transit in-vehicle travel time, and drive-alone automobile travel time between all TAZs.

Bicycle and Pedestrian RTOs

Bicycle and pedestrian RTOs will be based on the countywide Low-Stress Bike Network (LSBN) adopted in the 2018 CCTA Countywide Bike and Pedestrian Plan. This network consists of existing and planned Class 1 bike paths and Class 4 cycle tracks throughout Contra Costa County.

MODE SHARE OF BICYCLING AND WALKING

The methodology for this RTO will be identical to the methodology for the “Mode Share of Transit Trips” RTO. See the previous section for more details.

PROPORTION OF THE COUNTYWIDE LOW-STRESS BIKE NETWORK THAT HAS BEEN COMPLETED

The LSBN is a component of the CCTA Countywide Bicycle and Pedestrian Plan (CBPP) adopted in 2018. The CBPP introduced a new way of evaluating a facility’s “Level of Traffic Stress,” in which roadways are evaluated on several factors, including, but not limited to, the speed and number of vehicles and presence and width of bicycle facilities. Facilities are given a rating from one (least stressful) to four (most stressful) to evaluate the stress a bike rider will experience. The goal of the 2018 CBPP is to ensure the countywide bicycle network is complete and rated either Level of Traffic Stress 1 (most children can feel safe riding on these facilities) or Level of Traffic Stress 2 (The “interested but concerned” adult population will feel safe riding on these facilities). Ultimately, construction of the entire LSBN would result in an increase in bicycle mode share and a reduction in KSI collisions. It is assumed that the LSBN includes only Class I and Class IV facilities.

For this RTO, the project team will update the LSBN to reflect any portions that have been constructed since the 2018 CBPP and map adoption. Once the LSBN is updated, the number of total miles in the network upon buildout will be calculated and compared with the total miles already completed.

NUMBER OF LOCATIONS WHERE THE LOW-STRESS BIKE NETWORK MAKES AN UNPROTECTED CROSSING OVER A HEAVILY TRAVELED VEHICLE ROUTE

PlaceWorks will create an ArcGIS point data set to identify each location where the LSBN (Class I and Class IV facilities) crosses a vehicle roadway. Then, we will rank the crossing by how protected it is using Google Maps. Ranking will occur as follows:



- **Fully protected** by grade separation or a signalized intersection with cyclist protections.
- **Semi-protected** at an at-grade crossing with a beacon system, or with a signal but without cyclist protections.
- **Unprotected** at an at-grade crossing, which includes none of the improvements listed above.

This exercise will be conducted for low-stress bikeway crossings of all arterials and major collectors in each subarea. The types of roadways included in this exercise are interstates, freeways, expressways, other principal arterials, minor arterials, and major collectors. The only roadways not included in this exercise are minor collectors and local routes.

Safety RTOs

NUMBER OF KILLED OR SERIOUSLY INJURED (KSI) COLLISIONS

DKS will obtain KSI collisions data for Contra Costa County from the Transportation Injury Mapping System (TIMS) and will then geocode and clean the data to form the basis for the RTO. The number of KSI collisions will be tabulated and mapped by subregion.

NUMBER OF BIKE- OR PEDESTRIAN-INVOLVED COLLISIONS

This RTO will be developed using the same TIMS data set described above. The number of bicycle- or pedestrian-involved KSI collisions will be tabulated and mapped by subregion.

NUMBER OF BIKE- OR PEDESTRIAN-INVOLVED COLLISIONS WITHIN 500 FEET OF A SCHOOL

This RTO will be developed using the same TIMS data set described previously. The project team will use GIS school site polygon data to create a 500-foot buffer around school sites and determine which of the geocoded collisions occurred within these school site buffers. The resulting data will be tabulated and mapped by subregion. The number of crash records is expected to be low, so the records identified through GIS analysis will be individually reviewed to confirm that the crashes involve student bicyclists or pedestrians.

Equity RTOs

PROPORTION OF KSI AND BIKE- OR PEDESTRIAN-INVOLVED COLLISIONS THAT OCCUR IN EQUITY PRIORITY COMMUNITIES

This RTO will be developed using the same TIMS data set described for the Safety RTOs. Using GIS, this analysis will map the boundaries of identified Equity Priority Communities (EPCs). For each subregion and the county as a whole, the proportion of collisions occurring in EPCs will be reported and mapped. This RTO would not be tracked in Action Plans that do not contain EPCs, including Tri-Valley and Lamorinda.



SHARE OF COUNTY JOBS THAT CAN BE REACHED BY EPC RESIDENTS WITH A 30-MINUTE DRIVE, AS COMPARED TO COUNTY RESIDENTS AS A WHOLE

DKS will compare the model's map of TAZs to identified EPCs in Contra Costa and identify each TAZ as either "EPC" or "non-EPC." DKS will then calculate which TAZs can be reached within a 30-minute drive from each TAZ in the study area and will sum the number of jobs within those TAZs. The average number of jobs per TAZ that are reachable within 30 minutes will be calculated for EPC and non-EPC TAZs, and the results will be compared to each other. Since this analysis has not been completed, it is unknown if there is any correlation in the data. If there is no correlation, the RTO will be recommended to move forward. This RTO would not be tracked in Action Plans that do not contain EPCs, including Tri-Valley and Lamorinda.

SHARE OF COUNTY JOBS THAT CAN BE REACHED BY EPC RESIDENTS WITH A 45-MINUTE TRANSIT TRIP, AS COMPARED TO COUNTY RESIDENTS AS A WHOLE

DKS will use the TAZs identified as "EPC" and "non-EPC" in the previous RTO to calculate which TAZs can be reached within a 45-minute transit trip from each TAZ in the study area. DKS will then sum the number of jobs within those TAZs. The average number of jobs per TAZ that are reachable by a 45-minute transit trip will be calculated for EPC and non-EPC TAZs, and the results will be compared to each other. Since this analysis has not been completed, it is unknown if there is any correlation in the data. If there is no correlation, the RTO will be recommended to move forward. This RTO would not be tracked in Action Plans that do not contain EPCs, including Tri-Valley and Lamorinda.

PROPORTION OF EPC ACRES THAT ARE NOT WITHIN A QUARTER-MILE DISTANCE OF A TRANSIT STOP SERVED BY HIGH-QUALITY TRANSIT

GIS data will be used to map the EPC boundaries and all high-quality transit stops in the CCTA area. A buffer of a quarter mile will be created around the high-quality transit stops to determine if there are any portions of EPCs that are not within this buffer. A calculation will then be made to determine how many acres of EPCs in each subregion are not within the buffer and thereby not served by high-quality transit. This RTO would not be tracked in Action Plans that do not contain EPCs, including Tri-Valley and Lamorinda.

Climate Change RTOs

SINGLE-OCCUPANT VEHICLE MODE SHARE

The methodology for this RTO will be identical to the methodology for the "Mode Share of Transit Trips" RTO, except that the metric associated with this RTO will track a decrease in overall single-occupant vehicle (SOV) mode share, not an increase as desired for transit and bicycle/pedestrian mode share. See the previous section for more details.



VEHICLE MILES TRAVELED PER CAPITA

VMT per capita will be modeled for the 2019 Base Year and Baseline 2050 condition using outputs from the CCTA Countywide Travel Demand Model. Scripts tabulating VMT per capita at the residential location and VMT per employee at the worksite for each TAZ have already been developed as part of CCTA's Technical Procedures update. Final processing will be done in a spreadsheet, and results will be tabulated by subregion.

TRANSPORTATION GREENHOUSE GAS EMISSIONS PER CAPITA

This RTO will be based on the VMT data developed, as described previously. DKS will divide the VMT by speed bin and time period to create inputs for the most recent Emission Factor (EMFAC) mobile source emissions model maintained by the California Air Resources Board. Subregional scenarios will be created for the 2019 Base Year and 2050 Baseline conditions. Total tons of GHG emissions will be divided by the subregional population assumed in the CCTA Countywide Travel Demand Model to arrive at average daily GHG emissions per capita (in tons).

ZERO-EMISSION VEHICLE OWNERSHIP IN THE SUBREGION

The California Energy Commission tracks zero-emission vehicle (ZEV) ownership in partnership with the Department of Motor Vehicles. Data are updated annually in April and are published on the Zero Emission Vehicle and Infrastructure Statistics web page.

Vehicle population is also updated annually in April, to reflect the number of vehicles on the road during the previous calendar year. The vehicle population number includes vehicles whose registration is either current or less than 35 days expired.

PlaceWorks will assemble this data and disaggregate it by subregion. Total registrations by vehicle type are available by county and zip code, so a rough approximation of ownership by subregion is possible.

Technology RTOs

LEVEL OF ETHERNET-BASED SIGNAL INTERCONNECTION

Interconnected signal systems are those that communicate with other signals or systems. Signal interconnect helps in establishing a connection between the traffic signals and the central system, which enables remote access to the signals from the local agency locations or the Traffic Management or Operations Center. This will allow signal timings to be adjusted remotely, during regular day-to-day operations, during major incidents, and during special events. Interconnection enables cross-jurisdiction communications, coordination, and data exchange to respond to varying traffic conditions.



Information will be collected from cities regarding signal systems to identify percentage of signals that are currently interconnected through ethernet-based communications. The assembled data will determine the level of signal interconnection as compared to the total number of signals with the jurisdiction and countywide as a whole.

RTOs Considered but Not Recommended

WAIT TIME FOR PARATRANSIT

Several RTPC TAC members expressed interest in an RTO relating to wait time for paratransit services. The project team met with CCTA staff and consultant Nelson Nygaard to discuss their work with paratransit services and other accessible transit in the county. This group prepared CCTA's *Accessible Transportation Strategic Plan* in 2021, which provides a detailed catalog of existing accessible transportation facilities in the county, needed improvements, and goals and strategies to address gaps in service. Upon recommendation from this group, the Action Plans and Countywide Transportation Plan will include language and actions that refer to the *Accessible Transportation Strategic Plan* but will not include an RTO related to such service.

SPEED REDUCTION

Several RTPC TAC members stated that reducing typical travel speeds on surface streets around Contra Costa, especially in areas where prevailing speeds exceed designated speed limits, may improve overall safety. Reducing vehicular speeds is critical to improve safety outcomes and make streets more comfortable for active users such as bicyclists and pedestrians.

CCTA's Vision Zero effort includes speed reduction as a defined goal. The CCTA Vision Zero Implementation Guide for Local Jurisdictions points to encouraging safe speeds as a key priority, and notes that "[managing] speeds is critical to achieving zero fatalities because the kinetic transfer of energy from vehicles traveling at high speeds is much greater than at lower speeds, and results in more fatalities and more injuries, increasing in severity as speeds increase." It additionally suggests that local jurisdictions "[identify] high-speed corridors based on speed surveys and Safety Priority Locations Maps. The concentration of locations on high-speed arterials reveals a relationship between speed and traffic collisions resulting in fatal or severe injuries."

Mobile device data can be used to measure existing prevailing speeds on specific roadways, so an RTO could be defined that monitors prevailing speeds along specific corridors and sets a goal to reduce those prevailing speeds over time. However, this mobile device data can be difficult to gather, especially within a large geographic area, so use of this data is not practical for this RTO. However, the CCTA countywide travel model also produces estimates of vehicular speed along each road segment, and that data could hypothetically be used to forecast changes in travel speeds under various future scenarios. Thus, gathering data for this RTO is possible.



Regardless, a potential RTO relating to speed reduction is not as relevant to land use as the RTOs described previously. Therefore, the project team does not propose to move forward with this RTO.

USE OF SHARED (POOLED) TRANSPORTATION NETWORK COMPANIES

Data assembled before the pandemic showed that the emerging presence of Transportation Network Companies (TNCs), such as Lyft and Uber, were leading to increases in VMT and congestion, but that shared TNC rides (also referred to as pooled rides), in which several unrelated riders share a vehicle for a trip, could result in reductions in VMT and congestion. For this reason, many experts suggested that shared TNC rides should be considered, and several RTPC TAC members thought it would be useful to track the proportion of TNC rides that are shared.

However, the pandemic has led to the cancellation of shared services by both Lyft and Uber in the greater Bay Area market, so it is impossible to track such rides today. Moreover, data from Lyft and Uber is not readily available and is difficult to obtain. For these reasons, no RTO regarding shared TNC rides is recommended at this time, but one could be added if shared services are reinstated, and data can be collected from TNCs.

NUMBER OF SHARED SCOOTERS, SHARED BICYCLES, AND PUBLIC AUTONOMOUS VEHICLES THAT ARE DEPLOYED

Several RTPC TAC members indicated that they'd like to track micromobility programs through the Action Plans. Potential metrics included the number of shared devices deployed, miles of rides completed, and number of operators, among others. However, there is only one subarea with an active micromobility program and only one other subarea currently pursuing deployment of their own. To determine feasibility of this RTO, the project team met with these jurisdictions and government relations staff at micromobility operator Lime. Lime and local jurisdiction staff expressed support for increasing the number of micromobility programs. However, it was agreed that the most efficient use of time and funding is to first support CCTA in taking a regional leadership role similar in the way that the Transportation Authority of Marin and the Sonoma County Transportation Authority have done. This role could include working with operators and jurisdictions to create a draft ordinance and/or Request for Proposals or a set of model standards for the local jurisdictions to adopt locally. Therefore, the project team proposes that micromobility programs be addressed in the Action Plans as actions and not as an RTO. The action will consider a micromobility RTO in the next iteration of Action Plans.

PAVEMENT CONDITION ON THE COUNTYWIDE LOW-STRESS BIKE NETWORK

Several RTPC TAC members indicated that condition of pavement along bicycle and pedestrian routes could potentially encourage or deter their use. The project team explored how and where pavement condition on these facilities is measured to determine if this RTO would be feasible. The project team found that there are no programs that track pavement condition on the entirety of the countywide LSBN. Pavement condition is currently tracked in a few areas of the county:



- Some portions of the LSBN are on arterial roadways, which, in some cases, do have a tracking system for pavement condition. However, pavement condition data for these arterial roadways is limited to the portion used by vehicles and does not include shoulder bicycle or pedestrian facilities.
- The East Bay Regional Parks District (EBRPD) measures Pavement Condition Index (PCI) on their off-street bicycle facilities. This data is used by the EBRPD to determine where pavement needs to be enhanced or replaced on their facilities. However, the project team discussed this potential RTO with EBRPD staff and heard that the PCI is not considered a truly accurate measurement of overall pavement condition. EBRPD staff noted that the tool is tailored for vehicle roadways and does not account for varying pavement conditions resulting from tree uprooting, settling, or damage.

Given that no comprehensive data regarding pavement conditions on bikeways currently exists, no RTO regarding this topic is recommended at this time.

AVERAGE COMMUTE TIME FOR LOW-INCOME RESIDENTS VERSUS HIGHER-INCOME RESIDENTS

Various RTPC TAC members were interested to know if there is a correlation between the time that commuters spend traveling to and from work and their income. Specifically, RTPC TAC members were curious to know if low-income commuters spend a disproportionately longer amount of time traveling to work than higher-income commuters. They wanted to determine:

- Is there a correlation between household income and **total** commute time?
- Is there a correlation between household income and **transit** commute time?
- Is there a correlation between household income and **driving (solo)** commute time?

Commute time and income can be estimated through data collected by the ACS, as published by the Census Bureau. The ACS estimates only cover work commute trips for workers 16 years of age and over. The current data release includes one-year estimates for 2019. The project team pulled this ACS data and calculated the average travel time in each census tract by dividing the aggregate travel time by the number of workers over 16 that commute to work. The finding from this exercise was that the correlation value was 0.3, indicating a weak correlation between all three commute types and household income. Due to this lack of correlation, the project team moved forward to check related questions, including:

- Is there any correlation between income and the percentage of commuters at 19 minutes or less (total of three commute time groups)?
- Is there any correlation between income and the percentage of commuters at 60 minutes or more?
- Is there any higher commute time for tracts inside of EPCs vs those outside EPCs?



A detailed examination revealed that none of these questions resulted in a strong correlation. Therefore, the project team could not make a conclusion that household income is directly related to the amount of time that commuters spend traveling to and from work. For these reasons, the project team does not propose moving forward with this RTO.

MILES OF ROUTES OF REGIONAL SIGNIFICANCE ESTIMATED TO BE VULNERABLE TO SEA-LEVEL RISE

RTPC TAC members and the project team indicated interest in how rising sea levels would potentially impact RRS. PlaceWorks identified all key facilities subject to inundation through sea-level rise, which were limited to bay shore areas in West, Central, and East County. These facilities subject to inundation were determined using RRS maps, which the project team then overlaid with sea-level rise projections. The sea-level rise projections are also used in Contra Costa County's ongoing Climate Action Plan and 2019 Vulnerability Assessment, congruent with best practices. Through this exercise, the project team determined that the majority of RRS or other infrastructure are in areas where private property owners and entities, such as Union Pacific Railroad, will likely work with local agencies to protect their infrastructure, thereby reducing the need for local intervention. In cases where local intervention or action would need to occur, sea-level rise adaptation planning will occur incrementally over time and is likely already being considered, such as through the current update to the Contra Costa County General Plan and Climate Action Plan and regional work through agencies such as the Association of Bay Area Governments and State working groups. Furthermore, it is difficult to know the true extent of infrastructure impacted by sea-level rise due to elevation of existing roadways (that may not be at sea level, such as the Carquinez Bridge) and unknowns related to vital infrastructure along these routes that may not be identified, such as bus storage lots or utility boxes. For these reasons, the project team does not propose moving forward with this RTO.

PERCENTAGE OF VULNERABLE RRS FOR WHICH REMEDIATION PLANS OR A MITIGATION APPROACH HAVE BEEN CREATED

Much like the above RTO, the RTPCs and project staff wanted to know if there were existing or proposed remediation plans or mitigation approaches to address the RRS that are vulnerable to sea-level rise inundation. Since the project team does not propose moving forward with the above RTO, we recommend not moving forward with this subsequent RTO.



MEMORANDUM

DATE July 21, 2022
TO John Hoang and Matt Kelly, CCTA
FROM David Early and Torina Wilson, PlaceWorks
Erin Vaca, DKS Associates
SUBJECT Regional Transportation Objectives Analysis Memorandum

The Action Plan planning process will incorporate performance metrics known as Regional Transportation Objectives (RTOs) that address transportation modes such as driving, transit, and bicycle and pedestrian travel, along with nonmodal topics of safety, equity, climate change, and technology. This memorandum presents the initial results of modeling and data collection for each of these RTOs for the East County subregion, and it presents performance targets for each RTO based on the modeling and data collection results.

This memorandum was compiled and authored by PlaceWorks. DKS conducted the modeling and wrote most of the text regarding the roadway, mode share, collision, and climate change RTOs. PlaceWorks prepared the content for the remaining RTOs.

The RTOs and proposed performance targets are summarized in Table 1.

Information about the methods used to calculate this data is contained in the RTO Methodology Memorandum dated July 7, 2022.

TABLE 1. REGIONAL TRANSPORTATION OBJECTIVES FOR EAST COUNTY SUBREGION

Facility Type or Planning Focus	Metric	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
Roadways	Freeway Delay Index	Travel time ratio for congestion vs. free-flow conditions	Delay index: ≤ 2.5	Delay index: 2.0	Delay index: 2.0
	Freeway Buffer Index	Proportion of added travel time between the 95 th percentile and the average	Buffer index: None	Buffer index: 0.5	Buffer index: 0.5
	Intersection Level of Service (LOS)	Average control delay during peak hours	Maintain LOS D or better at all signalized intersections, except on Bailey Road, where LOS E will be acceptable; or, at Traffic Management Program (TMP) sites that use performance measures other than average intersection delay.	LOS D in all areas except for downtowns, key school sites, and freeway ramps; LOS E at freeway ramps; no LOS standards for downtowns, key school sites, or Transit Priority Areas (TPAs)	LOS D in all areas except for downtowns, key school sites, and freeway ramps; LOS E at freeway ramps; no LOS standards for downtowns, key school sites, or TPAs
	Roadway Segment LOS outside of urban areas	Average speed during peak hours	None	LOS D (40 to 45 mph)	LOS D (40 to 45 mph)
	Transit Mode Share	Proportion of daily person trips using transit	None	6% for commute trips	12% for commute trips
Transit	Travel Time Ratio	Ratio of peak commute period travel time on transit to drive alone auto travel time for key corridors	None	Transit time \leq auto travel time	Transit time \leq auto travel time
Active Transportation	Bicycle Mode Share	Proportion of daily person trips made by bicycle	None	5% all trips 2.5% commute trips	10% all trips 5% for commute trips,
	Low Stress Bike Network (LSBN)	Proportion of the LSBN that is complete	None	33%	100%
	LSBN Crossings	Number of locations the LSBN crosses a roadway and is considered to be unprotected	None	Zero unprotected crossings	Zero unprotected or semi-protected crossings
Safety	KSI Collisions	Number of crashes resulting in fatality or injury	None	Zero fatality and severe injury crashes	
	Bike-Ped Collisions	Number of KSI crashes involving a bicyclist of pedestrian	None		
	Bike-Ped Collisions near Schools	Number of bicycle or pedestrian involved KSI collisions occurring within 500 feet of schools	None		
Equity	KSI Collisions in EPCs	Proportion of KSI collisions that occur in EPCs	None	Zero fatality and severe injury crashes	



Facility Type or Planning Focus	Metric	Definition	Existing Target	Proposed 2027 Target	Proposed 2050 Target
	Job Share Accessible by driving in EPCs	Share of jobs accessible by EPCs residents with a 30-minute drive	None	53% of jobs accessible	59% of jobs accessible
	Job Share Accessible by transit in EPCs	Share of jobs accessible by EPCs residents with a 45-minute transit trip	None	53% of jobs accessible	100% of jobs accessible
	High Quality Transit Access in EPCs	Number of people in EPCs not within a quarter-mile distance of a transit stop served by high quality transit	None	8%	100%
	Single-Occupant Vehicle (SOV) Mode Share	Proportion of daily person trips made by single occupant vehicle	None	68%	66%
	Greenhouse Gas (GHG) Emissions per Capita	Tons of CO ₂ emissions	None	12 lbs per capita	Zero transportation related
Climate Change	Electric Vehicle Ownership	Number of battery electric vehicles owned by subregion residents	None	50% market penetration	100% market penetration
	VMT per capita	Home-based vehicle miles traveled per capita	None	29.3 VMT	21 VMT
Technology	Level of Signal Interconnection	Number of connected signals	None	84	84

Mode Share RTOs

Mode share is considered in RTOs regarding the transit, bike/pedestrian, and climate change topics. Since mode share is relevant to three separate topics, information on it is presented in this section. Specific RTOs for each mode are contained in the sections below.

REPORTED CURRENT COMMUTE MODE SHARE

The American Community Survey (ACS) estimates published by the Census Bureau reports the number of work trips by mode. An estimated mode share based on this data is shown in Table 2 and shows the commute mode share for Contra Costa County and the East County subregion. As shown in Table 2, about 78 percent of the work trips in Contra Costa County are made by automobile either driving alone or by carpool, while 85 percent are made by automobile in the East County subregion.

TABLE 2. MEANS OF TRANSPORTATION TO WORK IN CONTRA COSTA COUNTY AND THE EAST COUNTY SUBREGION (2019)

Mode	Contra Costa County			East County Subregion		
	Estimate	Margin of Error	Percentage Mode Share	Estimate	Margin of Error	Percentage Mode Share
Total:	559,646	±7,121		155,348	±3,655	
Car, truck, or van - drove alone	380,290	±7,760	68%	109,339	±2,977	70%
Car, truck, or van - carpooled	56,092	±4,997	10%	23,924	±1,563	15%
Public transportation (excluding taxicab)	63,846	±4,543	11%	9,939	±903	6%
Taxicab, motorcycle, bicycle, walked, or other means	20,444	±3,970	4%	4,804	±691	3%
Worked from home	38,974	±3,917	7%	7,340	±713	5%

Source: American Community Survey 5-Year Estimates, Table B08301.

MODELED COMMUTE MODE SHARE

Mode shares for the home-based work trip purpose have been calculated based on the residence location (Table 3) or the work location (Table 4). These tables report mode shares for both East County and Contra Costa County as a whole. The modeling results show that most work trips by East County residents are made by automobile, specifically driving alone. Bicycling and walking account for a very small portion of commute trips made by East County residents (note that the bicycle mode share only reflects those trips made by bicycle from beginning to end and does not count access trips to and from transit stops).

Commuters to jobs located within East County predominantly use the automobile modes to get to work, specifically driving alone. Transit, bicycling, and walking account for relatively small shares of this market. Commute mode shares are predicted to remain much the same by 2050, with only a small increase in the transit mode share.

TABLE 3. MODELED HOME-BASED JOURNEY-TO-WORK MODE SHARE – EAST COUNTY RESIDENTS

	Planning Area		East County	
	2019	2050 Baseline	2019	2050 Baseline
Drive Alone Auto	73%	71%	75%	73%
Carpool	14%	15%	17%	16%
Transit	11%	12%	6%	10%
Bike	0.4%	0.7%	0.1%	0.2%
Walk	1.3%	1.5%	0.8%	0.9%

Source: CCTA travel demand model and DKS Associates.

Note: Mode shares calculated with home-based work person trip ends at the production (home location) zone. Totals may not add due to rounding.

TABLE 4. MODELED HOME-BASED JOURNEY-TO-WORK MODE SHARE – JOBS LOCATED IN EAST COUNTY

	Planning Area		East County	
	2019	2050 Baseline	2019	2050 Baseline
Drive Alone Auto	83%	79%	84%	83%
Carpool	12%	14%	11%	11%
Transit	2%	4%	2%	4%
Bike	0.6%	1%	0.3%	0.5%
Walk	2%	3%	2%	2%

Source: CCTA travel demand model and DKS Associates.

Note: Mode shares calculated with home-based work person trip ends at the attraction (work location) zone. Totals may not add due to rounding.

MODE SHARE FOR ALL TRIP PURPOSES

Table 5 reports the mode share calculated for all trip purposes included in the CCTA travel demand model – home-based work, home-based shopping, home-based social/recreation, non-home-based, home-based grade school, home-based high school, and home-based college. The modeling results show that most trips are currently made by automobile, with transit and active transportation modes accounting for less than 8 percent of all trips.

By 2050, the mode shares are expected to remain like existing conditions, with only a modest increase in the transit and walk mode shares.

TABLE 5. MODE SHARE FOR ALL TRIPS— EAST COUNTY SUBREGION RESIDENTS

	Planning Area		East County	
	2019	2050 Baseline	2019	2050 Baseline
Drive Alone Auto	63%	62%	63%	63%

Carpool	27%	28%	30%	28%
Transit	3%	3%	1.9%	2%
Bike	0.6%	0.9%	0.5%	1.2%
Walk	6%	6%	5%	6%

Source: CCTA travel demand model and DKS Associates.

Note: Totals may not add due to rounding.

Freeway RTOs

Freeway Routes of Regional Significance (RRS) in the East County subregion include:

- State Route 4 (SR-4) from Willow Pass Grade to Balfour Road
- State Route 160 (SR-160) from SR-4 to the Sacramento County Line

PEAK-HOUR DELAY INDEX ON SELECT FREEWAY SEGMENTS

The delay index is a measure of delay experienced by motorists on a roadway segment during a peak commute hour in a single direction. The delay index is calculated by measuring the time it takes to travel a segment of road during peak-period congested conditions and comparing it to the time it takes to travel the same segment during uncongested, free-flow conditions. The delay index may also be calculated as the ratio of congested speed to uncongested speed, given that the distance is fixed on any given corridor.

Baseline observed and modeled results for freeway delay index on SR-4 and SR-160 are shown in Table 6. The observed delay index for existing conditions is high in the a.m. westbound direction for SR-4 and p.m. northbound direction for SR-160. The modeled condition for 2050 generally shows a decrease in delay index for SR-4 while SR-160 remains consistent with existing conditions.

The previous East County Action Plan set a delay index standard of 2.5 or better during the peak period/peak direction. Since the observed 2019 and modeled 2050 delay index is currently meeting this standard with a large margin, we propose a standard of 2.0 for this Action Plan.

BUFFER INDEX ON SELECT FREEWAY SEGMENTS

The buffer index represents the extra buffer time (or time cushion) that most travelers add to their average travel time when planning trips to ensure on-time arrival. This extra time is added to account for any unexpected delay. The buffer index is expressed as a percentage and its value increases as reliability gets worse. For example, a buffer index of 40 percent means that, for a 20-minute average travel time, a traveler should budget an additional 8 minutes (20 minutes × 40 percent = 8 minutes) to ensure on-time arrival most of the time. In this example, the 8 extra minutes is called the buffer time. The buffer index is computed as the difference between the 95th percentile travel time and average travel time, divided by the average travel time.

Baseline observed and modeled results are shown in Table 6. The observed buffer index for existing conditions and peak direction of travel ranges from .05 to 0.81, reflecting a high degree of travel time

variability, especially in the morning westbound direction on SR-4 and evening northbound directions on SR-160.

The existing East County Action Plan does not have a buffer index performance target set for any RRS. The proposed performance target for the buffer index is 0.50, which means that the extra travel time that must be considered for travelers would be no more than half of the average travel time over the corridor.

TABLE 6. FREEWAY RTOS

Route of Regional Significance	2019 Observed			2050 Baseline Modeled	
	Avg Speed (MPH) ^a	Delay Index	Buffer Index	Avg Speed (MPH) ^a	Delay Index
STATE ROUTE 4					
A.M. Eastbound	62.6	1.0	0.05	65.0	1.0
A.M. Westbound	37	1.3	0.75	57.0	1.1
P.M. Eastbound	60.8	1.0	0.19	65.0	1.0
P.M. Westbound	63.8	1.0	0.06	68.7	0.9
STATE ROUTE 160					
A.M. Northbound	48.1	1.2	0.27	55.7	1.2
A.M. Southbound	58.8	1.1	0.07	59.0	1.1
P.M. Northbound	42.1	1.3	0.81	51.9	1.3
P.M. Southbound	60.4	1.0	0.09	62.3	1.0

Notes: a) Average speed over corridor as a whole.

Surface Roadway RTOS

PEAK-HOUR LOS AT SELECTED INTERSECTIONS IN URBAN AREAS

This RTO will be applied to signalized intersections along the defined arterial RRS. Signalized Intersection LOS is a delay-based qualitative measure of traffic conditions at a signalized intersection. LOS is expressed in ratings from “A” through “F,” with “A” meaning that all traffic clears the intersection in every cycle and “F” meaning that drivers must wait through multiple cycles to clear the intersection. Signalized intersection LOS is determined based on intersection turning movement counts (also called turning/traffic volumes), intersection geometry, and signal timing data. The CCTA Technical Procedures specify that methods documented in the latest edition of the *Highway Capacity Manual* be used to measure signalized intersection LOS.¹ The relationship between average control delay and LOS is shown in Table 7. The key arterial intersections that are analyzed for LOS are listed in Table 8. However, the

¹ The *Highway Capacity Manual* 7th Edition was published by the Transportation Research Board in January 2022.



project team requires more time to analyze the LOS of these intersections and they will be available at a later date.

The existing East County Action Plan adopted an LOS D threshold for all arterial intersections except for Bailey Road where LOS E is acceptable.

Congestion in downtown areas often results from economically- and socially-positive increased activity, so it is considered acceptable. Congestion at freeway ramps is often unavoidable since large numbers of trips are concentrated in areas where motorists get onto freeways. Therefore, the proposed performance targets for signalized intersection LOS for the East County subregion is as follows:

- LOS D in all areas except downtowns, at key schools, and freeway ramps.
- LOS E at freeway ramps.
- No LOS standard for downtowns, key schools, or TPAs.

TABLE 7. INTERSECTION LOS DEFINITIONS

Control Delay (Seconds/Vehicle)	LOS
≤10	A
>10-20	B
>20-35	C
>35-55	D
>55-80	E
>80	F

Source: *Highway Capacity Manual*, 6th Edition, Exhibit 19-8



TABLE 8. SIGNALIZED INTERSECTION PEAK-HOUR LOS [DATA IN PROGRESS AND IS FORTHCOMING]

Intersection	2019 A.M.		2019 P.M.		2050 A.M.		2050 P.M.	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
10th Street & G Street								
10th Street & L Street								
A Street & 18th Street								
Auto Center Drive & W 10th Street								
Bailey Road & SR-4 Eb Ramps								
Bailey Road & SR-4 Wb On-Ramp								
Bailey Road & W Leland Road								
Bailey Road & Willow Pass Road								
Balfour Road & Fairview Avenue								
Balfour Road & SR-4								
Brentwood Boulevard & Balfour Road								
Brentwood Boulevard & Byron Highway (South)								
Brentwood Boulevard & Lone Tree Way								
Brentwood Boulevard & Oak Street								
Brentwood Boulevard & Sand Creek Road								
Brentwood Boulevard & Sellers Avenue								
Buchanan Road & Harbor Street								
Byron Highway & Camino Diablo								
Byron Highway & SR-4								
Camino Diablo Road & Vasco Road								
Cypress Road & Bethel Island Road								
Cypress Road & Sellers Avenue								
Dallas Ranch Road & Prewett Ranch Drive								
Deer Valley Road & Lone Tree Way								
Delta Fair Boulevard & Century Boulevard								
E 10th Street & Railroad Avenue								



East 18th Street & Hillcrest Avenue
Empire Avenue & Lone Tree Way
Fairview Avenue & Lone Tree Way
Hillcrest Avenue & Davidson Drive
Hillcrest Avenue & Laurel Road
Hillcrest Avenue & Lone Tree Way
Hillcrest Avenue & SR-4 Eb Ramps
Hillcrest Avenue & SR-4 Wb Ramps
James Donlon Boulevard & Contra Loma Boulevard
James Donlon Boulevard & Gentrytown Drive
Laurel Road & Empire Avenue
Laurel Road & Live Oak Avenue
Laurel Road & Main Street
Laurel Road & Nb SR-4 Off Ramp
Laurel Road & O'hara Avenue
Laurel Road & Sb SR-4 Off Ramp
Leland Road & Harbor Street
Leland Road & San Marco Boulevard
Lone Tree Way & Eagleridge Drive
Lone Tree Way & Ridgerock Drive
Lone Tree Way & SR-4 Eb Ramps
Lone Tree Way & SR-4 Wb Ramps
Loveridge Road & Buchanan Road
Loveridge Road & E Leland Road
Main Street & Empire Avenue
Main Street & O'Hara Avenue
Main Street & W Cypress Road
Marsh Creek Road & SR-4
O'Hara Avenue & Lone Tree Way
Pittsburg-Antioch Highway & Loveridge Road

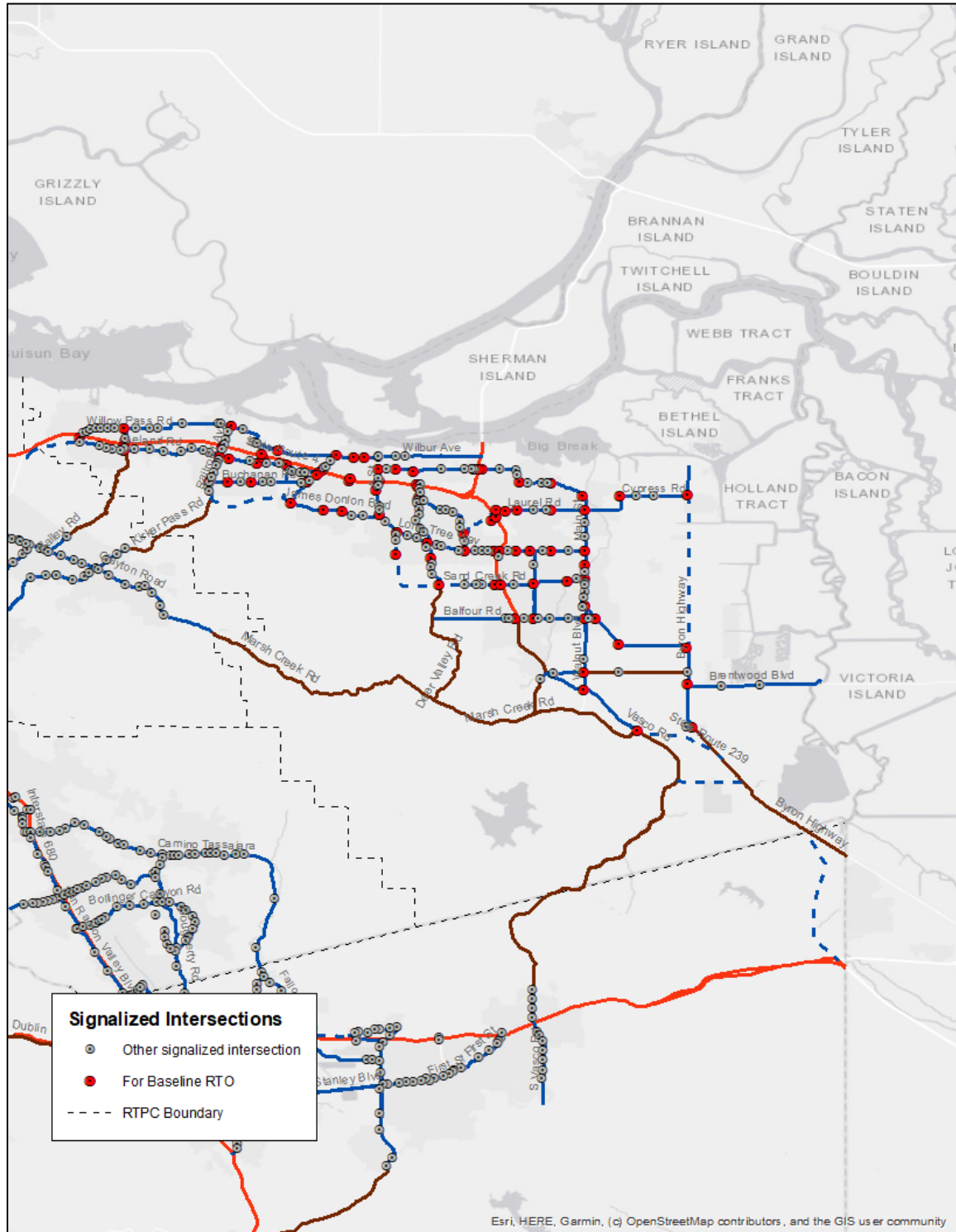


Railroad Avenue & Buchanan Rodd
Railroad Avenue & Leland Road
Railroad Avenue & SR-4 Eb Ramps
Railroad Avenue & SR-4 Wb On-Ramp
Sand Creek Road & Fairview Avenue
Sand Creek Road & O'hara Avenue
Somersville Road & Buchanan Road
Somersville Road & Delta Fair Road
Somersville Road & James Donlon Boulevard
Somersville Road & SR-4 Eb Ramps
Somersville Road & SR-4 Wb Ramps
SR-160 Nb Ramps & Main Street
SR-160 Sb Ramps & Main Street
SR-160 Sb Ramps & Main Street
SR-4 Eb Ramps & Contra Loma Boulevard
SR-4 Eb Ramps & Loveridge Road
SR-4 Eb Ramps & Willow Pass Road
SR-4 Nb On Ramp & Lone Tree Way
SR-4 Nb Ramps & Sand Creek Road
SR-4 Sb Ramps & Lone Tree Way
SR-4 Sb Ramps & Sand Creek Road
SR-4 Wb Ramps & California Avenue
SR-4 Wb Ramps & Contra Loma Boulevard
SR-4 Wb Ramps & Willow Pass Road
Vasco Road & Walnut Boulevard
Walnut Boulevard & Balfour Road
Walnut Boulevard & Marsh Creek Road

Notes: Delay is average control delay reported in seconds. Cells that are bolded indicate performance below target.



FIGURE 1. SIGNALIZED INTERSECTIONS AND ROADWAY RRS - EAST COUNTY





PEAK-HOUR SEGMENT LOS ON SELECTED TWO-LANE ROADWAYS OUTSIDE OF URBAN AREAS

Roadway segment LOS is a measure of traffic efficiency and smoothness of flow along roadway segments that are not constrained by a nearby traffic signal. This has been calculated in accordance with the methods specified in the 2010 *Highway Capacity Manual* using average speed for Class I highways (Class I highways are two-lane facilities in largely rural areas that motorists expect to traverse at relatively high speed).

For the East County subregion, this metric is applied to Bailey Road, Byron Highway, Camino Diablo Road, Deer Valley Road, Marsh Creek Road, SR-4, and Vasco Road.

The segment LOS is related to average speed, as shown in Table 9. Table 10 lists the rural roadway corridors analyzed for the East County subregion and reports the existing and forecasted LOS.

The existing East County Action Plan does not have an adopted LOS threshold for any two-lane rural roadways. The recommended performance target for this metric is LOS D for all corridors which corresponds to an average speed across the corridor of 40-45 mph.

TABLE 9. LOS FOR TWO-LANE ROADWAYS

LOS	Average Speed (MPH)
A	>55
B	>50-55
C	>45-50
D	>40-45
E	≤40

Source: *Highway Capacity Manual* 2010, Exhibit 15-3.

TABLE 10. ROADWAY CORRIDOR LOS FOR TWO-WAY ROADWAYS OUTSIDE URBAN AREAS

Route of Regional Significance	Time of Day	Direction	2019		2050	
			Avg Speed	LOS	Avg Speed	LOS
Bailey Road	A.M.	NB	36.0	E	38.0	E
Bailey Road	A.M.	SB	35.1	E	55.1	A
Bailey Road	P.M.	NB	36.8	E	55.5	A
Bailey Road	P.M.	SB	41.1	D	46.7	C
Byron Highway	A.M.	NB	42.2	D	37.6	E
Byron Highway	A.M.	SB	40.9	D	31.6	E
Byron Highway	P.M.	NB	42.6	D	31.4	E
Byron Highway	P.M.	SB	43.2	D	48.8	C
Camino Diablo Road	A.M.	EB	46.1	C	46.1	C
Camino Diablo Road	A.M.	WB	46.0	C	46.0	C
Camino Diablo Road	P.M.	EB	45.6	C	45.6	C
Camino Diablo Road	P.M.	WB	44.1	D	44.1	D



Deer Valley Road	A.M.	NB	45.6	C	45.6	C
Deer Valley Road	A.M.	SB	46.6	C	46.7	C
Deer Valley Road	P.M.	NB	47.5	C	47.5	C
Deer Valley Road	P.M.	SB	42.8	D	42.8	D
Marsh Creek Road	A.M.	EB	46.7	C	42.8	D
Marsh Creek Road	A.M.	WB	49.3	C	57.5	A
Marsh Creek Road	P.M.	EB	49.5	C	57.4	A
Marsh Creek Road	P.M.	WB	36.1	E	42.6	D
SR-4 s/o Balfour	A.M.	EB	52.6	B	61.7	A
SR-4 s/o Balfour	A.M.	WB	52.6	B	62.2	A
SR-4 s/o Balfour	P.M.	EB	51.3	B	65.0	A
SR-4 s/o Balfour	P.M.	WB	49.8	C	65.0	A
Vasco Road	A.M.	NB	54.7	B	54.8	A
Vasco Road	A.M.	SB	49.0	C	29.1	E
Vasco Road	P.M.	NB	34.5	E	43.0	D
Vasco Road	P.M.	SB	55.0	B	54.5	A

Source: Inrix Roadway Analytics, CCTA Travel Demand Model

Transit RTOs

MODE SHARE OF TRANSIT TRIPS

As shown in Table 3 in the first section of this memo (“Mode Share RTOs”), 6 percent of East County residents commute to work using transit, compared to 11 percent of Planning Area residents. Table 3 and Table 4 illustrate that the model output predicts that this number will increase to 10 percent of home-based work mode share based on residence location and 4 percent based on job location. Meanwhile, Table 5 illustrates that the model predicts that 2 percent of all trips (not strictly commute trips) will be taken by transit by 2050.

The existing East County Action Plan does not have an adopted transit mode share target. Covid has greatly reduced transit trips, so the proposed performance target for transit mode share in the East County subregion is to return to pre-pandemic levels of 6 percent of home-based work trips by 2027. We also propose a target is to double the level of home-based work transit trips to 12 percent by 2050. This is an ambitious goal, but one that will be needed to meet goals to minimize VMT, transportation-related GHG emissions, and congestion.

RATIO OF TRAVEL TIME FOR TRANSIT AS COMPARED TO AUTOMOBILE TRAVEL TIME FOR SELECT TRIPS

This metric compares the peak period transit travel time on select corridors to the equivalent single occupant vehicle travel time in the peak commute direction. The key corridor(s) monitored for the East County subregion along with the comparative travel times are shown in Table 11.

The proposed performance target is that transit travel time should be less than or equal to auto time, when measured from transit station to transit station. As shown in Table 11, travel by BART is somewhat



slower than driving between the Antioch BART station and 12th Street (Oakland) BART station except for eastbound during the afternoon peak. In 2050, the congested travel times predicted by the travel demand model will give transit an advantage in the morning westbound and afternoon eastbound directions in this corridor (assuming BART service remains constant).

TABLE 11. TRAVEL TIME RATIO FOR AUTOS VS TRANSIT ON KEY CORRIDORS

	Median Drive Time (min:sec) ^a	Scheduled Transit Time (min) ^b	2050 Drive Alone (min) ^c	Existing	2050 ^d
Morning – Westbound	56:53	61	103:7	1.07	0.59
Morning – Eastbound	37:10	56	48:00	1.51	1.17
Afternoon- Westbound	36:20	61	43:00	1.68	1.41
Afternoon- Eastbound	66:15	56	95:00	0.85	0.58

Notes:

a) Range of average driving time for Tuesdays – Thursdays for April 2019 from INRIX Roadway Analytics

b) From published schedules

c) CCTA travel demand model congested time skim

d) CCTA travel demand model “best path” transit skim

Bike/Pedestrian RTOs

MODE SHARE OF BICYCLING AND WALKING

As shown in Table 3 in the first section of this memo (“Mode Share RTOs”), about 0.9 percent of East County residents commute to work through active transportation such as biking or walking. Table 3 and Table 4 illustrate that these shares will remain roughly constant at 1.1 percent of home-based work trips based on residence location and 2.5 percent based on job location. As shown in Table 5, the model predicts that about 5.5 percent of all trips (not strictly commute trips) were taken by walking or biking in 2019 and that it will increase to 7.2 percent in 2050.

The existing East County Action Plan does not have an adopted biking or walking mode share target. The proposed performance target for biking and walking mode share in the East County subregion is to approximately double the combined mode share for all trips for bikes and walking to 10 percent by 2050. Because biking and walking modes are important to CCTA and their member jurisdictions, the proposed performance target for 2027 is half of the 2050 target, at 5 percent. Further, the project team proposes the East County Action Plan include biking and walking mode share performance targets for commute trips in addition to all trips. The proposed biking and walking performance targets for commute trips are 2.5 percent by 2027 and 5 percent by 2050. These are ambitious goals but will be needed to meet goals to minimize VMT, transportation-related GHG emissions and congestion.

PROPORTION OF THE COUNTYWIDE LOW STRESS BIKE NETWORK THAT HAS BEEN COMPLETED

The Low Stress Bike Network (LSBN) is a component of the CCTA Countywide Bicycle and Pedestrian Plan (CBPP) adopted in 2018. The CBPP introduced a new way of evaluating a facility’s Level of Traffic Stress, in which roadways are evaluated on several factors, including, but not limited to the speed and number of vehicles and presence and width of bicycle facilities. Facilities are given a rating from one



(least stressful) to four (most stressful) to evaluate the stress a bike rider will experience. The goal of the 2018 CBPP is to ensure the LSBN is complete and rated either Level of Traffic Stress 1 (most children can feel safe riding on these facilities) or Level of Traffic Stress 2 (The “interested but concerned” adult population will feel safe riding on these facilities). Ultimately, construction of the entire LSBN would result in an increase in bike/pedestrian mode share and a reduction in KSI collisions.

The status of the entire East County portion of the LSBN is shown in Figure 2. If the entire LSBN in the East County subregion were completed, it would result in 235.3 miles of Class I and Class IV facilities.

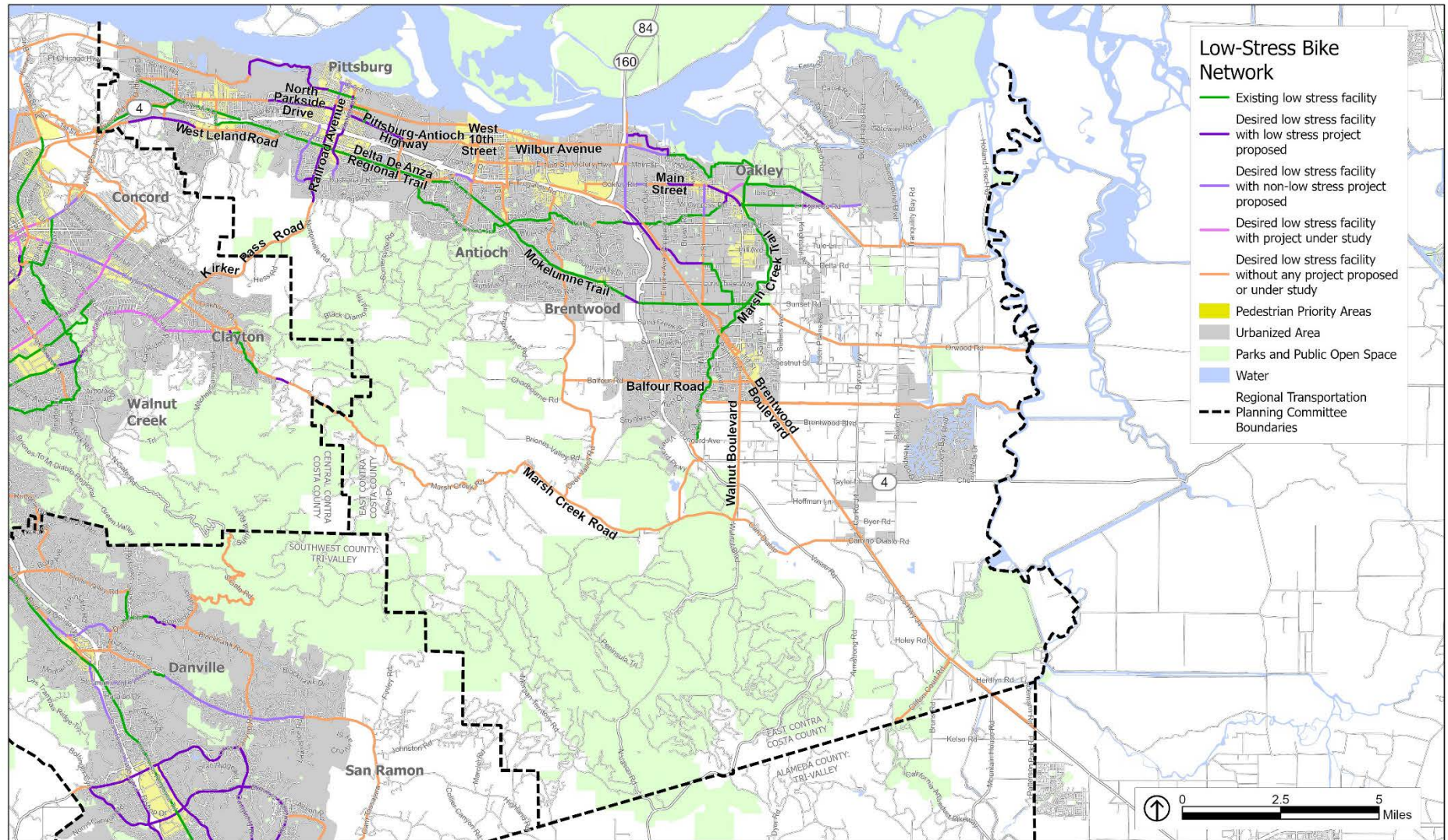
Table 12 shows that 20 percent of East County’s LSBN is already completed. A further 9 percent of low stress facilities are incomplete yet have an adopted plan to complete the facility. There are projects proposing improvements that would not result in low-stress facilities on an additional 4 percent of the LSBN while an additional 0.2 percent is designated as “under study”. A total of 67 percent of the total LSBN miles are incomplete and do not have a plan to complete them or to study them further.

We suggest that the region aim to achieve 100 percent completion of the LSBN by 2050. We also propose an interim target of 33 percent (78.2 miles) completion by 2027. This is the sum of existing completed facilities (46.8 miles) and 150 percent of the already proposed low-stress additions to the network (20.9 miles x 150 percent = 31.4 miles). This would require completion of the low-stress projects that already have an adopted plan.

TABLE 12. PROPORTION OF THE EAST COUNTY SUBREGION LSBN THAT IS COMPLETE

Status of Facility	Miles	Percentage
Existing Low Stress Facility	46.8	20%
Desired Low Stress Facility with Low Stress Project Proposed	20.9	9%
Desired Low Stress Facility with Non-Low Stress Project Proposed	9.6	4%
Desired Low Stress Facility with Project Under Study	0.6	0.2%
Desired Low Stress Facility without any Project Proposed or Under Study	157.4	67%

FIGURE 2. STATUS OF THE EAST COUNTY LSBN



WORKING DRAFT — EAST CONTRA COSTA COUNTY LOW-STRESS BIKE NETWORK



NUMBER OF LOCATIONS WHERE THE LOW STRESS BIKE NETWORK MAKES AN UNPROTECTED CROSSING OF A HEAVILY TRAVELED VEHICLE ROUTE

For this RTO, PlaceWorks created an ArcGIS point data set, shown in Figure 3, that identifies each location where the existing LSBN crosses a heavily-traveled vehicle route and is considered:

- **Fully protected** by grade separation or a signalized intersection with cyclist protections.
- **Semi-protected** at an at-grade crossing with a beacon system, or with a signal but without cyclist protections.
- **Unprotected** at an at-grade crossing which includes none of the improvements listed above.

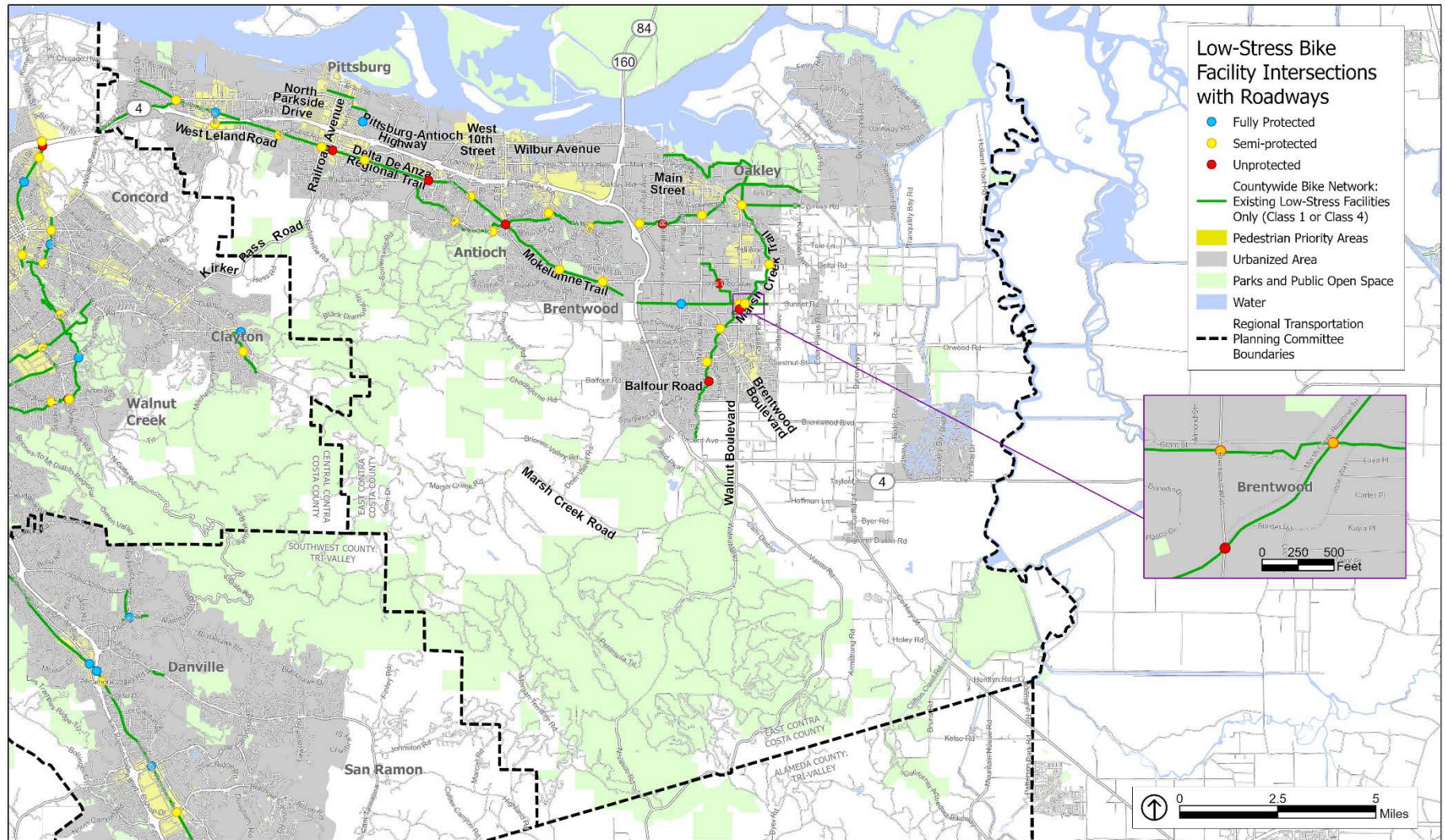
As illustrated in Figure 3, there are 7 intersections in the East County subregion that are currently unprotected. The unprotected intersections are:

- Delta de Anza Trail mid-block crossing with Lone Tree Way between Clayburn Road and James Donlon Boulevard.
- Delta de Anza trail crossing at Buchanan Road and Somersville Road.
- Delta de Anza Trail mid-block crossing with Harbor Street near Atlantic Avenue.
- Delta de Anza Trail mid-block crossing with Empire Avenue near Laurel Road.
- Marsh Creek Trail mid-block crossing with Balfour Road between Sweetgrass Drive and Rosegate Avenue.
- Marsh Creek Trail mid-block crossing with Brentwood Boulevard between Havenwood Avenue and Grant Street.
- Unnamed bike path mid-block crossing with Lone Tree Way between Tilton Lane and Anderson Lane.

We propose that the Action Plan set a target to modify these 7 unprotected intersections to become fully protected by 2027. The project team also proposes that the Action Plan set a target to complete crossing improvements at the 20 semi-protected crossings to ensure they are also classified as fully protected.

As the LSBN is completed over time, new locations where the LSBN crosses a heavily traveled vehicle route will be added. Local jurisdictions should install full intersection protections for cyclists and pedestrians at these locations.

FIGURE 1. TYPES OF CROSSINGS AT INTERSECTIONS OF THE LSBN AND A HEAVILY TRAVELED ROADWAY



Source: ABAG/MTC, 2021, 2019; CCTA, 2021; ESRI, 2021; PlaceWorks, 2021.

WORKING DRAFT — EAST CONTRA COSTA COUNTY LOW-STRESS BIKE NETWORK AND SIGNIFICANT ROADWAY INTERSECTIONS



Safety RTOs

The RTOs presented in this section are based on the injury and fatality crashes reported by the Transportation Injury Mapping System (TIMS).² TIMS crash records represent cleaned and geocoded data compiled by the Statewide Integrated Traffic Records System (SWITRS) maintained by the California Highway Patrol. The statistics reflect the most recent five years available data (January 1, 2016, through December 31, 2020).

CCTA has published the *Vision Zero & Systemic Transportation Safety "How To" Policy and Implementation Guide* and encourages local jurisdictions to adopt and implement Vision Zero Action plans. In addition, an objective found in the Contra Costa Countywide Bicycle and Pedestrian Plan is to, "Reduce the rate of pedestrian and bicycle fatalities and injuries per capita."

In alignment with the Vision Zero philosophy, the proposed performance target is zero fatalities and severe injuries for each of the below safety RTOs.

NUMBER OF KILLED OR SERIOUSLY INJURED (KSI) COLLISIONS

This RTO tracks the number of bicycle or pedestrian involved KSI crashes from the TIMS data set. The crash locations are depicted in Figure 4. Table 13 summarizes the crashes by type and Table 14 summarizes the crashes by severity.

As shown, many of the crashes occurred along the SR-4 corridor, although clusters also occur along major arterials, and other facilities. The most common type of crash was rear-end, followed by broadside collisions and vehicles hitting objects. During this timeframe, there were 127 fatal crashes and 475 severe injury crashes, accounting for about 2 percent and 9 percent of all crashes, respectively.

NUMBER OF BIKE- OR PEDESTRIAN-INVOLVED COLLISIONS

The crash locations for the East County subregion are depicted in Figure 5 and summarized by severity in Table 14. During this timeframe, there were 529 bicycle or pedestrian involved crashes, accounting for about 10 percent of all crashes. Of these 529 bicycle or pedestrian crashes, 36 of them resulted in fatalities and 95 resulted in severe injury.

NUMBER OF BIKE- OR PEDESTRIAN-INVOLVED COLLISIONS WITHIN 500 FEET OF A SCHOOL

This RTO tracks the number of bicycle or pedestrian involved KSI crashes that occur within 500 feet of school campuses. These crash locations are also depicted in Figure 5. A total of 74 crashes occurred near school campuses, 58 of which involved collision with a pedestrian and 16 with a bicyclist, none resulting in a fatality.

² Transportation Injury Mapping System (TIMS), Safe Transportation Research and Education Center, University of California, Berkeley. 2022

FIGURE 4. FATALITY AND INJURY COLLISIONS (2016-2020)

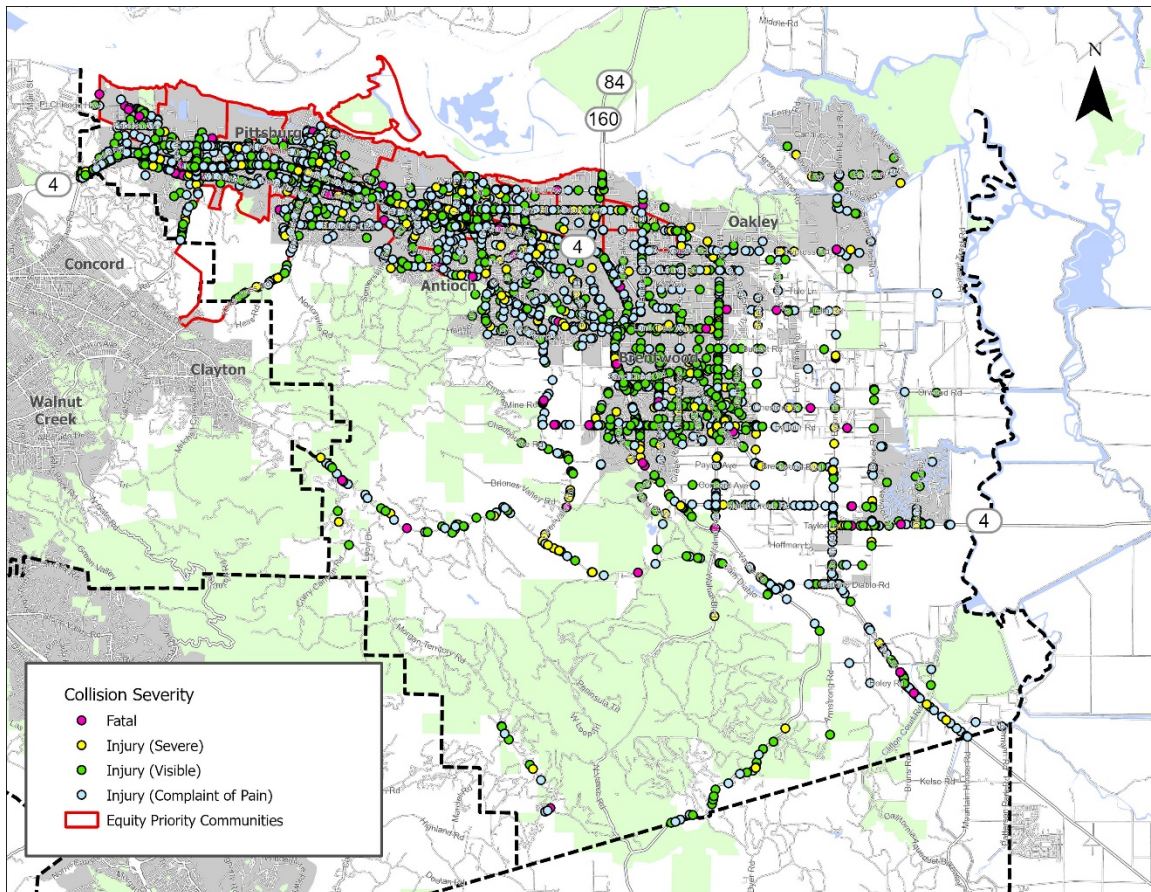




TABLE 13. INJURY AND FATALITY COLLISION BY CRASH TYPE - EAST COUNTY SUBREGION FROM JANUARY 1, 2016, THROUGH DECEMBER 31, 2020

Crash Type	Number of Crashes
Not Stated	23
Head-on	398
Sideswipe	568
Rear-End	1,652
Broadside	1,121
Hit Object	870
Overtaken	218
Vehicle/Pedestrian	349
Other	75
Total	5,274

Source: Transportation Injury Mapping System and DKS Associates

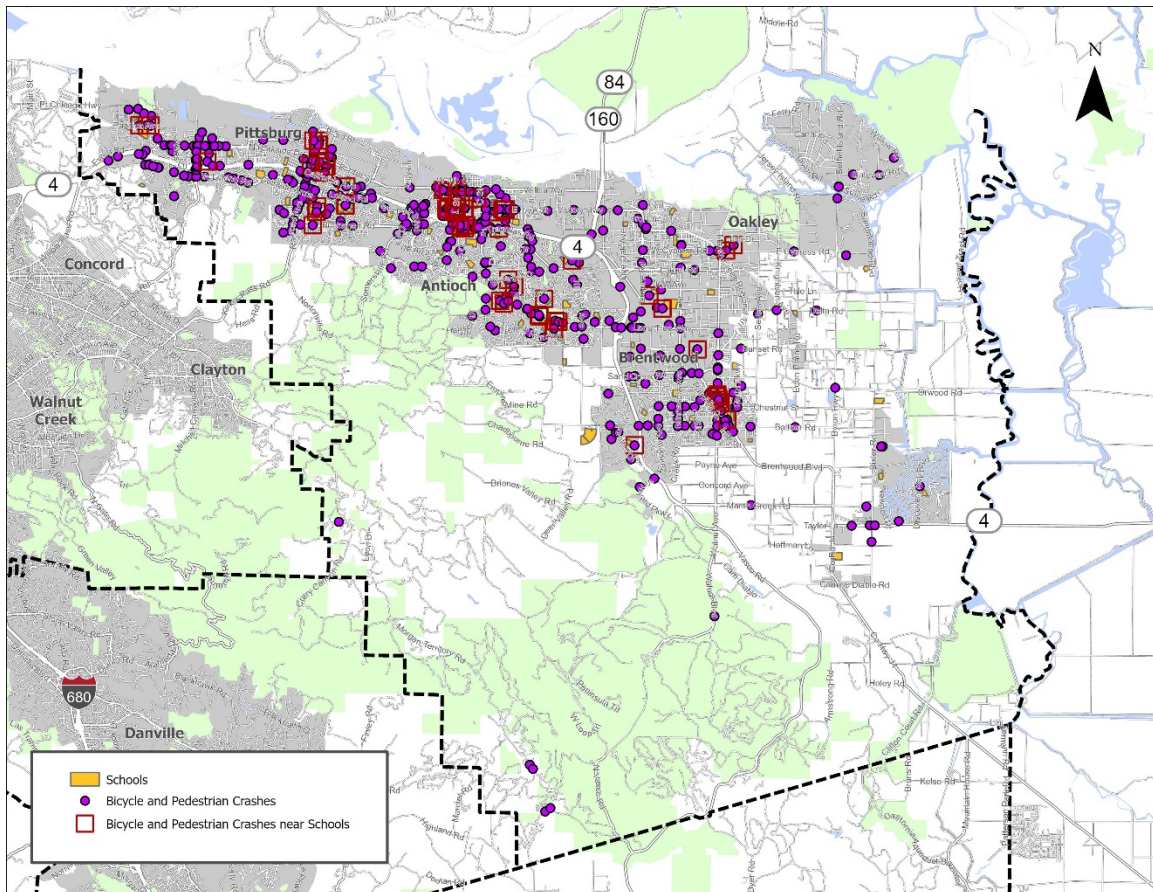
TABLE 14. NUMBER OF CRASHES BY SEVERITY - EAST COUNTY SUBREGION FROM JANUARY 1, 2016, THROUGH DECEMBER 31, 2020

Severity	Number of Total Crashes	Bike and Ped Crashes
Fatal	127	36
Injury (Severe)	475	95
Injury (Other Visible)	1,576	208
Injury (Complaint of Pain)	3,096	190
Total	5,274	529

Source: Transportation Injury Mapping System and DKS Associates



FIGURE 5. BICYCLE- AND PEDESTRIAN-INVOLVED CRASHES INCLUDING WITHIN 500 FEET OF SCHOOLS





Equity RTOs

PROPORTION OF KSI AND BIKE- OR PED-INVOLVED COLLISIONS THAT OCCUR IN EPCS

This metric tracks the proportion of all collisions that occur within EPCs. Of the 5,274 crashes summarized under Safety RTOs, 2,058 or about 39 percent occurred within East County EPCs.

SHARE OF COUNTY JOBS THAT CAN BE REACHED BY EPC RESIDENTS WITH A 30-MINUTE DRIVE, AS COMPARED TO COUNTY RESIDENTS AS A WHOLE

This metric compares the proportion of Contra Costa County jobs reachable within a 30-minute peak period drive from each TAZ in the subregion compared to the proportion of County jobs reachable from all TAZs within subregion EPCs. The number of jobs corresponds to those used in the travel demand model inputs. As shown in Table 15 below, while 52 percent of County jobs are reachable from the East County subregion, only 51 percent of County jobs are reachable from within the EPCs. By 2050, the share of County jobs reachable from the East County region is forecasted to rise to 59 percent while the EPC share only rises to 57 percent.

The proposed performance target for this RTO is that the share of accessible jobs from within the EPCs should be equivalent to that of the subregion as a whole by 2050. This implies that the EPC accessibility for East County should rise to 53 percent by 2027.

TABLE 15. SHARE OF COUNTY JOBS ACCESSIBLE WITHIN A 30 MINUTE DRIVE

GEOGRAPHY	JOBS 2019	PERCENT REACHABLE 2019	COUNT TAZs 2019	JOBS 2050	PERCENT REACHABLE 2050	COUNT TAZs 2019
Contra Costa County	404,286	100%	1,493	530,467	100%	1,493
East County	210,636	52%	839	312,417	59%	941
East County EPCs	206,499	51%	796	300,151	57%	840

SHARE OF COUNTY JOBS THAT CAN BE REACHED BY EPC RESIDENTS WITH A 45-MINUTE TRANSIT TRIP, AS COMPARED TO COUNTY RESIDENTS AS A WHOLE

This metric compares the proportion of Contra Costa County jobs reachable within a 45-minute peak period transit trip from each TAZ in the subregion compared to the proportion of County jobs reachable from all TAZs within subregion EPCs. The number of jobs corresponds to those used in the travel demand model inputs. As shown in Table 16 below, 100 percent of County jobs are reachable from the East County subregion and are reachable from within East County EPCs. While percent of County jobs reachable from the East County subregion remains 100 percent in 2050, East County EPC share drops significantly to 37 percent.

The proposed performance target for this RTO is that the share of accessible jobs from within the EPCs should be equivalent to that of the subregion as a whole by 2050. This implies that the EPC accessibility for East County should rise to 53 percent by 2027.



TABLE 16. SHARE OF COUNTY JOBS ACCESSIBLE WITHIN A 45 MINUTE TRANSIT TRIP

GEOGRAPHY	JOBS 2019	PERCENT REACHABLE 2019	COUNT TAZs 2019	JOBS 2050	PERCENT REACHABLE 2050	COUNT TAZs 2019
Contra Costa County	404,491	100%	1,495	530,616	100%	1,495
East County	404,491	100%	1,495	530,616	100%	1,495
East County EPCs	404,491	100%	1,495	195,371	37%	739

PROPORTION OF EPC ACRES THAT ARE NOT WITHIN A QUARTER-MILE DISTANCE OF A TRANSIT STOP SERVED BY HIGH QUALITY TRANSIT

As shown on Figure 6, there is a significant portion of EPC areas in East County that are not within a quarter mile of high frequency bus stops with 15-minute headways or less, or within a half-mile of rail or ferry terminals. Table 17 indicates that only 5 percent of EPC acreage is within the high-quality transit buffer.

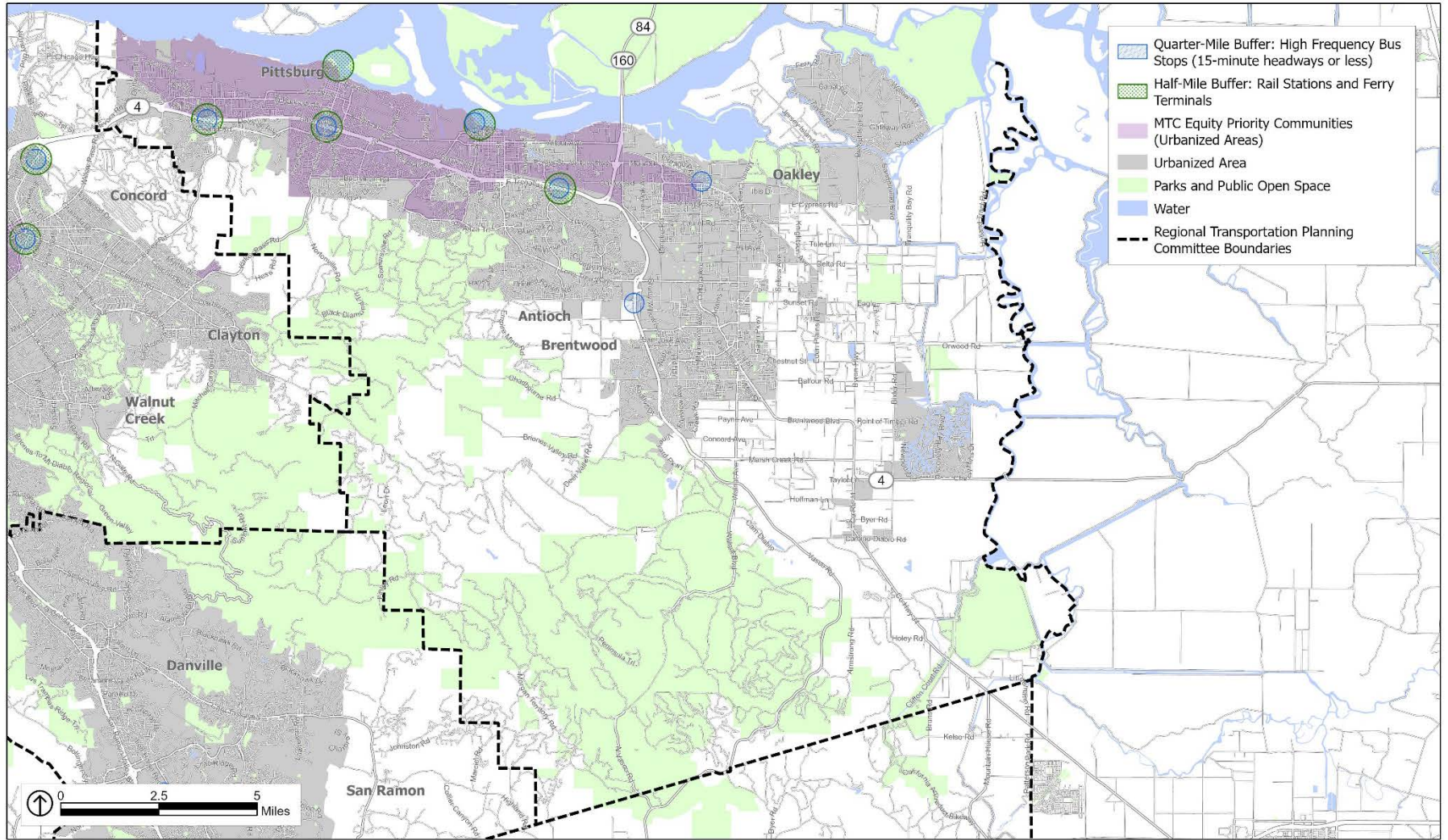
We suggest that the region should aim to achieve 100 percent of EPC acres within a quarter mile of high-quality transit by 2050. We know that this is an ambitious goal, especially in cases where EPC acreage includes industrial areas. However, this goal will help the subregion and CCTA meet broad transit goals and increase access in areas considered to be EPCs.

We also propose an interim target of 8% completion by 2027 (a roughly 50% increase over the current condition).

TABLE 17. EAST COUNTY EPC ACRES IN RELATION TO HIGH-QUALITY TRANSIT

	Acres	Proportion of Total Acres
Within high-quality transit buffer	868.3	5%
Not within high-quality transit buffer	15,440	95%
Total EPC acres in East County	16,308.3	100%

FIGURE 6. EAST COUNTY EPCs AND HIGH-QUALITY TRANSIT



Source: ABAG/MTC, 2021; CCTA, 2021; ESRI, 2021; PlaceWorks, 2021.

EQUITY PRIORITY COMMUNITIES AND HIGH-QUALITY TRANSIT: EAST CONTRA COSTA COUNTY



Climate Change RTOs

SINGLE-OCCUPANT VEHICLE MODE SHARE

As shown in Table 3 in the first section of this memo (“Mode Share RTOs”), 75 percent of total East County work trips were taken by driving alone, compared to 73 percent of total Contra Costa County residents. Table 3 and Table 4 illustrate that the model output predicts that this number will decrease to 73 percent of home base work mode share based on East County residence location and 83 percent based on East County job location. Meanwhile, the model predicts that 63 percent of all trips made by East County residents (not strictly commute trips) will be taken by driving alone by 2050.

The proposed performance target for single-occupant vehicle work commute mode share in the East County subregion is 68 percent for home-based work trips in 2027 and 66 percent in 2050. These numbers have been derived by reducing future single-occupant vehicle mode share by the targeted increases in transit, bike and walk trip mode share, and by also assuming the carpooling (multiple-occupant vehicle) mode share remains at 17 percent.

VEHICLE MILES TRAVELED PER CAPITA

The Action Plans will consider total VMT for County and subregion residents, along with per-capita targets.

The 2020 VMT study conducted for CCTA by Fehr & Peers found that 2018 VMT per service population in the East County subregion was 33.5 VMT per service population, and that the same number for Contra Costa County was 30.3 VMT.

The California Air Resources Board’s (CARB’s) document entitled *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals* published in January 2019³ states that California needs to reduce daily per capita total VMT to 21 to achieve carbon-neutrality, which is the State’s goal for 2045.

Based on this finding, we propose that the Action Plan contain a goal for 2050 to reduce VMT per capita to 21 VMT per service population in the East County area. Using a straight-line projection for reductions from 2018 until 2045, this would mean a reduction to 29.3 VMT per capita by 2027.

TABLE 18. VMT PER SERVICE POPULATION

	2018	2050
East County	33.5	25.8
Contra Costa County	30.3	25.6

Source: Fehr and Peers, 2020; DKS and CCTA Travel Demand Model, 2022

³ Available at https://ww2.arb.ca.gov/sites/default/files/2019-01/2017_sp_vmt_reductions_jan19.pdf



TRANSPORTATION GREENHOUSE GAS EMISSIONS PER CAPITA

This metric reflects the total daily VMT occurring on roadways within the planning area, including commercial vehicle trips and through traffic. DKS will use the EMFAC model to translate this total daily roadway VMT into GHG emissions.

This metric reflects the total daily VMT occurring on roadways within the planning area, including commercial vehicle trips and through traffic but does not include estimates of VMT occurring outside the travel demand model boundaries. The EMFAC emissions model has been used to translate this total daily roadway VMT into GHG emissions (specifically, CO₂)⁴. The emissions outputs also reflect assumptions about the future vehicle fleet.

The proposed target for this metric is zero tons of transportation related emissions by 2050 or about a 1/3 reduction in GHG per capita by 2027. With the currently estimated 18 pounds of GHG per capita, this translates to a 2027 target of about 12 pounds per capita. Although transportation related CO₂ emissions are projected to fall by 2050, more work is needed to reach the target of zero.

TABLE 19. AVERAGE DAILY TRANSPORTATION RELATED GHG PER CAPITA

	2019			2050		
	POPULATION	CO ₂ EMISSIONS (TONS)	CO ₂ EMISSIONS PER CAPITA (LBS)	POPULATION	CO ₂ EMISSIONS (TONS)	CO ₂ EMISSIONS PER CAPITA (LBS)
East County	346,047	3,130	18.09	470,334	2,003	8.52
Contra Costa County	1,148,922	13,734	23.91	1,457,615	8,737	11.99

Source: DKS Associates, EMFAC 2021, COTA Travel Demand Model.

ZERO-EMISSION VEHICLE OWNERSHIP IN THE SUBREGION

This RTO tracks the number of battery electric vehicles “on the road,” with the goal of increasing total EV penetration. Data as of April 2021, which is the most recent report date, are shown in Table 19 for East County as well as all of Contra Costa County for comparison. East County currently has 2,926 EVs, as compared to 21,609 percent in the County overall.

Under a rule proposed by CARB, 35 percent of new passenger vehicles sold in the state must be powered by batteries or hydrogen by 2026, and 100 percent 2035⁵. Currently, 12.4 percent of new vehicles sold in California are ZEV and ZEVs make up about 4 percent of the light duty vehicle fleet in Contra Costa County.

By executive order, California has set a target of one million ZEVs on the road by 2025 and five million ZEVs by 2030⁶. Since East County accounts for less than one percent of the state’s population, this

⁴ [California Air Resources Board, EMFAC 2021 v1.0.2 Scenario Analysis.](#)

⁵ [California Air Resources Board. Advanced Clean Cars II.](#)

⁶ [Executive Order B-16-2012](#) and [Executive order B-48-18.](#)



suggests that the subregion should have 8,800 EVs by 2025 and 44,000 EVs by 2030. A straight-line extrapolation of this number through 2050 suggests about 185,203 EVs in East County by 2050.

With all the above factors in mind, we propose a target of 100 percent of fleet, contrasted to the estimated existing EV fleet penetration of about 1 percent. The estimated number of light duty vehicles currently based in East County is about 272,300.

TABLE 20. ELECTRIC VEHICLES BY SUBREGION AS OF APRIL 2021

Area	Battery Electric Vehicles
Central County	4,879
East County	2,926
Lamorinda	3,141
Tri-Valley	15,262
West County	4,258
Total Subregion	30,466
Contra Costa County	21,609

Source: California Energy Commission (2022). California Energy Commission Zero Emission Vehicle and Infrastructure Statistics. Data last updated April 2022. Retrieved June 29, 2022 from <http://www.energy.ca.gov/zevstats>.

Note: Correspondence of zip codes to RTPC boundaries is approximate.

Technology RTO

LEVEL OF ETHERNET-BASED SIGNAL INTERCONNECTION

Interconnected signal systems are those that communicate with other signals or systems. Signal interconnection helps in establishing a connection between the traffic signals and the central system, which enables remote access to the signals from the local agency locations or the Traffic Management or Operations Center. These interconnections allow signal timings to be adjusted remotely, during regular day-to-day operations, during major incidents, and during special events. Interconnection also enables cross-jurisdiction communications, coordination, and data exchange to respond to varying traffic conditions.

CCTA is currently working with East County's jurisdictions to interconnect a total of 84 signals in Antioch, Brentwood, Oakley, and Pittsburg, using funding to come primarily from the Metropolitan Transportation Commission's (MTC's) OBAG3 program. Since this effort is already underway, the target for this RTO is the completion of all 84 signal improvements by 2027. There is no additional target for 2050, since there are no plans for a further interconnection program.



MEMORANDUM

DATE July 21, 2022

TO John Hoang and Matt Kelly, CCTA

FROM David Early and Torina Wilson, PlaceWorks
Erin Vaca, DKS Associates
Julie Morgan and Terence Zhao, Fehr & Peers

SUBJECT East County Subregion Actions Memorandum

This Memorandum lists the existing East County Action Plan actions and proposes revisions to those actions as part of the Action Plan update. These actions will reinforce the Regional Transportation Objectives (RTOs) set, and described in further detail, in the RTO Methodology and RTO Analysis Memorandums submitted as part of the Round 4 TAC meeting materials and dated July 7, 2022, and July 21, 2022, respectively.

The revisions proposed in Table 1 reflect consolidation and/or wordsmithing of existing actions, removing of actions which are now complete, and the introduction of new actions. Proposed new actions come from several sources, including:

- Actions recommended by the project team based on best management practices or similar projects, that are necessary to achieving the performance targets established under the RTOs.
- Actions to introduce topics that would have been RTOs but the project team decided not to pursue. These RTOs considered but not recommended are discussed in detail at the end of the RTO Methodology Memorandum dated July 7, 2022.
- Actions to address topics requested by TRANSPLAN TAC members or through other subregional TAC members that are also applicable to the East County subregion.

The middle column of Table 1 lists the existing East County Action Plan text and includes strikethrough and underline edits to show revisions proposed by the project team. Column B includes notes on why the edit has been made while the first column assigns each revised action with an action number that will be used in the Draft Action Plan. TAC members can make comments on these revisions at the Round 4 TAC meeting or through email before or after the meeting.



TABLE 1 RECOMMENDED REVISIONS TO THE EAST COUNTY ACTION PLAN ACTIONS

New Action Number	Proposed Action Language Revisions	Notes
<i>Freeways</i>		
Freeways-1	Current SR 4 Freeway Projects: For projects currently under construction, TRANSPLAN and the local jurisdictions should continue to work with the Contra Costa Transportation Authority (CCTA) and Caltrans to ensure successful completion of the new facilities. (A.1.1a) <u>Improve the operational efficiency of freeways and arterial streets through effective corridor management strategies, such as ramp metering, traffic operations systems, Intelligent Transportation Systems (ITS) improvements, HOV/HOT lane and bypass lanes, selective point control metering, among others, to support a cohesive transportation system for all modes.</u>	Replaced with a general operational improvement action
	Future SR 4 Freeway Projects: For projects not yet under construction, TRANSPLAN and the local jurisdictions should work in cooperation with CCTA and Caltrans to complete studies and design, and initiate construction. (A.1.1b)	Removed because this is an operational improvement that could be included under the general action above
	TriLink (also referred to as SR 239): Work with CCTA and Caltrans on the ongoing TriLink feasibility study. Tasks include public workshops, committee meetings, board presentations, and Project Study Report (PSR). Estimated study completion in 2014. (TRANSPLAN, Brentwood, Contra Costa County) (A.1.1c)	Removed because it is complete
Freeways-2	SR 84: Work with Alameda County jurisdictions to determine the feasibility of a Route 84 extension into East County. (TRANSPLAN, Contra Costa County) (A.1.1d)	Kept as is
Freeways-3	SR 160: Study future needs along this route SR 160 including potential interchange improvements at SR 160 and Wilbur Avenue. (TRANSPLAN, Oakley, CCTA) (A.1.1k)	Slightly revised to be more specific
Freeways-4	Byron Highway — Vasco Road Connector (also known as Armstrong Road Connector Byron Airport Connector): Pursue project to connect Vasco Road with Byron Highway; note that a Byron Airport Connector element is included in the current TriLink (SR 239) feasibility study. (Contra Costa County) (A.1.1g)	Revised to be more direct
	Southern Parallel Arterial Improvements: Pursue projects to provide additional vehicle capacity on arterial routes parallel to and south of SR 4 in Antioch, Pittsburg, and Contra Costa County, including the extension of West Leland Road to Willow Pass Road. (Antioch, Pittsburg, Contra Costa County) (A.1.1h)	Removed
	Northern Parallel Arterial Improvements: Pursue projects to provide additional vehicle capacity on arterial routes parallel to and north of SR 4 in Antioch, Pittsburg, and Contra Costa County. This includes widening Pittsburg Antioch Highway to four lanes. (Antioch, Pittsburg, Oakley) (A.1.1i)	Removed
	Coordinate with Caltrans and local jurisdictions for ongoing cooperation regarding ramp metering operations at freeway interchanges. (Local jurisdictions, CCTA, Caltrans, MTC)	Removed because ramp metering is covered in general freeway improvements action



TABLE 1 RECOMMENDED REVISIONS TO THE EAST COUNTY ACTION PLAN ACTIONS

New Action Number	Proposed Action Language Revisions	Notes
	SR 4 widening and interchange reconstruction from Loveridge Road to Hillcrest Avenue, including median to accommodate eBART	Removed because it is considered an operational improvement that is included under the general operational improvement action
	SR 4 widening from Laurel Road to Sand Creek Road, and construction of the Sand Creek Road interchange	Removed because it is considered an operational improvement that is included under the general operational improvement action
	SR 160/SR 4 Connector Ramps	Removed because it is considered an operational improvement that is included under the general operational improvement action
	Widening of SR 4 from Balfour Road to Vasco Road (Segment III)	Removed because it is considered an operational improvement that is included under the general operational improvement action
	Balfour Road interchange	Removed because it is considered an operational improvement that is included under the general operational improvement action
	Marsh Creek Road interchange	Removed because it is considered an operational improvement that is included under the general operational improvement action
	Vasco Road interchange	Removed because it is considered an operational improvement that is included under the general operational improvement action
Freeways-5	Continue to pursue development of additional park and ride lots along the SR 4 corridor and at other appropriate locations, including potential shared use agreements at shopping centers which have	Replaced with a more general action that merges



TABLE 1 RECOMMENDED REVISIONS TO THE EAST COUNTY ACTION PLAN ACTIONS

New Action Number	Proposed Action Language Revisions	Notes
	unused spaces. (Tri-Delta Transit, Local jurisdictions, Caltrans) (A.4.4a) <u>Implement park and ride facilities at appropriate locations, including shared-use agreements at activity centers with underutilized parking spaces, and continually promote awareness of park and ride lots for transit and ridesharing.</u>	the three park and ride actions
	Maintain and improve park and ride lots in East County. (511CC, TRANSPLAN, BART, Tri-Delta Transit, Local jurisdictions) (A.4.4d)	Merged with general park and ride action
	Promote greater awareness of East County park and ride lots for transit and ridesharing where capacity is available. (511CC, TRANSPLAN, Local jurisdictions, BART) (A.4.4e)	Merged with general park and ride action
	Review and implement appropriate operational strategies originally recommended in the East Central Commute Corridor Traffic Management Plan, such as selective control point metering, to maximize traffic flow without creating excessive localized air pollution and reducing parallel street capacity. (TRANSPLAN, Pittsburg) (A.3.3a)	Removed because this is an operational improvement that could be included under the general action above
Freeways-6	<u>Encourage coordination with the California Highway Patrol to promote safer traffic operations, including facilitating enforcement. (Local jurisdictions, CCTA, Caltrans) (A.3.3d) Work with CCTA, Caltrans, and California Highway Patrol to track HOV/HOT and Fastrak lane violators, among other enforcement on East County freeways.</u>	Replaced using language drafted for all action plans
Freeways-7	<u>Work with CCTA and local jurisdictions to study the feasibility of bus on shoulder pilot and long term programs on subregional freeways.</u>	Added using language drafted for all action plans
Freeways-8	<u>Work with CCTA and local jurisdictions to discourage diversion from freeways and cut through travel on surface roadways by developing traffic management programs, increasing trip capacity on freeways, completing freeway operational improvements, implementing traffic calming measures on surface roadways, and exploring surface roadway redesign to support active and public transportation modes.</u>	Added using language drafted for all action plans
Freeways-9	<u>Work with CCTA, Caltrans, and other applicable agencies to conduct Integrated Corridor Management (ICM) studies for subregional corridors to improve multimodal function of countywide facilities.</u>	Added using language drafted for all action plans
<i>Surface Roadways</i>		
	James Donlon Boulevard Extension (previously known as Buchanan Road Bypass): Pursue completion of project. (City of Pittsburg, ECCRFFA) (A.1.1e)	Removed because it is considered an operational improvement that is included under the general operational improvement action
	Main Street/Brentwood Boulevard: Pursue the widening of Main Street/Brentwood Boulevard through Oakley and Brentwood to Discovery Bay. (A.1.1f)	Removed because it is considered an operational improvement that is included under the general operational improvement action



TABLE 1 RECOMMENDED REVISIONS TO THE EAST COUNTY ACTION PLAN ACTIONS

New Action Number	Proposed Action Language Revisions	Notes
	Improve Interchange at SR 160 and Main Street. (CCTA, Caltrans, Oakley)	Removed because it is considered an operational improvement that is included under the general operational improvement action
	Improve and widen Main Street from SR 160 to Delta Road. (Oakley, ECCRFFA)	Removed because it is considered an operational improvement that is included under the general operational improvement action
	Widen Brentwood Boulevard from Delta Road to Sellers Avenue (Brentwood, ECCRFFA)	Removed because it is considered an operational improvement that is included under the general operational improvement action
	Improve California Delta Highway from Sellers Avenue to Marsh Creek Road (where State Route 4 rejoins). (Contra Costa County)	Removed because it is considered an operational improvement that is included under the general operational improvement action
	Vasco Road: Improve safety along Vasco Road with widened pavement and median barrier; coordinate with the Tri Valley Transportation Council (TVTC) and be consistent with the TVTC Gateway Constraint Policy. Also seek opportunities to work with TVTC to advance a Vasco Road Corridor project into the Countywide Comprehensive Transportation Plan and Bay Area Regional Transportation Plan, subject to the conditions of the "East County Corridors (Vasco Rd, SR 4, and Byron Highway)" Project in the Measure J Expenditure Plan. (Contra Costa County, TRANSPLAN) (A.1.1.i)	Removed because the Gateway Constraints information is now policy direction for the Action Plans
Surface Roadways-1	Maintain and enhance local pavement management systems. (Local jurisdictions (D.1.1a))	Kept as is
Surface Roadways-2	<u>Complete necessary operational improvements (i.e. protected turn lanes, synchronized signal timing, and auxiliary lanes, among others) at select intersections or roadway segments, while ensuring that the improvements are balanced against the objectives and actions set forth elsewhere in this Action Plan.</u>	Added using language drafted for all action plans
Surface Roadways-3	<u>Develop subregional corridor management plans to provide adequate roadway capacity for local and subregional travel while also including both public and active transportation modes and nonmodal transportation issues such as equity, climate change, safety, and technology.</u>	Added using language drafted for all action plans



TABLE 1 RECOMMENDED REVISIONS TO THE EAST COUNTY ACTION PLAN ACTIONS

New Action Number	Proposed Action Language Revisions	Notes
<i>Transit</i>		
Transit-1	<u>Support the on-going study and future construction of the eBART Next Phase Study Alignment. Support construction of eBART from the current BART terminus at Pittsburg/Bay Point to a new station at Hillcrest Avenue and support on-going study to connect of the next eBART segment to the future Mokelumne Trail station. (Local jurisdictions, TRANSPLAN)(B.1.1a)</u>	Revised language
Transit-2	<u>Work with relevant parties to improve rail infrastructure, access, and service through the following actions:</u> <u>- Participate in any future studies regarding rail options or stations for East County that may be conducted by the Capitol Corridor Joint Powers Authority, Caltrans, Altamont Commuter Express (ACE) and/or AMTRAK, and the San Joaquin Joint Powers Authority, or other groups. (Local jurisdictions, TRANSPLAN, CCTA) (B.1.1b)</u> <u>- Develop BART, eBART and other rail stations as major transportation and business hubs for East County. (BART, CCTA, Tri-Delta Transit, Local jurisdictions)</u> <u>- Continue exploring development of new rail station sites as appropriate with rail corridor proposals. (Local jurisdictions) (B.3.3d)</u> <u>- Identify and plan for future rail grade separations where feasible. (Local jurisdictions, CCTA) (A.3.1e)</u> <u>- Plan and implement enhanced railroad crossings to improve pedestrian and bicycle access and to reduce noise and quality-of-life impacts throughout East County; enhancements may involve implementing quiet zones, grade separations, train-traffic signal preemption systems, or other measures.</u>	Revised to merge all rail related actions together
	<u>Work with Tri Delta Transit to provide bus oriented improvements along local routes, and to improve and expand service. (Local jurisdictions) (B.2.2a)</u>	Removed because this is included under the general transit action
	<u>If a community is considering transit-oriented development, encourage adoption of development guidelines that would incorporate transit-oriented design, where feasible, to be determined by each local jurisdiction. (Local jurisdictions) (B.2.2b)</u>	Removed because it is more policy language, not an action
	<u>Continue working with TRANSPLAN and CCTA to pursue funding opportunities for expanded bus service. (Local jurisdictions, Tri-Delta Transit) (B.2.2c)</u>	Removed because several actions below would accomplish this
Transit-3	<u>Encourage the region's bus transit operators to increase and improve coordination where possible, particularly in linking East and Central County bus services. (Tri-Delta Transit, County Connection) (B.2.2f)</u> <u>Work with CCTA, local jurisdictions, and local public transit operators to:</u> <u>- Develop a TRANSPLAN Transit Plan to identify future community transit needs and set a shared vision for viable, sustainable public transit service for all.</u>	Revised to include other general actions



TABLE 1 RECOMMENDED REVISIONS TO THE EAST COUNTY ACTION PLAN ACTIONS

New Action Number	Proposed Action Language Revisions	Notes
	<ul style="list-style-type: none"> - Work with the region's bus transit operators to increase and improve coordination where possible, particularly in linking East and Central County bus services. - <u>Standardize operations, regional mapping, and wayfinding.</u> - <u>Implement traffic signal management and bus prioritization technology on regionally significant transit routes to improve bus speed and reliability.</u> 	
Transit-4	<p>Encourage Work with local jurisdictions to <u>evaluate systemwide bus stop design and safety improvements, including making it safer and easier for people to access transit stations and ensuring that transit is safe and attractive design-safety treatments</u> (such as crosswalks, bus bulbs, bus pullouts and Americans with Disabilities Act improvements) <u>at transit stops where appropriate, and to seek regional funding when possible. (Tri-Delta Transit, Local jurisdictions) (B.2.2g)</u></p> <p>Develop BART, eBART and other rail stations as major transportation and business hubs for East County. (BART, CCTA, Tri-Delta Transit, Local jurisdictions)</p>	Revised to include more broad improvements too
Transit-5	<p>Consider the adoption of station area specific plans to guide development and transportation infrastructure around intermodal transit centers. (Local jurisdictions) (B.3.3a) <u>Work with local jurisdictions to develop intermodal transportation facilities ("Mobility Hubs") that serve major activity centers and connect transit, pedestrian, bicycle facilities, and car/ride share in their planning documents, and site park and ride facilities, where needed and feasible.</u></p>	Removed and replaced with general mobility hub action
Transit-6	<p>Conduct a study to Explore the feasibility and development of ferry service to East County. (TRANSPALN, CCTA) (B.3.3c)</p> <p>Continue exploring development of new rail station sites as appropriate with rail corridor proposals. (Local jurisdictions) (B.3.3d)</p> <p>Identify and plan for future rail-grade separations where feasible. (Local jurisdictions, CCTA) (A.3.1e)</p>	Revised language
Transit-7	<p>Continue to provide and promote express commuter bus service to major employment centers. (511CC, Tri-Delta Transit) (C.1.1a)</p> <p><u>Complete a feasibility study to explore feasibility of a Regional Express Bus Program and expansion and enhancement of Bus Rapid Transit, along SR-4 and other key roadways.</u></p>	Revised using language drafted for all action plans
Transit-8	<p>Work with MTC to provide funding to maintain and enhance local transit facilities and to purchase replacement of rolling stock. (MTC, CCTA, Transit operators) (D.1.1e)</p>	Kept as is
Transit-9	<p><u>Implement the recommendations of the Contra Costa Accessible Transportation Strategic Plan, including the establishment of a new Coordinating Entity and establishing a new, ongoing, dedicated funding stream.</u></p>	Added using language drafted for all action plans
Transit-10	<p><u>Work with CCTA and local transit operators to explore financial incentives and reduced fares for public transportation, including a</u></p>	Added using language drafted for all action plans



TABLE 1 RECOMMENDED REVISIONS TO THE EAST COUNTY ACTION PLAN ACTIONS

New Action Number	Proposed Action Language Revisions	Notes
	<u>feasibility study to explore a subregional or countywide Universal Basic Mobility program.</u>	
Transit-11	<u>Provide educational awareness of public transportation options through outreach, education, and advertising, particularly in local schools.</u>	Added using language drafted for all action plans
Transit-12	<u>Assist local jurisdictions in reviewing and considering options for improving curb management and bus and truck loading on public streets.</u>	Added using language drafted for all action plans
Transit-13	<u>Work with CCTA and MTC to promote Safe Routes to Transit projects and programs and submit applications for funding for construction of local Safe Routes To Transit projects and programs.</u>	Added using language drafted for all action plans
Transit-14	<u>Work with CCTA to fund and develop a regional mapping data services digital platform to enable the standardization and routine updating of digital and paper maps across all transit services</u>	Added using language drafted for all action plans
Transit-15	<u>Complete a feasibility study to explore feasibility of a Regional Express Bus Program and expansion and enhancement of Bus Rapid Transit, along SR-4 and other key roadways.</u>	Added using language drafted for all action plans
Transit-16	<u>Work with local transit agencies, regional policymakers, and private entities to promote pooled regional ridesharing services.</u>	Added using language drafted for all action plans
<i>Bike/Ped</i>		
Bike/Ped-1	<u>Continue to update and implement local and regional bicycle plans. Work with local jurisdictions in adopting and updating their bicycle and pedestrian plans to expand and/or improve their facilities to ensure a seamless active transportation network that provides a positive user experience. (TRANSPLAN, Local jurisdictions, East Bay Regional Park District) (C.2.2a)</u>	Replaced using language drafted for all action plans
Bike/Ped-2	<u>Continue to maintain and improve existing regional multipurpose trails, such as the Delta de Anza Trail through Oakley, Antioch, Pittsburg and Bay Point, the American Discovery Trail through Antioch to the summit of Mount Diablo, and the Marsh Creek Regional Trail through Brentwood, Oakley, and north to the Delta. (TRANSPLAN, Local jurisdictions, East Bay Regional Park District) (C.2.2b)</u>	Revised to simplify language
Bike/Ped-3	<u>Complete unbuilt segments of regional multipurpose trails such as the Mokelumne Coast to Crest Trail, Delta de Anza Trail, Union Pacific Rail Trail, Big Break Regional Trail, and the Marsh Creek Trail and the Great California Delta Trail. (TRANSPLAN, Local jurisdictions, EBRPD) (C.2.2c)</u> <u>Complete gaps in the Countywide Low Stress Bike Network, including but not limited to the Mokelumne Trail, Delta de Anza Trail, the Great California Delta Trail, and the EBMUD Trail, among others.</u>	Revised using language drafted for all action plans and listed gap closure related actions; gaps to be closed will be determined at the round 4 TAC discussion
	<u>Emphasize the construction of unbuilt segments of Class II and Class III bikeways on the Countywide Bikeway Network, as identified in the 2009 Contra Costa Countywide Bicycle and Pedestrian Plan. (Local jurisdictions) (C.2.2d)</u>	Removed language because this is implied with the general action above, which also lists several of these facilities



TABLE 1 RECOMMENDED REVISIONS TO THE EAST COUNTY ACTION PLAN ACTIONS

New Action Number	Proposed Action Language Revisions	Notes
	Facilitate planning and design of the Great California Delta Trail, linking the Delta shoreline in Contra Costa County to the Bay Trail and to San Joaquin, Solano, Sacramento, and Yolo counties. (Local jurisdictions) (C.2.2e)	Removed language because this is implied with the general action above, which also mentions the Great California Delta Trail
	Support improvements to the Delta-De Anza Trail, particularly in addressing the gap along Bailey Road; this is the subject of a current study through the SR 4/Bailey Road Interchange improvement project. (East Bay Regional Park District, Caltrans, Contra Costa County) (C.2.2e)	Removed because improvements are now mentioned in the general maintenance action above
	Complete the East Bay Municipal Utility District (EBMUD) Trail, linking Los Medanos College in Pittsburg to Brentwood. (Local jurisdictions) (C.2.2g)	Removed language because this is implied with the general action above, which also mentions the EBMUD trail
	Study bikeway connections parallel to SR 4 such as improvements on Kirker Pass Road and Marsh Creek Road. (Local jurisdictions) (C.2.2h)	Removed because improvements are now mentioned in the general maintenance action above
	Study bikeway and pedestrian needs at school areas, including participation in Safe Routes to School and Safe Routes to Transit programs, to help plan, fund and construct future facilities in these areas. Projects should support the Countywide Safe Routes to School Master Plan. (511CC) (C.2.2i)	Removed because SR2S is covered by action below and Safe Routes to Transit are now in the transit section
Bike/Ped-4	Provide bike racks, lockers and other secure bike parking options at key locations and activity centers throughout the county. (511CC) (C.2.2j)	Kept as is
Bike/Ped-5	Encourage consideration of <u>Enhance</u> bicycle and pedestrian use in neighborhood planning and design, to ensure that infrastructure such as soundwalls do not create barriers to travel through neighborhoods on bicycle or on foot. (Local jurisdictions) (C.2.2k)	Revised language
Bike/Ped-6	Maintain existing and provide new shoulders, bicycle lanes, and sidewalks on all streets and rural roads to provide for better bicycle and pedestrian connectivity and safety where feasible, <u>with an emphasis on Class I and IV bicycle lanes where feasible.</u> (Local jurisdictions)(C.2.2l)	Slightly revised to be more specific
Bike/Ped-7	Improve trail crossings at arterials. (Local jurisdictions) (C.2.2a) <u>Complete bicycle and pedestrian crossing improvements at the following intersections:</u> <u>- Delta de Anza Trail mid-block crossing at Lone Tree Way between Clayburn Road and James Donlon Boulevard.</u> <u>- Marsh Creek Trail mid-block intersection with Balfour Road.</u> <u>- Marsh Creek Trail mid-block intersection with Brentwood Boulevard.</u> <u>- Unnamed bike path mid-block crossing with Lone Tree Way between Tilton Lane and Anderson Lane.</u> <u>- Delta de Anza Trail crossing at Buchanan Road and Somersville Road.</u>	Revised using language drafted for all Action Plans that will implement one of the bike/ped RTOs



TABLE 1 RECOMMENDED REVISIONS TO THE EAST COUNTY ACTION PLAN ACTIONS

New Action Number	Proposed Action Language Revisions	Notes
	<u>- Delta de Anza Trail mid-block crossing at Harbor Street.</u> <u>- Delta de Anza Trail intersection with Empire Avenue.</u>	
	Promote and deliver Safe Routes to School programs. (511CC) (C.1.1e)	Removed because SR2S is covered by action below
Bike/Ped-8	Promote transit, carpooling, bicycle use, and walking to students, employees and residents at K-12 schools, technical schools and college sites. (511CC) (C1.1d) <u>Work with CCTA, Contra Costa Health Services, and Street Smarts Diablo Region to facilitate a countywide coordinated approach to Safe Routes to Schools programs, and to identify continual funding streams to encourage students, employees, and residents at K-12 schools, technical schools, and college sites to use non-vehicle modes to get to school.</u>	Replaced with language drafted for all action plans
Bike/Ped-9	<u>Continue the program to reduce the cost of bicycles, pedal-assist bicycles, and electric bicycles for Contra Costa residents.</u>	Added with language drafted for all action plans
Bike/Ped-10	<u>Work with CCTA and other regional agencies to develop a method of tracking the Pavement Condition Index (PCI) of bicycle facilities on the low-stress bike network and implement rehabilitation improvements where needed.</u>	Added with language drafted for all action plans
<i>Safety</i>		
Safety-1	<u>Support and deliver education programs for students and others to learn how to bicycle and walk safely. (511CC, Local jurisdictions) (C.2.2m)</u> <u>Develop a program to provide educational awareness of active transportation options and safety through outreach, education, and advertising.</u>	Replaced with language drafted for all action plans
Safety-2	<u>Develop a program to coordinate the collection and analysis of safety data, identify areas of concern, and propose safety-related improvements and user awareness so as to support state and federal safety programs and performance measures.</u>	Added with language drafted for all action plans
Safety-3	<u>Work with Caltrans to prepare an incident management plan for East County freeways.</u>	Added with language drafted for all action plans
Safety-4	<u>Work with CCTA to implement the Countywide Vision Zero Framework.</u>	Added with language drafted for all action plans
Safety-5	<u>Work with CCTA, MTC, and East Bay Regional Parks to study and avoid the impacts safety of electric bicycles on local trails and streets, so as to eventually allow electric bicycles on all local trail facilities.</u>	Added with language drafted for all action plans
Safety-6	<u>Work with regional and local agencies to increase the level of public education about bicycle safety and to reduce injuries due to pedestrian or bicycle collisions.</u>	Added with language drafted for all action plans
Safety-7	<u>Conduct a study to identify all safety-related transportation improvements needed within 500 feet of schools.</u>	Added with language drafted for all action plans
Safety-8	<u>Work with TVTC to implement the Vasco Road Safety Improvements Project.</u>	Added per the TVTC Action Plan
<i>Equity</i>		



TABLE 1 RECOMMENDED REVISIONS TO THE EAST COUNTY ACTION PLAN ACTIONS

New Action Number	Proposed Action Language Revisions	Notes
Equity-1	<u>Increase express bus service to regional job centers, particularly those with low-income workers, inside and outside of the subregion.</u>	Added with language drafted for all action plans
Equity-2	<u>Conduct a study to identify strategies to increase low-income resident access to transit hubs, jobs, and areas with goods and services (for example, in East County the study could explore enhancing existing transit hubs, constructing new transit hubs, and first/last mile solutions).</u>	Added with language drafted for all action plans
Equity-3	<u>Increase access to car sharing services for low-income residents and support financial incentives for using them.</u>	Added with language drafted for all action plans
Equity-4	<u>Increase high frequency transit lines and stops in EPC areas.</u>	Added with language drafted for all action plans
<i>Climate Change</i>		
Climate Change-1	<u>Work with 511 Contra Costa to expand Transportation Demand Management (TDM) programs, adopt local TDM plans, and conduct regular monitoring and reporting for program on the effectiveness of East County TDM programs. (511CC) (C.1.1b)</u>	Revised with language drafted for all action plans
Climate Change-2	Encourage the funding and provision of alternative-fueled vehicles and related fueling stations for transit operators to improve air quality, as they expand their bus fleets. (Tri Delta Transit, Contra Costa Transportation Authority, Local jurisdictions) (B.2.2c)	Kept as is
Climate Change-3	<u>Encourage tele work, compressed work week and other alternative work location strategies to reduce traffic congestion at peak hours. (511CC) (C.1.1f)</u> <u>Work with regional agencies, local employers and schools to increase tele-work, compress work weeks, alternative work location, and flex schedules, and provide pre-tax employer transportation benefit programs.</u>	Revised with language drafted for all action plans
Climate Change-4	<u>Continue to implement a program to support deployment of high-quality, fast and diverse electrical vehicle chargers in the subregion.</u>	Added with language drafted for all action plans
Climate Change-5	<u>Continue to promote electric vehicle ownership by offering financial incentives and providing educational programs and demonstrations.</u>	Added with language drafted for all action plans
Climate Change-6	<u>Work with local transit agencies, regional policymakers, and private entities to promote pooled regional ridesharing services.</u>	Added with language drafted for all action plans
Climate Change-7	<u>Work with regional agencies, local employers and schools to increase tele-work, compress work weeks, alternative work location, and flex schedules, and provide pre-tax employer transportation benefit programs.</u>	Added with language drafted for all action plans
Climate Change-8	<u>Coordinate with impacted jurisdictions, property owners, and other applicable agencies that own or maintain Routes of Regional Significance that would be impacted by sea level rise, to coordinate and plan for inundation mitigation.</u>	Added with language drafted for all action plans
Climate Change-9	<u>Encourage regional agencies and local jurisdictions to refer to the Adapting to Rising Tides Adaptation Roadmap when planning for sea level rise.</u>	Added with language drafted for all action plans



TABLE 1 RECOMMENDED REVISIONS TO THE EAST COUNTY ACTION PLAN ACTIONS

New Action Number	Proposed Action Language Revisions	Notes
<i>Technology</i>		
Technology-1	In cooperation with CCTA, encourage the ongoing investigation of new transportation-related technologies that have the potential to improve traveler safety, smooth traffic flow and reduce delay, and/or reduce the environmental or quality-of-life impacts associated with current travel modes. (Local jurisdictions, CCTA) (A.3.3e)	Revised language
Technology-2	Consider traffic signal management / bus prioritization technology on major arterials in Antioch, Oakley and Pittsburg as described in the State Route 4 Corridor Management Plan. (Local jurisdictions, Tri Delta Transit) (B.2.2d) <u>Upgrade the signal system along certain Routes of Regional Significance, including the 60 signals identified for interconnection.</u>	Replaced with language drafted for all action plans because this signal interconnection has a goal of increasing signal management and including bus prioritization technology
Technology-3	<u>Continue to pursue the feasibility, and implementation of, Dynamic Personal Micro Transit systems in East County.</u>	Added using language drafted for all action plans
Technology-4	<u>Coordinate with CCTA and local jurisdictions to identify solutions to the Intelligent Transportation System (ITS) communications needs during the development and implementation of a Regional ITS Communications Plan and/or regional communications infrastructure, including expanding fiber to link all traffic signals and bolster communications for signals, etc.</u>	Added using language drafted for all action plans
Technology-5	<u>Work with CCTA, micromobility operators, and local jurisdictions to create a subregional model ordinance and model RFP to deploy micromobility systems, built off industry best management practices.</u>	Added using language drafted for all action plans
<i>Funding</i>		
Funding-1	Periodically update the fee structure to ensure it will produce sufficient funds in light of current and anticipated growth rates and construction costs in East County. (ECCRFFA) (E.1.1a)	Kept as is
	Work with regional and state agencies to obtain a greater local share of gasoline taxes, toll bridge revenues and other sources for major projects. (TRANSPLAN, CCTA, Tri Delta Transit, BART) (E.2.2a)	Removed
Funding-2	Continue to participate in the fee program through the East Contra Costa Regional Fee & Financing Authority. (ECCRFFA, Local jurisdictions) (E.1.1c)	Kept as is
	Explore ways to advance revenues from the fee program through the use of bonds or other financial mechanisms, such as tolls, gasoline taxes and other user fees. (TRANSPLAN) (E.1.1d)	Removed
	Continue to explore ways to increase revenue to maintain roads and provide arterial street improvements countywide, and fund multimodal improvements, such as through gasoline taxes and toll bridge revenues. (Local jurisdictions) (E.2.2b)	Removed



TABLE 1 RECOMMENDED REVISIONS TO THE EAST COUNTY ACTION PLAN ACTIONS

New Action Number	Proposed Action Language Revisions	Notes
	Continue to explore ways to increase revenue to maintain roads and provide arterial street improvements countywide (such as through gasoline taxes and toll bridge revenues). (Local jurisdictions) (D.1.1b)	Removed
	Support the study of new transportation facilities (such as TriLink/SR 239) that could attract new business development in East County by improving accessibility between East County and neighboring regions. (Local jurisdictions, TRANSPLAN, CCTA) (E.3.3b)	Removed because this is goal/policy direction
	Work with MTC and other agencies to implement regional initiatives such as OBAG/PDA development strategies. (Local jurisdictions, TRANSPLAN, CCTA) (E.3.3c)	Removed because this is goal/policy direction
<i>Multimodal</i>		
	Promote alternatives to the single occupant vehicle through public outreach, working with employers and residents. (511CC, Tri-Delta Transit) (C.1.1e)	Removed because it is vague and would be implemented through other components of this Action Plan
<i>Misc.</i>		
	Monitor conditions on the regional route system and construct improvements as necessary to alleviate conditions that exceed traffic service objectives. Improvements will be listed in the Countywide Transportation Project List (CTPL) maintained by CCTA. (A.2.2a)	Removed
	Traffic studies are required for any development project or General Plan amendment that generates 100 or more net new peak hour vehicle trips, in order to achieve compliance with the Measure J Growth Management program. Results of traffic studies for projects and General Plan amendments that generate 100 or more net new peak hour vehicle trips should be shared with other jurisdictions, consistent with TRANSPLAN procedures, to allow for collaboration and comment. General Plan amendments that generate 500 or more net new peak hour vehicle trips must undergo the CCTA General Plan Amendment Review Procedure, outlined in Chapter 4 of the Contra Costa Growth Management Program Implementation Guide. (Local jurisdictions) (C.3.3a)	Removed
	Coordinate with economic development agencies and non-governmental organizations (NGOs) on a cooperative East County effort to attract new employment development. (Local jurisdictions) (E.3.3a)	Removed because this is goal/policy direction



CONNECT CONTRA COSTA

Planning for Tomorrow's Transportation



Outreach Summary

Action Plan and Countywide Transportation Plan Updates March - May 2022



CONTRA COSTA
transportation
authority

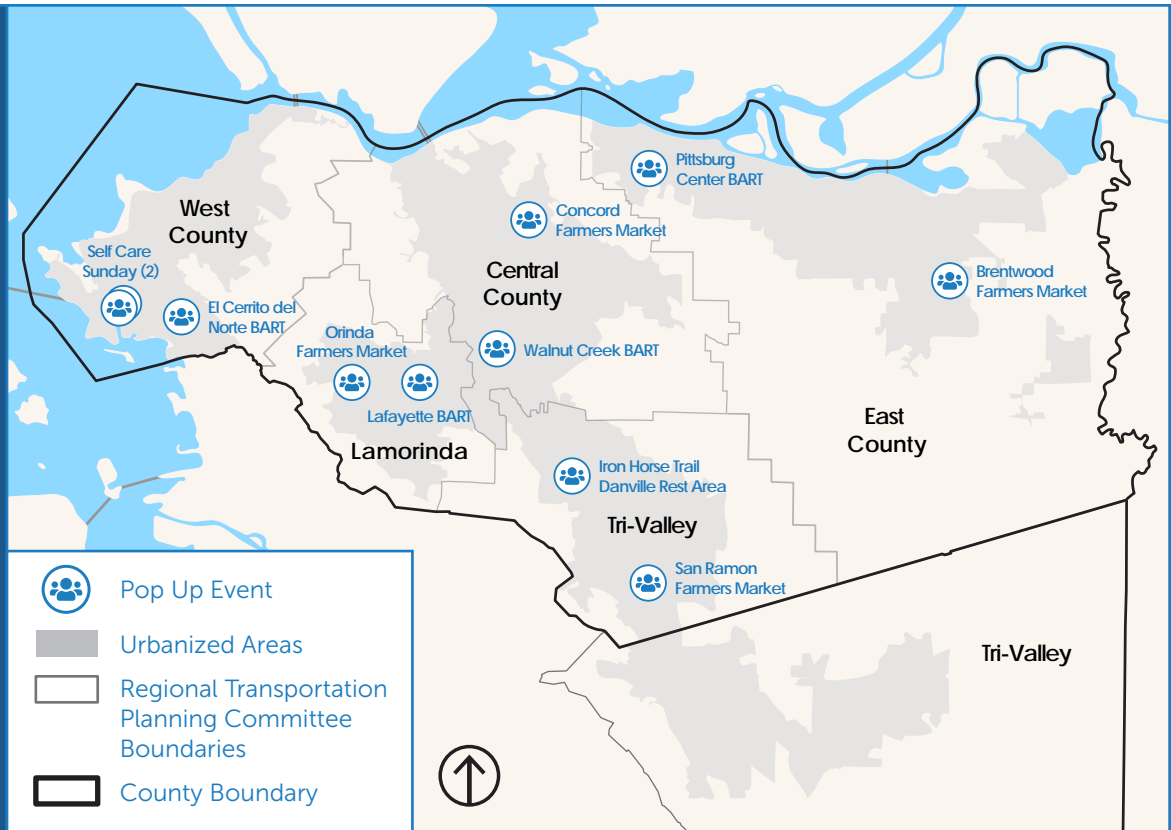
Prepared by:



PLACEWORKS

This document outlines the first round of public outreach conducted by the Contra Costa Transportation Authority (CCTA) and its consultants between March and April 2022 for the Action Plan and Countywide Transportation Plan Updates. Outreach was conducted to the general Contra Costa Community and the Alameda County portion of the Tri Valley area. Feedback was collected both in-person and virtually to provide for a variety of feedback channels:

- **11 In-Person Pop Up Events**
- **5 Virtual Workshops**
- **Online Community Forum Survey**
- **421 Project Flyers Distributed!**



Each CCTA subregion had two in-person pop up events and one virtual workshop, except for the West County subregion where a repeated pop up was conducted due to a last-minute rain cancellation. The online community forum survey was available countywide for all residents.



TRI-VALLEY AREA: San Ramon Farmers Market

Saturday, March 5th 2022 from 9:00 am to 1:00 pm
6000 Bollinger Canyon Road
San Ramon

In-person pop up events included interactive poster boards, surveys, and project flyers while the virtual workshops included a PowerPoint presentation and group discussion. Regardless the event, participants were asked the same set of questions (*though additional feedback was welcomed and encouraged*):

- **What do you think transportation should look like in the future?**
- **What can we do to help you with your transportation needs?**
- **What is your bright idea for improving transportation in the County?**

A total of 704 comments were collected through this outreach effort. 151 of these comments were made on the online community forum survey, the remaining 553 comments were collected during the pop-up and workshop events.



151
People
Commented
Online

553 People
Commented
In Person





Demographic Breakdown



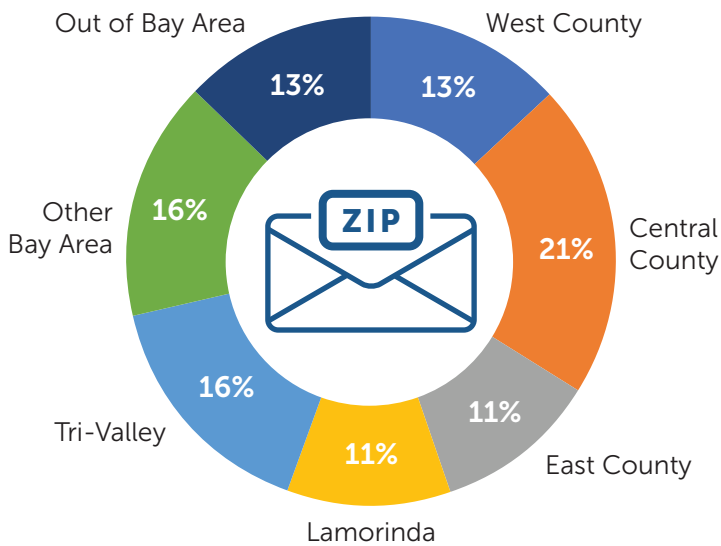
The project team collected optional demographic information on the written surveys at the pop-up events, during registration for the virtual workshops, and on the online community forum survey. Note that not all respondents chose to share demographic information. Percentages shown on this page indicate the percentage of responses in each category, not demographics of all respondents.



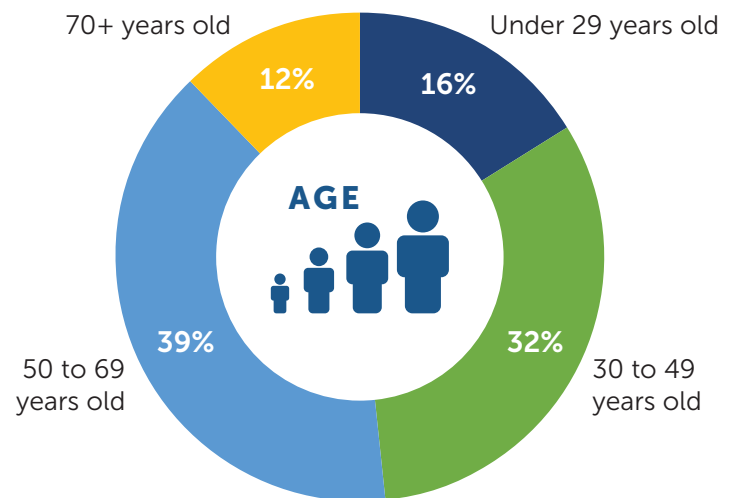
WEST COUNTY: El Cerrito del Norte BART

Tuesday, March 22nd
2022 from 4:00 pm
to 6:00 pm
6400 Cutting Blvd,
El Cerrito

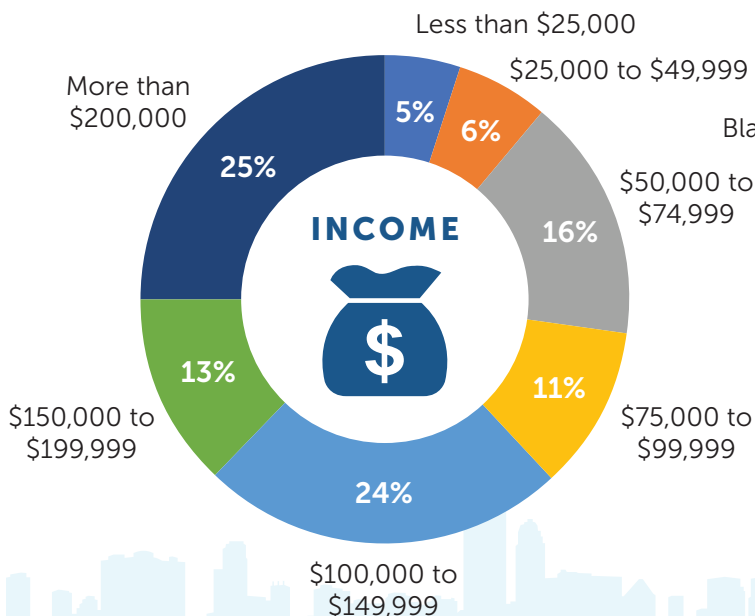
Zip Code - 38 Responses



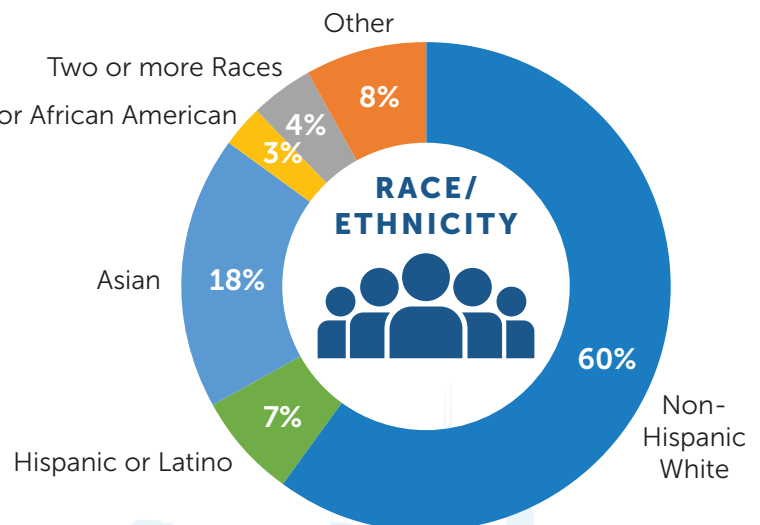
Age - 74 Responses



Household Income - 63 Responses

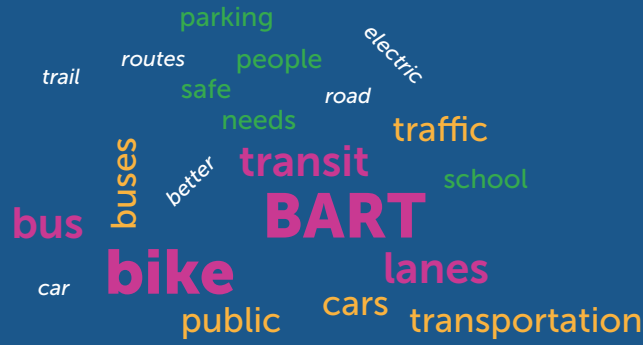


Race/ Ethnicity - 73 Responses



* 0% American Indian or Alaska Native
** 0% Native Hawaiian or Pacific Islander

Of the 704 total comments, 470 of them were general comments about countywide transportation and not focused on improvements in a specific subregion. The most commented words include:



This list of comments includes frequently mentioned topics and ideas but is not an exhaustive list of general comments. Comments are not listed in order of priority.

- Increase walkability and explore pedestrian-only areas
- Increase bikeability, number of bike lanes, and their convenience and safety
- Ensure bicyclists and pedestrians feel safe
- Conduct safety presentations for pedestrians, cyclists, and drivers
- Bike and scooter share
- Improve last mile connections to public transit
- Bus express lanes or bus-only lanes on freeways and arterials
- Public transit improvements to frequency, hours of service, reliability, and cleanliness
- Ensure public transportation is accessible for all socioeconomic groups
- Improve paratransit and other accessible transportation options and solutions
- Safety improvements on BART and buses
- Improved parking options at major transit stations
- Plan for regional connections throughout the county and beyond
- Electrify the transportation system (public and private) and improve infrastructure
- Explore autonomous vehicles
- Decrease number of potholes on freeways and major roadways
- Decrease traffic congestion
- Improve the timing of traffic lights



EAST COUNTY: Brentwood Farmers Market

Saturday, March 26th 2022
from 8:00 am to 12:00 pm
Oak Street and 1st Street,
Brentwood

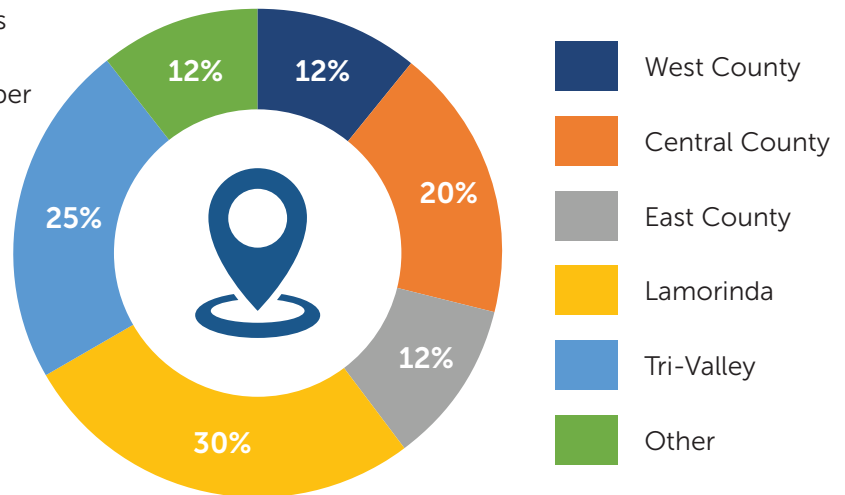


CENTRAL COUNTY: Concord Farmers Market

Tuesday, March 8th 2022
from 10:00 am to 2:00 pm
Todos Santos Plaza at 2175
Willow Pass Road,
Concord

The graph to the right indicates the percent of comments that were collected by subregion, with some subregions more eager to comment than others. Note that the number of comments by subregion does not reflect the number of people engaged with, but rather the number of comments since many participants chose to provide more than one comment.

Of the 704 comments collected, 234 of them were comments made to indicate transportation improvements in a specific subregion. The most frequently mentioned topics and ideas are listed in the following pages. Note that this list is not exhaustive and are not listed in order of priority.



West County

Incorporated Jurisdictions:

Hercules, Pinole, San Pablo, Richmond, El Cerrito

Feedback regarding West County focused on safe and adequate roadways, transit improvements, bike and pedestrian improvements and safety of all modes. There was little mention of technology, climate change, and equity.

- Desire for well-maintained, continuous, protected/safe/calm bike facilities that cross cities, especially connecting to waterfront destinations and regional routes, with safe and easy freeway crossings
- Need for traffic calming techniques
- Improve transit access for those with mobility needs
- Give bus priority on arterial routes between Alameda County and Contra Costa County
- Provide timed/coordinated service between BART, Amtrak, and various bus agencies to serve long-distance and regional travel
- Ensure public transportation is safe, comfortable, and efficient
- Increase frequency of BART
- Improve streetlight issues throughout Richmond, replace traffic lights, fix potholes and paving issue areas
- Many comments mentioning improvements to specific roadways, including: San Pablo Ave, Cutting Blvd, Central Ave, Canal Blvd, and 15th Street

Central County

Incorporated Jurisdictions:

Martinez, Concord, Pleasant Hill, Walnut Creek, Clayton

Feedback regarding Central County focused on transit improvements, bike and pedestrian sidewalk and intercity access, need for traffic calming, and equity in the transportation system. Few comments are made regarding climate change and technology.

- Address active and public transportation barriers for those with mobility needs, including ADA accessible bike and pedestrian facilities, taxi service with wheelchair access, and extended service hours
- Increase traffic calming techniques along busy roadways
- Desire for safe bike and pedestrian connections across the subregion, particularly when crossing roadways and train tracks
- Provide continuous sidewalks and bike lanes and install lighting for safe travel in the dark
- Provide protected bike lanes to schools
- Improve traffic light cycles and remove unprotected left turns
- Reduce neighborhood cut-through traffic
- Connect trail networks to transit hubs
- Encourage public transit ridership again

Incorporated Jurisdictions:

Pittsburg, Antioch, Brentwood, Oakley

Feedback regarding East County focused on improvements to and extension of the BART system.

- More frequent BART service and extension to Brentwood
- Increased BART connections and access, including parking, carpooling, or commuter buses from outlying communities
- Deploy High-Occupancy Vehicle (HOV) commuter buses to job centers and BART stations
- Increase off-street bikeways and connections to BART and railroads
- Increase first and last mile connections from residential areas to public transportation
- Increase lighting and shade on trails
- Ensure adequate ADA accessibility on all modes
- Reduce frequency of automobile speeding

Incorporated Jurisdictions:

Lafayette, Moraga, Orinda

Feedback regarding the Lamorinda area included safe routes to schools, BART access, transportation electrification, and roadway speeding. Little mention of equity concerns or climate change were given.

- Increase traffic calming solutions around schools and improve general Safe Routes to Schools techniques
- Increase controlled crossings of major roads
- Explore first and last mile connections to BART
- Improve bike and pedestrian facilities with traffic lights and bike activation of traffic signals
- Expand County Connection service to middle and high school students
- Explore small bus options
- Explore feasibility of autonomous vehicles
- Reduce frequency of automobile speeding

Tri-Valley

Incorporated Jurisdictions:

Danville, San Ramon, Dublin, Pleasanton, Livermore

Feedback regarding the Tri Valley area focused on I-580/I-680 corridor connections, bike and pedestrian improvements, general equity, and general safety concerns. Climate change was not a specific concern mentioned.

- Increase traffic calming techniques, especially near schools
- Improve crossings of bike and pedestrian facilities with roadways
- Deploy bike and scooter share programs
- Improve bike and pedestrian facilities, especially with better lighting and restroom facilities
- Increase bus service to schools and other major facilities
- Expand BART service through the Tri Valley area
- Examine the success of HOV and toll lanes on I-680



LAMORINDA: Orinda Farmers Market

Saturday, March 12th 2022 from 9:00 am to 1:00 pm
Orinda Village at 14 Orinda Way, Orinda



TRI-VALLEY: Iron Horse Trail Danville Rest Area

Sunday, March 6th 2022 from 9:00 am to 12:00 pm