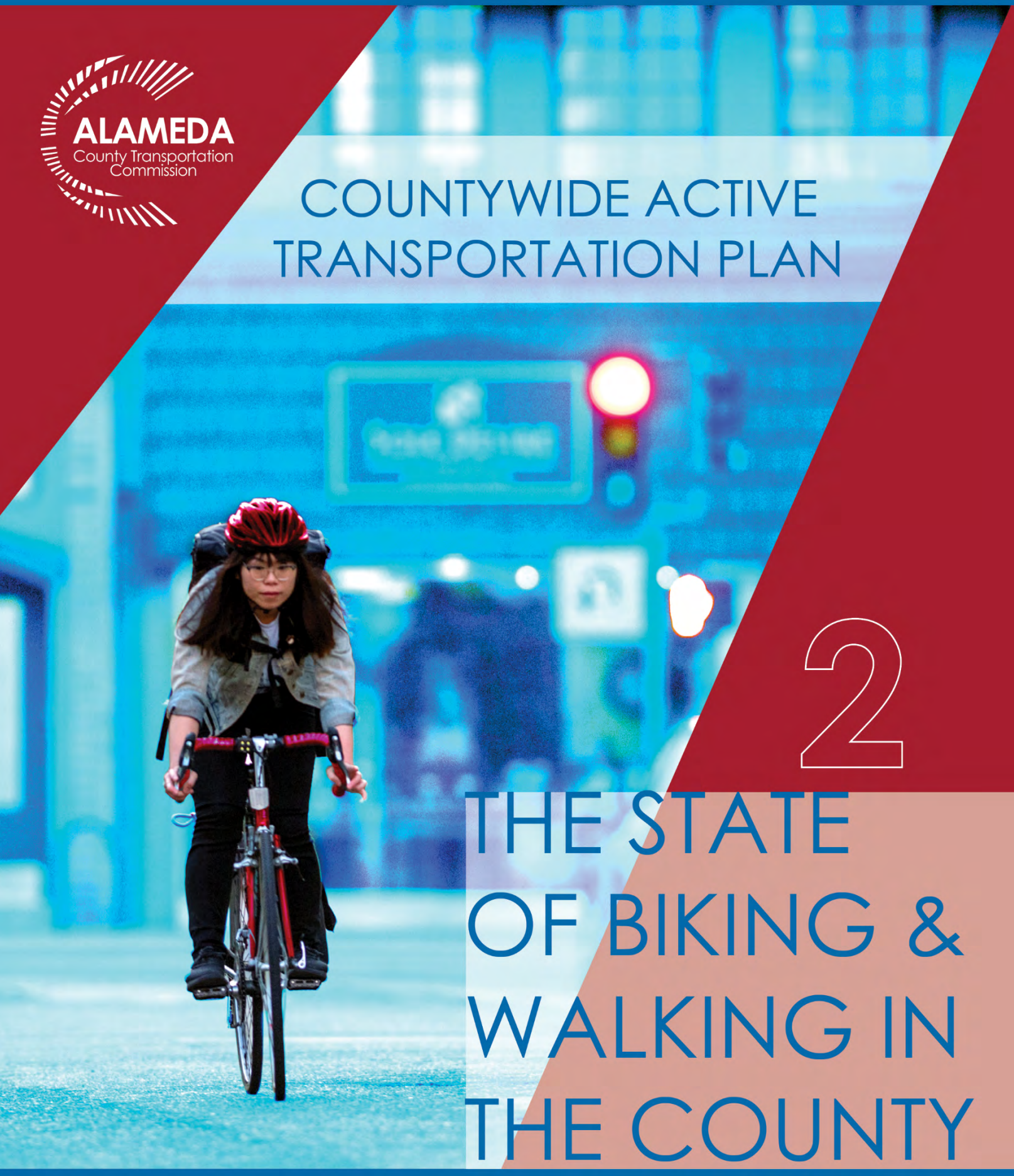
ALAMEDA
County Transportation Commission

COUNTYWIDE ACTIVE TRANSPORTATION PLAN



2 THE STATE OF BIKING & WALKING IN THE COUNTY

June 2019

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1 | Introduction

This book quantifies the state of biking and walking in Alameda County and identifies relevant trends. This information helps identify *who* is walking and biking; *how much* and *where* they are doing so; where the land uses and infrastructure support these active modes; and where there are safety concerns for vulnerable road users. The book is organized as follows:

- 2 | What, Where, Who? – This chapter describes mode choices, where people are walking and biking, and the demographics of people walking and biking.
- 3 | Comfort and Connectivity – This chapter describes how well connected the biking and walking networks are based on access to transit and other desirable destinations as well as the level of comfort (e.g., bicycle level of traffic stress). This includes analysis based on current built networks and planned networks by planning area.
- 4 | Countywide Biking Network – This chapter presents the proposed updated biking network, including how the network was updated and notable changes relative to the 2012 Plan. This chapter includes major countywide barriers.
- 5 | Walking Conditions Around Transit Stations – This chapter assesses the existing walking conditions in the proximity of transit stations countywide.
- 6 | Countywide Desired Walking Conditions – This chapter provides general guidance to establish and maintain high quality walking facilities and connections countywide.
- 7 | Safety – This chapter provides an overview of roadway safety for Alameda County compared to other counties in California; the countywide bicycle and pedestrian high injury networks; and collision profiles, patterns, and trends.
- 8 | Countywide Trail Network – This chapter describes and maps the existing and planned trails of countywide significance.
- 9 | Major Barriers by Planning Area – This chapter discusses barriers that create gaps and break up connections in the pedestrian and bicycle networks in the county.

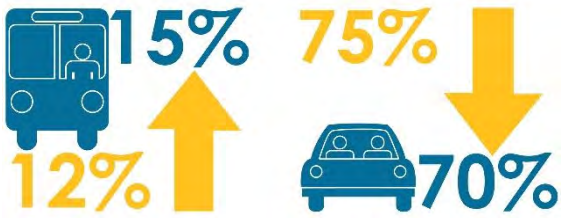
2 | What, Where, Who?

Alameda County is located in the heart of the San Francisco Bay Area. With 15 diverse jurisdictions, Alameda County is home to major employment hubs, diverse residential communities, and recreational destinations. Alameda County is home to approximately 1.6 million residents, making it one of the largest population centers in California. Many residents already choose to walk or bike for some of their trips within and to/from Alameda County. Many residents also walk or bike for trips to connect to transit. It is important to understand the "what" (choice of mode, type of trip), "where" (location within Alameda County), and "who" (characteristics of people) for countywide walking and biking activity. This baseline understanding will help jurisdictions within Alameda County to support those already walking and biking and to plan their land uses and transportation networks to encourage more people to walk and bike safely.

Alameda County has the second largest share of workers who use transit of active modes for their commute: 15% of residents use transit, 3% walk, and 2% bike to work. Only San Francisco County has a lower automobile mode share.

2.1 What: Commute Mode Choice

While the majority of Alameda County's 1.6 million residents commute by car each day (70% of commuters), Alameda County has the second largest share of workers who use transit or active transportation modes for their commute among Bay Area counties: 15% of residents use transit and 5% walk or bike to work. Scenarios modeled in Plan Bay Area 2020 and 2040 show Alameda County to have the second lowest auto commute mode share in California. Today's commute mode split shows a decrease in automobile usage relative to the previous Countywide Bicycle and Pedestrian Plans adopted in 2012 (70% versus 75%).[1] Transit use has increased from 12% to 15%; biking and walking mode share is nearly the same. However, the increase in transit mode share may also mean an increase in walking trips that is not represented in the data since many of these public transit trips start and end by walking or biking to complete first- and last-mile connections. Additionally, a greater percentage of residents work from home now than in 2012 (7% versus 5%).



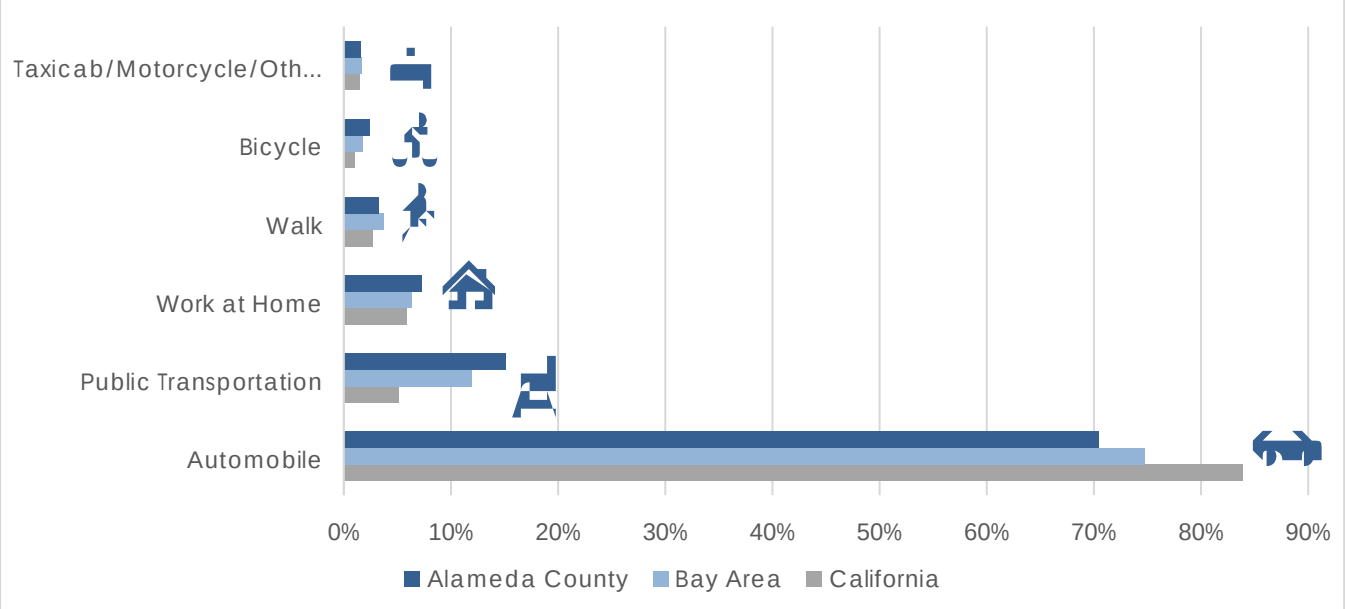
Commute data show an increase in transit commute share and a decrease in driving commute share since the 2012 Countywide Bicycle and Pedestrian Plans.

Slightly fewer Alameda County residents walk to work compared to the Bay Area as a whole by 0.4%. Although Alameda County is ahead of the state average for active transportation modes and on par with the region, the Countywide Transportation Plan calls for continued increases in walk, bike, and transit mode share. This Plan supports that goal. The following chart shows countywide commute mode split compared to the regional and state averages. Alameda County exceeds state averages for

[1] Commute mode shares reported here from the time of the last plan use ACS 2011 1-year estimate data in efforts to be more directly comparable to the ACS 2016 1-year estimates used throughout this Plan. The 2012 Countywide Plans used Bay Area Travel Survey data from 2000 for some mode share statistics, but these data are too outdated to provide a reasonable comparison that shows change over the last five years.

walking and biking mode share and far exceeds that for public transportation, likely due to the robust network of bus and rail options countywide. Note that commute data from the American Communities Survey only captures the travel mode for the longest segment of a trip, so combined mode travel (e.g., walking to BART) would not capture the mode for the shorter leg of a commute trip (which is often walking).

Commute Mode Share, Alameda County, Bay Area, and California (2016)

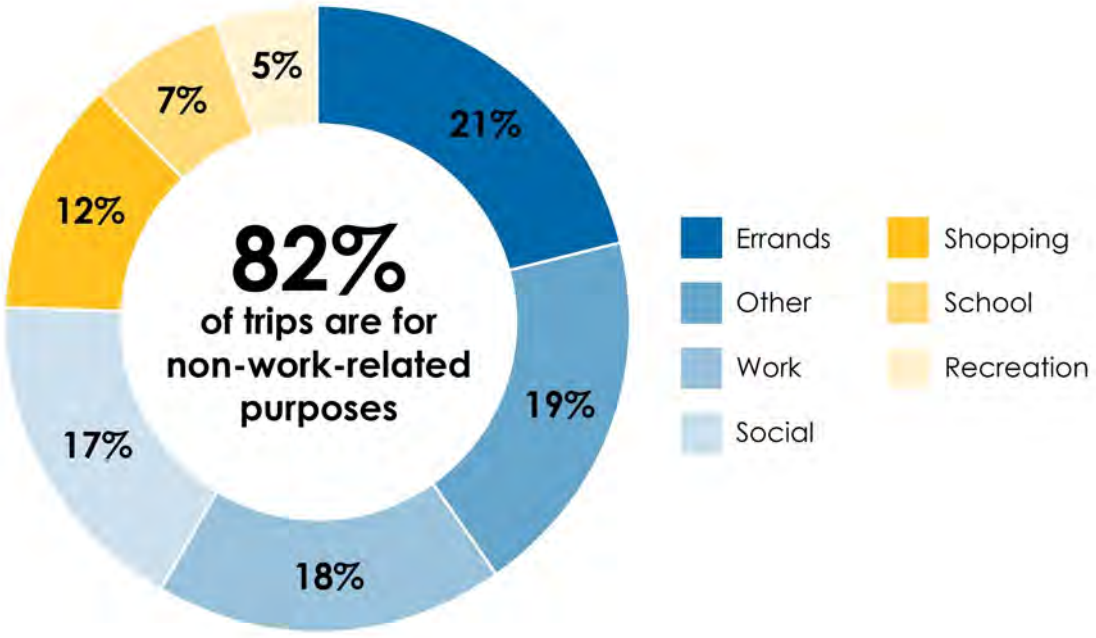


Source: US Census, ACS 2016 (1-Year Estimate) and MTC Vital Signs

2.2 What: Non-Commute Mode Choice

Alameda County residents travel for many reasons other than commuting. Only 12% of Alameda County trips are commute trips according to the California Household Travel Survey (CHTS), and an additional 6% of trips are work-related, including trainings, meal-related trips to and from work, meetings, deliveries, and work-related social activities. The reported purpose of all trips in Alameda County are presented in the following chart.

Trip Purpose for Alameda County



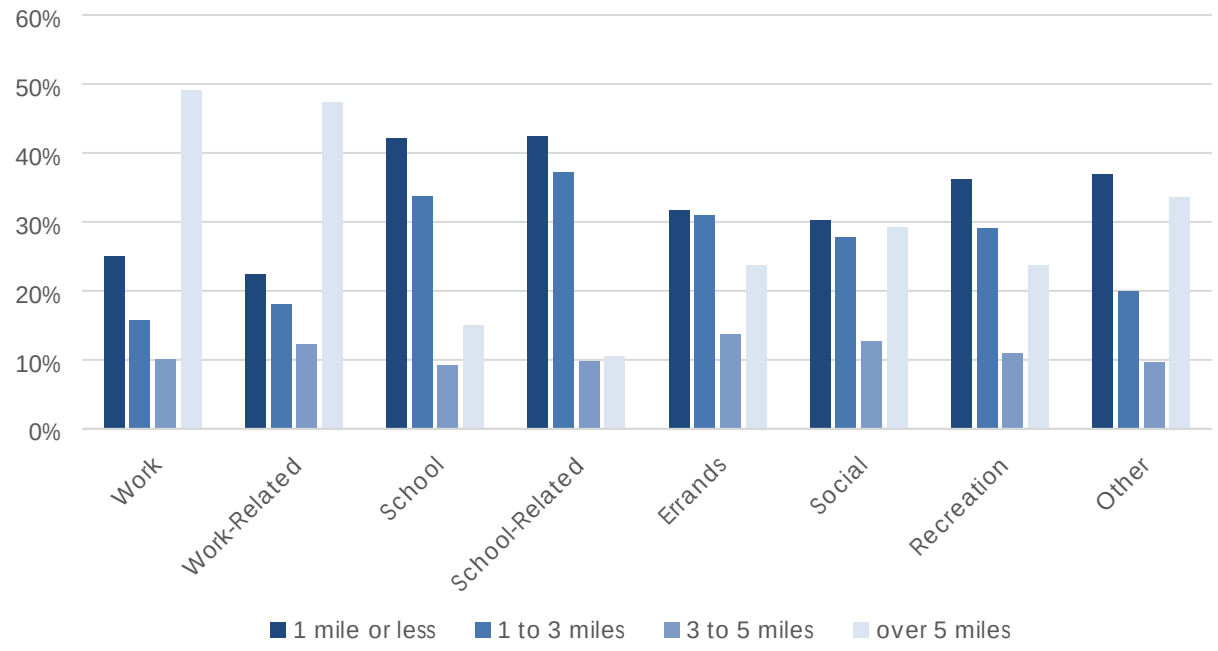
Note: "Errands" can include bank, dry cleaning, etc. "Other" encompasses any uncategorized trips, and can include medical purposes, civic/religious activities, etc. Percentages do not add to 100 due to rounding.
Source: California Household Travel Survey, 2013.

The great majority of trips made within Alameda County (82% of trips) are for non-work-related purposes, which is consistent with national data that suggests 81% of trips are non-work related.[2]

Non-work trips tend to be shorter, which may allow them to fall within easy walking distances (one mile or less), easy bicycling distances (one to three miles), and/or moderate bicycling distances (three to five miles). In Alameda County, the most commonly reported purposes for bicycle trips are work-related and recreational outings. The most commonly reported purposes for walking trips are for recreation and school trips.

[2] Errands include multiple trip types not related to shopping from dropping off a passenger to picking up dry cleaning to taking a vehicle in for service. Recreation includes trips taken for exercise either indoors or outdoors.

Trip Purpose by Distance (All Modes)



Source: California Household Travel Survey, 2013.

The CHTS findings shows that school and school-related trips are generally the shortest countywide, with over 40% being shorter than one mile. Today, around one quarter of these countywide school trips are made on foot, which could increase with more Safe Routes to School programming and focused infrastructure projects near schools. Commute trips are the longest trips made and are therefore less likely to be covered wholly by bicycling or walking. A combination of walking, biking, and transit can be a viable alternative to driving for these longer trips.

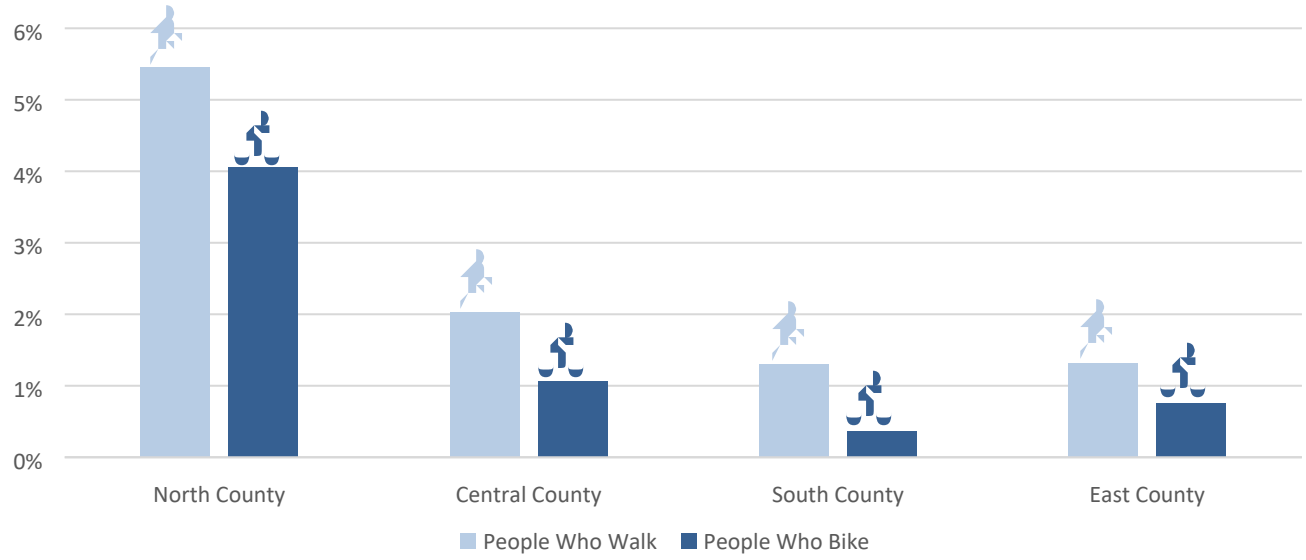
2.3 Where: Sub-County Trends

Throughout Alameda County, residents walk or bike to work at differing rates. Alameda CTC divides Alameda County into four parts for planning purposes:

- North: Alameda (City), Albany, Berkeley, Emeryville, Oakland, and Piedmont
- Central: Hayward, San Leandro, and surrounding unincorporated urban areas such as Ashland, Cherryland, Castro Valley and San Lorenzo
- South: Fremont, Newark, and Union City
- East: Dublin, Livermore, Pleasanton, and surrounding unincorporated areas such as Sunol

The North planning area is the densest in both employment and housing and has the highest share of people who walk and bicycle to work (6% and 4%, respectively), more than double the share of other planning areas. The South and East planning areas have the lowest share of people walking and biking to work (1% and 0.4%, respectively). Overall, walking trips make up a larger percentage of commute trips than bicycle trips in every planning area. Similar trends were seen in the 2012 Plans, with the highest active transportation mode shares in the North planning area and walking exceeding bicycling in all areas.

Share of People Who Walk or Bicycle to Work by Planning Area

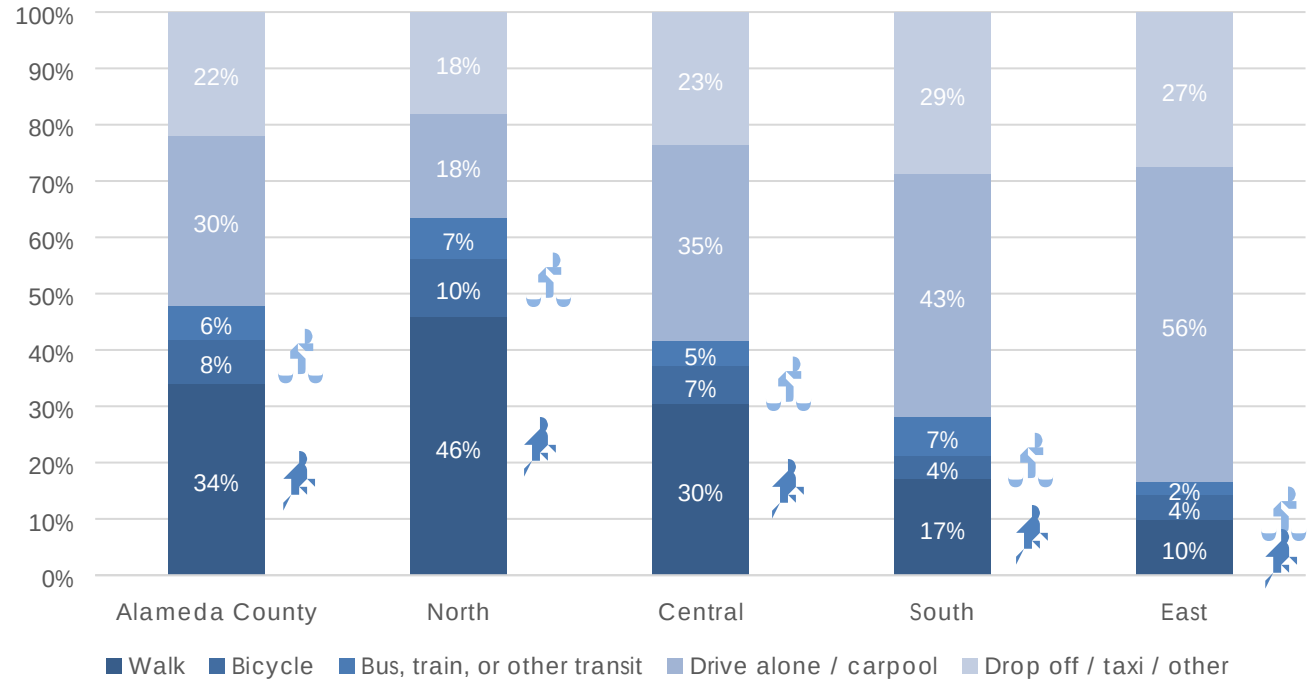


Source: US Census, ACS 2016 (1-Year Estimate)

For most people, walking is the easiest mode of transportation to use. No automobile is needed, no bicycle is needed, and there is no transit fare. However, people do not walk to work when work is too far (over approximately one mile), or if there are perceived and/or actual barriers to safety and comfort that exist between the home and work.

Alameda County is served by numerous transit systems. AC Transit, Union City Transit, and Livermore Amador Valley Transit Authority (LAVTA) provide bus service throughout Alameda County; Altamont Corridor Express (ACE) and Amtrak provide inter-regional rail service; and BART forms the backbone of regional transit service. BART periodically conducts studies to obtain information on how people access their train system. The chart on the following page shows the breakdown of station access mode share for stations located in Alameda County by planning area. Countywide, a greater percentage of people walk to BART than drive alone (34% versus 30%).

Countywide BART Access Mode Share by Planning Area



Source: 2015 BART Station Profile Study.

Walking to BART is common in North County (46%). This is likely due to the more compact land use patterns and limited parking availability. In comparison to the other planning areas within Alameda County, walking is least common in East County (10%). This is likely due to the longer distances to access stations, higher availability of parking, and less friendly pedestrian environment. Bicycling to BART is highest in North County (10%) and lowest in South County and East County (4%). This is likely due to many factors including longer distances and lack of a network of comfortable bike facilities that directly connect from residential areas to stations.

2.4 Where: Pedestrian and Bicycle Counts

Alameda CTC counts pedestrians and bicyclists at locations throughout Alameda County to better understand travel trends for these modes. Counts help staff understand return on investment for specific projects, communicate the role of pedestrian and bicycle facilities in the larger transportation system, and support census data. Counts were conducted at 150 locations countywide over 2016 and 2017. Some key takeaways from the counts are:

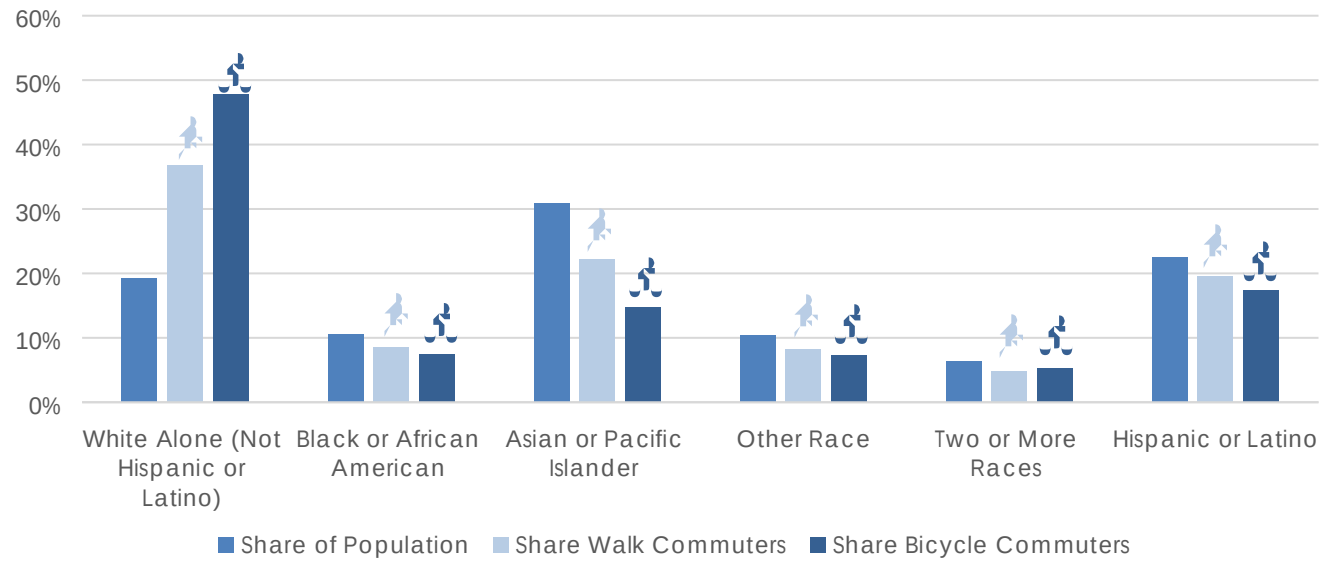
- School-time pedestrian counts are high in areas where commuter pedestrian volumes are low. This underscores the value of the Safe Routes to Schools program and supports the need for continued support for the program.
- High pedestrian and bicycle volumes are not necessarily correlated. The data indicates that some locations with high pedestrian counts are among the lowest bicycling volumes in Alameda County and vice versa. Additionally, this data suggests the need to understand if there are factors driving demand for only one mode or if there are barriers preventing high volumes of one mode in these locations.

- Places where high volumes of sidewalk and wrong-way bicycle riding exist are often locations where the existing infrastructure does not provide a comfortable or perceived safe riding environment. Determining where these activities are occurring through count data evaluation can help determine where projects are needed to provide more comfortable facilities.

2.5 Who: Demographics

Alameda County has a diverse population. Rates of bicycling and walking vary by the demographics of a population. Approximately 31% of Alameda County's population are Asian, 22% are Latino, 20% are White, 11% are Black, 6% are mixed race, and 10% are of other races. The chart below presents countywide population by racial group, as well as the share each group represents of walking and bicycling commuters. While white residents make up only one-fifth of the population, they make up a majority of the walking and bicycling commuters throughout Alameda County. Latino and Asian residents each make up the next closest percentage of people who walk or bicycle. These figures may indicate a need to understand the specific barriers preventing greater shares of these racial and ethnic groups from choosing to walk or bike for their commute.

Share of Population, Walking and Bicycling Commuters by Race



Source: US Census, ACS 2016 (1-Year Estimate)

Young people in Alameda County (ages 16 to 24) commute by walking more frequently than other age groups, representing 27% of walking commuters though they are only 12% of the population. Because the best available mode choice data (from the US Census) only covers commute trips, this data underestimates the number of children and seniors who complete trips by walking and biking since no data is collected about persons under age 16 and fewer seniors commute, even though they may walk for other purposes.

The gender split of walking commuters countywide is similar to statewide trends and to that presented in the 2012 Plan, with slightly more women walking to work (52%) than men. Women make up a smaller share of bicycle commuters (36%) in Alameda County than men (64%). In comparison to the statewide average of 29% women, men and women living in Alameda County travel by bike at more similar rates. In bicycle planning, the share of female riders is often seen as an indicator of the level of comfort of the bicycling environment. This low share of female bike commuters countywide and across the state of California may indicate that the current bicycle network is not viewed as adequately comfortable.

In Alameda County, 36% of bicyclists are women, versus 29% statewide—a comparatively even gender split.

2.6 Who: Vehicle Ownership

The choice to walk or bike may be impacted by whether a household has a vehicle available for trips. If a household has two commuters but one vehicle, one of the commuters must find another mode of transportation to work unless the household carpools. In Alameda County, most households have at least two vehicles available, and those households are less likely to walk or bike to work than those with one or no vehicles available.

3 | Comfort and Connectivity

The comfort and connectivity of a network impact where people bike and walk, the number of people who bike and walk, and the different types of trips they take. This Plan aims to facilitate a comfortable and interconnected network that inspires people of all ages and abilities to bike and walk in all parts of Alameda County. Comfort relates to how a person walking or biking feels on a given street or path. If a person considers a facility uncomfortable, they are less likely to choose to walk or bike there, or to choose to walk or bike at all if that is a necessary link to their destination. Connectivity relates to whether those facilities reach destinations and are linked to one another. A comfortable, beautiful separated multi-use path in isolation may provide a pleasant walking or riding experience, but it does not provide a connection to places people want and need to access.

The following sections describe the approach for evaluating existing bicycling and walking conditions countywide.

3.1 Bicycling: Planning for All Ages and Abilities

Planners and designers of bicycle networks often aim to serve groups of riders and potential riders that represent all ages and abilities. These are people from young children learning the rules of the road, to high-confidence adult commuters, to elderly adults who may have mobility concerns that impact their riding ability.

The population in general is broken down into three types of bicyclists, shown in the following diagram, including about 30% of the population who cannot or are not interested in bicycling. The largest part of the population is the *Interested but Concerned* group, so we aim to design facilities for this group to produce a network comfortable for all ages and abilities. Those in the *Interested but Concerned* group are riders or potential riders who will choose to bike if their concerns about safety and comfort of their route are addressed through street improvements. Separated or off-street bicycle facilities are most suitable for members of this group. If their route includes even one intersection or road segment that is uncomfortable, the *Interested but Concerned* group may choose not to ride. Some people may be willing to go out of their way to find a more comfortable route, but it is not reasonable to expect people to detour significant distances.

Many recent bicycle plans adopted by jurisdictions within Alameda County reference this idea of planning for all ages and abilities. Cities recognize that many parts of their bicycle network do not currently attract more *Interested but Concerned* people to ride bicycles, so they are planning for implementation of more comfortable connected networks that offer increased protection and safety for users and are able to serve a large proportion of users and potential users. Additionally, Alameda CTC's guidelines for local bike plans include a requirement for developing a low-stress biking network.

Bicyclist Types for Network Planning and Design

Comfort Typology of Bicyclists

Design User Profile	Non-Bicyclist	Interested but Concerned	Somewhat Confident	Highly Confident
Bicycling Preferences	Uncomfortable bicycling in any condition, have no interest in bicycling, or are physically unable to bicycle.	Often not comfortable with bike lanes, may bike on sidewalks even if bike lanes are provided; prefer off-street or separate bicycle facilities or quiet or traffic-calmed residential roads. May not bike at all if bicycle facilities do not meet needs for perceived comfort.	Generally prefer more separated facilities, but are comfortable riding in bicycle lanes or on paved shoulders if need be.	Comfortable riding with traffic, will use roads without bike lanes.
Percent of General Public	31-37%	51-56%	5-9%	4-7%

Source: Toole Design Group

4 | Countywide Biking Network

As previously mentioned, the existing and planned bikeway networks as defined in this Plan represent the Alameda County's jurisdictions' defined networks as they exist today and as they are envisioned in local adopted bicycle plans. Alameda CTC has not examined each planned facility for suitability.

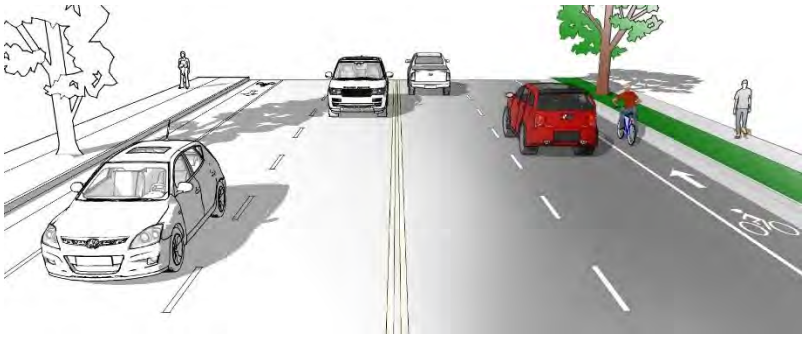
Many existing or proposed bicycle facilities share routes with primary transit routes. With this potential modal conflict in mind, bicycle facilities should be carefully studied and planned so their implementation would not be detrimental to transit service. Bikeway projects can be coordinated with transit-focused improvements like bus boarding islands, transit-only lanes, transit signal priority at signals, and bus relocation or consolidation. In many cases, with coordinated planning, users of both travel modes can be served with bikeway implementation.

4.1 Existing and Planned Jurisdiction Bikeway Networks

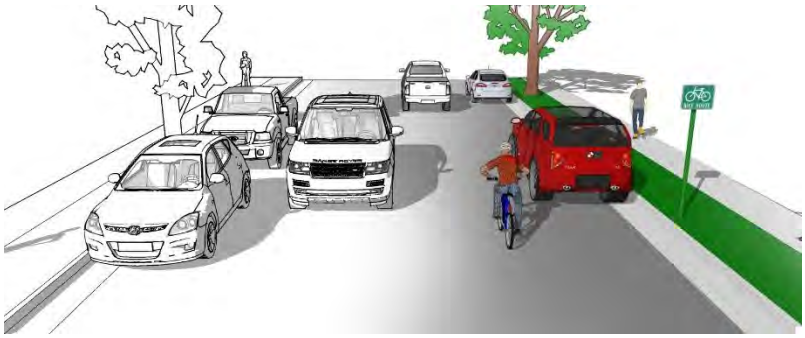
The bicycle network in Alameda County today consists of the four types of bikeways, organized into classes in California:

- Class I: Shared-use paths. These bikeways provide exclusive right-of-way for bicyclists and pedestrians, separate from roadways. Paths may be in their own right-of-way, such as along a natural corridor or former railway, or they may be within a roadway right-of-way, in which case they are sometimes referred to as sidepaths. Paths cross roadways with some providing grade-separated crossings that allow users to move continuously and to avoid potential conflict with vehicles. Paths exist in urban, suburban, and rural parts of Alameda County.

- Class II: Bike lanes. These bikeways exist on roadways as spaces for the exclusive use of bicyclists. Drivers may enter the bike lane to make a turn or to access curbside parking. Bike lanes may also be buffered with wide striping where space is available to provide greater separation from traffic.

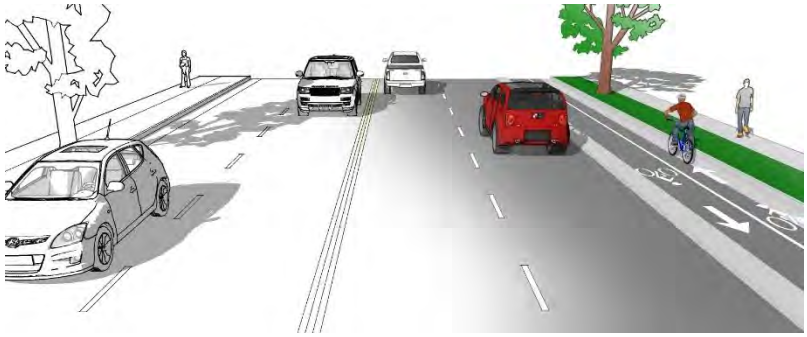


- Class III: Bike routes. These bikeways designate a preferred route on a street with no exclusive space for bicyclists. Routes are designated by signage and/or pavement markings. They exist both on low-volume, low-speed streets and on major arterials within Alameda County. Bike routes on low-volume, low-speed streets are generally comfortable for *Interested but Concerned* riders, while bike routes on more major streets can feel uncomfortable for families with children and other *Interested but Concerned* riders due to higher exposure levels to motorists. Bike routes exist in urban, suburban, and rural areas of Alameda County.



- Class III: Bicycle boulevards. These bikeways are also shared roadways, but they prioritize bicycle travel. Bicycle boulevards are located on low-speed, low-volume streets, which in some instances, include use of traffic calming and traffic diversion tools in order to reduce traffic volume along these corridors. Bike boulevards are generally an urban treatment.

- Class IV: Separated bike lanes. These bikeways are for the exclusive use of bicyclists, separated from both automobile and pedestrian traffic. Separation can be provided by grade separation, an on-street parking lane, flexible posts, or inflexible barriers (e.g., pre-cast curb, bollards). Separated bike lanes are generally an urban treatment.



ALAMEDA County Transportation Commission

Existing and Planned Bicycle Facilities

Alameda County

Bicycle Facilities

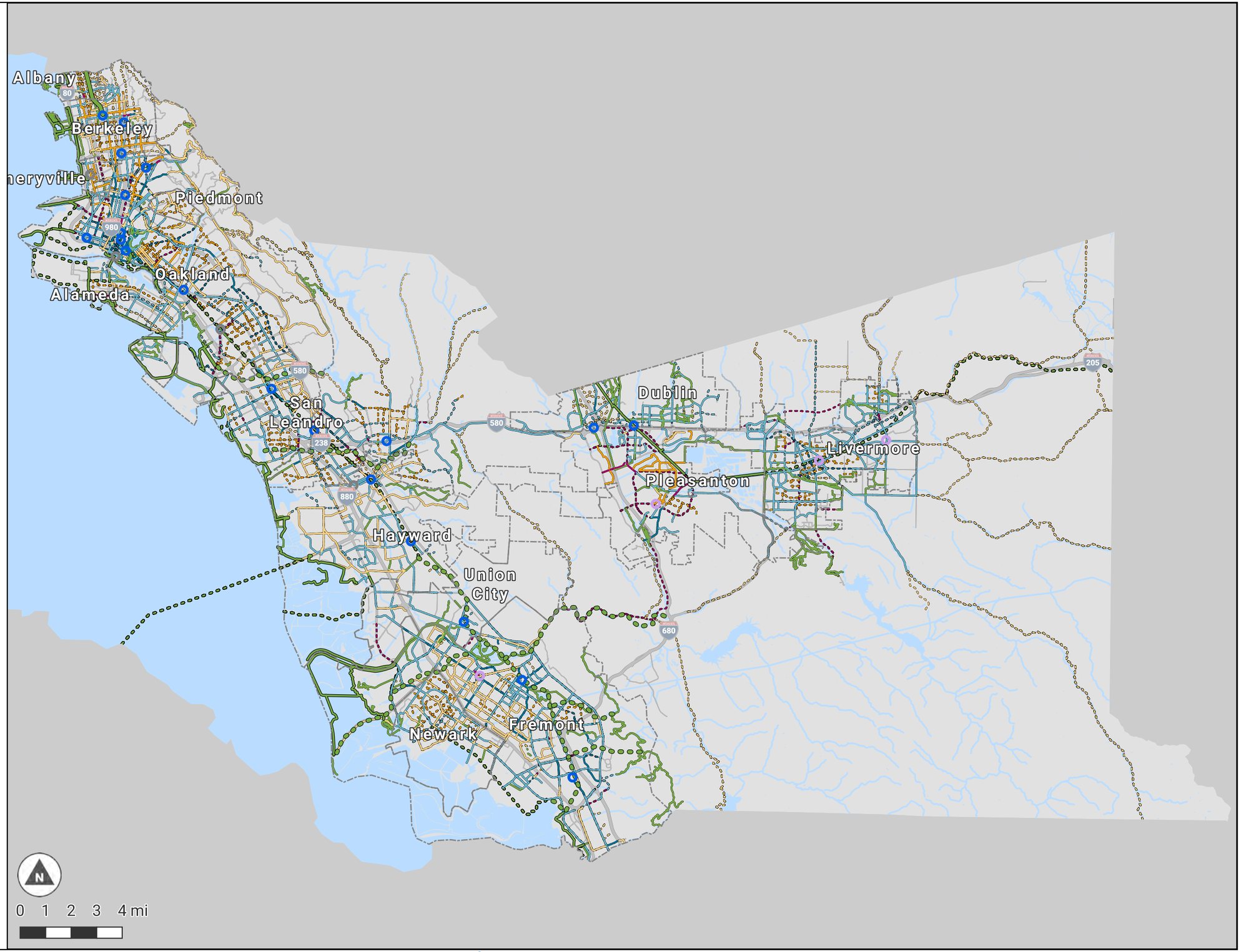
- Major Regional Trails
- Class I - Shared Use Path
- Class II - Bike Lane
- Class II - Buffered Bike Lane
- Class III - Shared Lane
- Class III - Bike Boulevard
- Class IV - Separated Bike Lane
- Existing
- Planned
- Study Corridor

Other

- BART Station
- Amtrak Station
- ACE

Note: This map is not comprehensive, it is for Illustrative Purposes only. Trail alignments maybe subject to change.

Alameda CTC Countywide Active Transportation Plan



4.2 Bicycling in Alameda County

The bicycling environment in Alameda County today varies widely: in some areas, comfortable local streets are well-connected to one another and to destinations. In other areas, destinations are farther than many people will bike and/or barriers exist between comfortable bicycle facilities and places where people want to go. Some of this variation is inherent in the land use and transportation development patterns of Alameda County. Large geographies in the North planning area and some locations in older districts or neighborhoods in other planning areas that were developed prior to the automobile tend to have more gridded street patterns that can be conducive to bicycle travel when those grids comprise local streets that are low-speed, low-volume environments. Challenges exist even here, though, with arterial crossings interrupting local streets, and when destinations are located on arterial streets themselves, often causing bicyclists to ride on the sidewalk to access the front door when they do not feel comfortable on the street.

In certain areas of Alameda County, the lack of network connections and the auto-centric nature of the street network create challenges to bicycling. These areas tend to have been developed after the advent of the automobile or in an era when strict divisions of land uses and inward-focused residential development were popular. Destinations such as grocery stores, schools, and many workplaces tend to be farther from residential development in areas served by a smaller number of high-speed arterial roadways.

In other areas, quiet neighborhoods may offer opportunities for bicycling on low-traffic, low-speed roadways, but often these areas are cut off from other neighborhoods and destinations by arterial roadways. Even where bike facilities are provided on these high-volume streets, it is not surprising that they are not highly used given the concerns about safety and comfort shared by most potential riders. Analysis results, included later in this book, paint a more detailed picture of bicycling connectivity in the different planning areas and jurisdictions of Alameda County.

The following section will discuss the suitability of the existing network for different types of bicyclists.

4.3 How Comfortable is the Network?

The Plan assessed Alameda County's street and trail network for Level of Traffic Stress (LTS). LTS measures how people feel when they are bicycling. Many people experience stress when riding alongside high-speed traffic, but they feel comfortable when riding on a separated path away from high volumes of cars. The proximity, volume, and speed of traffic impact how people feel, and these are the variables included when measuring LTS for street and trail segments. Intersections can also create stressful riding environments, so they are assessed by reviewing the characteristics of the cross street (traffic speed and number of lanes), as well as the traffic control provided. Signalized intersections give the bicyclist the opportunity to cross when traffic is stopped, creating a lower-stress experience.

The LTS scale is calibrated to a typical *Interested but Concerned* rider because this group represents the greatest opportunity to generate new bicycle ridership and potential mode shift. More experienced or confident riders would feel differently on roadways with the same characteristics and generally tolerate a higher LTS rating. The scale is from 1 to 4, with LTS 1 and 2 being considered low-stress experiences suitable for the *Interested but Concerned* rider, and LTS 3 and 4 considered high stress.

The LTS analysis for Alameda County points to issues with traffic stress on the major streets—arterials and connectors—throughout Alameda County. These are streets that carry most of Alameda County's car traffic, connecting over longer distances to major destinations. While 70% of Alameda County's streets rate as low stress for bicycling, nearly all (89%) of those streets are classified as local (generally smaller lower traffic streets). For the most part, these are residential streets, meaning that many people have a low-stress route outside their front door. However, many residents may not feel comfortable bicycling out of their own neighborhood

because it is hemmed in by larger, high-stress streets, or cut off from the adjacent neighborhood by a high-stress crossing of a major street. Additionally, many destinations such as employment and shopping centers are located on Alameda County's arterial and connector network.

Communities throughout Alameda County have adopted bike plans that include facilities designed to make riding on arterials and connectors less stressful. In assessing these planned networks, there is a notable increase in low-stress major streets, meaning that as these projects are implemented, more and more destinations will be accessible to a wider range of riders.

The low-stress network today also includes Alameda County's long-distance shared use paths, such as the Iron Horse Trail and Bay Trail, and shorter connector trails. These paths currently provide a low-stress, off-street riding environment. Some people use these trails for transportation, but many also use them for recreation. Currently, many people are likely to drive to a trailhead or access point with their bike since low-stress connections to those trails are lacking. The trails serve an important recreational purpose, but with better low-stress connectivity in the surrounding street networks, they could serve even more of riders' transportation purposes.

Current local bike and pedestrian plans include recommendations to construct an additional 180 miles of trails to create low-stress connections, especially to natural areas. The longest planned path is the East Bay Greenway (EBGW). The planned EBGW will provide a continuous walking and bicycling path from the Lake Merritt BART Station to the Bay Trail south of the Warm Springs BART Station. This facility will extend over 30 miles and will connect Oakland, San Leandro, Hayward, Union City, and Fremont as well as the unincorporated communities of Ashland and Cherryland, creating a regionally significant active transportation route. These new trails would also benefit from low-stress on-street connections.

4.4 How Connected is the Network?

The Level of Traffic Stress analysis is not only used to assess the comfort of specific streets and intersections, but also to determine how much of Alameda County is accessible by bike via low-stress routes, i.e. accessible to the *Interested but Concerned* population. This assessment uses the Bicycle Network Analysis (BNA) approach. The BNA allows planners to understand where there is good low-stress connectivity in the bicycle network, and where there are challenges. This analysis methodology and results are summarized here and discussed in more detail in Appendix B. Results by jurisdiction are summarized in Book 3, Community Profiles.

The BNA assesses the connectivity of a city's low-stress bicycle network by testing whether Census blocks are or are not connected by a continuous, low-stress route. Blocks are considered connected when a route exists between them consisting only of low-stress streets and intersections. Detour is acceptable to use a low-stress route, but only up to 25% more than the shortest path between the two blocks. Being connected to other blocks with lots of destinations (e.g., schools, jobs, etc.) will give a block a higher score.

Looking at the overall picture of Alameda County, cities with more developed bicycle networks score better. This can be seen by looking at the average score for each of Alameda County's four planning areas presented in the table below. The bicycle networks of North County result in the highest overall score for low-stress connectivity. The BNA was conducted for the existing and planned network. Although South County presently has the least connected low-stress network, it sees the greatest percentage improvement in the planned conditions. Based on scoring across multiple applications of the BNA so far in the US, the scores below can be interpreted using the following ranges:

- 0 – 20 = Poor Connectivity
- 20 -35 = Fair Connectivity

- 35 – 50 = Good Connectivity
- > 50 = Very Good Connectivity

Weighted Average Bicycle Network Analysis Score by Planning Area

Planning Area	Existing	Planned	Change
North	52	55	6%
Central	21	29	38%
South	16	25	56%
East	33	42	27%

Note: BNA scores were computed in March 2018 and do not reflect local planned networks approved after that time.
Source: Toole Design Group

BNA assessments of the existing and planned networks are presented on subsequent pages. Cities with grid street networks (i.e. more streets and intersections) score better than those with lower intersection density, which is similar to BNA results in other cities that have been studied. A finer grid of streets gives bicyclists more route choices to a destination, even when accounting for detour; in this case, a bicyclist may only need to ride two blocks out of the way to find a low-stress crossing of a high-stress street, whereas a more disconnected network will not provide the same variety of route options.

4.5 Connectivity of Existing and Planned Jurisdiction Bikeway Networks

The 2012 Countywide Bicycle Plan defined a vision network of bicycle facilities. It focused on cross-county corridors, plus areas, routes, and projects of countywide significance. The network consisted of approximately 400 built and 370 unbuilt miles of bikeways. Since 2012, some of these bikeways have been constructed by local jurisdictions according to their own local plans.

For the purposes of this Plan, the planned network being assessed for the connectivity analysis is the result of a compilation of all jurisdictions' current planned networks from adopted local bike plans. Alameda CTC has not examined each planned facility for suitability. This network was evaluated for future connectivity instead of the 2012 Countywide Bicycle Plan vision network because many local jurisdictions have updated their local plans since the 2012 Countywide Plan. The planned jurisdiction bikeway networks are presented in this Plan's Executive Summary (Book 0).

ALAMEDA County Transportation Commission

Existing BNA Scores

Alameda County

Existing BNA Scores

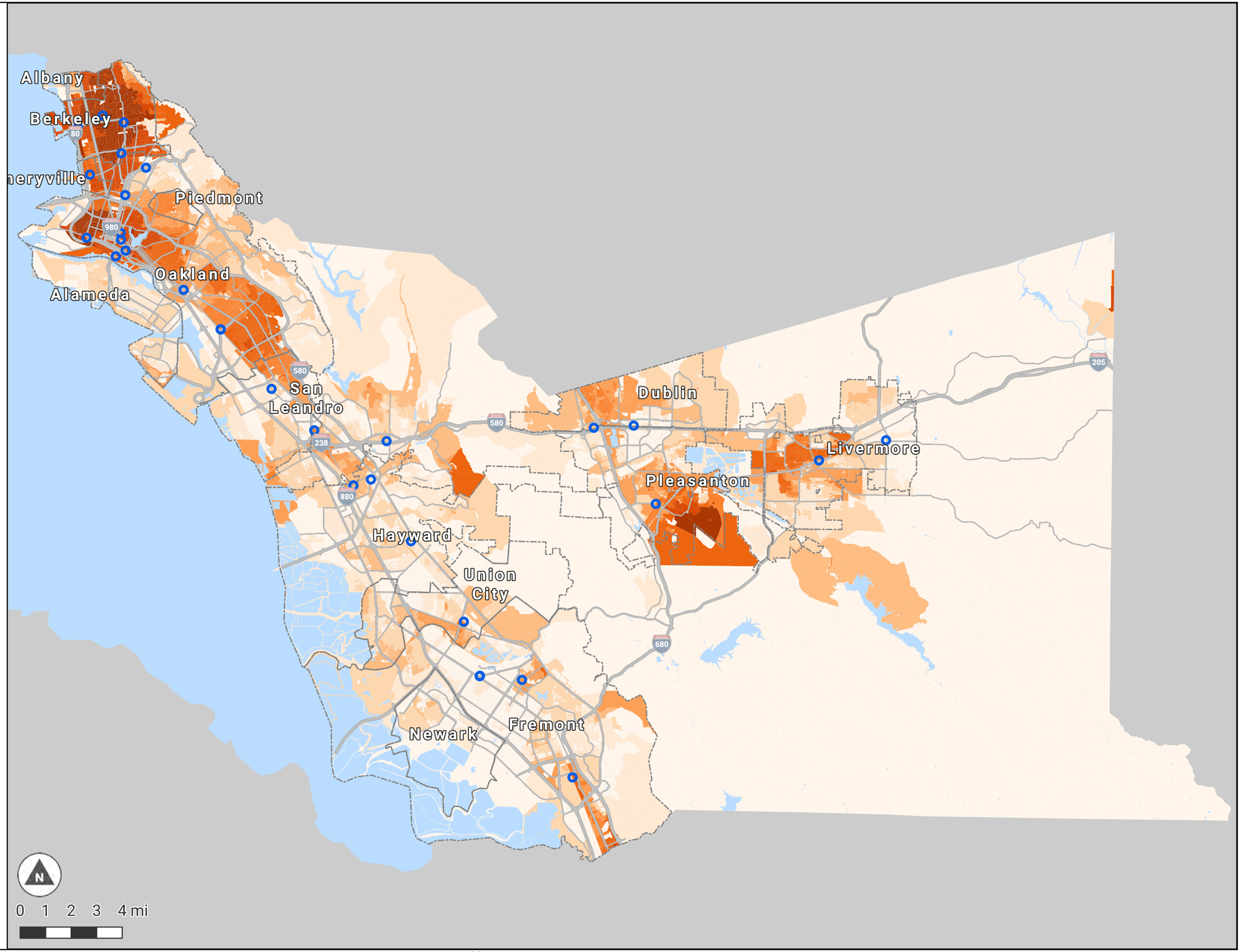
- 90 - 100
- 80 - 90
- 70 - 80
- 60 - 70
- 50 - 60
- 40 - 50
- 30 - 40
- 20 - 30
- 10 - 20
- 0 - 10

Other

- BART, ACE and Capitol Corridor Stations

Note: Bicycle facility data used for this analysis were those received from local staff, current as of March 2018.

Alameda CTC Countywide Active Transportation Plan



ALAMEDA County Transportation Commission

Planned BNA Scores

Alameda County

Planned BNA Scores

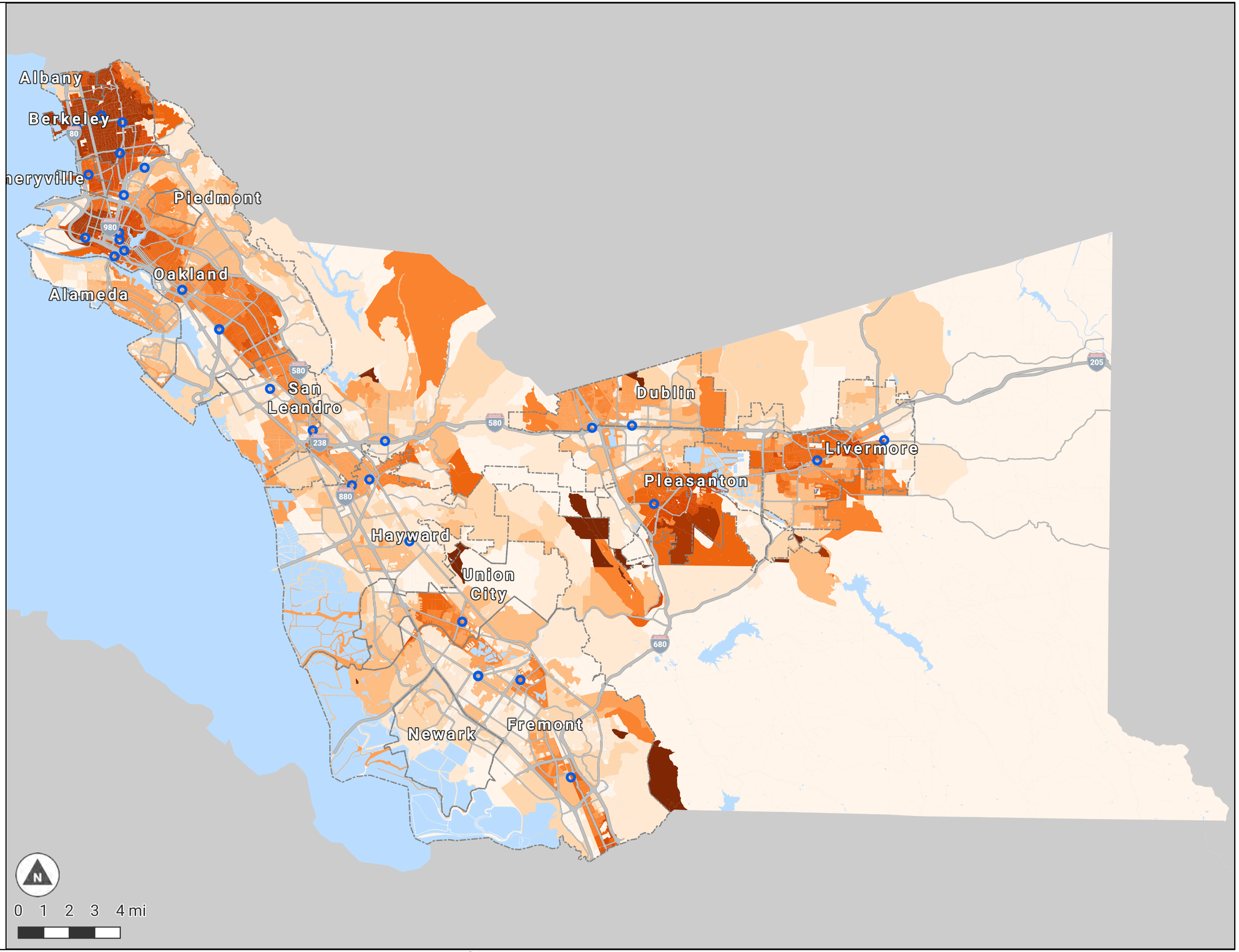
- 90 - 100
- 80 - 90
- 70 - 80
- 60 - 70
- 50 - 60
- 40 - 50
- 30 - 40
- 20 - 30
- 10 - 20
- 0 - 10

Other

- BART, ACE and Capitol Corridor Stations

Note: Bicycle facility data used for this analysis were those received from local staff, current as of March 2018.

Alameda CTC Countywide Active Transportation Plan



4.5.1 North Planning Area

Though the North planning area has the greatest overall connectivity score in both existing and planned conditions, there is still a wide variation in how well-connected particular areas are. Generally, connectivity scores are lower in the hilly areas to the east (including those in Berkeley and Oakland and near the border with Contra Costa County) than in flatter portions of the planning area where there are higher densities, a more connected street grid, and more destinations. Connectivity also breaks down where traffic volumes are higher and bike facilities limited, or where large streets interrupt or dominate the network. These results are explored in city-specific sections in Book 3, Community Profiles.

4.5.2 Central Planning Area

The Central area of Alameda County is generally less well connected by a low-stress bicycling network than the North. Many neighborhoods in the urban unincorporated areas, Hayward, Union City, and San Leandro developed after World War II when the automobile dictated street planning. Their street networks are dominated by large arterials which are high-stress riding environments, and local street networks, which are generally low-stress, and are not well connected internally or across arterials. Natural features such as creeks and topography are challenges in some areas as well. Some improvement (38% change in score) is seen with the implementation of planned bicycle facilities in this area.

4.5.3 South Planning Area

The South planning area of Alameda County today has the lowest existing connectivity score according to the BNA. Creeks, canals, rail lines, street development patterns, and jurisdictional boundaries all pose challenges to the connectivity of the street network. All jurisdictions in this area face these connectivity challenges; the best-connected streets are high-speed, high-volume arterials where even providing a buffered bike lane will not make the street a low-stress riding environment. A large percentage change (56% improvement) is seen in the South planning area's BNA score for the planned bicycle network. This improvement can be attributed to local plans that call for separated bike lanes on major arterials.

4.5.4 East Planning Area

The East planning area generally has poor low-stress connectivity in the rural and outlying suburban areas, and the business park portions of Dublin and Pleasanton. In the future, planned bicycle facilities will improve low-stress connectivity somewhat (27% change) with bicycle boulevards and separated bike lanes providing connectivity in the urban areas of East County, while the rural parts of the county will stay relatively disconnected from a low-stress network perspective.

4.5.5 How was the connectivity analysis used?

The results of the LTS and BNA analyses conducted as part of the Plan have been used to help identify areas of relatively good or poor connectivity given the existing and planned bicycle networks. This Plan has reviewed interjurisdiction connections to make sure riders do not encounter barriers when crossing from one jurisdiction to the next.

It is important to acknowledge that there are other factors influencing people's comfort when bicycling that are not included in LTS analysis. For example, Alameda County's bicyclists face topographical challenges in the East Bay Hills. The LTS analysis also does not account for percentages of heavy vehicles on the road, which can make riders uncomfortable or deter people from choosing to ride. Routes from ports, rail yards, and industrial areas may have lower vehicle volumes but a high proportion of heavy vehicles. Additionally, lack of road maintenance impacts bicyclist comfort and safety by drawing the rider's attention to the road surface rather than surrounding conditions. All of these factors need to be borne in mind when creating a comfortable, connected network for bicycling.

4.6 Walking: Planning for All Ages and Abilities

Walking is an important part of people's ability to fulfill their daily needs. Being able to safely and comfortably walk for daily or weekly errands or as part of a longer commute to access transit is critical to the quality of life people experience in the communities in which they live. Walk Score® data was used to assess current walking conditions countywide, classified based on their walking access to destinations.

Walk Score is an application that categorizes whether a location is walkable by analyzing potential walking routes to nearby amenities including transit stops and stations, schools, grocery stores, restaurants, and parks. Pedestrian friendliness is also measured by analyzing population density, intersection density, and block length for the square mile surrounding each location. Points are awarded based on pedestrian friendliness and the distance to amenities in various categories, with destinations within five minutes of walking time contributing most to the score. The numerical walk score ranges associated with the walkability designations are summarized below with a brief description of the type of walking environment.

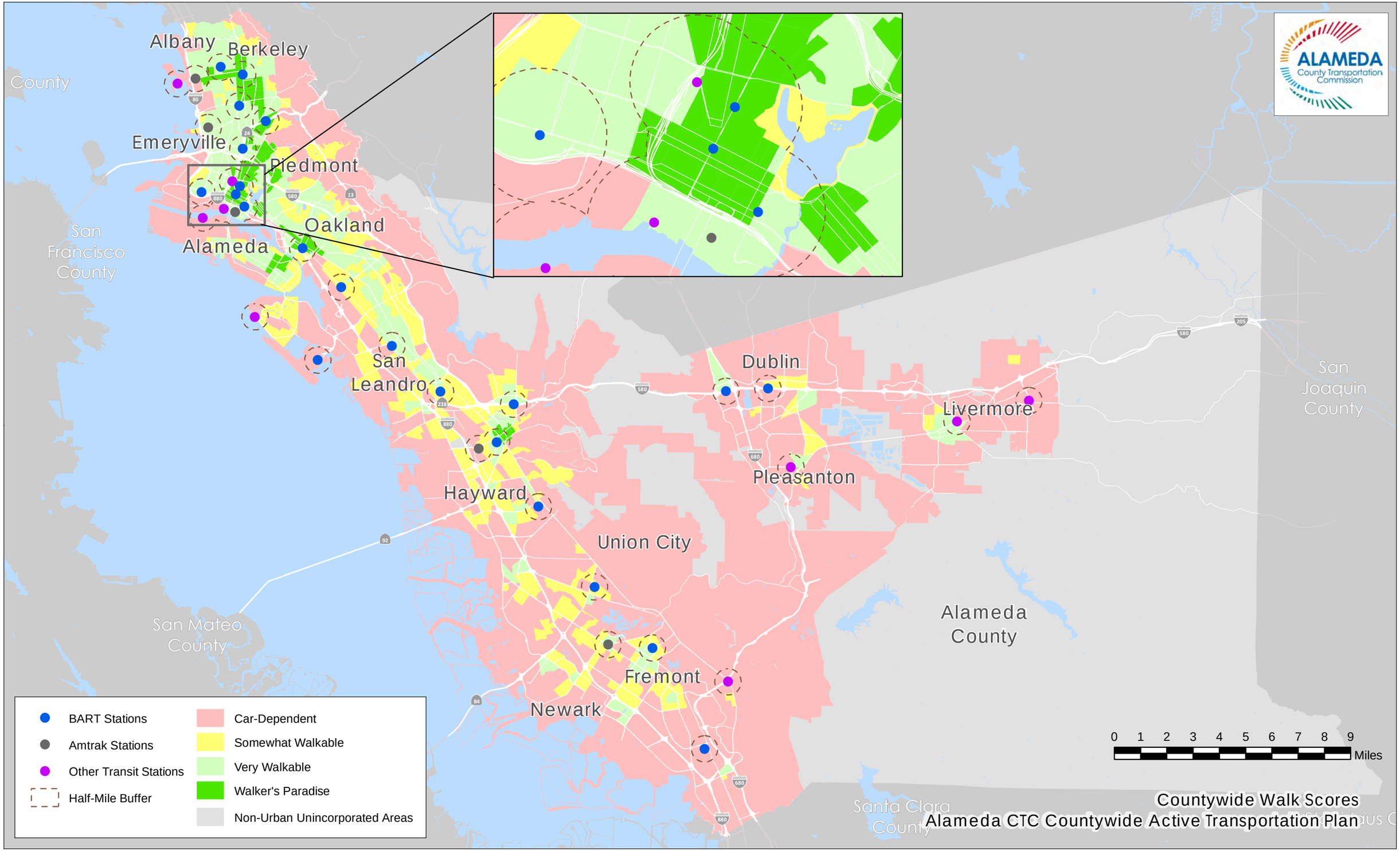
It must be noted that Walk Score uses a proprietary algorithm to assess destination density and proximity, which is not an outcome that this Plan would directly affect. The methodology also does not consider all roadway or streetscape design factors. Walk Score analysis does not represent a perfect method but rather a means to pinpoint locations with rich walkability or latent walkability based on proximate destinations. However, given pedestrian amenity and sidewalk data is generally not available at the county level, Walk Score analysis can be a useful indicator for locations that can benefit from improvements.

Walk Score Categories

Walk Score Ranking	Label	Description
90-100	**Walker's Paradise**	Daily errands do not require a car
70-89	**Very Walkable**	Most errands can be accomplished on foot
50-69	**Somewhat Walkable**	Some errands can be accomplished on foot
25-49	**Car-Dependent**	Most errands require a car
0-24	**Car-Dependent**	Almost all errands require a car

4.7 Walking in Alameda County

The walkability analysis considered destination proximity within each of the four planning areas and around major transit like BART stations and Amtrak. The following table describes the trends and observations for each planning area.


Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
San Leandro
Hayward
Union City
Fremont
Newark
Dublin
Pleasanton
Livermore
San Francisco County
San Mateo County
Alameda County
San Joaquin County
Santa Clara County
BART Stations
Amtrak Stations
Other Transit Stations
Half-Mile Buffer
Car-Dependent
Somewhat Walkable
Very Walkable
Walker's Paradise
Non-Urban Unincorporated Areas
0 1 2 3 4 5 6 7 8 9
Miles
Countywide Walk Scores
Alameda CTC Countywide Active Transportation Plan

5 | Walking Conditions around Transit Stations

The following tables summarize the walk scores and trends for BART stations, Amtrak stations, and other transit stations; the tables also include the planning area and jurisdiction(s) each transit station is located in. Note that this analysis was conducted for existing conditions and as such, planned stations were not included.

For all stations, the predominant ranking is determined by the Walk Score(s) that covers most of the half-mile buffer area around a station. The secondary ranking consists of any other Walk Scores that are within the half-mile buffer. When a station's predominant or secondary ranking is split between scores, the cell is colored according to the predominant score if the categories are adjacent and according to an 'average' of the scores if the categories are on either end of the walkability spectrum. For example, if the Walk Scores rankings are split between *Very Walkable* and *Car-Dependent*, the cell is colored yellow to represent mixed conditions.

BART Station Walk Score Rankings

BART Station	Planning Area	Jurisdiction	Predominant Walk Score Ranking(s)	Secondary Walk Score Ranking(s)	Notes
North Berkeley BART Station	North	Berkeley	*Very Walkable*	*Walker's Paradise*	The area around this station, primarily directly around the station and to the north, is categorized as *Very Walkable*. However, south of Hearst Avenue and University Avenue, walkability is substantially higher.
Downtown Berkeley BART Station	North	Berkeley	*Walker's Paradise*	*Very Walkable*	The area around this station is primarily categorized as a *Walker's Paradise*. However, east of Oxford Street and north of Bancroft Way (the UC Berkeley campus) walkability is lower at *Very Walkable*.
Ashby BART Station	North	Berkeley	*Very Walkable*	*Walker's Paradise*	The area directly around this station as well as to the west, south, and east is categorized as *Very Walkable*. To the northeast (west of Martin Luther King Boulevard and north of Ashby Avenue), walkability is higher (*Walker's Paradise*).
Rockridge BART Station	North	Berkeley	*Walker's Paradise*	*Very Walkable / Somewhat Walkable*	The area surrounding this station is primarily categorized as *Walker's Paradise*, with some block groups along the northern, western, and southern perimeters of the catchment area being *Very Walkable*. However, east of Broadway, walkability significantly drops to *Somewhat Walkable* or *Car-Dependent*.
MacArthur BART Station	North	Oakland	*Very Walkable*	*Walker's Paradise*	This station is itself within a *Walker's Paradise* block group; overall, the area around the station is categorized lower (*Very Walkable*).

Note that the stations analyzed are organized generally from north to south along the BART system.

BART Station Walk Score Rankings (Continued)

BART Station	Planning Area	Jurisdiction	Predominant Walk Score Ranking(s)	Secondary Walk Score Ranking(s)	Notes
West Oakland BART Station	North	Oakland	*Very Walkable*	*Car-Dependent*	The area around this station is predominantly *Very Walkable*. While a significant portion of the area to the south and southwest is *Car-Dependent* (south of Interstate 880), that area is dominated by freight rail and industrial uses rather than residential, office, or retail uses.
19th St. Oakland BART Station	North	Oakland	*Walker's Paradise*	*Very Walkable*	The area around this transit station is predominantly categorized as *Walker's Paradise*; a portion of the area to the west is categorized as *Very Walkable*.
12th St. Oakland City Center BART Station	North	Oakland	*Walker's Paradise*	--	The area around this transit station is predominantly categorized as *Walker's Paradise*.
Lake Merritt BART Station	North	Oakland	*Walker's Paradise / Very Walkable*	--	The area to the northwest of this station (north of I-880 and west of Oak Street) is categorized as *Walker's Paradise*; to the south and east of the station, the area is generally *Very Walkable*.
Fruitvale BART Station	North	Oakland	*Walker's Paradise*	*Very Walkable / Somewhat Walkable*	The walkability around this station varies substantially. To the north and west of the station (providing direct access), the area is a *Walker's Paradise*. However, walkability decreases to the southwest of the station, corresponding to I-880 and bridges crossing the Tidal Canal.

Note that the stations analyzed are organized generally from north to south along the BART system.

BART Station Walk Score Rankings (Continued)

BART Station	Planning Area	Jurisdiction	Predominant Walk Score Ranking(s)	Secondary Walk Score Ranking(s)	Notes
Coliseum/Oakland Airport BART Station	North	Oakland	*Somewhat Walkable*	*Car-Dependent*	The area around this station generally exhibits low walkability. To the north and east of the station (providing direct access) the area is somewhat walkable. To the southwest, walkability drops to *Car-Dependent*; however, this area corresponds to the Coliseum stadium and industrial uses.
Oakland Airport BART Station[1]	North	Oakland	*Car-Dependent*	--	The area around this station, completely encompassed by the Oakland International Airport loop road (Airport Drive) and parking lots, is categorized as *Car-Dependent*.
San Leandro BART Station	Central	San Leandro	*Very Walkable*	*Somewhat Walkable / Car-Dependent*	The area around and to the northeast of the station (including Old San Leandro) is categorized as *Very Walkable*. Walkability drops to *Somewhat Walkable* and *Car-Dependent* to the southeast of the railroad track right-of-way.
Bay Fair BART Station	Central	San Leandro / Unincorporated County	*Somewhat Walkable*	*Very Walkable / Car-Dependent*	The area around this station is predominantly categorized as *Somewhat Walkable*. A portion of the catchment area to the north, which includes the Bayfair Center retail, is categorized as *Very Walkable*.
Castro Valley BART Station	Central	Castro Valley	*Very Walkable / Somewhat Walkable*	*Car-Dependent*	The walkability around this station varies substantially. To the north of I-580 (including direct access points to the station) walkability is generally categorized as *Very Walkable*. South of I-580, walkability drops to either *Somewhat Walkable* or *Car-Dependent*.

Note that the stations analyzed are organized generally from north to south along the BART system.

[1]Note also that the Oakland Airport BART station is not a typical BART station, as it only really grants walking access to the airport terminals.

BART Station Walk Score Rankings (Continued)

BART Station	Planning Area	Jurisdiction	Predominant Walk Score Ranking(s)	Secondary Walk Score Ranking(s)	Notes
Hayward BART Station	Central	Hayward	*Very Walkable*	*Walker's Paradise / Somewhat Walkable*	The walkability around this station varies substantially. The area directly around the station is primarily *Very Walkable*, with areas to the west categorized as *Somewhat Walkable*. To the east, (corresponding with Downtown Hayward) walkability is categorized as *Walker's Paradise*.
South Hayward BART Station	Central	Hayward	*Car-Dependent*	*Somewhat Walkable*	The area around this station generally exhibits very low walkability; access to the station is primarily categorized as *Car-Dependent*.
Union City BART Station	South	Union City	*Somewhat Walkable*	*Car-Dependent*	The area around this station is primarily *Somewhat Walkable*; portions corresponding with industrial uses are *Car-Dependent*.
Fremont BART Station	South	Fremont	*Somewhat Walkable*	*Very Walkable / Car-Dependent*	The area directly around the station, corresponding to residential uses and hospitals, is predominantly *Somewhat Walkable*. To the southwest, corresponding with more retail uses, walkability increases to *Very Walkable*.
Warm Springs/South Fremont BART Station	South	Fremont	*Car-Dependent*	--	The area around this station, characterized by industrial uses, is *Car-Dependent*.
West Dublin/Pleasanton BART Station	East	Dublin / Pleasanton	*Very Walkable / Car-Dependent*	--	A portion of the area to the north of this station, including to the northern access point, is categorized as *Very Walkable*. However, access to the southern access point is categorized as *Car-Dependent*.
Dublin/Pleasanton BART Station	East	Dublin / Pleasanton	*Car-Dependent*	*Somewhat Walkable*	A limited portion of the area around this station is categorized as *Somewhat Walkable*; however, the majority of the station's catchment area is *Car-Dependent*.

Note that the stations analyzed are organized generally from north to south along the BART system.

Amtrak Station Walk Score Rankings

BART Station	Planning Area	Jurisdiction	Predominant Walk Score Ranking(s)	Secondary Walk Score Ranking(s)	Notes
Berkeley Amtrak Station	North	Berkeley	*Very Walkable / Car-Dependent*	*Walker's Paradise*	Access to this station from the north is generally *Very Walkable*; access from the south is categorized as *Car-Dependent*, although the southeastern portion of the catchment area is categorized as *Walker's Paradise*.
Emeryville Amtrak Station	North	Emeryville	*Very Walkable*	*Somewhat Walkable*	The catchment area around this station is characterized primarily by *Walker's Paradise* block groups.
Oakland Amtrak Station	North	Oakland	*Very Walkable*	*Walker's Paradise*	The catchment area around this station along the waterfront is categorized as *Very Walkable*. The northern portion of the area (north of I-880 towards Downtown Oakland) is categorized as a *Walker's Paradise*.
Hayward Amtrak Station	Central	Hayward	*Car-Dependent / Somewhat Walkable*	--	The area around this station (primarily residential and industrial uses) generally exhibits low walkability (*Somewhat Walkable* to the east and *Car-Dependent* to the west).
Fremont/Centerville Amtrak/ACE Station	South	Fremont	*Very Walkable / Somewhat Walkable*	*Car-Dependent*	The area directly encompassing this station is categorized as *Very Walkable*. However, the outer perimeter of the catchment area and surrounding areas generally exhibit low walkability (*Somewhat Walkable* and *Car-Dependent*).
Livermore Amtrak Station	East	Livermore	*Very Walkable*	*Car-Dependent*	The southwestern half of this station's catchment area is categorized as *Very Walkable*. However, to the northeast, walkability decreases to *Car-Dependent*.

Other Transit Station Walk Score Rankings

BART Station	Planning Area	Jurisdiction	Predominant Walk Score Ranking(s)	Secondary Walk Score Ranking(s)	Notes
Oakland Greyhound Station	North	Oakland	*Walker's Paradise / Very Walkable*	--	Access to this station from the west is generally categorized as *Very Walkable*, whereas access from the east (closer to Downtown Oakland) is categorized as *Walker's Paradise*.
Berkeley Marina Ferry Terminal	North	Berkeley	*Car-Dependent*	--	The area around this station, characterized by retail and recreational uses, is *Car-Dependent*.
San Francisco Bay Ferry Terminal	North	Oakland	*Very Walkable*	*Walker's Paradise / Car-Dependent*	The area around this station, characterized by commercial, is generally *Very Walkable*.
Alameda Main Street Terminal	North	Alameda	*Car-Dependent*		The area around this station, characterized by residential and industrial, is *Car-Dependent*.
Harbor Bay Ferry Terminal	North	Alameda	*Car-Dependent*	*Somewhat Walkable*	The area around this station, characterized by residential, is *Car-Dependent*.
Pleasanton ACE Station	East	Pleasanton	*Car-Dependent*	*Very Walkable / Somewhat Walkable*	A portion of this area, including access from Main Street in Pleasanton, is categorized as *Very Walkable*. The remainder of the catchment area from the west and south (which includes recreational uses) is *Car-Dependent*.
Vasco Road ACE Station	East	Livermore	*Car-Dependent*	--	The area around this station, predominantly industrial uses with some residential, is *Car-Dependent*.
Livermore Station	East	Livermore	*Very Walkable*	*Car-Dependent*	The southwestern half of this station's catchment area is categorized as *Very Walkable*. However, to the northeast, walkability decreases to *Car-Dependent*.

5.1 Key Findings Related to Walking in Alameda County

Trends in walkability tend to vary as presented below.

Planning Area Walk Score Trends

Planning Area	Cities and Communities	Walk Score Rankings Description
North	Cities of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont	Generally, incorporated areas in the North planning area are *Very Walkable*. There are high concentrations of block groups with a Walk Score of *Very Walkable* or *Walker's Paradise*. Some areas, including hilly areas of Berkeley and Oakland, parts of east Oakland and western Alameda, are categorized as *Car-Dependent*.
Central	Cities of Hayward and San Leandro; Unincorporated communities of Ashland, Castro Valley, Cherryland, Fairview, and San Lorenzo	The Central planning area is primarily categorized as *Somewhat Walkable* or *Car-Dependent*; a limited number of block groups are categorized as *Very Walkable* (primarily in San Leandro and Hayward). Downtown Hayward is categorized as *Walker's Paradise*.
South	Cities of Fremont, Newark, and Union City	The South planning area is predominantly *Car-Dependent* or *Somewhat Walkable*, with some *Very Walkable* block groups, including within central Fremont south of the BART station.
East	Cities of Dublin, Livermore, and Pleasanton; Unincorporated community of Sunol	The East planning area is overwhelmingly categorized as *Car-Dependent*, with a few concentrations of *Very Walkable* block groups including along Railroad Avenue and First Street in Livermore.

The following table shows a summary of the BART, Amtrak, and other transit stations of countywide significance identified as having relatively low walkability.

Transit Stations with Major Barriers to Walking Access

Planning Area	Station	Walk Score Rankings
North	Oakland Airport BART Station[1]	*Car-Dependent*
North	Berkeley Marina, Harbor Bay, and Alameda Main Street Ferry Terminals	*Car-Dependent*
North	Coliseum/Oakland Airport BART Station	*Somewhat Walkable / Car-Dependent*
Central	South Hayward BART Station	*Car-Dependent / Somewhat Walkable*
Central	Hayward Amtrak Station	*Somewhat Walkable / Car-Dependent*
Central	Bay Fair BART Station	*Somewhat Walkable / Very Walkable / Car-Dependent*
Central	Castro Valley BART Station	*Very Walkable / Somewhat Walkable / Car-Dependent*
South	Warm Springs/South Fremont BART Station	*Car-Dependent*
South	Union City BART Station	*Somewhat Walkable / Car-Dependent*
South	Fremont BART Station	*Somewhat Walkable / Very Walkable / Car-Dependent*
South	Fremont/Centerville Amtrak/ACE Station	*Very Walkable / Somewhat Walkable / Car-Dependent*
East	Pleasanton Station	*Car-Dependent / Very Walkable / Somewhat Walkable*
East	Vasco Road Station	*Car-Dependent*
East	West Dublin/Pleasanton BART Station	*Very Walkable / Car-Dependent*
East	Livermore Station	*Very Walkable / Car-Dependent*

[1]Note that the Oakland Airport BART station is not a typical BART station, as it only really grants walking access to the airport terminals.

6 | Countywide Desired Walking Conditions

While regional facilities such as countywide trails can help to support walking in Alameda County and improve access to destinations, local projects play a role in improving walking conditions. Robust pedestrian facilities across Alameda County that accommodate users of all ages and abilities can enhance access to key destinations and to local and regional transit connections. Local jurisdictions can apply a series of best engineering practices to their local transportation systems to facilitate local and inter-jurisdictional pedestrian access.

Comfortable, well-designed pedestrian facilities can consist of improvements to sidewalks (providing safe and comfortable pathways to transit and trails) and crossing facilities (increasing safety when pedestrians are most vulnerable). The series of best practices discussed below include design recommendations from the National Association of City Transportation Officials (NACTO) *Urban Street Design Guide* ("Urban Street Design Guide") and *Transit Street Design Guide*, as well as the BART *Multimodal Access Design Guidelines*, which includes recommended standards for planning pedestrian access within BART's station areas.

Sidewalks and other pedestrian facilities should be uninterrupted and clear of physical barriers. Bus stops and bike parking share the right-of-way with sidewalks; as such, local jurisdictions have an opportunity in their streetscape design to provide seamless connections among the travel modes. At the same time, improper planning can lead to crowded pedestrian facilities, insufficient bike parking, or detrimental effects to transit operations. Recommended practices for sidewalk design includes:

- Reducing gaps in the sidewalk network and providing continuous walkways on both sides of the street with smooth surfaces that make them traversable for mobility devices
- Providing a minimum sidewalk width that provides a "through zone" of at least 5 to 7 feet for travel. The through zone represents a clear area for pedestrian passage (exclusive of street furniture or building frontages).
- Where a bus stop is present, The AC Transit Multimodal Corridor Guidelines ("Multimodal Guidelines") recommends at least an 8-foot-wide "rear clear zone"
- The total minimum sidewalk width to maintain ADA accessibility is 4 feet, or 8 feet in the presence of a bus stop. The minimum width may be necessary at a pinch point but is generally not sufficient for the design of pedestrian right-of-way.
- Providing pedestrian-scale lighting on sidewalks promotes safe walking

As noted previously, sidewalks provide direct connections to transit: bus stop design and sidewalk or crossing design are closely related. The following is general guidance provided by both the *Urban Street Design Guide* and the Multimodal Guidelines:

- Provide stop amenities including seating, wayfinding, vending machines, and trash cans to increase passenger comfort.
- Keep far-side bus stops and crosswalks separated, such that the back of the bus and a crosswalk are at least 10 feet apart. For near-side stops, keep the front of the bus at least 10 feet back from a marked crossing. This clear zone enhances pedestrian visibility and safety.

- Maintain clear circulation at bus stops between the sidewalk through zone and the boarding and alighting areas.
- Provide bicycle parking that is clear of the bus's path of travel and the pedestrian through zone.
- An accessible landing zone (at least 8 feet wide and 5 feet long) should be maintained at bus stops, with appropriate clearance (preferably 8 feet) for the length of the bus stop. The bus stop length is determined by the buses it serves; consult the Multimodal Guidelines for recommended dimensions.
- Where bike lanes are routed behind a bus stop and floating boarding islands are provided, access to the boarding island from the crosswalk should include a detectable edge and ample room for waiting, boarding, and alighting passengers.

It is also important to create safe and comfortable crossing opportunities for pedestrians, given that pedestrians are most vulnerable and exposed when crossing the street. Recommended practices for crossing provision include:

- Improving crosswalk markings with a higher degree of visibility than standard (transverse) crossing markings, such as continental, ladder, and zebra crosswalk markings.
- Providing crosswalks or other high-visibility crosswalks across bicycle facilities that can help to reduce conflicts between bicyclists and pedestrians.
- Building curb ramps at intersections that are perpendicular to the roadway, parallel to the crosswalk, and at least 10 feet wide. Curb ramps can benefit from being as wide as the crosswalk width if not wider. Truncated domes are also recommended to communicate the edge of the traveled way.
- Providing raised crosswalks at midblock crossings to increase driver awareness and propensity to yield.
- Additional recommendations to increase awareness of pedestrians at uncontrolled midblock crossings include yield markings, signage and rectangular rapid flash beacons.
- Implementing treatments to reduce crossing distances such as curb extensions. Note that bus boarding islands previously discussed may also serve to shorten crossing distances.
- Providing a pedestrian crossing refuge island where pedestrians cross at least three lanes of traffic. Refuge islands should be at least 6 feet wide; the recommended width is 10 feet wide.
- Providing rectangular rapid flashing beacons (RRFBs), pedestrian hybrid beacons (PHBs), or a pedestrian signal as appropriate to promote driver yielding at multilane crosswalks. The number of lanes, speed, and traffic volume can help to determine the appropriate treatment.
- Pedestrian-scale lighting directed at the crosswalk.
- Tightening intersection turn radii to reduce right-turning vehicle speeds (while still accommodating design vehicles)
- Modifying traffic signals with a leading pedestrian interval (LPI), dedicated pedestrian phases, or other modifications

Unsignalized Pedestrian Crosswalk Signs

From left tor right: R1-5, R1-5a, R1-6

Source: California Manual on Uniform Traffic Control Devices (CA-MUTCD)

Intersection with Continental Crosswalks, Directional Curb Camps, Curb Extensions, and Tight Right Turn Radii

Source: NACTO Urban Street Design Guide

7 | Safety

Reducing the risk of being struck by a car while walking or biking is integral to improving quality of life countywide. This chapter documents existing safety conditions countywide, beginning with a general overview of collision history and relative safety performance and followed by a more detailed look at high injury locations and profiles of bicycle and pedestrian collisions.

7.1 County Safety Performance Overview

Based on California's Office of Traffic Safety (OTS) statewide ranking, Alameda County performs approximately average for overall roadway safety but is recognized as one of the lowest performing counties in the state with respect to Pedestrian Collisions (5th) and Bicyclist Collisions (8th). OTS maintains a ranking system to compare traffic safety statistics among counties and among similarly sized cities and to evaluate relative safety performance. The comparison allows counties to identify relative safety performance. OTS uses data from the Statewide Integrated Traffic Records System (SWITRS), Caltrans, California Department of Justice, and the Department of Finance to develop rankings. Rankings are based on weighing factors including population, daily vehicle miles traveled, and collision records.

The latest available OTS rankings represent 2016 data and are provided on the following page, along with Alameda County's 2012 rankings (the year of the previous pedestrian and bicycle plans). A number one ranking in a category indicates that a county is the worst performer in the state of California.

Alameda County Safety Performance Relative to Other California Counties

Type of Collision	OTS Ranking, 2012 (1=worst)	OTS Ranking, 2016 (1 = worst)
Total Fatal and Injury	3/58	30/58
Alcohol Involved	27/58	49/58
Had Been Drinking, Driver <21	45/58	57/58
Had Been Drinking, Driver 21-34	47/58	51/58
Motorcycles	41/58	15/58
Pedestrians	55/58	5/58
Pedestrians Age 65+	56/58	1/58
Bicyclists	54/58	9/58
Bicyclists <15	17/58	44/58
Speed Related	11/58	13/58
Nighttime (9 p.m. – 2:59 a.m.)	11/58	25/58
Hit and Run	49/58	3/58

Green highlighting indicates that Alameda County falls among the highest-performing third of counties.
Red highlighting indicates that Alameda County falls among the lowest-performing third of counties.
Source: California Office of Traffic Safety, Kittelson 2018.

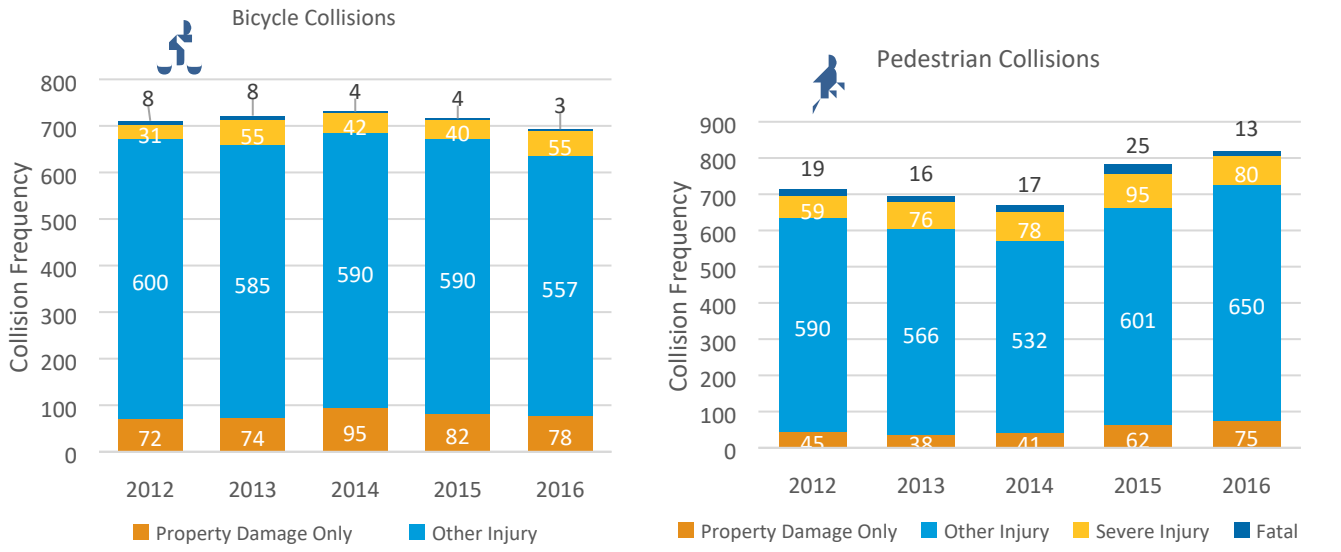
As noted above, the rankings show Alameda County performing roughly average in total fatalities and injuries, but among the lowest performing counties in the state in several safety categories, including pedestrian and bicyclist safety. California Department of Finance estimates Alameda County's population at 1,646,405 in 2016, making it the seventh-largest county by population. Counties are not uniform in size or land use and transportation characteristics; however, these rankings indicate that improving pedestrian and bicyclist safety are vitally important priorities for Alameda County.[3]

Bicycle collisions and pedestrian collisions have remained relatively consistent in frequency from 2012 to 2016, with a slight uptick in pedestrian collisions in more recent years. The following chart presents the number of bicycle and pedestrian collisions per year for each collision severity. In this exhibit and the following section, PDO is defined as "property damage only" or any collisions where there are no associated injuries.

[3] The OTS rankings are based on an Empirical Bayes Ranking Method, which uses population, daily vehicle miles traveled, crash records, crash trends, and other weighting factors to arrive at a single ranking. More information is available at the OTS website: https://www.ots.ca.gov/media-and-research/collision-rankings/.

Note that severity is determined by police officers responding to a reported collision and may not match with severity determined by a medical professional. A comparison conducted by the San Francisco Department of Public of Health of reported collision severity by police officers responding to bicycle and pedestrian collisions to severity recorded by medical professionals for the same collision event identified significant discrepancies, indicating police officers often underreport severe injuries.

Annual Bicycle and Pedestrian Collisions (Alameda County, 2012-2016)



Source: TIMS, SWITRS, Kittelson 2018.

During the five-year period, from 2012 to 2016, there was an average of 690 bicycle collisions per year and a total of 24 fatal bicycle collisions, for an average of 5 per year. Over the same period, there were 704 pedestrian collisions per year and a total of 90 fatal collisions, for an annual average of 18 fatal collisions per year.

Reported Collision Severities (Bicycle and Pedestrian Collisions)

Reported Severity	Share of Bicycle Collisions	Share of Pedestrian Collision
Fatal / Severe Injury	7%	13%
Moderate Injury or Complaint of Pain	82%	81%
Property Damage Only	11%	6%

Sources: TIMS, SWITRS, Kittelson 2018.

Bicyclists and pedestrians are considered vulnerable road users because of their lack of protection when riding, crossing, or walking in the road. Thus, the distribution of collision severities in the reported collision data is generally as expected.

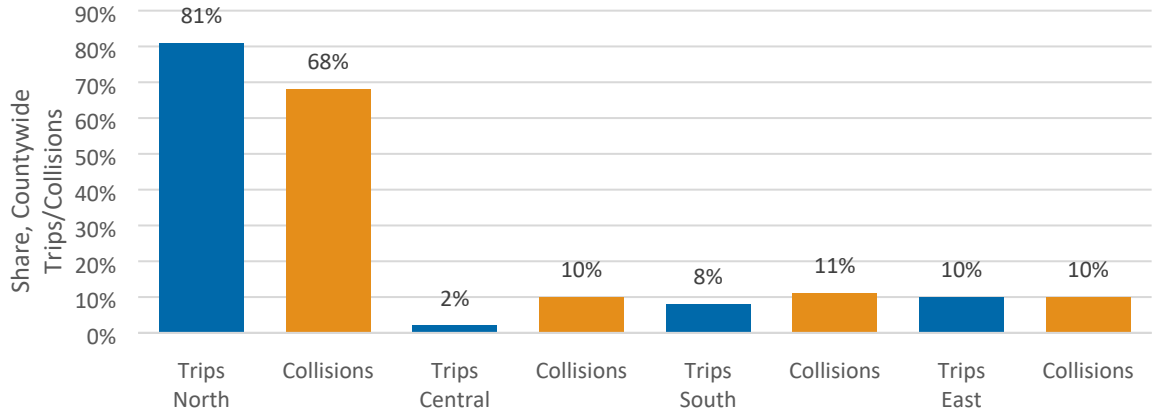
7.2 Biking and Walking Collisions by Planning Area

Bicycle activity is not evenly distributed countywide. The North County planning area includes a considerable portion of Alameda County's urbanized area—including Berkeley and Oakland—and as such, contains most of its bicycling activity. The chart below presents the countywide share of bicycle trips alongside the share of bicycle collisions by planning area.[4]

North County includes the majority of countywide bicycle collisions (68%) but an even higher share of bicycle trips (81%) per the California Household Travel Survey from 2010 to 2012. This results in a lower relative bicycle collision rate (share of collisions compared to share of trips) than in other parts of Alameda County, which is consistent with the industry expectation that there is safety in numbers for bicyclists. The more people bike in a geography, the more motorists are aware of their potential presence and the fewer collisions as a result. There are other factors that are likely also at play, such as the presence of bicycle facilities and/or the type of bicycle facilities.

The Central County planning area includes an outsize share of collisions relative to its recorded bicycle activity—2% of bicycle trips but 10% of bicycle collisions. As noted above, we expect this to be related to fewer high-quality bicycle facilities for those who are biking and motorists being less attentive or less aware of the potential for people to be biking on the roadways. East and South planning areas have relatively even shares of bicycle trips and collisions.

Bicycle Trip and Collision Share by Planning Area (Alameda County, 2012-16)

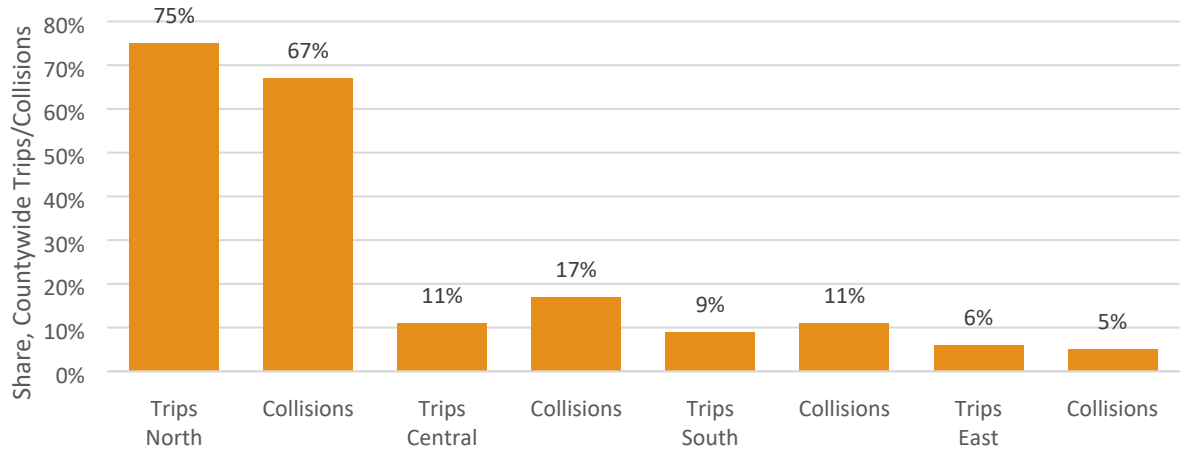


Source: TIMS, SWITRS, CHTS 2012, Kittelson 2018.

[4] The bicycle trip information is gleaned from the 2010-2012 California Household Travel Survey (CHTS), a statewide effort led by Caltrans to gather travel information for travel and environmental demand models. The CHTS collected travel information from households throughout California, with 42,431 households participating via phone and online interviews and GPS devices. While the American Communities Survey (ACS) collects only commute data, the CHTS provides information about travel for all purposes.

The chart below shows walking trips relative to collisions by planning area within Alameda County. As with bicycle trips and collisions, pedestrian activity and pedestrian collisions are not evenly distributed countywide. Similar to bicycle safety trends, the North County planning area includes the majority of countywide pedestrian collisions (67%) but a higher share of trips (75%), yielding a lower collision/trip rate and indicating that there is safety in numbers. The Central County planning area includes an outsize share of collisions relative to its recorded walking activity, but to a much smaller degree than for bicycling—11% of walking trips and 17% of pedestrian collisions. The rate of collisions/trip for walking are very similar to biking for South and East County, with the share of collisions closely aligned with the share of trips.

Walking Trip and Collision Share by Planning Area (Alameda County, 2012-2016)



Source: TIMS, SWITRS, CHTS 2012, Kittelson 2018.

7.3 Countywide High Injury Networks

An analysis of the countywide roadway network was conducted to identify a set of "high injury corridors," which constitute the worst performing street locations based on severity and frequency of collisions. The screening analysis used the most recently available complete collision data, from 2012 to 2016,[5] and weighted collisions by reported severity.[6] The weights seek to reflect an order of magnitude difference between the societal costs of fatal and severe injury collisions versus non-severe injury collisions. The weighting factors intentionally weigh fatal and severe injuries equally to recognize that the difference between a severe injury collision versus a fatal collision are often more of a function of the individuals involved – therefore, both represent locations where Alameda County may want to prioritize improvements. The countywide high injury

[5] In order to analyze data from a sufficient span of time while also avoiding the effects of significant roadway network, land use, or other changes, five years of collision data were utilized.

[6] Fatal and severe collisions were given ten points; minor and moderate injury collisions were given five points; and property damage collisions were given one point. For more information on the screening process, refer to the HIN Methodology Memo included as Appendix B.

network (HIN) represents roughly the top 20% of streets with the worst scores (i.e. most collision and/or most severe collisions over a five-year period countywide).[7]

Generally, collisions are highly concentrated on a small number of Alameda County's streets:

- 59% of bicycle collisions in Alameda County occurred on 4% of the street miles across Alameda County.
- 65% of pedestrian collisions in Alameda County occurred on 4% of the street miles across Alameda County.
- 254 miles of the network (approximately 5% of linear roadway miles) are considered part of the high injury network for bicyclists.
- 243 miles of the network (approximately 5% of linear roadway miles) are considered part of the high injury network for pedestrians.

Further, the HIN is not distributed evenly throughout the county. The North County planning area accounts for over half of the HIN, which is driven primarily by locations in Oakland and Berkeley. Oakland accounts for the highest number of injury locations in all three categories (bicycle, pedestrian, and combined), and Berkeley has the second-highest share in bicycle and combined categories and is third in the pedestrian category. Both cities have high levels of biking and walking, including the presence of urban BART stations where a higher share of riders access the station by walking or biking.

- 53% of the bicycle high injury network is in the North Planning Area.
- 51% of the pedestrian high injury network is in the North Planning Area.

In all cases, the planning areas' relative shares of the HIN by travel mode correspond to their identified shares of bicycling and walking activity (i.e. a higher share of biking/walking activity translates to a higher share of the HIN).

Given that this collision analysis uses recent yet historical data from 2012 through 2016, the results of this HIN analysis may not reflect the impact or results of current planning efforts in various jurisdictions in Alameda County. In addition, the high injury network methodology includes collisions that occur at intersections along a corridor when identifying corridors with higher severity. Therefore, the method will identify some relatively low-speed corridors that have crashes concentrated at intersections where the road intersects with larger higher-speed arterials.

The following page presents the HIN broken out by planning area and city/community. The details of each mode's analysis results are discussed in the subsequent sections.

[7] The Analysis used a scoring metric of annualized equivalent property damage only (EPDO). EPDO represents the relative societal cost of a location's collision history in terms of property damage only collisions; e.g., a location with a score of 12 has experienced on average the equivalent of 12 property damage collisions per year, through a combination of collision frequency and severity.

High Injury Network by Planning Area and City/Community

City/Unincorporated Community	Bicycle High Injury Network Mileage (Share)	Pedestrian High Injury Network Mileage (Share)	Combined High Injury Network Mileage[1] (Share)
North County	134 (53%)	123 (51%)	77 (59%)
Alameda	20 (8%)	7 (3%)	4 (3%)
Albany	1 (<1%)	3 (1%)	1 (1%)
Berkeley	36 (14%)	29 (12%)	24 (19%)
Emeryville	2 (<1%)	2 (<1%)	1 (<1%)
Oakland	75 (30%)	82 (34%)	46 (35%)
Piedmont	0.5 (<1%)	0.2 (<1%)	0 (0%)
Central County	33 (13%)	64 (26%)	23 (18%)
Hayward	20 (8%)	31 (13%)	15 (11%)
San Leandro	8 (3%)	18 (7%)	5 (4%)
Ashland	1 (<1%)	3 (1%)	1 (<1%)
Castro Valley	3 (1%)	8 (3%)	1 (<1%)
Cherryland	0 (0%)	2 (<1%)	0 (0%)
Fairview	0.4 (<1%)	2 (<1%)	0.1 (<1%)
San Lorenzo	0.8 (<1%)	1 (<1%)	0.8 (<1%)
South County	51 (20%)	38 (16%)	22 (17%)
Fremont	33 (13%)	23 (9%)	13 (10%)
Newark	10 (4%)	4 (2%)	2 (2%)
Union City	8 (3%)	11 (5%)	7 (5%)
East County	36 (14%)	18 (8%)	7 (5%)
Dublin	4 (1%)	6 (3%)	0.6 (<1%)
Livermore	9 (4%)	6 (3%)	1 (1%)
Pleasanton	19 (8%)	6 (2%)	5 (4%)
Sunol	0 (0%)	0 (0%)	0 (0%)
Other Unincorporated Areas	3 (1%)	0.3 (<1%)	0.2 (<1%)
Total	254 (100%)	243 (100%)	129 (100%)

[1]Note that the combined HIN mileage represents locations on *both* the bicycle and pedestrian HIN.
Sources: TIMS, SWITRS, Kittelson 2018.

7.3.1 Bicycle High Injury Network

The 254 miles of the identified bicycle HIN are divided among planning areas and cities/communities as shown below. The three cities with the highest share of the bicycle HIN, together accounting for over half of the HIN, are the following:

- Oakland (76 miles and 30% of HIN)
- Berkeley (36 miles and 14% of HIN)
- Fremont (33 miles and 13% of HIN)

The North County planning area accounts for 53% of the bicycle high injury network, with a relatively even distribution among remaining planning areas. Oakland has the highest single city or community share of the identified network, with 30% of the countywide high injury network. These HIN represent roughly 5% of linear roadway miles and 63% of county bicycle collisions.

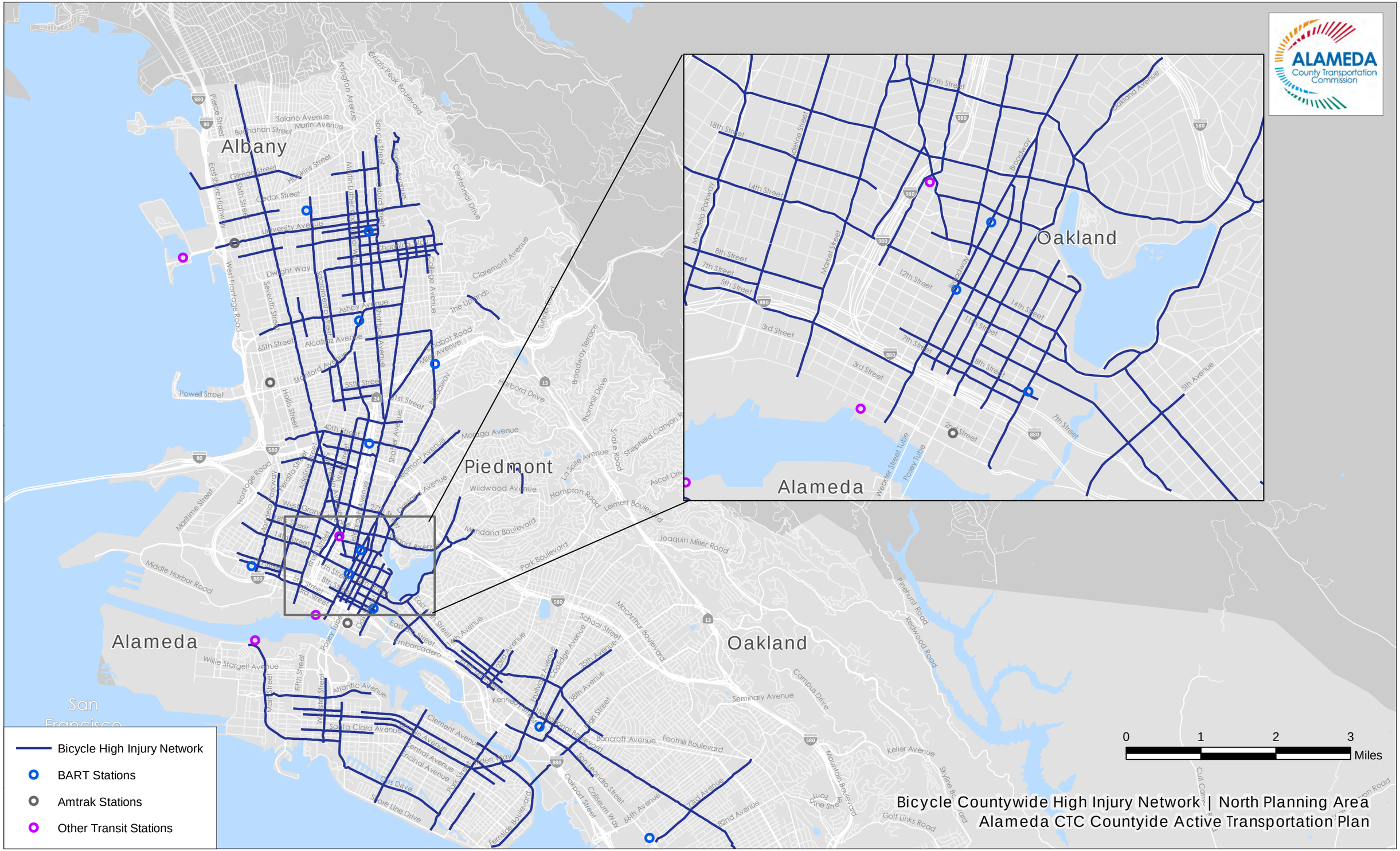
The three half-mile road segments with the highest bicycle collision severity history per planning area, and the three roadways with the greatest mileage of bicycle HIN per planning area, are presented in the following table.

The High Injury Network is based on collision data recorded between 2012 and 2016. It does not reflect recently implemented safety projects and programs

Highest Collision Severity Score and Mileage, Screened Bicycle Roadway Segments

Segments with Highest Collision Severity Score		*Roads with Most Mileage on HIN*		
Road Name and Location	Jurisdiction	Road Name	Mileage	Jurisdiction(s)
North County				
Milvia Street, Berkeley Way to Channing Way	Berkeley	San Pablo Avenue	7	Albany, Berkeley, Emeryville, Oakland
Shattuck Avenue, University Avenue to Haste Street	Berkeley	International Boulevard	7	Oakland
14th Street, Broadway to Lakeside Drive	Oakland	Telegraph Avenue	4	Berkeley, Oakland
Central County				
A Street, Second Street to Montgomery Avenue	Hayward	East 14th Street / Mission Boulevard	7	Ashland, Hayward, San Leandro
East 14th Street, Estudillo Avenue to Dutton Avenue	San Leandro	Hesperian Boulevard	4	Ashland, San Leandro, San Lorenzo, Hayward
West Tennyson Road, Tampa Avenue to I-880	Hayward	B Street	2	Hayward
South County				
Dyer Street, Santa Susana Way to Atlas Way	Union City	Paseo Padre Parkway	4	Fremont
Blacow Road, Fremont Boulevard to Greenpark Drive	Fremont	Fremont Boulevard	4	Fremont
Dyer Street*, Ratekin Drive to city boundary, Fremont Boulevard*, Bonde Way to Alder Avenue	Union City Fremont	Thornton Avenue	4	Fremont, Newark
East County				
Santa Rita Road, Black Avenue to Lockhart Lane	Pleasanton	Stoneridge Drive	3	Pleasanton
Dublin Boulevard, Arnold Drive to Hacienda Drive	Dublin	Valley Avenue	3	Pleasanton
Village Parkway, Davona Drive to Tamarack Drive	Dublin	Santa Rita Road	2	Pleasanton

*Note: The Dyer Street and Fremont Boulevard roadway segments listed had the same collision severity score.
Sources: SWITRS/TIMS 2012-2016, Kittelson 2018.


Albany
Piedmont
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San Francisco
Bicycle High Injury Network
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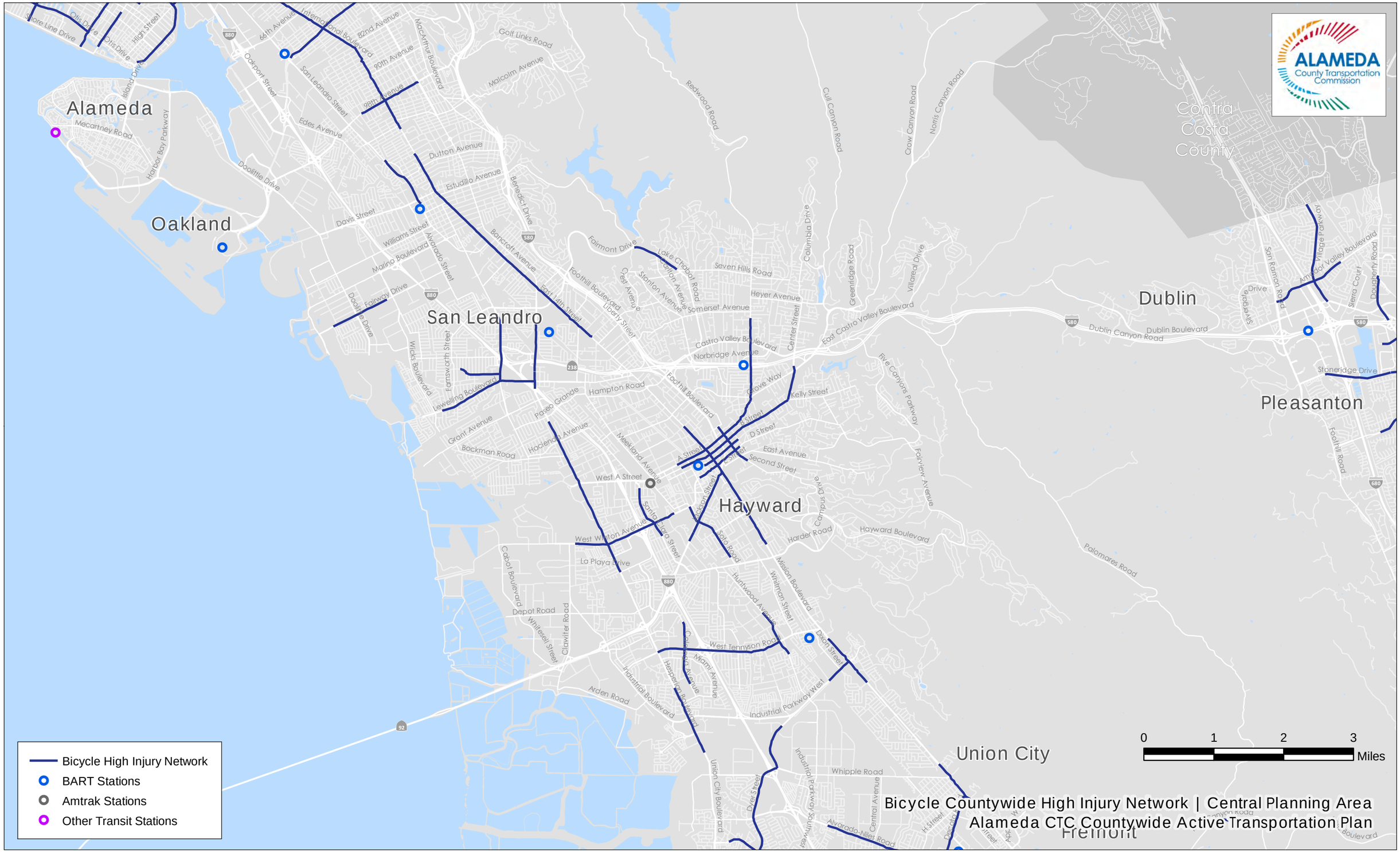
Bicycle Countywide High Injury Network | North Planning Area
Alameda CTC Countyide Active Transportation Plan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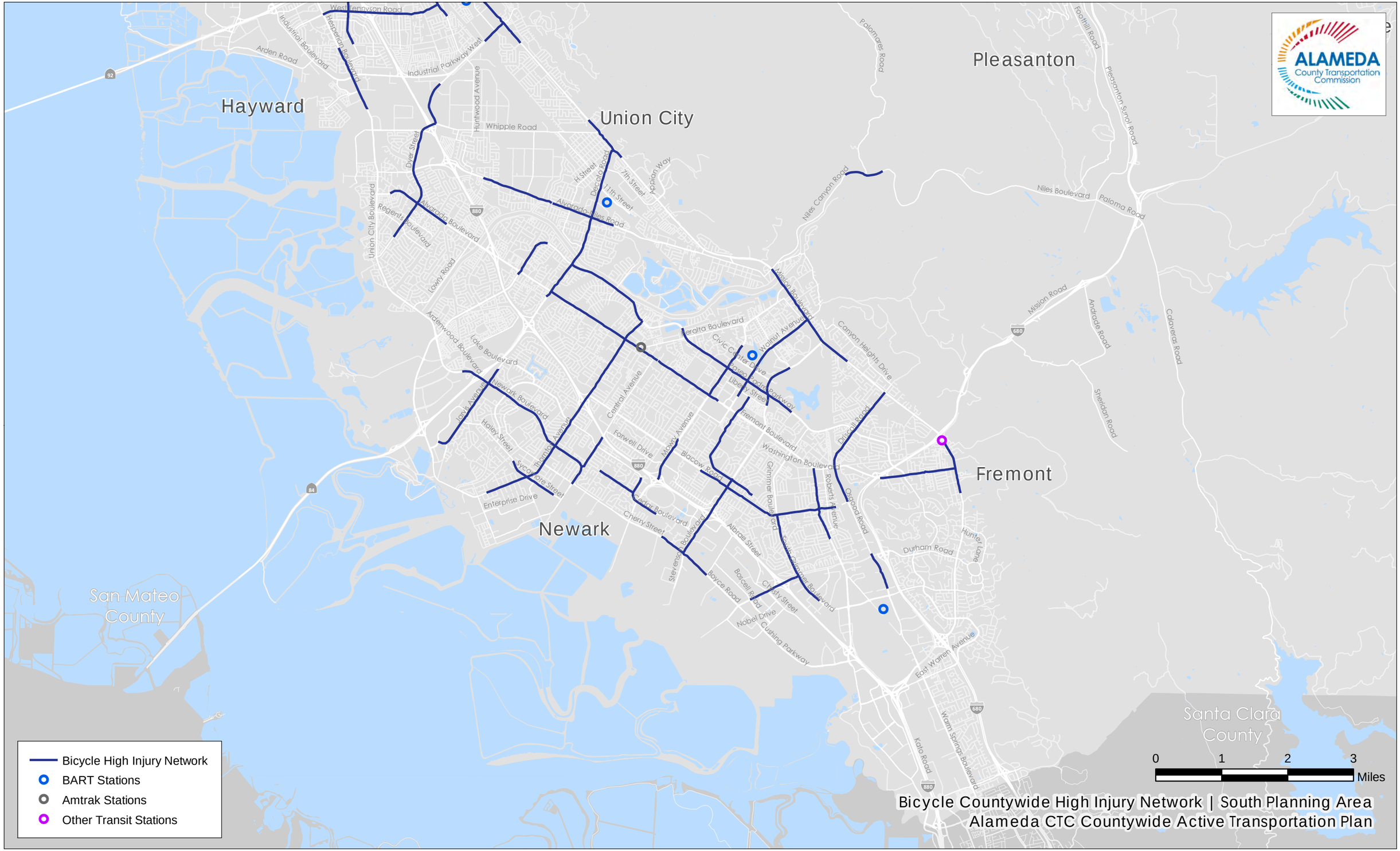
Alameda CTC Countywide Active Transportation Plan


Hayward
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Newark
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Santa Clara County
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Huntwood Avenue
Whipple Road
Dyer Street
Union City Boulevard
Regents Boulevard
Alvarado Boulevard
Lowry Road
Ardenwood Boulevard
Lake Boulevard
Newark Boulevard
Jarvis Avenue
Haley Street
Thornton Avenue
Sycamore Street
Enterprise Drive
Cedar Boulevard
Cherry Street
Stevenson Boulevard
Boyce Road
Nobel Drive
Cushing Parkway
Farwell Drive
Mowry Avenue
Blacow Road
Fremont Boulevard
Washington Boulevard
Grimmer Boulevard
South Grimmer Boulevard
Albrae Street
Bonceli Road
Christy Street
Roberts Avenue
Osgood Road
Durham Road
Hunter Lane
East Warren Avenue
Warm Springs Boulevard
Kato Road
Decoto Road
H Street
11th Street
7th Street
Alvarado-Niles Road
Appian Way
Niles Canyon Road
Palomares Road
Foothill Road
Pleasanton Sunol Road
Niles Boulevard
Paloma Road
Mission Road
Andrade Road
Calaveras Road
Sheridan Road
Mission Boulevard
Canyon Heights Drive
Walnut Avenue
Civic Center Drive
Paseo Padre Parkway
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Peralta Boulevard
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Bicycle High Injury Network
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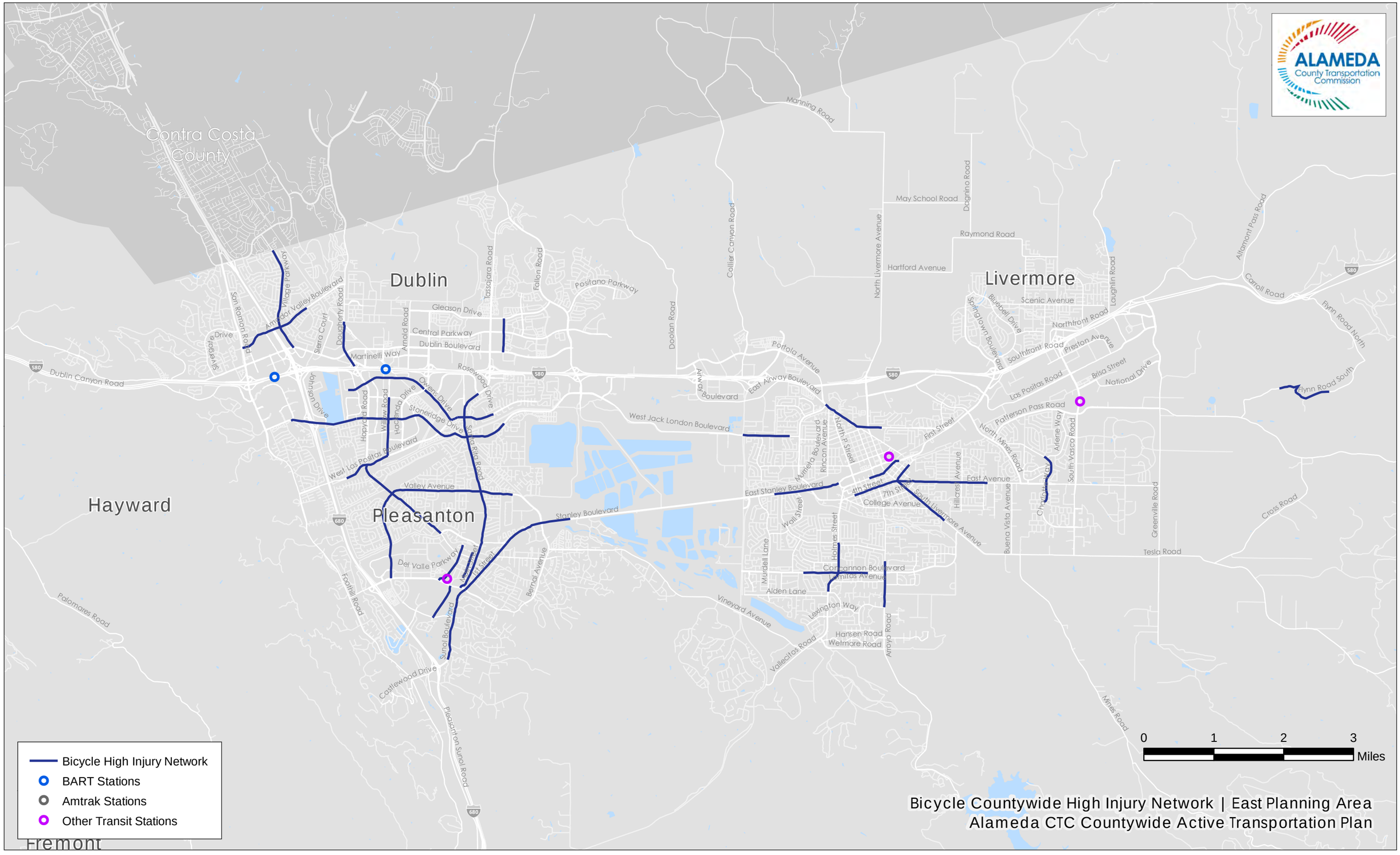
Bicycle Countywide High Injury Network | South Planning Area
Alameda CTC Countywide Active Transportation Plan


Contra Costa County
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Dagnino Road
Raymond Road
Hartford Avenue
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Carroll Road
Flynn Road North
Flynn Road South
Collier Canyon Road
North Livermore Avenue
Laughlin Road
Scenic Avenue
Bluebell Drive
Springtown Boulevard
Northfront Road
Southfront Road
Preston Avenue
Brisa Street
National Drive
Los Positas Road
Patterson Pass Road
First Street
North Mines Road
Arlene Way
South Vasco Road
East Avenue
Hillcrest Avenue
Buena Vista Avenue
Greenville Road
Cross Road
Tesla Road
Mines Road
South Livermore Avenue
College Avenue
4th Street
7th Street
East Stanley Boulevard
Wall Street
Holmes Street
Murrieta Boulevard
Rincon Avenue
North P Street
Concannon Boulevard
Almitas Avenue
Alden Lane
Lexington Way
Hansen Road
Wetmore Road
Arroyo Road
Vallecitos Road
Vineyard Avenue
Dublin Canyon Road
San Ramon Road
Amador Valley Boulevard
Amador Village Parkway
Sierra Court
Dougherty Road
Arnold Road
Gleason Drive
Central Parkway
Dublin Boulevard
Martinelli Way
Tassajara Road
Fallon Road
Positano Parkway
Doolan Road
Rosewood Drive
Owens Drive
Stoneridge Drive
Santa Rita Road
Johnson Drive
Hopyard Road
Willow Road
Hacienda Drive
West Las Positas Boulevard
Valley Avenue
Stanley Boulevard
Del Valle Parkway
Vineyard Avenue
Foothill Road
Bernal Avenue
Sunol Boulevard
Castlewood Drive
Pleasanton Sunol Road
Portola Avenue
Airway Boulevard
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Bicycle High Injury Network
BART Stations
Amtrak Stations
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Bicycle Countywide High Injury Network | East Planning Area
Alameda CTC Countywide Active Transportation Plan

7.3.2 Pedestrian High Injury Network

The 243 miles of the identified pedestrian HIN are divided among planning areas and cities/communities. The three cities with the highest share of the pedestrian HIN, together accounting for 58% of countywide share, are the following:

- Oakland (82 miles and 34% of countywide share)
- Hayward (31 miles and 13% of countywide share)
- Berkeley (29 miles and 12% of countywide share)

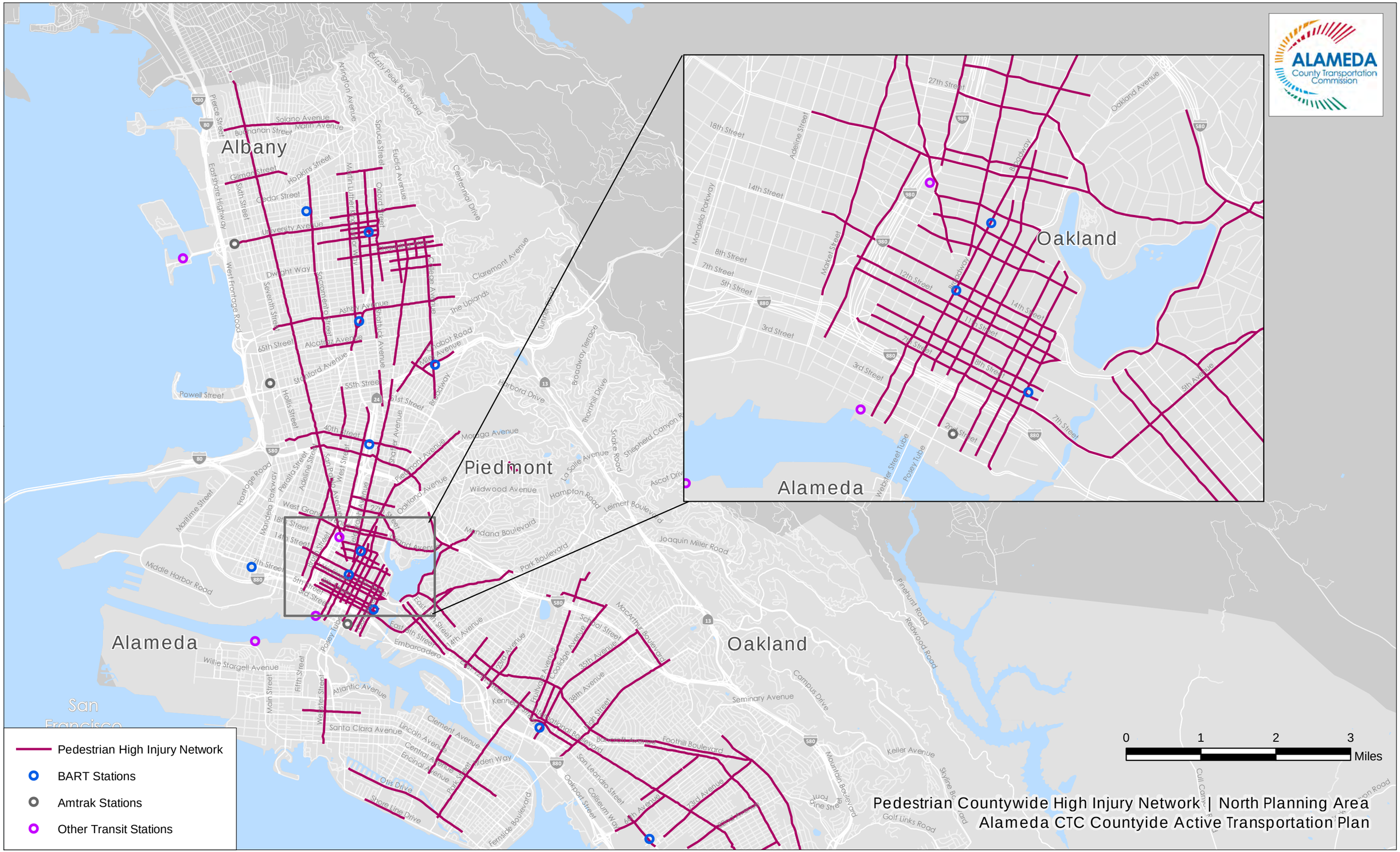
The North County planning area accounts for 51% of HIN miles, and Central County accounts for 26% of mileage. Oakland has the highest single city or community share of identified roads on the HIN, with 34% of the countywide HIN. This high injury network represents roughly 5% of county roadway miles and 68% of county pedestrian collisions. The three half-mile road segments with the highest pedestrian collision severity history per planning area, and the three roadways with the greatest mileage of pedestrian HIN per planning area, are presented in the following table.

The High Injury Network is based on collision data recorded between 2012 and 2016. It does not reflect recently implemented safety projects and programs.

Highest Collision Severity Score and Mileage, Screened Pedestrian Roadway Segments

Segments with Highest Collision Severity Score		*Roads with Most Mileage on HIN*		
Road Name and Location	Jurisdiction	Road Name	Mileage	Jurisdiction(s)
North County				
International Boulevard, Hegenberger Road to 82nd Avenue	Oakland	San Pablo Avenue	7	Albany, Berkeley Emeryville, Oakland
International Boulevard, 31st Street to 39th Street	Oakland	International Boulevard	7	Oakland
Broadway, 7th Street to 17th Street	Oakland	MacArthur Boulevard	5	Oakland
Central County				
East 14th Street, Haas Avenue to Parrott Street	San Leandro	East 14th Street / Mission Boulevard	10	Ashland, Cherryland, Hayward, San Leandro
Hesperian Boulevard, Hacienda Avenue to Gold Course Road	San Lorenzo, Hayward	Hesperian Boulevard	7	Ashland, Hayward, San Leandro, San Lorenzo
A Street, Main Street to Western Boulevard	Hayward	A Street	2	Castro Valley, Cherryland, Hayward
South County				
Fremont Boulevard, Washington Boulevard to Eugene Street	Fremont	Fremont Boulevard	5	Fremont
Fremont Boulevard, Thornton Avenue to Central Avenue	Fremont	Mowry Avenue	4	Fremont, Newark
Civic Center Drive, Mowry Avenue to Kerney Street*	Fremont	Paseo Padre Parkway	3	Fremont
East County				
Santa Rita Road, Black Avenue to Morganfield Road	Pleasanton	Dublin Boulevard	4	Dublin
Dublin Boulevard, Donlon Way to Golden Gate Drive	Dublin	Santa Rita Road, Tassajara Road	4	Dublin, Pleasanton
1st Street, Kottinger Drive Park to Bernal Avenue	Pleasanton	First Street	2	Livermore

*Note: The City of Fremont reports that with the implementation of a road diet and two pedestrian beacons on Civic Center Drive, there have been no severe-injury or fatal crashes since 2016.
Sources: SWITRS/TIMS 2012-2016, Kittelson 2018.


Albany
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Pedestrian High Injury Network
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Pedestrian Countywide High Injury Network | North Planning Area
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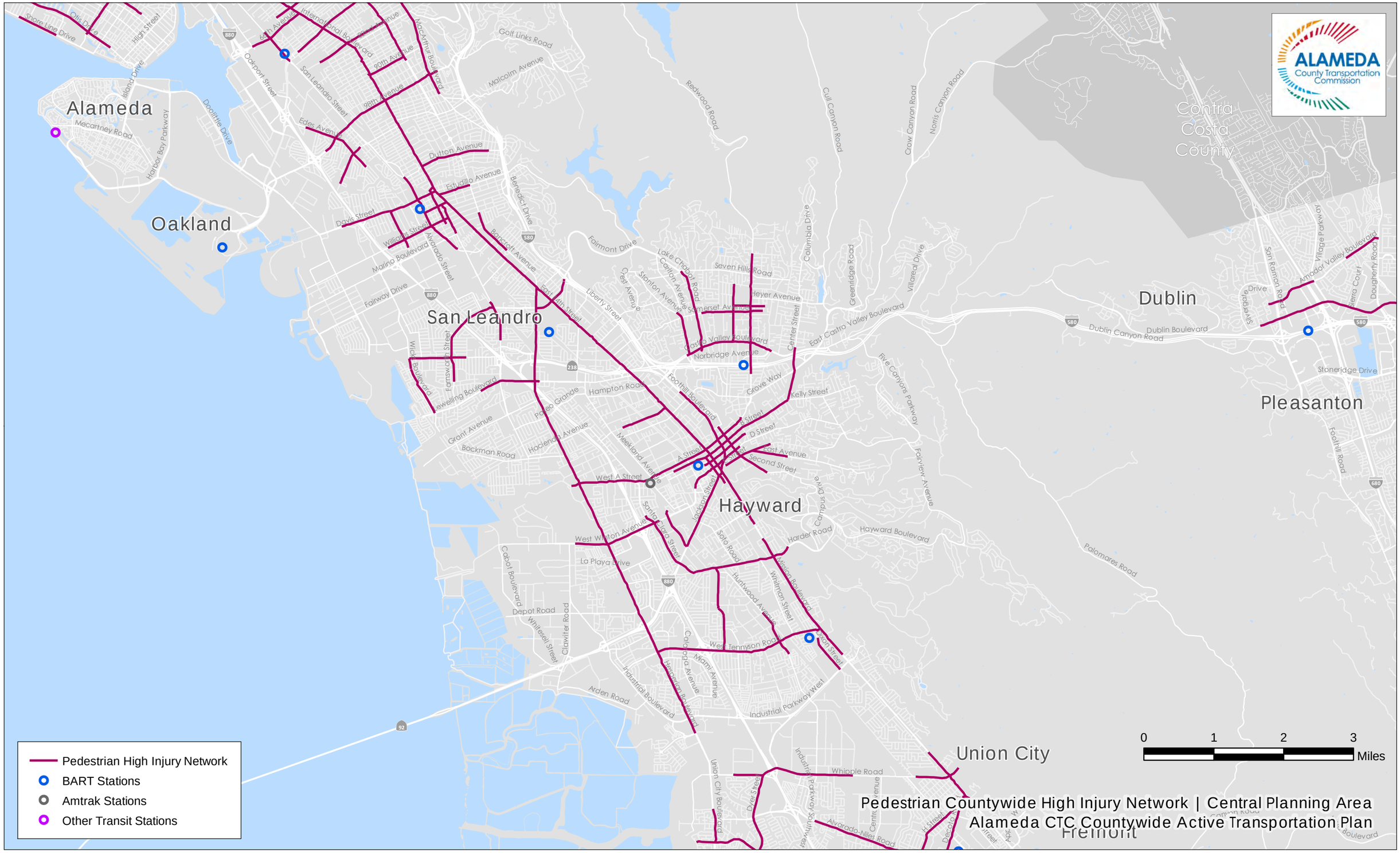
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Other Transit Stations
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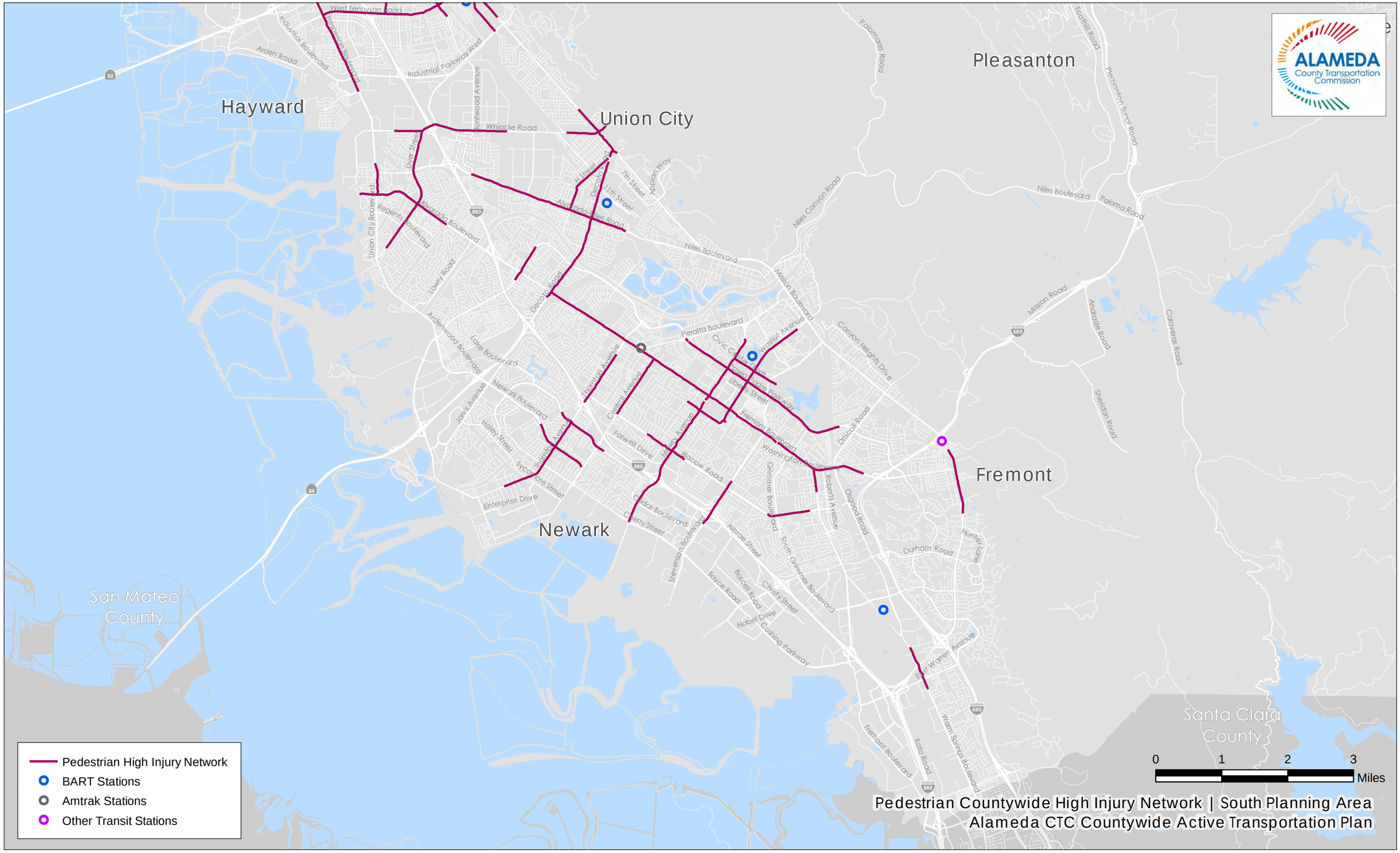
Pedestrian Countywide High Injury Network | Central Planning Area
Alameda CTC Countywide Active Transportation Plan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Industrial Parkway West
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Whipple Road
Dyer Street
Union City Boulevard
Regents Boulevard
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Appian Way
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Mission Boulevard
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Andrade Road
Calaveras Road
Canyon Heights Drive
Peralta Boulevard
Civic Center Drive
Walnut Avenue
Paseo Padre Parkway
Liberty Street
Fremont Boulevard
Washington Boulevard
Driscoll Road
Sheridan Road
Lowry Road
Ardenwood Boulevard
Lake Boulevard
Newark Boulevard
Jarvis Avenue
Haley Street
Thornton Avenue
Central Avenue
Farwell Drive
Willow Avenue
Blacow Road
Grimmer Boulevard
South Grimmer Boulevard
Roberts Avenue
Osgood Road
Durham Road
Hunter Lane
Sycamore Street
Enterprise Drive
Cedar Boulevard
Cherry Street
Stevenson Boulevard
Albrae Street
Boyce Road
Boscell Road
Nobel Drive
Cushing Parkway
Christy Street
Ellery Warren Avenue
Fremont Boulevard
Kato Road
Warm Springs Boulevard
880
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Pedestrian High Injury Network
BART Stations
Amtrak Stations
Other Transit Stations
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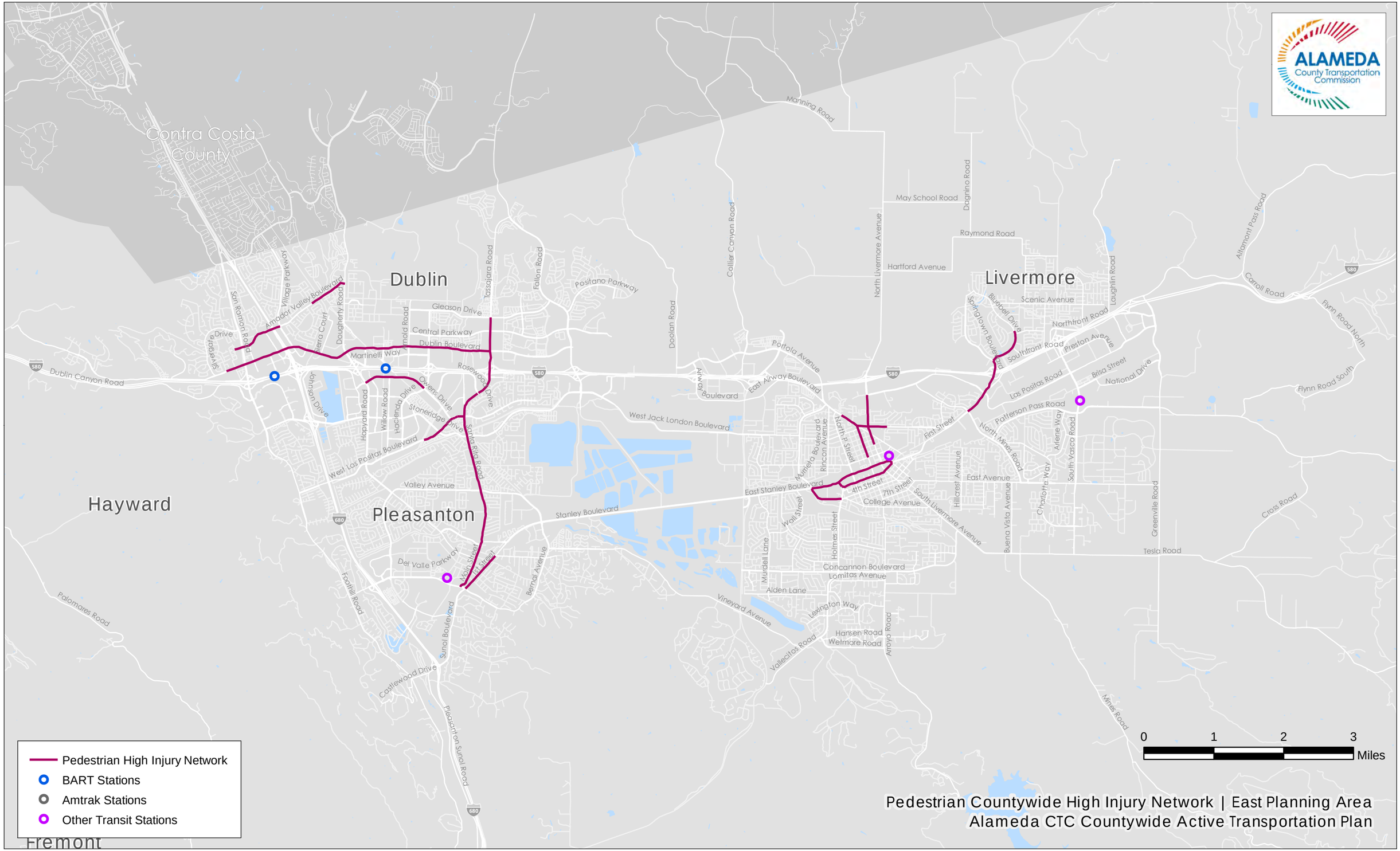
Pedestrian Countywide High Injury Network | South Planning Area
Alameda CTC Countywide Active Transportation Plan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Carroll Road
Flynn Road North
Flynn Road South
Scenic Avenue
Northfront Road
Southfront Road
Preston Avenue
Brisa Street
National Drive
Los Positas Road
Patterson Pass Road
Bluebell Drive
Springtown Boulevard
Laughlin Road
Collier Canyon Road
North Livermore Avenue
Tassajara Road
Fallon Road
Positano Parkway
Doolan Road
Gleason Drive
Central Parkway
Dublin Boulevard
Martinelli Way
Arnold Road
Dougherty Road
Amador Valley Boulevard
Village Parkway
San Ramon Road
Silvergate Drive
Sierra Court
Dublin Canyon Road
Rosewood Drive
Owens Drive
Stoneridge Drive
Santa Rita Road
Hacienda Drive
Willow Road
Hopyard Road
Johnson Drive
West Las Positas Boulevard
Valley Avenue
Stanley Boulevard
Portola Avenue
Airway Boulevard
East Airway Boulevard
West Jack London Boulevard
First Street
North P Street
Murrieta Boulevard
Rincon Avenue
East Stanley Boulevard
4th Street
7th Street
College Avenue
South Livermore Avenue
East Avenue
Hillcrest Avenue
Buena Vista Avenue
Charlotte Way
South Vasco Road
North Mines Road
Greenville Road
Cross Road
Tesla Road
Mines Road
Concannon Boulevard
Lomitas Avenue
Alden Lane
Lexington Way
Vineyard Avenue
Vallecitos Road
Hansen Road
Wetmore Road
Arroyo Road
Holmes Street
Murdell Lane
Wall Street
Del Valle Parkway
Main Street
K Street
Bernal Avenue
Foothill Road
Sunol Boulevard
Castlewood Drive
Pleasanton Sunol Road
Palomares Road
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Pedestrian High Injury Network
BART Stations
Amtrak Stations
Other Transit Stations
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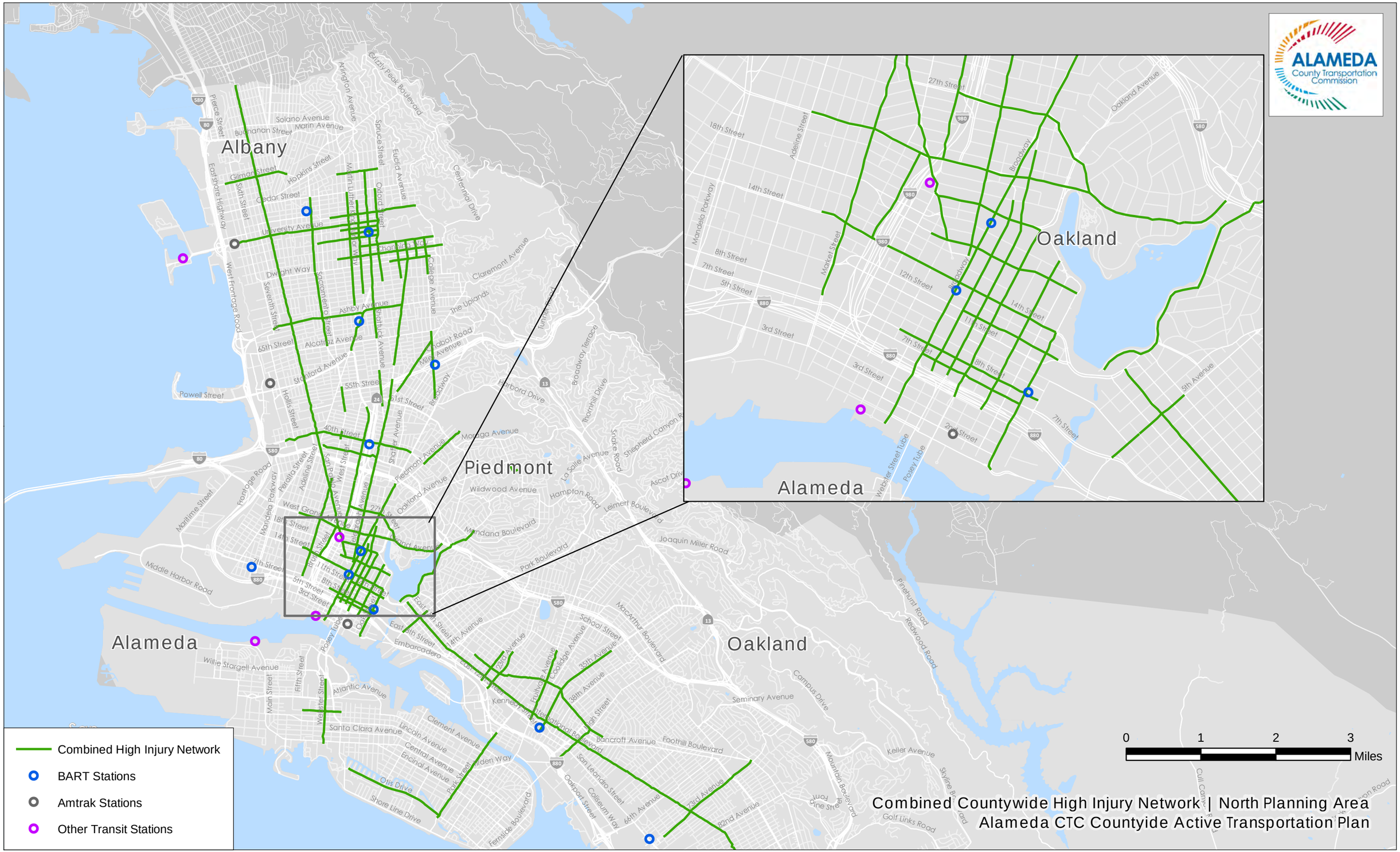
Miles
Pedestrian Countywide High Injury Network | East Planning Area
Alameda CTC Countywide Active Transportation Plan

7.3.3 Combined High Injury Network

A combined high injury network represents those portions of each HIN that is on both the bicycle and pedestrian HIN. There are 129 miles of roadway that constitute the combined HIN (approximately 3% of linear county roadway miles), which does not represent any adjustments by jurisdiction or planning area for pedestrian or bicyclist exposure or mode share. The three cities with the highest share of the combined HIN, together accounting for 65% of the countywide share, are the following:

- Oakland (46 miles and 35% of countywide share)
- Berkeley (24 miles and 19% of countywide share)
- Hayward (15 miles and 11% of countywide share)

The North County planning area accounts for 60% of combined HIN miles, with the top two highest total city shares in North County (Berkeley and Oakland).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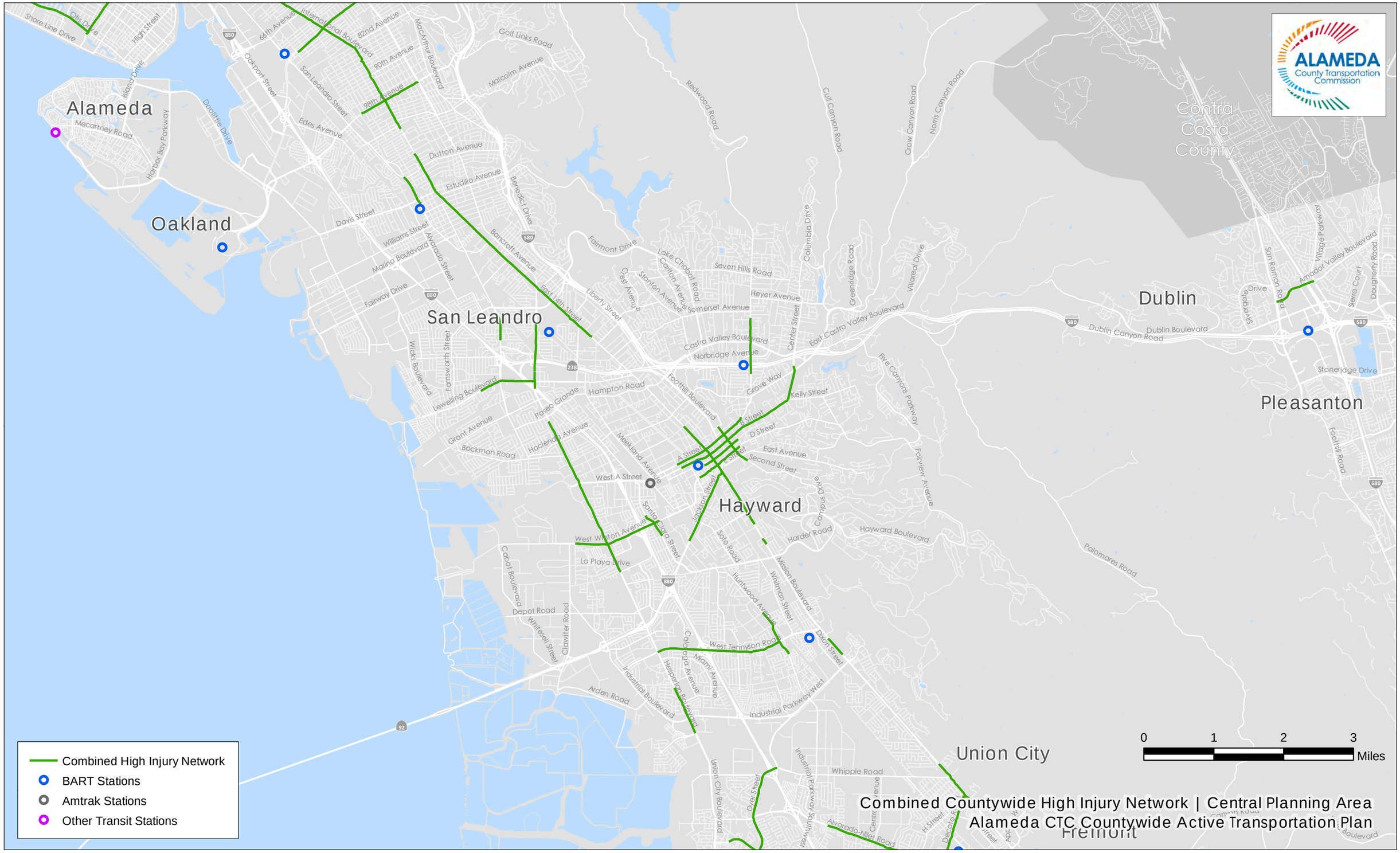
Combined Countywide High Injury Network | North Planning Area
Alameda CTC Countyide Active Transportation Plan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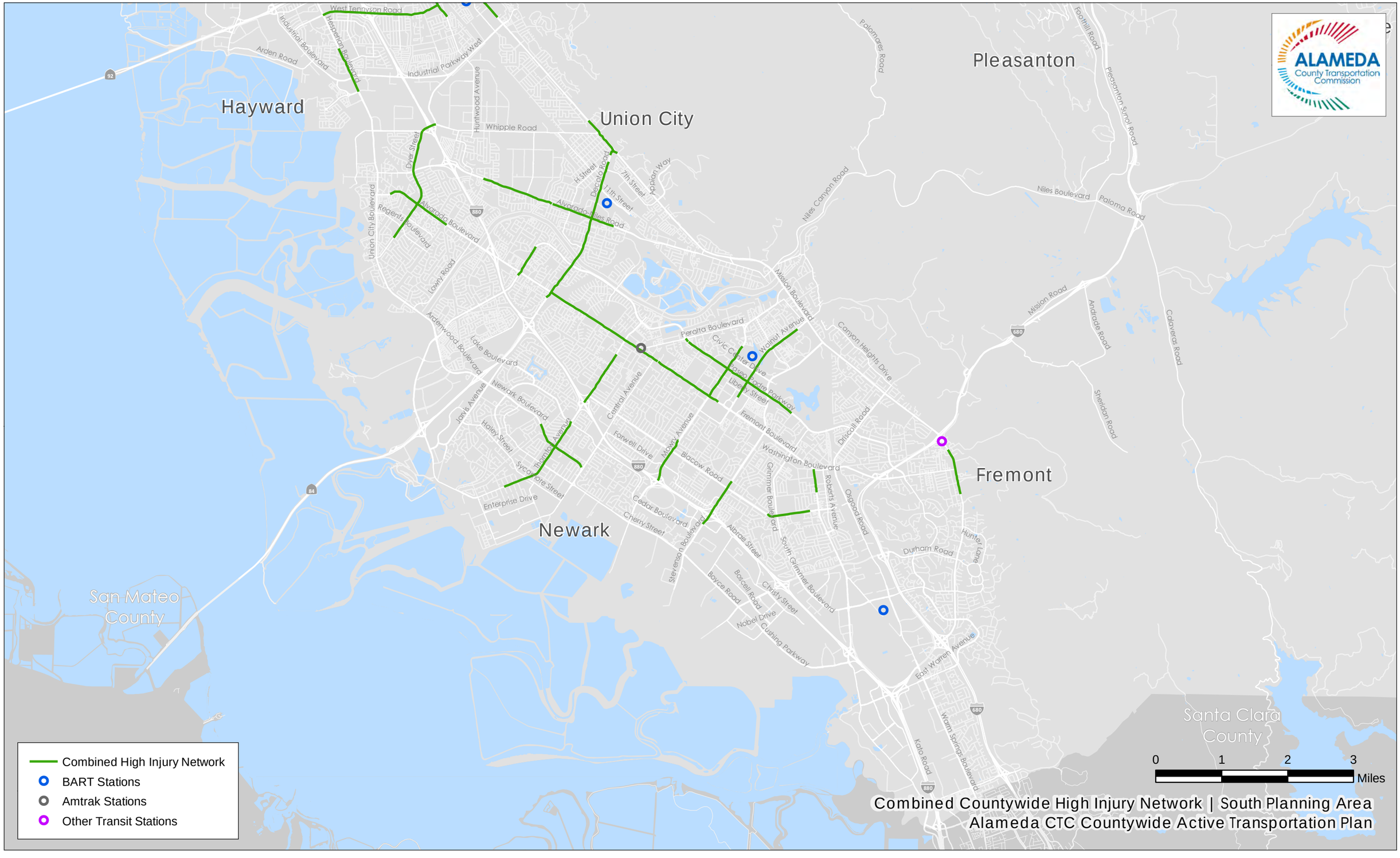
Combined Countywide High Injury Network | Central Planning Area
Alameda CTC Countywide Active Transportation Plan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Albrae Street
Boyce Road
Boscell Road
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Nobel Drive
Cushing Parkway
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Combined High Injury Network
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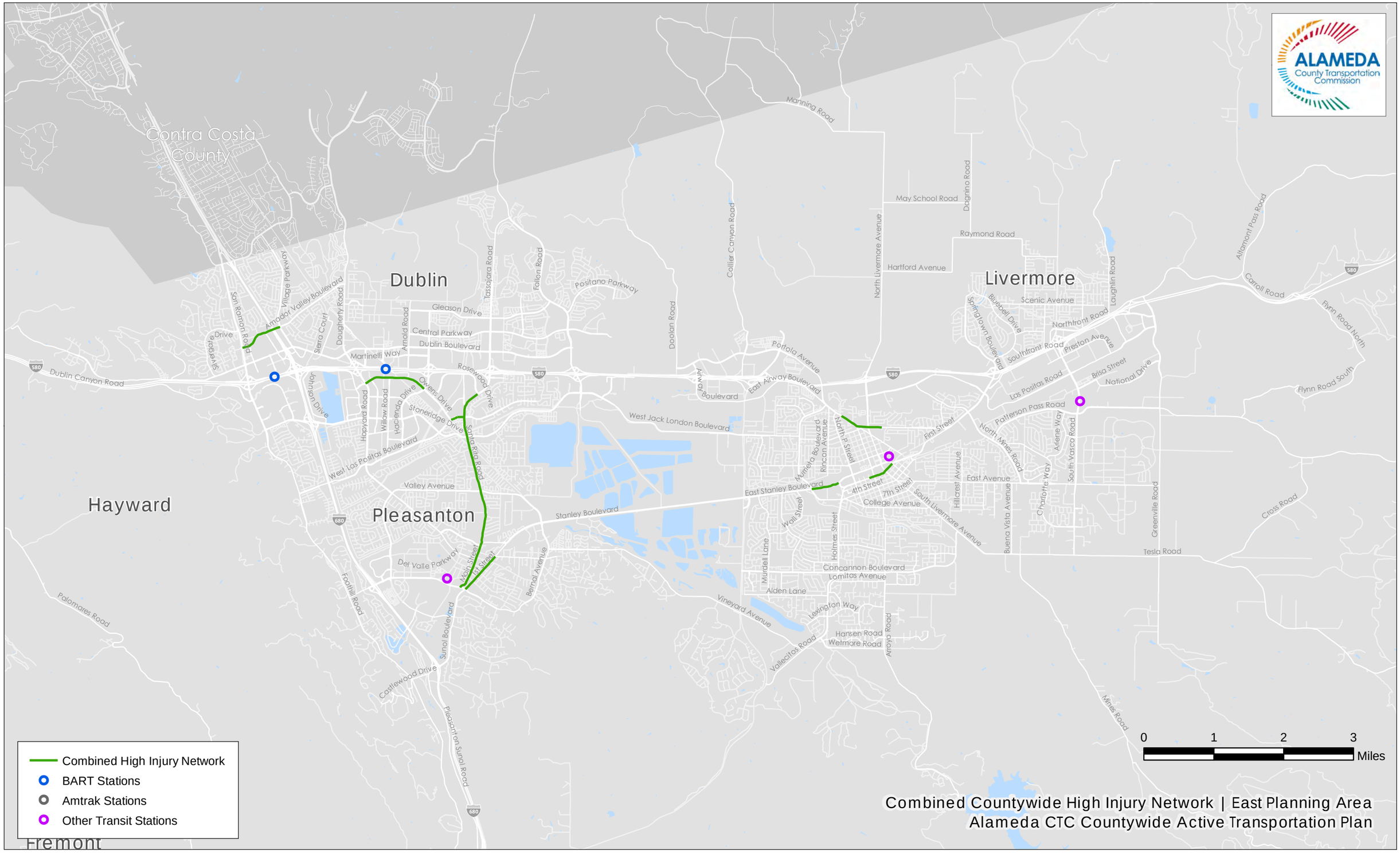
Combined Countywide High Injury Network | South Planning Area
Alameda CTC Countywide Active Transportation Plan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Hillcrest Avenue
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Arlene Way
South Vasco Road
Greenville Road
Cross Road
Tesla Road
Buena Vista Avenue
Charlotte Way
Wall Street
Holmes Street
Murdell Lane
Concannon Boulevard
Lomitas Avenue
Alden Lane
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Arroyo Road
Vineyard Avenue
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Palomares Road
Combined High Injury Network
BART Stations
Amtrak Stations
Other Transit Stations
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Miles
Combined Countywide High Injury Network | East Planning Area
Alameda CTC Countywide Active Transportation Plan

7.4 Transit Presence and Collisions

Transit centers and stops are notable pedestrian and bicycle attractors countywide. Considerations to increase bicyclist and pedestrian safety and decrease the incidence of collisions must be considered when planning for access around transit centers and stops. The tables below present collision history in relation to transit stops. Bicycle and pedestrian collisions are significantly higher at transit stops. This may in part be due to the higher numbers of bicyclists and pedestrians going to transit stops and the fact that access to transit stops is often adjacent to high volume arterials.

How Does This Relate to the Vision?

"...a safe, comfortable, and interconnected network which links to transit and major activity centers ..."

Bicyclist Collision Proximity to Transit, Alameda County, 2012-2016

Proximity to Transit Stops	Share of Bicycle Collisions Near BART Station Entrance	Share of Bicycle Collisions Near AC Transit Stop	Share of Bicycle Collisions Near Any Transit Stop
≤ 250 feet	1%	45%	48%
≤ 500 feet	4%	66%	72%
≤ 1,320 feet (1/4 mile)	13%	84%	92%

Note: The analysis determining number of collisions near any transit stop included BART stations, AC Transit stops, and LAVTA stops. Union City Transit bus stop spatial data was not readily available.

Source: TIMS, SWITRS, BART, AC Transit, Kittelson 2018/

The AC Transit stops with the highest bicyclist collision count within 500 feet include:

- Allston Way & Shattuck Avenue, Berkeley: 15 collisions
- Adeline Street & Oregon Street, Berkeley: 15 collisions
- Martin Luther King Jr. Way & West Grand Avenue, Oakland: 14 collisions
- San Pablo Avenue & West Grand Avenue: 13 collisions
- 40th Street & Horton Street, Emeryville: 13 collisions

Pedestrian Collision Proximity to Transit, Alameda County, 2012-2016

Proximity to Transit Stops	Share of Pedestrian Collisions Near BART Station Entrance	Share of Pedestrian Collisions Near AC Transit Stop	Share of Pedestrian Collisions Near Any Transit Stop
≤ 250 feet	2%	55%	57%
≤ 500 feet	5%	76%	80%
≤ 1,320 feet (1/4 mile)	15%	91%	95%

Note: The analysis determining number of collisions near any transit stop included BART stations, AC Transit stops, and LAVTA stops. Union City Transit bus stop spatial data was not readily available.

Source: TIMS, SWITRS, BART, AC Transit, Kittelson 2018

The AC Transit stops with the highest pedestrian collision count within 500 feet of the stops include the following:

- San Pablo Avenue & West Grand Avenue (Oakland), 15 collisions
- 81st Avenue & International Boulevard (Oakland), 15 collisions
- MacArthur Boulevard & Fruitvale Avenue (Oakland), 13 collisions
- International Boulevard & 38th Avenue (Oakland), 13 collisions
- San Pablo Avenue & 32nd Street (Oakland), 12 collisions

The BART stations with the highest concentration of pedestrian collisions in their vicinity (within 1/4 mile) include the following stations:

- 12th Street (Oakland), 84 collisions
- Downtown Berkeley, 71 collisions
- Fruitvale (Oakland), 53 collisions

Given the prevalence of many AC Transit stops countywide, the percentages of collisions in proximity to transit may give the impression that a majority of pedestrian struck were walking to or from their transit connection. Although that may not necessarily be the case, transit stops clearly indicate a reasonable starting point for identifying both where pedestrians are present and where they may be likely to be involved in a collision.

7.5 Key Findings Related to Safety

The following summarizes key findings related to safety. These findings will inform the training Alameda CTC provides to local jurisdictions related to safety project development. Along with the HIN development, these findings will form the basis for recommendations for improvements in the walking and biking network, and recommendations for programs and policies. Detailed collision information (including time-of-day trends, information about individuals involved, and characteristics unique to bicyclists and to pedestrians) is provided in the Appendix C.

Key Bicycle Safety Findings

Key Pedestrian Safety Findings

8 | Countywide Trail Network

Inter-jurisdictional trails are major transportation and recreation facilities for people walking and biking throughout Alameda County. They provide connections separated from automobile traffic and are comfortable for people of all ages and abilities. To the extent possible, trails in Alameda County have been, and should continue to be, built to minimize conflict with cross-street traffic. Where possible, grade-separated crossings are preferred. Where these types of crossings are not feasible, trail crossings of major streets should be signalized to provide an exclusive phase for trail traffic to cross the street. This maintains the high level of comfort of trails for all users.

There are two existing and one planned major regional trails in Alameda County that are included as funded projects in the 2014 Alameda CTC Transportation Expenditure Plan (TEP). While these three trails described below are the only trails eligible under the TEP trails category, other trails within Alameda County are eligible for funding through discretionary Alameda CTC bicycle/pedestrian funding programs and funding from individual cities.

The Bay Trail and Iron Horse Trail both have substantial existing segments within Alameda County, and both have significant gaps along their planned length. The East Bay Greenway is a planned trail with a short existing segment in East Oakland. These trails were retained from the 2012 Alameda County Bicycle and Pedestrian Plans. Further detail on each major regional trail is provided below.

8.1 Bay Trail

The Bay Trail is a planned, 500-mile walking and bicycling path around the San Francisco Bay, of which 356 miles has already been completed. A total of 158 miles are planned within Alameda County, of which 108 miles have been completed. The trail, when complete, will run through 47 cities, all nine Bay Area counties, and cross seven toll bridges. The trail runs along the edge of the Bay, often in its own alignment as a shared use path along the shoreline. In Alameda County, from north to south, the trail runs through the cities of Albany, Berkeley, Emeryville, Oakland, Alameda, San Leandro, Hayward, Union City, Newark, and Fremont, as well as unincorporated areas of Alameda County. Where an on-shore alignment is not possible, spur trails connect or will connect the main Bay Trail to the water.

The Bay Trail is a program of the Association of Bay Area Governments (ABAG) and is planned, managed, and coordinated by Metropolitan Transportation Commission (MTC) staff. MTC staff work in cooperation with local jurisdictions to plan for implementation, including coordination with local bicycle and pedestrian plans to ensure that connections for those modes are provided. Existing and planned on-street facilities in cities along the Bay provide connectivity to the existing and planned Bay Trail alignment. These on-street facilities would be eligible for trails funding through Alameda CTC because they are designated as part of the Bay Trail.

8.2 Iron Horse Trail

The Iron Horse Trail is a shared use path along the former right-of-way of the Southern Pacific Railroad, stretching from Concord in Contra Costa County in the north to Pleasanton in the south. Eventually, the Iron Horse Trail will continue extending to cover a distance of about 55 miles, connecting 12 cities from Suisun Bay in Contra Costa County to the San Joaquin County line. The trail enters Alameda County from San Ramon, connecting to the northern border of Dublin. Existing and planned on-street facilities in Dublin, Pleasanton, and Livermore provide access along the existing and planned Iron Horse Trail alignment. There are currently 9 miles of completed Iron Horse Trail in Alameda County, and an additional 20 miles are planned.

There is currently a gap in the trail at the Dublin/Pleasanton BART station, which is under study by BART to determine a design that will maintain a shared use path through their station property. The trail continues south from this location, connecting through Pleasanton to Shadow Cliffs Regional Recreation Area along Stanley Boulevard. Eventually, the trail will continue through Livermore along the ACE rail right-of-way, continuing into unincorporated Alameda County to its terminus at the San Joaquin County line. Planning, implementation and maintenance of the trail is managed by the East Bay Regional Parks District.

8.3 East Bay Greenway

The EBGW is a planned regional trail that will generally follow the BART alignment from the Lake Merritt BART station in Oakland to south of the Warm Springs BART Station. There is a short segment already constructed in East Oakland. The trail will be over 30 miles long and will connect the cities of Oakland, San Leandro, Hayward, Union City, and Fremont as well as the unincorporated communities of Ashland and Cherryland. This long-distance off-street route will provide a major opportunity for people walking and biking to travel separated from automobile traffic. The alignment provides an alternative route to several high-volume parallel streets along its length, such as International Boulevard in Oakland and East 14th Street and Mission Boulevard in San Leandro, Hayward, and Ashland/Cherryland. Various existing and planned east-west on-street facilities will provide access to the EBGW as it passes through different jurisdictions.

Alameda CTC is the project sponsor of the EBGW project from Lake Merritt to South Hayward. This segment is 16 miles long and traverses the cities of Oakland, San Leandro, and Hayward, and the unincorporated communities of Ashland and Cherryland. This project connects seven BART stations as well as downtown areas, schools, and other major destinations.

Alameda CTC is working with its partner agencies along this alignment, including BART, the East Bay Regional Park District, and Caltrans to implement this project. Alameda CTC's Board adopted the IS/MND for this project in March 2018. Generally, the trail will be either a shared use path (Class I) or a separated bike lane (Class IV) and sidewalk throughout the corridor.

8.4 Other Alameda County Trails

There are several other existing and planned trails in Alameda County that will provide major connectivity within and between jurisdictions. This is not a comprehensive list. These trails include the Ohlone Greenway, San Leandro Creek Trail, San Lorenzo Creek Trail, Niles Canyon Trail, and the Dumbarton Bridge to Quarry Lakes Trail.

8.4.1 Ohlone Greenway

Approximately five miles. Built.

The Ohlone Greenway runs from near El Cerrito del Norte BART station to the North Berkeley BART station, generally as a shared use path along the BART alignment. The trail traverses El Cerrito, Albany, and Berkeley. At its north end, it connects across San Pablo Avenue to the Richmond Greenway, providing greater access to the north into Richmond. At its south end, the Ohlone Greenway connects into Berkeley's on-street bicycle network at the North Berkeley BART station. Berkeley's bike plan proposes for the greenway to circumvent the BART station and traverse Ohlone Park to connect to the Milvia Street bike boulevard, extending the length by 0.9 miles. The existing connections are built but unimproved.

8.4.2 San Leandro Creek Trail

Approximately five miles. Planned.

The San Leandro Creek Trail is a planned trail along the creek of the same name that runs along the border between Oakland and San Leandro. The trail will run from Hegenberger Road in Oakland in the west, creating

a connection with the Bay Trail, to Lake Chabot Regional Park in San Leandro in the east. The San Leandro Creek Trail will connect with the East Bay Greenway in San Leandro.

8.4.3 San Lorenzo Creek Trail

Approximately eight miles. Planned.

The San Lorenzo Creek Trail is a planned trail along the creek of the same name that runs through the unincorporated communities of San Lorenzo, Cherryland, and Castro Valley, and the city of Hayward. The trail will connect from the Bay Trail in the west to Don Castro Regional Recreation Area on the east just southeast of the center of Castro Valley. Various existing and planned north-south on-street facilities in San Leandro, Hayward and the unincorporated communities of San Lorenzo, Ashland, Cherryland, and Castro Valley will provide access to the trail.

8.4.4 Niles Canyon Trail

Approximately six miles. Planned.

The Niles Canyon Trail is a planned trail through Niles Canyon, along Niles Canyon Road from Mission Boulevard in Fremont through unincorporated Alameda County to Sunol at its eastern end. This is a grade-separated station highway, there is no pedestrian or bicycle facility along this alignment today, and the variable-width paved shoulder along the roadway does not provide suitable accommodation for any but very confident bicyclists. Since Niles Canyon Road is also State Route 84, plans for this trail appear in the Caltrans District 4 Bike Plan (2018). The East Bay Regional Parks District completed a feasibility study for the trail in 2016.

8.4.5 Dumbarton Bridge to Quarry Lakes Trail

Approximately eight miles. Planned.

This trail in Fremont will provide a new east-west connection through the heart of southern Alameda County, connecting priority development areas and BART stations, and several other regional trails: the Bay Trail (on the west end), Alameda Creek Trail, and the planned East Bay Greenway and Niles Canyon Trail (on the east end). At its western end, the trail would connect to the Dumbarton Bridge path, creating a connection to San Mateo County. The City of Fremont recently completed a study of the trail that identifies a proposed alignment and specific infrastructure improvements along its length.[8]

8.4.6 Alameda Creek Trail

Approximately 12 miles. Built.

The Alameda Creek Regional Trail follows the banks of Alameda Creek running from the mouth of Niles Canyon in the east to San Francisco Bay to the west, traveling along the border between Fremont and Union City. The trail is located on both sides of Alameda Creek. It is paved on the south side and unpaved on the north side. The south side trail connects to Coyote Hills Regional Park and its trails, as well as unpaved trails along the Don Edwards San Francisco Bay National Wildlife Refuge.

8.4.7 Regional Trail Barriers

There are a number of barriers to an interconnected regional trail network that should be addressed as the planned trail network is built out. These include:

- Gaps between trails with few or poor quality on-street facilities for connectivity
- Physical barriers such as waterways and rail facilities

[8] The study is available online: https://fremont.gov/DocumentCenter/View/38635/Final-Scoping-Study?bidId

- Jurisdictional boundaries and cross-jurisdictional coordination
- At-grade crossings (e.g., streets and railways)
- Crossing and/or redirecting around freeways and highways
- Control of property rights

ALAMEDA County Transportation Commission

Countywide Trails

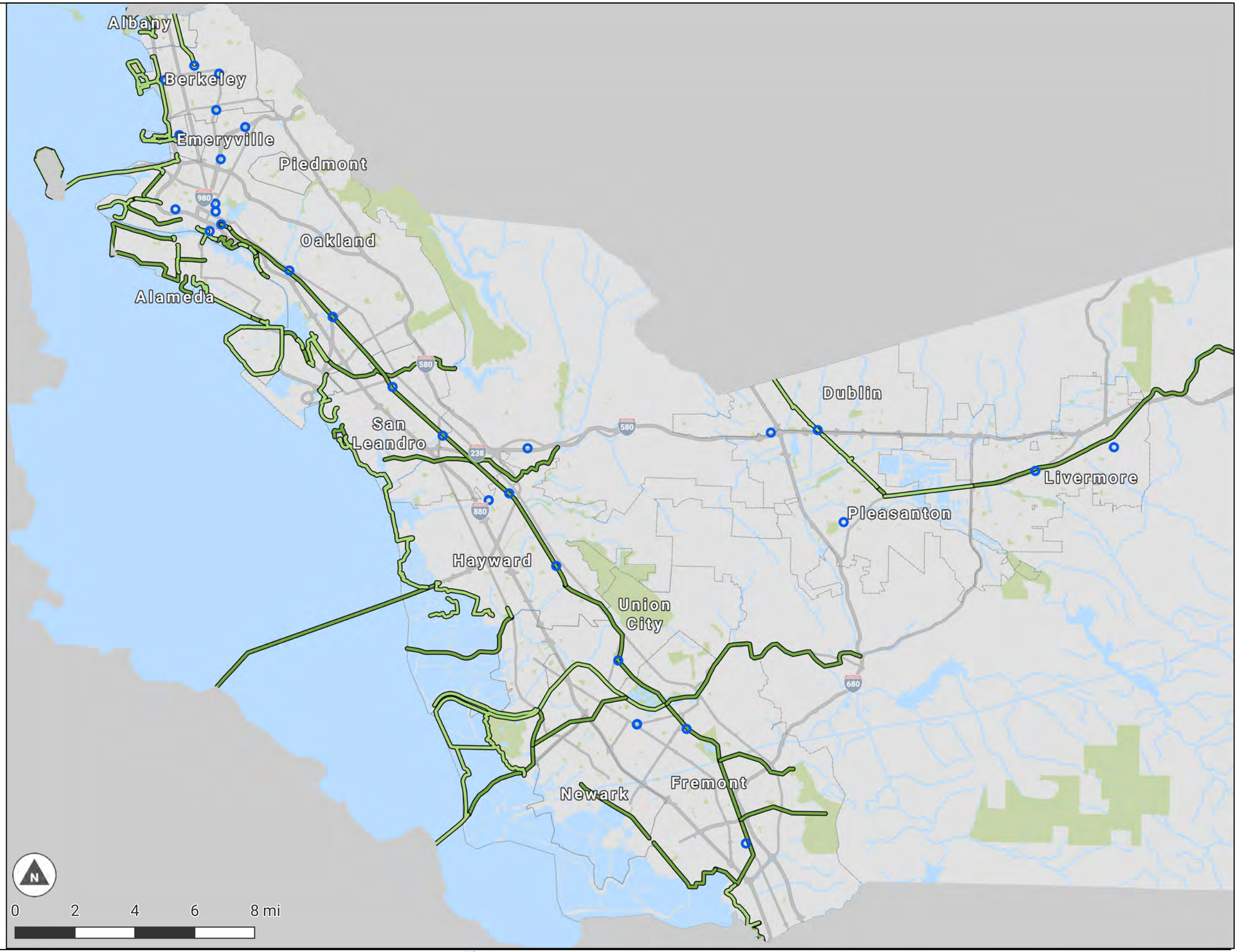
Alameda County

Regional Trails

- Existing
- Planned

Other

- BART, ACE and Capitol Corridor Stations
- Parks



Note: This map is not comprehensive, it is for Illustrative Purposes only. Trail alignments maybe subject to change.

Alameda CTC Countywide Active Transportation Plan

9 | Major Barriers

The 2012 Bicycle and Pedestrian Plans identified freeways, waterways, and rail lines as major barriers throughout Alameda County. These barriers still create gaps and break up connections in the pedestrian and bicycle networks in Alameda County. Major barriers analysis was conducted as part of this Plan to identify linear barriers and transit area barriers. Linear barriers include any elements (water bodies or railway) that create an obstacle to the continuity of a biking or walking route. The greater the necessary diversion due to such an obstacle, the more impactful the linear barrier is considered.

The primary purpose of this analysis is to equip local jurisdictions with tools to identify and develop projects to overcome major barriers. These resources will enable Cities to demonstrate how a project addresses a major barrier to walking or biking within Alameda County.

The Plan adds to the prior plans' barriers lists by identifying specific locations along rail and waterway linear barriers that have the greatest impact on pedestrian and bicycle network connectivity. The set of linear water barriers includes creeks, canals, and the Oakland-Alameda Estuary. The set of rail lines assessed includes freight, passenger rail, and at-grade BART lines. Freeways were not assessed as part of this analysis because the recently completed Caltrans District 4 Bike Plan addresses necessary corridor, interchange, and grade separated crossing improvements along the state freeway and highway systems. The Caltrans District 4 Bike Plan goes as far as identifying specific projects which are illustrated in pages 83, 84, 85, and 86; the CATP assessment of rail and waterway barriers only shows barriers to connectivity, but does not identify specific projects to address those barriers.

The barriers analysis compared an optimal straight-line connection across a given barrier and the actual network distance necessary to traverse the barrier. The maps illustrate a ratio showing the median ratio of the distance between each possible origin and destination pair across the given barrier. In places where this ratio is higher, the linear barrier has a more substantial impact on a pedestrian or bicyclist's ability to walk or bike along a route that crosses the barrier. People traveling by active modes are particularly sensitive to diversion because their trips are often short and always self-powered.

In some locations, barriers appear discontinuous because there are no streets that connect across them at all. These lines were removed from the maps, so they would not be a distraction from barriers of consequence. For instance, the Niles Canyon rail line does not appear on the barrier map. This is because there is no street network crossing it at all that would allow for pedestrian or bicycle connectivity across the rail line barrier.

9.1 Water Barriers

Water barriers represent locations where waterways create notable barriers to pedestrian and bicycle travel and are presented countywide.

9.2 Rail Barriers

Rail barriers represent rail lines located in areas with likely relatively high possibility for walking and biking trips (denser and/or mixed land use) and in areas where key destinations are clearly located on both sides of the rail line. Results of the rail barrier analysis are presented countywide.

9.3 State Highway System Barriers

Limited-access freeways and other major roads on the state highway system are also barriers to pedestrian and bicyclist travel in Alameda County. The Caltrans District 4 Bike Plan identifies three types of projects along and near roads on the state highway system:

- Interchange improvements
- Grade-separated crossings
- Linear bicycle facilities along Caltrans roads

This set of projects was identified in consultation with local jurisdictions and includes projects already included in local bicycle and active transportation plans, plus additional projects that Caltrans determined would improve connectivity.

ALAMEDA
County Transportation Commission

Water Barriers

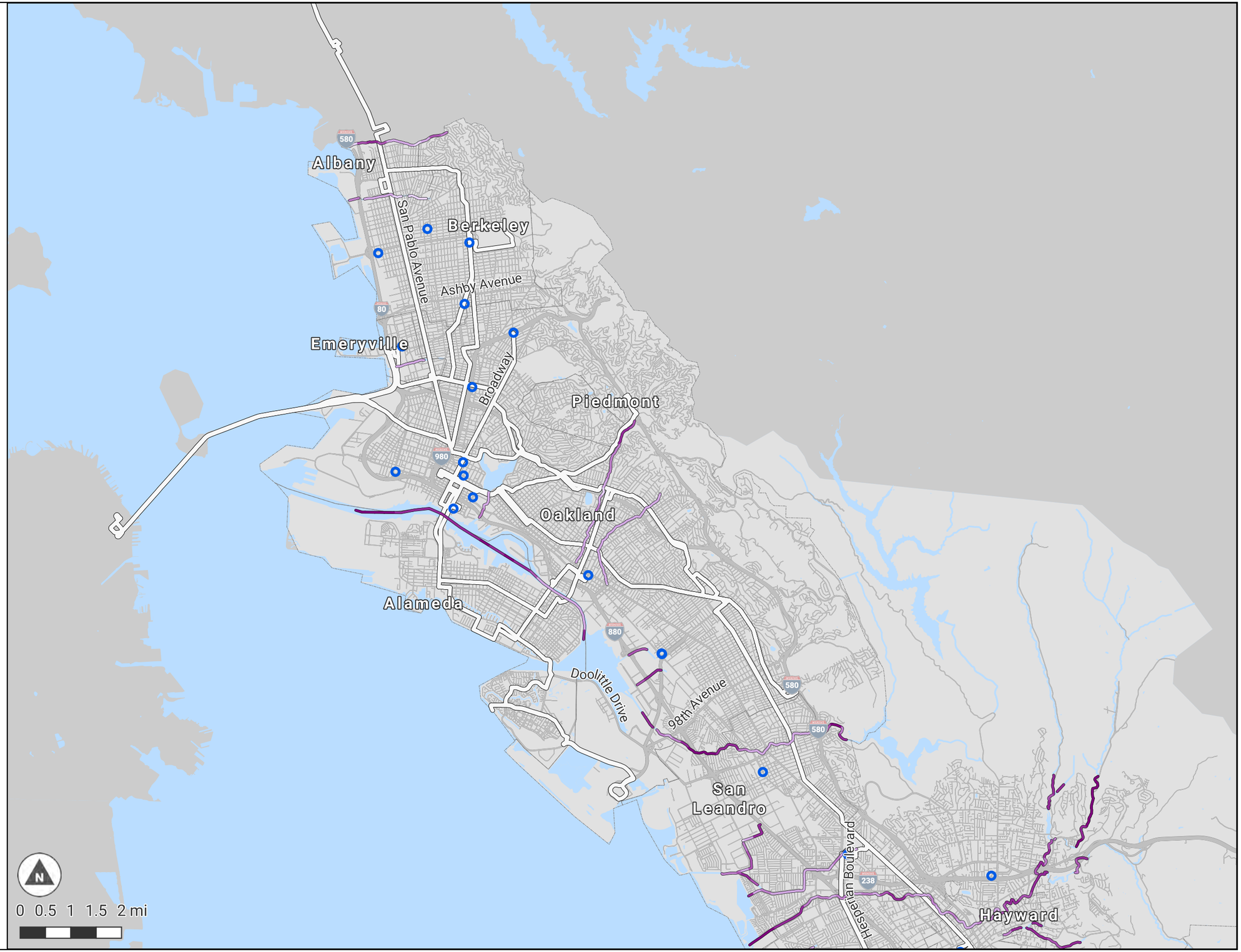
North Planning Area

Median Diversion Distance

- 1x to 1.25x distance
- 1.25x to 1.5x distance
- 1.5x to 1.75x distance
- 1.75x to 2x distance
- 2x to 4x distance
- 4x distance and greater

Other

- ACE and Capitol Corridor Stations
- Major Transit Corridors
- BART Lines



Alameda CTC Countywide Active Transportation Plan

ALAMEDA
County Transportation Commission

Water Barriers

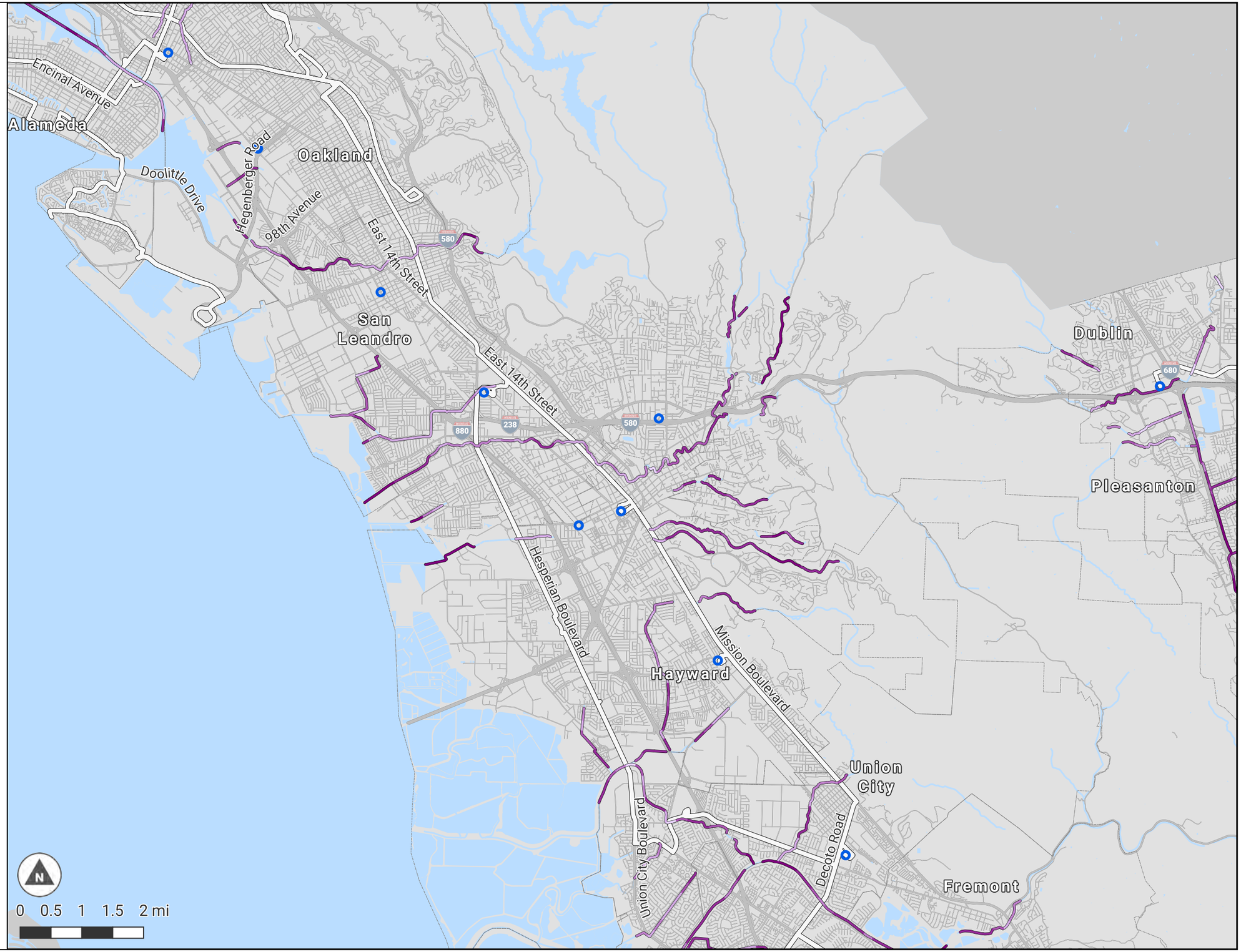
Central Planning Area

Median Diversion Distance

- 1x to 1.25x distance
- 1.25x to 1.5x distance
- 1.5x to 1.75x distance
- 1.75x to 2x distance
- 2x to 4x distance
- 4x distance and greater

Other

- ACE and Capitol Corridor Stations
- Major Transit Corridors
- BART Lines



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Water Barriers

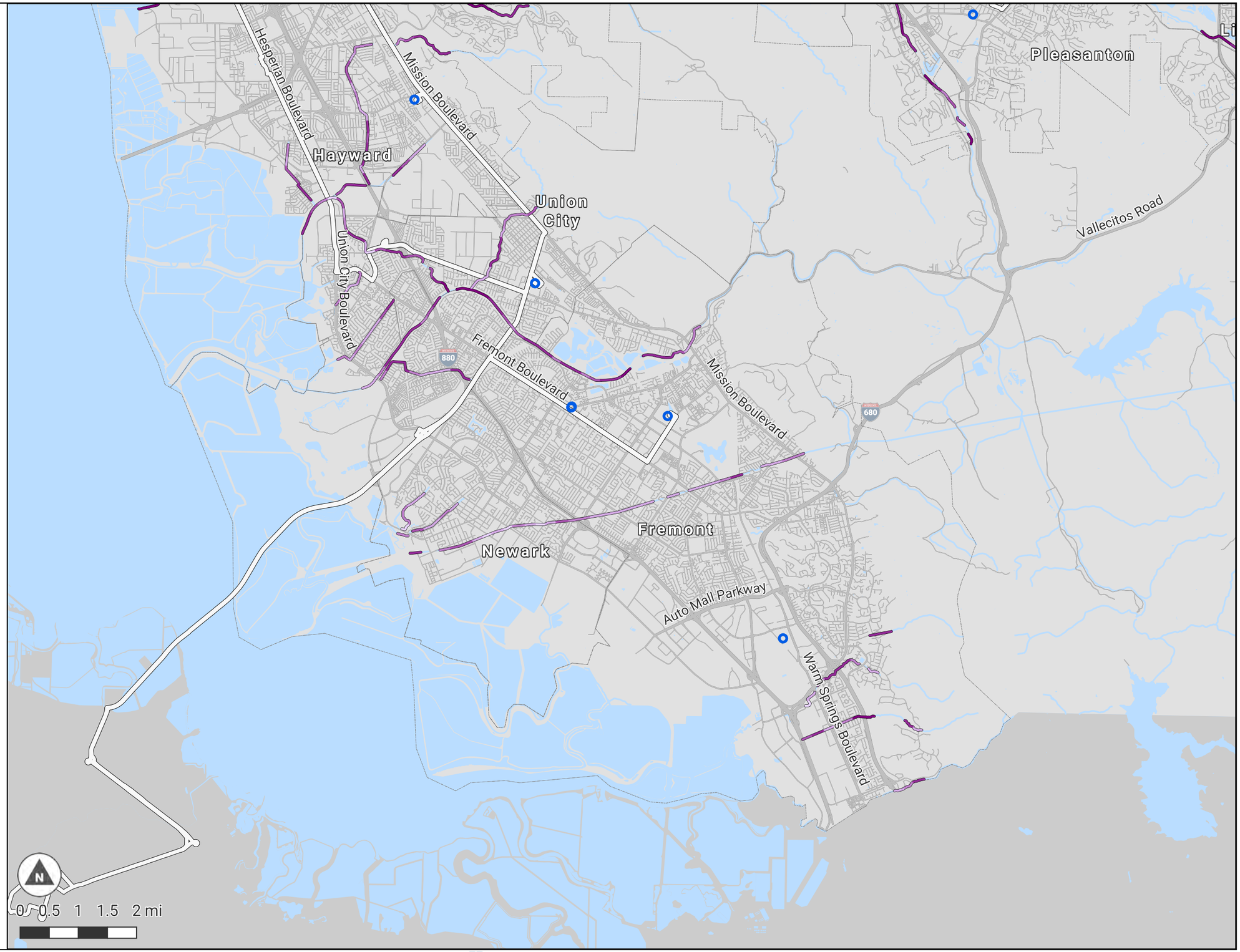
South Planning Area

Median Diversion Distance

- 1x to 1.25x distance
- 1.25x to 1.5x distance
- 1.5x to 1.75x distance
- 1.75x to 2x distance
- 2x to 4x distance
- 4x distance and greater

Other

- ACE and Capitol Corridor Stations
- Major Transit Corridors
- BART Lines



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Water Barriers

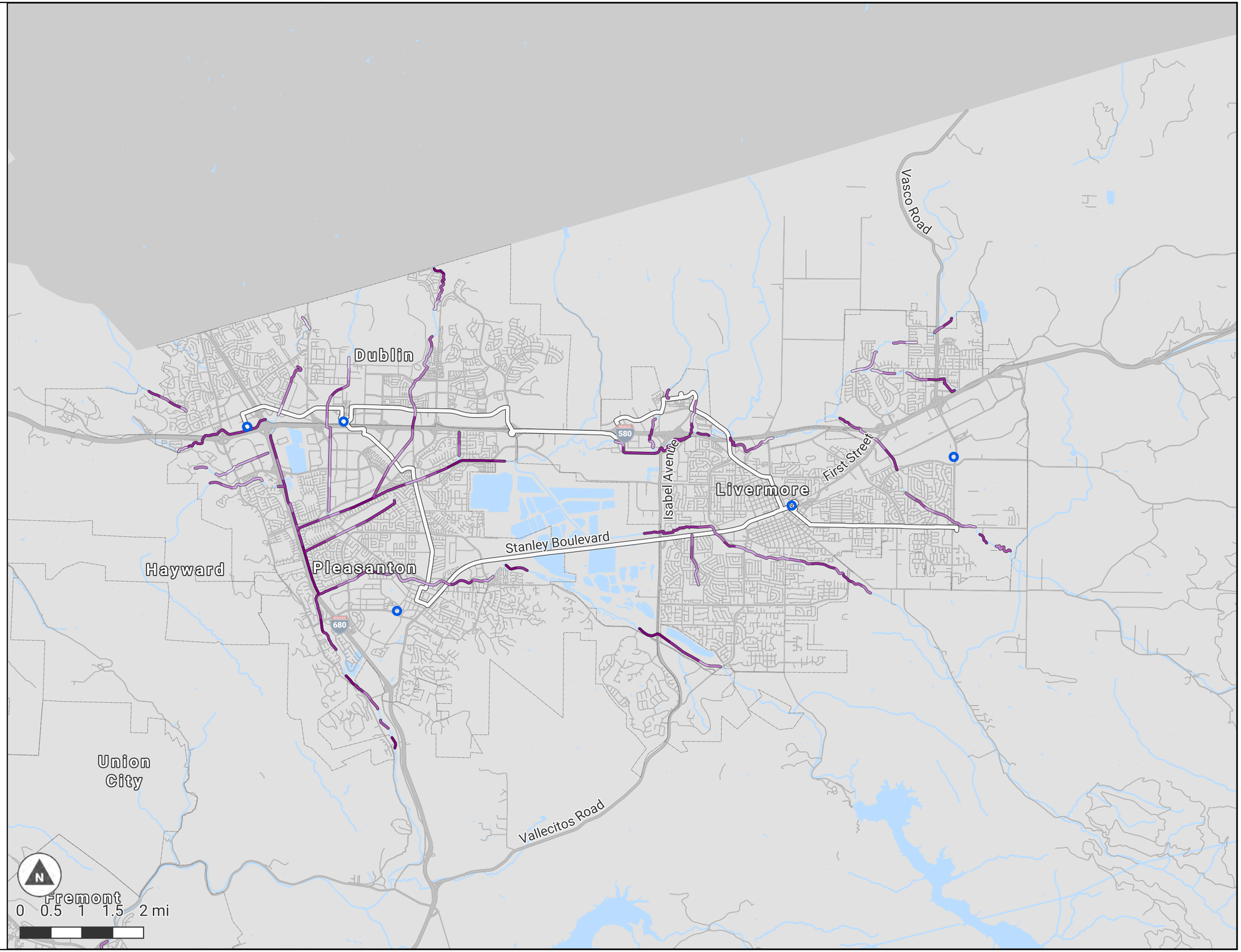
East Planning Area

Median Diversion Distance

- 1x to 1.25x distance
- 1.25x to 1.5x distance
- 1.5x to 1.75x distance
- 1.75x to 2x distance
- 2x to 4x distance
- 4x distance and greater

Other

- ACE and Capitol Corridor Stations
- Major Transit Corridors
- BART Lines



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Rail Barriers

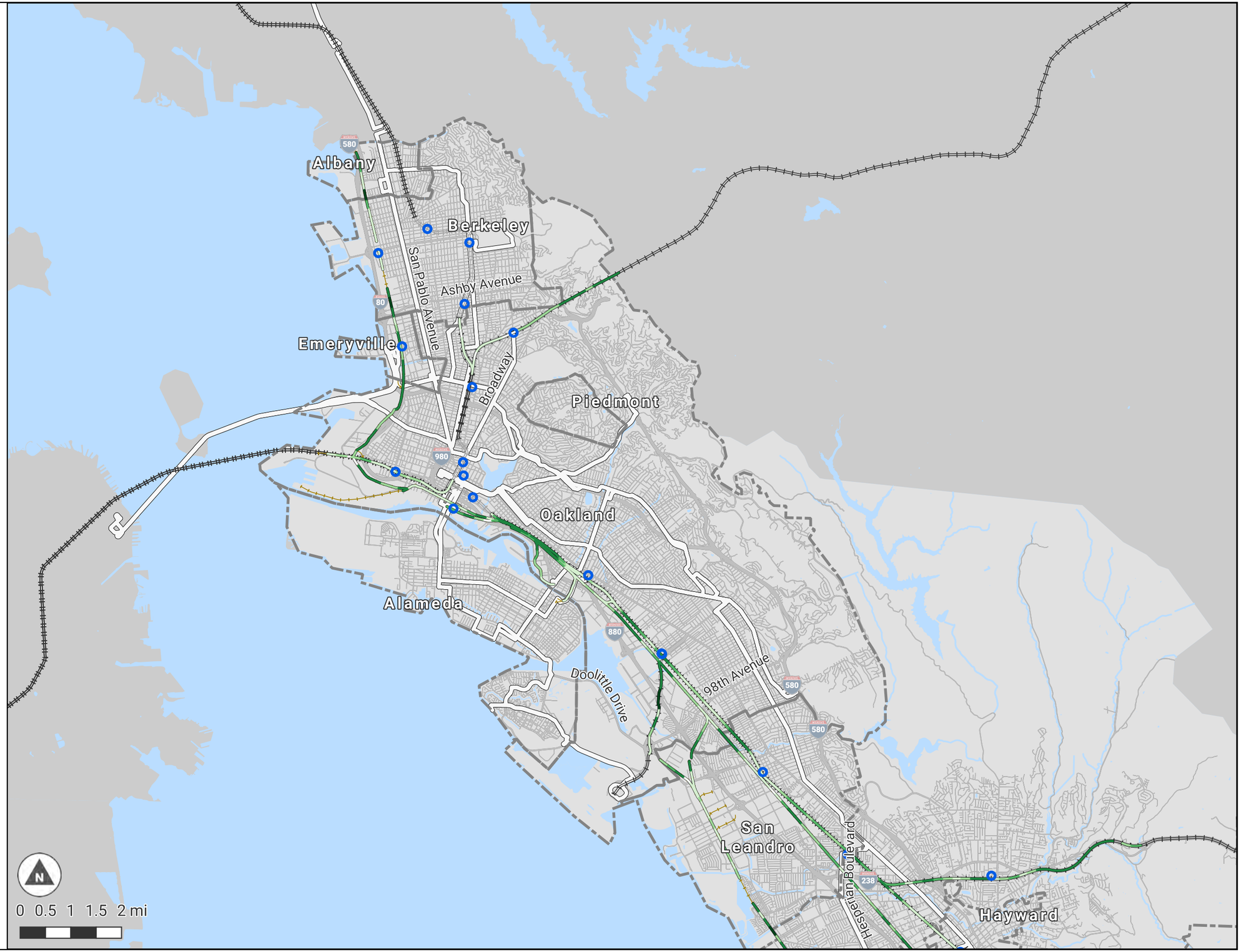
North Planning Area

Median Diversion Distance

- 1x to 1.25x distance
- 1.25x to 1.5x distance
- 1.5x to 1.75x distance
- 1.75x to 2x distance
- 2x to 4x distance
- 4x distance and greater

Other

- ACE and Capitol Corridor Stations
- Major Transit Corridor
- BART Lines



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Rail Barriers

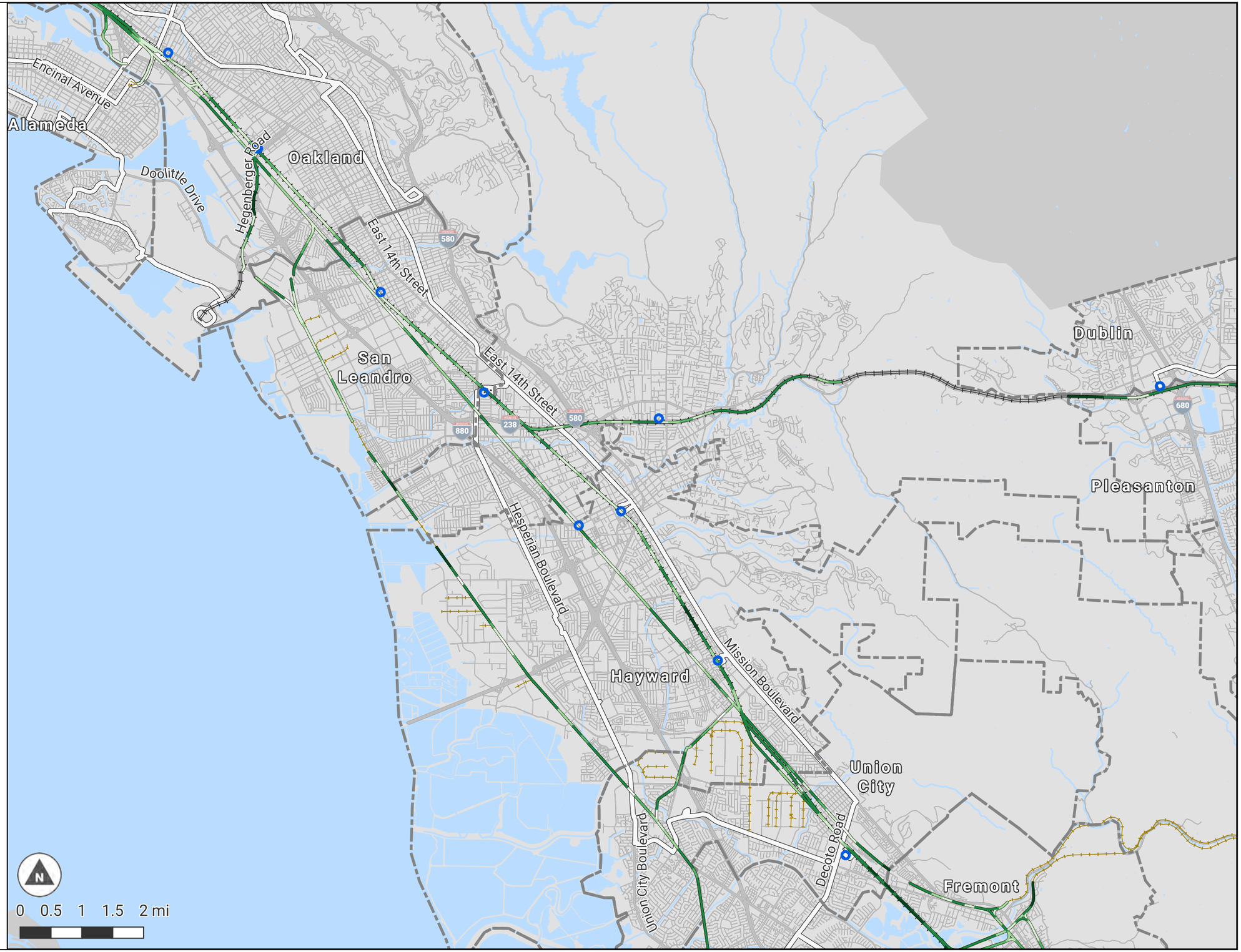
Central Planning Area

Median Diversion Distance

- 1x to 1.25x distance
- 1.25x to 1.5x distance
- 1.5x to 1.75x distance
- 1.75x to 2x distance
- 2x to 4x distance
- 4x distance and greater

Other

- ACE and Capitol Corridor Stations
- Major Transit Corridor
- BART Lines



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Rail Barriers

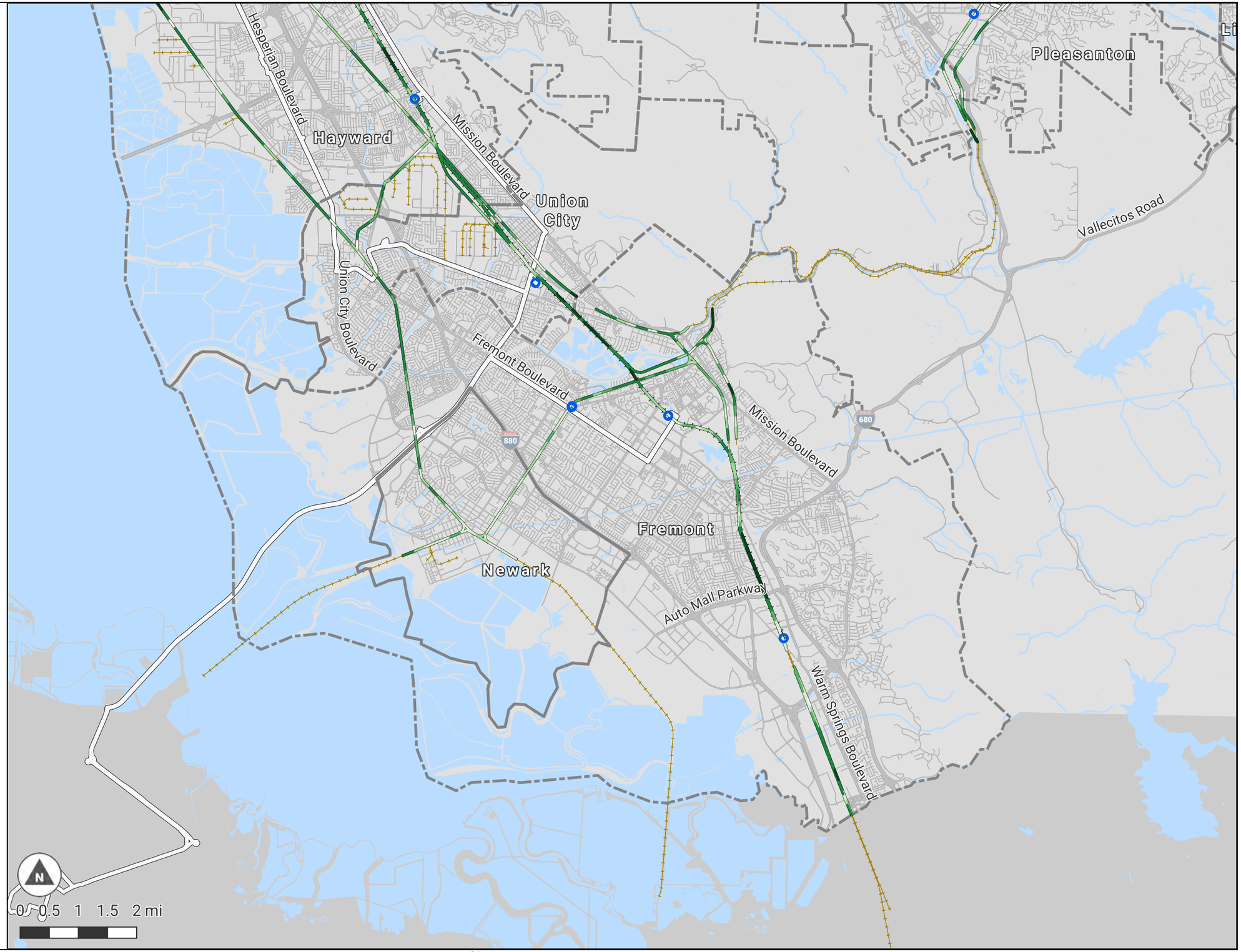
South Planning Area

Median Diversion Distance

- 1x to 1.25x distance
- 1.25x to 1.5x distance
- 1.5x to 1.75x distance
- 1.75x to 2x distance
- 2x to 4x distance
- 4x distance and greater

Other

- ACE and Capitol Corridor Stations
- Major Transit Corridor
- BART Lines



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Rail Barriers

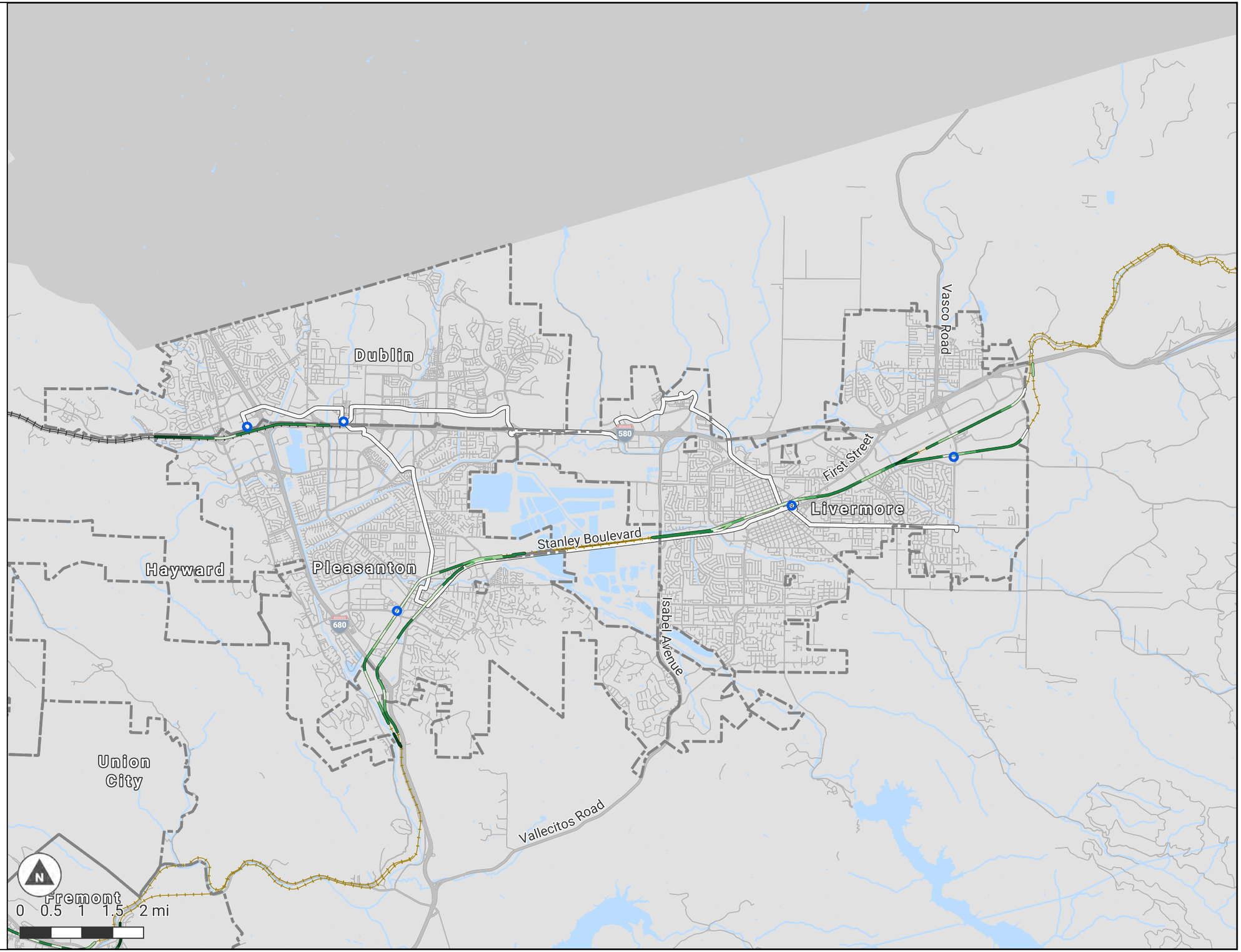
East Planning Area

Median Diversion Distance

- 1x to 1.25x distance
- 1.25x to 1.5x distance
- 1.5x to 1.75x distance
- 1.75x to 2x distance
- 2x to 4x distance
- 4x distance and greater

Other

- ACE and Capitol Corridor Stations
- Major Transit Corridor
- BART Lines



Alameda CTC Countywide Active Transportation Plan

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Caltrans Bike Projects for State Highways

North Planning Area

Caltrans Spot Projects

- Top
- Middle
- Low

Caltrans Corridor Projects

- Top
- Middle
- Low

Other

- BART Station
- Amtrak Station
- BART Lines

Source: District 4 Bike Plan (2018)

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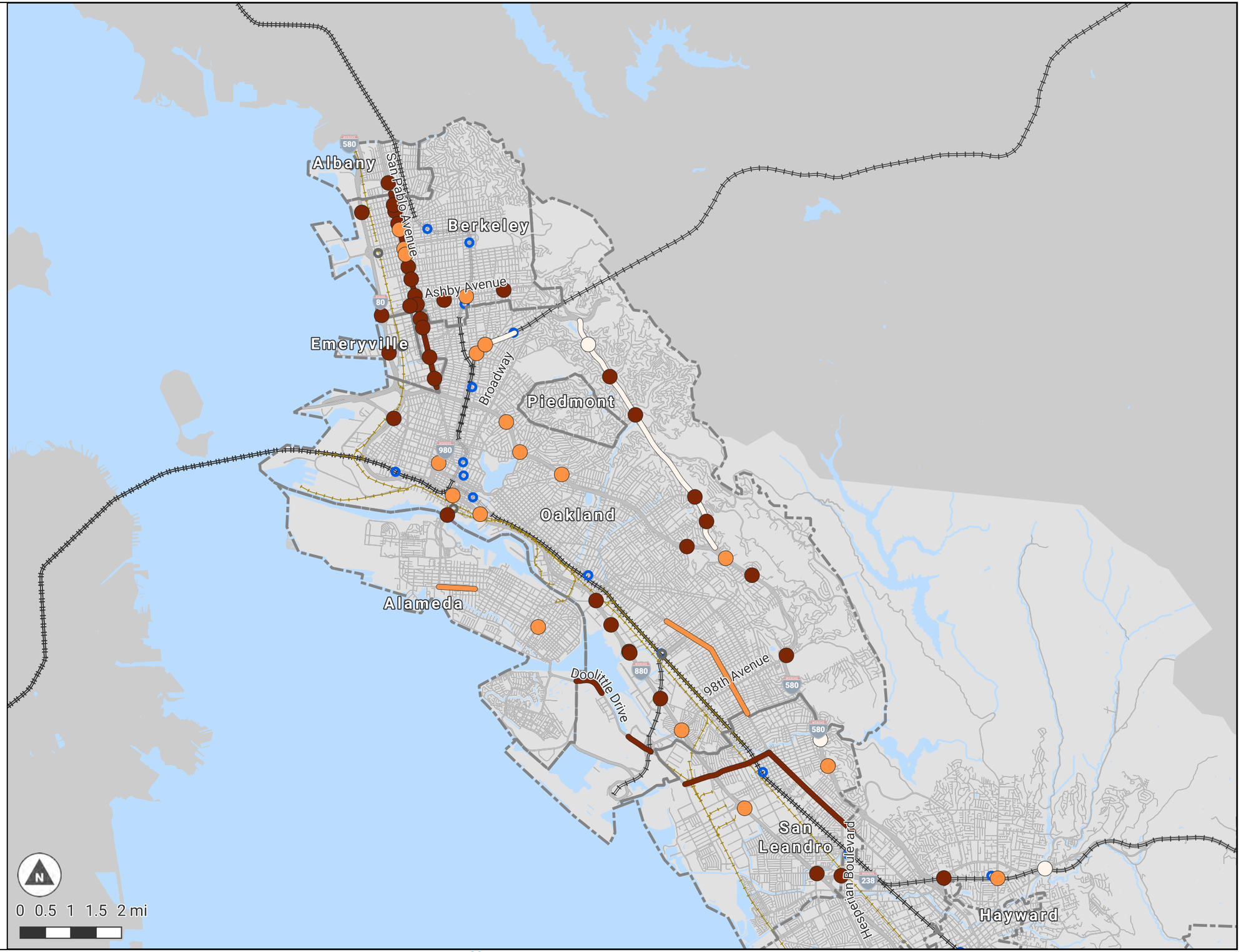

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Caltrans Bike Projects for State Highways

Central Planning Area

Caltrans Spot Projects

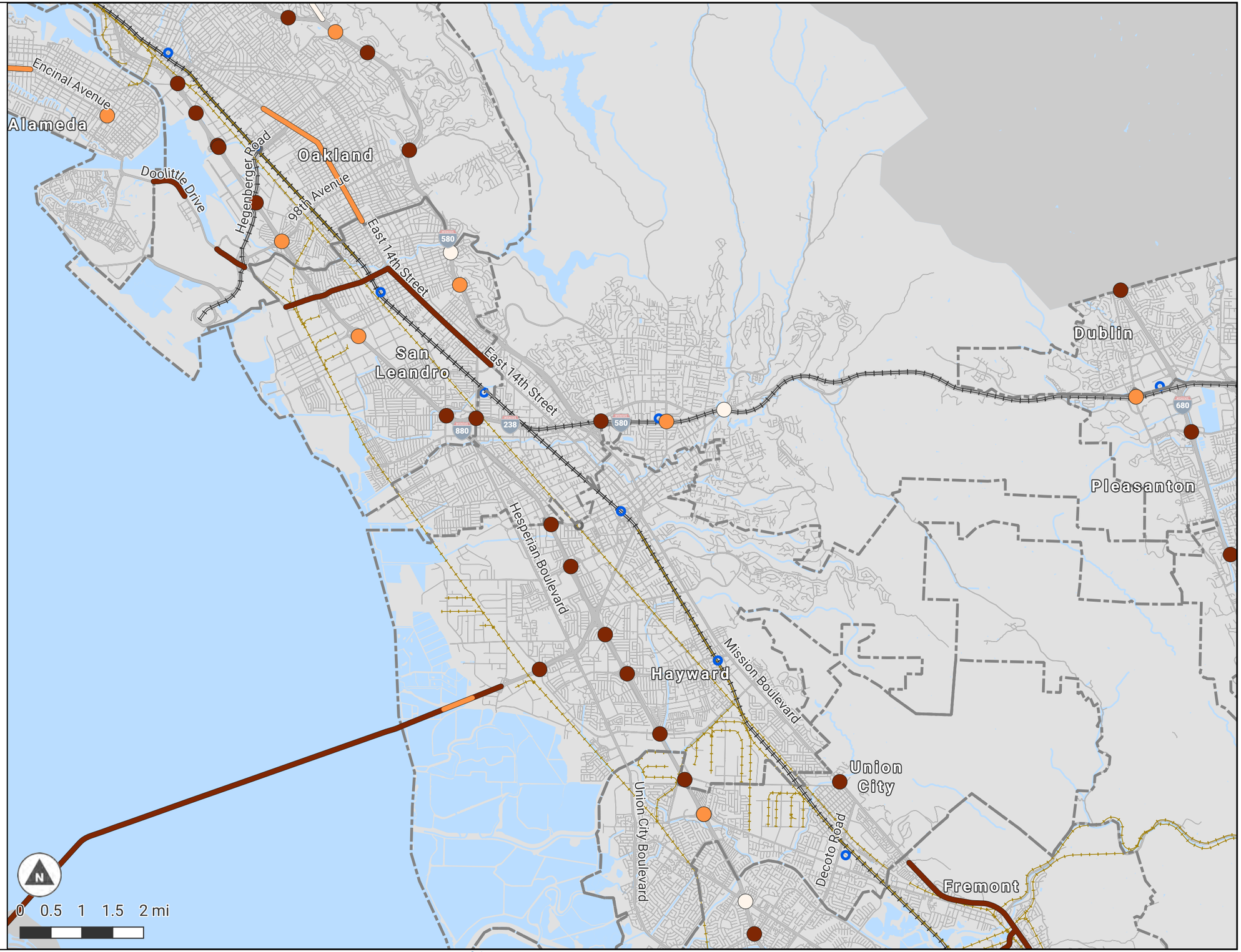
- Top
- Middle
- Low

Caltrans Corridor Projects

- Top
- Middle
- Low

Other

- BART Station
- Amtrak Station
- BART Lines



Source: District 4 Bike Plan (2018)

Alameda CTC Countywide Active Transportation Plan

ALAMEDA County Transportation Commission

Caltrans Bike Projects for State Highways

South Planning Area

Caltrans Spot Projects

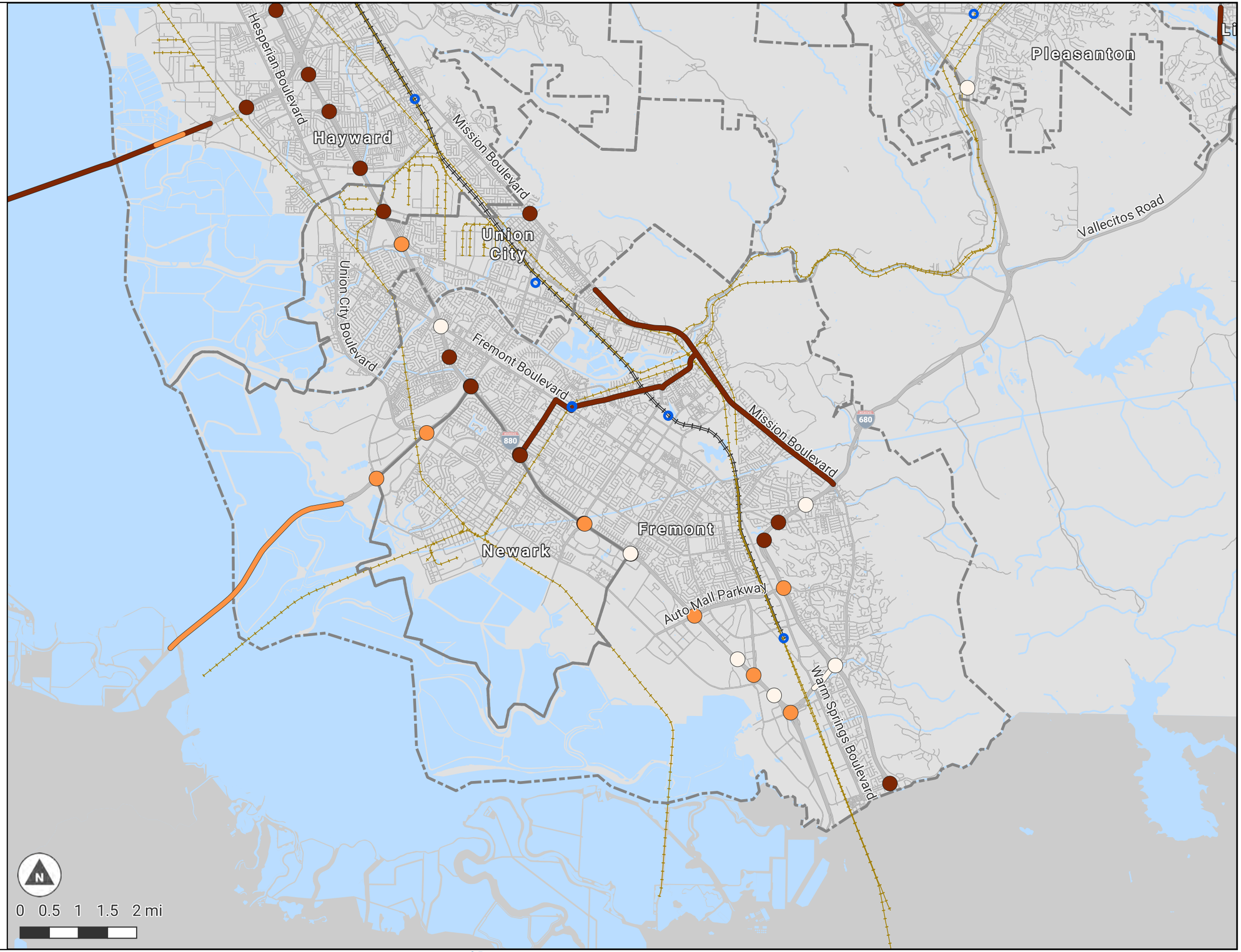
- Top
- Middle
- Low

Caltrans Corridor Projects

- Top
- Middle
- Low

Other

- BART, ACE and Capitol Corridor Stations
- BART Lines



Source: District 4 Bike Plan (2018)

Alameda CTC Countywide Active Transportation Plan

ALAMEDA County Transportation Commission

Caltrans Bike Projects for State Highways

East Planning Area

Caltrans Spot Projects

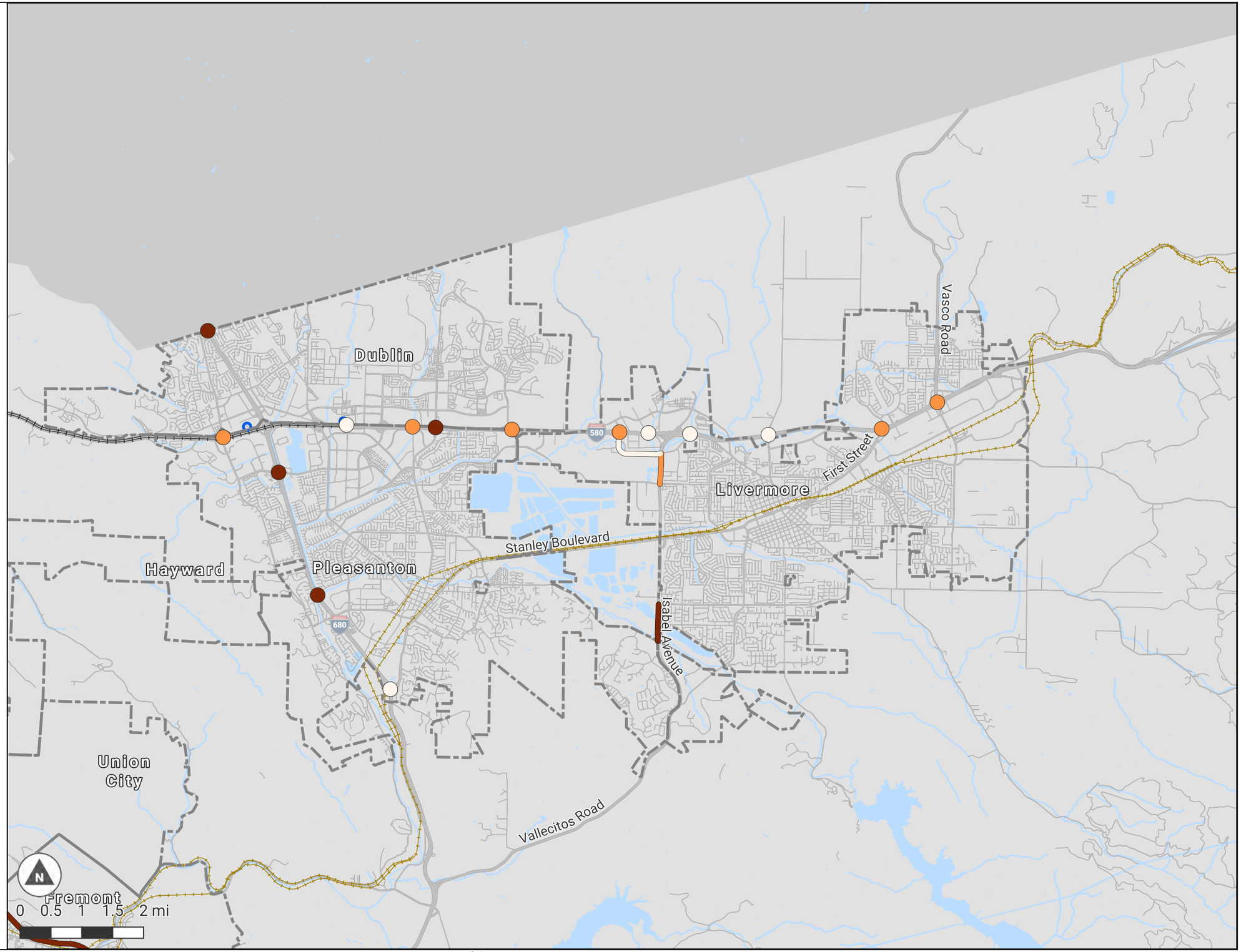
- Top
- Middle
- Low

Caltrans Corridor Projects

- Top
- Middle
- Low

Other

- BART Station
- Amtrak Station
- BART Lines



Source: District 4 Bike Plan (2018)

Alameda CTC Countywide Active Transportation Plan

9.4 Transit Access Barrier Assessment

For the purposes of this assessment, transit area barriers are those that impact pedestrian or bicyclist access to transit service of countywide significance (e.g., regional transit hubs and truck lines). These services include all heavy rail (BART, Amtrak, and ACE), ferry service, and bus major corridors served by AC Transit, LAVTA, and Dumbarton Express.[9] Projects that improve pedestrian or bicyclist connectivity near these locations will receive priority consideration when applying to Alameda CTC for funding. "Near," in this case, is defined as within a half-mile network distance from rail stations and ferry terminals, and within a quarter-mile network distance of stops along the major bus lines with the intent of improving access to a stop, station, or hub. Barriers to access may include, but are not limited to, lack of sidewalk or appropriate linear bicycle facilities, difficult pedestrian or bicyclist street crossings at intersections or mid-block, and gaps in the street network itself (e.g., disconnected cul-de-sacs).

9.5 Cross-Jurisdictional Barriers

Challenges to pedestrian and bicycle connectivity also occur at jurisdictional boundaries within Alameda County and between Alameda County and the neighboring Santa Clara, San Joaquin, and Contra Costa counties. The project team visually evaluated these boundaries and the areas around them for locations particularly challenging to pedestrian and bicyclist travel. These locations were identified first through evaluation of the BNA maps developed for the Plan (Section 4.5). Areas with poor street connectivity and few or no low-stress connections were further evaluated using aerial imagery to locate specific intersections that are challenging to pedestrian and bicycle travel. Last, these areas were checked against the High Injury Network (HIN) identified as part of the Plan process and against areas of higher employment and population density and Priority Development Areas. Sometimes, an additional challenge with overcoming such a barrier is the interagency coordination involved in developing a project when the right-of-way is owned by multiple parties.

9.6 Alameda CTC Barrier Projects and Studies

Many of the barriers identified through this analysis are well known to local communities, and Alameda CTC is involved in the following studies to identify and prioritize improvements:

- Final Grade Crossing Prioritization Report coming out of the Countywide Rail Strategy
- San Pablo Avenue Multimodal Corridor Project
- E14th St/Mission Blvd. and Fremont Blvd. Multimodal Corridor Project

Additionally, Alameda CTC is currently facilitating the following projects, which will address some of the conditions described in this book:

- East Bay Greenway
- Oakland/Alameda Access Project
- I-80/Ashby Interchange Project
- I-80/Gilman Interchange Project
- SR 262 (Mission Blvd) Cross Connector Project

[9] Union City (UC) Transit, while providing important connections within Union City, does not represent service of countywide significance and was thus not incorporated in this analysis.

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KITTELSON & ASSOCIATES